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INSTITUT de COMBUSTION, AEROTHERMIQUE, REACTIVITE et ENVIRONNEMENT

THÈSE présentée par :

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Etude expérimentale et modélisation cinétique de la combustion de composés modèles de biocarburants. Détermination d'intermédiaires par spectrométrie de masse à photo-ionisation par rayonnement synchrotron

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Avant-propos

Cette thèse a été réalisée au sein de l'Institut de Combustion, Aérothermie, Réactivité et Environnement (ICARE), laboratoire faisant parti du site CNRS-INSIS d'Orléans. Je tiens à remercier dans un premier lieu le CNRS et la région Centre pour le financement de ces 3 années de recherche doctorale.

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I. Introduction

Alors que la population mondiale est en constante augmentation (elle est passée d'environ 3 milliards de personnes en 1960 à plus de 7 milliards en 2015 [1]), le mode de vie occidental, de plus en plus énergivore, devient peu à peu un modèle standard. Selon les projections de l'ONU, la population mondiale devrait augmenter de 2 milliards d'individus au cours des 30 prochaines années, passant de 7,7 milliards actuellement à 9,7 milliards en 2050 et 11 milliards vers l'an 2100. Cette situation engendre une augmentation importante de la demande en énergie et des émissions de gaz à effet de serre.

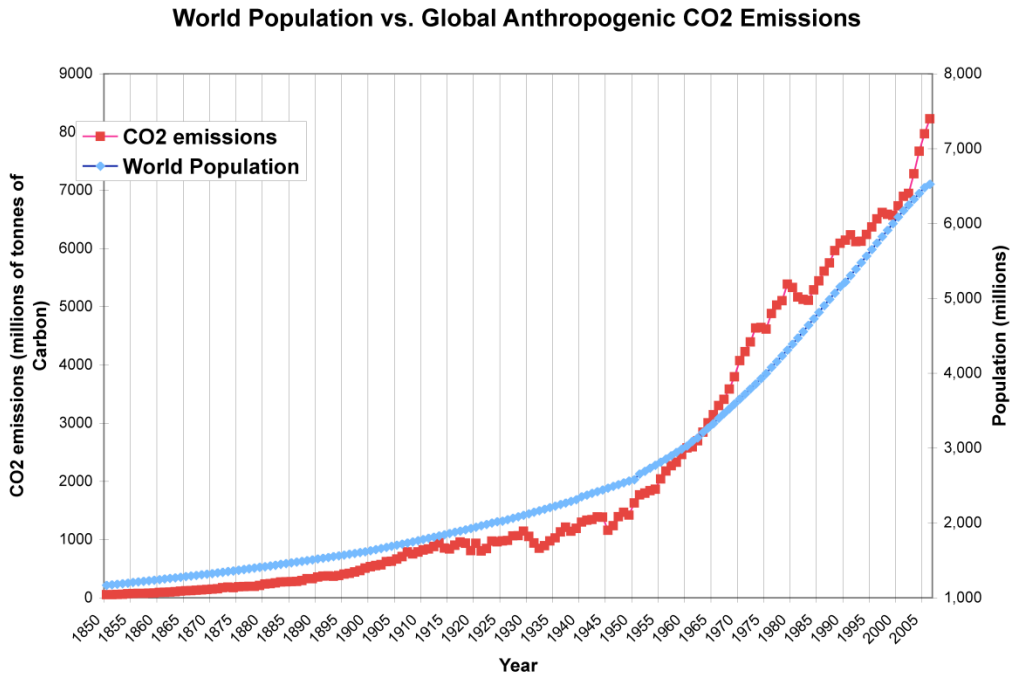

Figure I. 1 : Evolution des émissions de CO_2 et de la population mondiale au cours du temps. Source : Steve Easterbrook, University of Toronto https://www.easterbrook.ca/steve/2009/06/population-growth-vs-emissions-growth/.

Pour le transport comme pour d'autres secteurs, le pétrole est la principale énergie primaire. Ce développement des modes de transports utilisant du pétrole comme source d'énergie s'accompagne de problèmes de pollution.

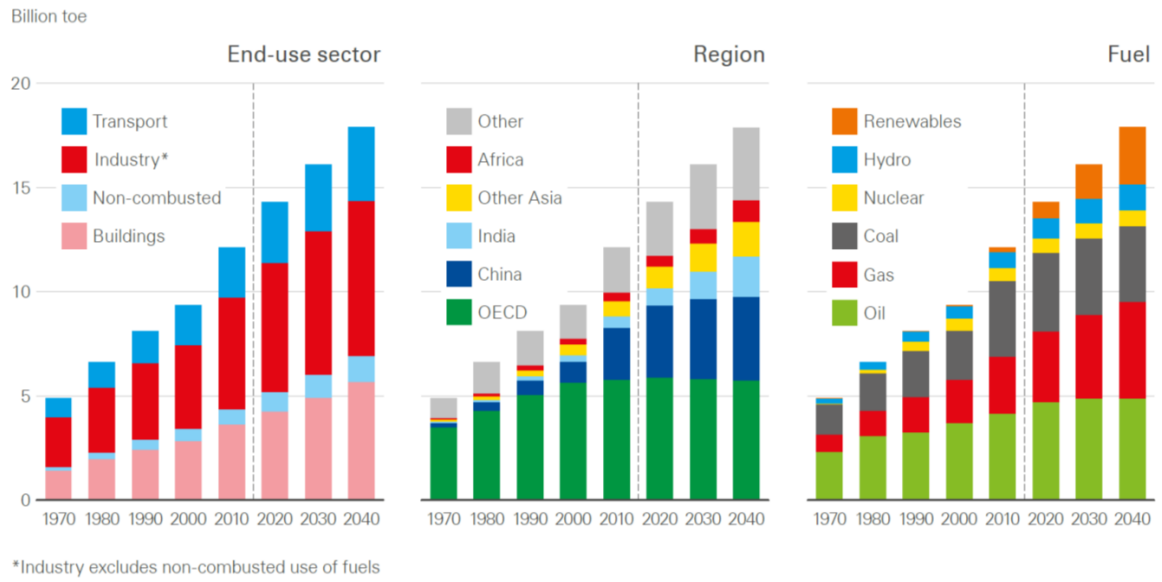

Figure I. 2 : Demande mondiale en énergie primaire en milliards équivalent pétrole. Source : BP Outlook 2019.

Toutefois, les réserves de pétrole sont limitées, ce qui nous pousse à rechercher des alternatives. Parmi celles-ci, on trouve les biocarburants qui peuvent être synthétisés à partir de matériaux renouvelables comme la biomasse ou les déchets. De nombreuses études concernent la synthèse et l'utilisation de ces composés [2-8].

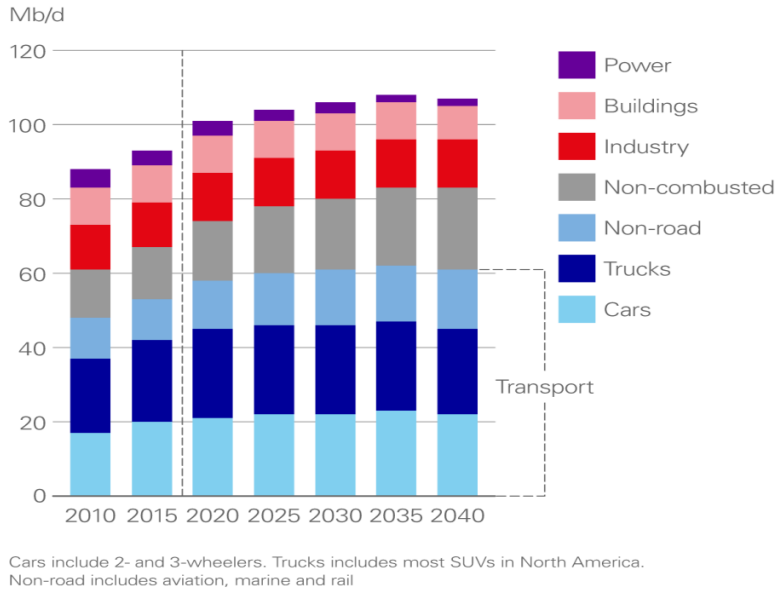

Figure I. 3 : Evolution de la demande mondiale en carburants liquides en million de barils par jour. Source : BP Outlook 2019.

De plus, les conséquences de la pollution engendrée par la combustion se répercutent sur la santé et l'environnement. Les principaux polluants du secteur automobile sont les oxydes d'azote (NOx), les hydrocarbures imbrûlés, les particules ou encore le monoxyde d'azote (CO). Ces trente dernières années, des directives ont été mises en place afin de contrôler dans un premier temps les émissions de ces polluants aux échappements telles que les normes Euro. Ces normes ont obligé les industriels à revoir le design de leur moteur, mais aussi à chercher de nouveaux carburants, non issus de ressource fossile, pouvant même n'être utiliser qu'en tant qu'additif, afin de réduire ces émissions de polluants et ainsi limiter l'impact écologique de nos moyens de transport.

Les éthers font partie des classes de composés pouvant être utilisés comme additifs aux carburants classiques ou comme carburant. A cette fin, il faut disposer de modèles cinétique pour représenter leur combustion et de données expérimentales obtenues dans des conditions bien contrôlées pour valider les modèles.

De nombreux travaux portant sur la combustion, l'oxydation, la pyrolyse de quelques éthers ont été publiés, comme indiqué dans le chapitre suivant. Toutefois, beaucoup d'incertitudes et d'inconnues demeurent.

L'objet de cette thèse est de fournir des données expérimentales fiables pour l'oxydation d'éthers et de proposer des modèles cinétiques détaillés validés sur la base d'expériences de laboratoire mettant en jeu des techniques complémentaires. Dans cette thèse, de nombreuses molécules ont été étudiées, mais seulement l'oxydation de deux éthers aliphatiques et de deux polyéthers seront développées.

Les composés retenus pour cette étude sont :

L'éther diéthylique a été sélectionné pour son intérêt applicatif et pour compléter les études antérieures ayant majoritairement porté sur l'éther diméthylique au démarrage de cette thèse.

L'éther dipropylique a été sélectionné parce qu'il est l'éther immédiatement supérieur à l'éther diéthylique et pour qui aucune étude cinétique n'avait été publiée au démarrage de cette thèse.

Le diméthoxyméthane a été sélectionné car c'est le composé le plus simple de la famille des éthers polyméthoxyméthyléniques. De plus, ce composé avait fait l'objet de peu d'études cinétiques au démarrage de cette thèse.

Le 1,2-diméthoxyéthane a été sélectionné car c'est un éther de glycol simple pouvant avoir un effet bénéfique sur la formation des particules de suie. Aucune étude cinétique n'avait été publiée au démarrage de cette thèse.

Dans cette thèse, les expériences ont été menées au moyen de réacteurs auto-agités par jets gazeux et de plusieurs systèmes analytiques complémentaires (chromatographie en phase gazeuse, spectrométrie infrarouge, spectrométrie de masse quadripolaire et à temps de vol, ionisation par impact électronique et photo-ionisation par lumière synchrotron). Ils sont décrits dans ce mémoire. Les modélisations cinétiques ont été menées en utilisant le code de calcul CHEMKIN.

Un récapitulatif des conditions expérimentales d'étude est présenté ci-dessous.

Composé	Structure	Pression	Richesse	τ (s)	$X_{carburant}$	T (K)
Ether diéthylique		700 Torr	1	1	1 %	450 - 900
		1 atm	0,5 / 1 / 2	0,07	1000 ppm	450 – 1220
		10 atm	0,5 / 1 / 2	0,7	1000 ppm	450 – 1240
Ether dipropylique		1 atm	0,5 / 1 / 2	0,07	1000 ppm	740 – 1280
		10 atm	0,5 / 1 / 2 /4	0,7	1000 ppm	450 – 1280
Diméthoxy méthane		750 Torr	0,5	2	2 %	460 - 820
		10 atm	0,2 / 0,5 / 1,5	0,7	1000 ppm	740 - 1220
1,2-diméthoxy éthane		700 Torr	1	1	1 %	450 - 900
		10 atm	0,5 / 1 / 2	0,7	1000 ppm	450 - 1160

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La combustion des hydrocarbures a été intensément étudiée au cours du 20ème siècle. Différents dispositifs expérimentaux ont permis de mieux comprendre les mécanismes régissant l'oxydation en fonction de la température. Malgré quelques disparités l'ensemble des familles chimiques ont été étudiées sur un large domaine de conditions expérimentales. Ces dernières années, l'accent a été mis sur les alcools et les esters méthyliques, fonctions typiques des biocarburants de première génération, qui étaient pressentis pour remplacer les carburants conventionnels dans les moteurs. Aujourd'hui les études sur les molécules oxygénées telles que les éthers, les cétones ou les esters se sont multipliées afin d'enrichir la base de données sur ces fonctions typiques des biocarburants de seconde génération produits à partir de biomasse.

Ce chapitre bibliographique décrit dans un premier temps des concepts généraux liés à la combustion (équations simples et mécanismes d'oxydation). Un état de l'art sur l'oxydation des éthers et di-éthers symétriques choisis pour ce travail est ensuite proposé.

1. Combustion : généralités

1.1. Équations

La combustion est une réaction chimique d'oxydoréduction au cours de laquelle un combustible (ou carburant) est oxydé par un comburant (l'oxygène contenu dans l'air le plus souvent). Elle a la particularité d'être exothermique et si la combustion est vive, elle peut se traduire par une flamme voire même une explosion (déflagration ou détonation si la vitesse du front de flamme dépasse la vitesse du son). Le combustible peut être solide (bois, charbon…), liquide (pétrole, alcool…) ou gazeux (gaz naturel, dihydrogène…) cependant la réaction n'a lieu qu'à l'état gazeux. L'énergie d'activation de cette réaction est élevée et il est donc nécessaire d'avoir un apport d'énergie du milieu extérieur pour initier la réactivité. Cette énergie peut être sous forme de chaleur, d'étincelle ou encore d'arc électrique. La production de chaleur due à l'exothermicité de la combustion permet d'auto-entretenir la réaction voire de l'amplifier.

La combustion met en jeu un enchaînement de dizaines, centaines voire milliers de réactions faisant intervenir des espèces intermédiaires communément appelées intermédiaires

réactionnels. Il est cependant possible de résumer en seule équation bilan la réaction entre un carburant oxygéné $C_xH_yO_z$ et de l'oxygène avec l'équation suivante :

$$C_xH_yO_z + \left(x + \frac{y}{4} - \frac{z}{2}\right) O_2 = x\, CO_2 + \frac{y}{2}\, H_2O$$

L'eau et le dioxyde de carbone sont les produits majoritaires formés au cours de la réaction en considérant une réaction complète. En réalité d'autres espèces sont formées et peuvent ne pas être entièrement oxydées selon les conditions de mélange, de température ou de concentration des réactifs. C'est le cas des espèces polluantes et particules relâchées par les moteurs à combustion interne par exemple. Leur concentration dépendant de la quantité relative de carburant par rapport au comburant. On note φ la richesse d'un mélange carburant/comburant défini par la relation :

$$\varphi = \frac{\left(\frac{X_{carburant}}{X_{comburant}}\right)_{réel}}{\left(\frac{X_{carburant}}{X_{comburant}}\right)_{stœchiométrie}}$$

Où X est la fraction molaire du carburant ou du comburant. Avec l'équation bilan de la combustion on remarque :

$$\left(\frac{X_{carburant}}{X_{comburant}}\right)_{stœchiométrie} = \frac{1}{\left(x + \frac{y}{4} - \frac{z}{2}\right)}$$

Si la richesse est égale à 1, on est dans les conditions stœchiométriques. C'est dans ces conditions que la réaction est la plus complète. Si la richesse est inférieure à 1, on parle alors d'un mélange pauvre dans lequel le carburant est le réactif limitant. Si la richesse est supérieure à 1, le mélange est qualifié de riche. L'oxygène fait défaut dans ce cas et la production d'espèces intermédiaires polluantes telles que le monoxyde de carbone ou les suies est augmentée.

1.2. Les mécanismes d'oxydation

Les réactions intervenant au cours de la combustion des hydrocarbures sont bien connues. Selon la température, différents mécanismes d'oxydation interviennent. On distingue sur la Figure II. 1 trois régimes principaux de température lors de l'oxydation d'un composé. Le mécanisme de basse température est caractérisé par une lente réactivité, une faible exothermicité (d'où l'appellation « flamme froide ») et une prédominance des réactions

d'isomérisation et de peroxydation. A haute température, la vitesse d'oxydation est beaucoup plus rapide et les réactions plus exothermiques. Ce sont les réactions de rupture de liaison qui prédominent ici. Enfin, entre ces deux domaines de température, on peut observer une diminution de la réactivité dans la zone de basse température : c'est la zone du « coefficient négatif de température (CNT) ».

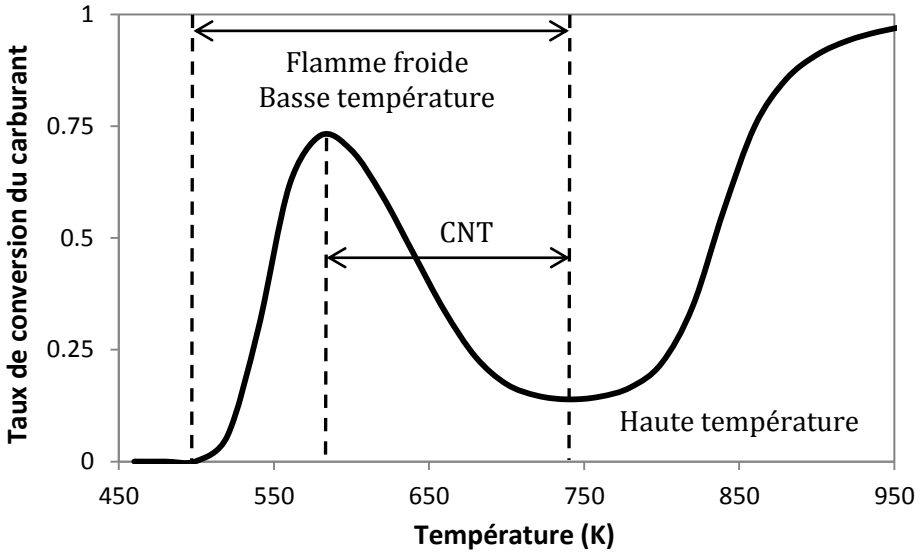

Figure II. 1 : Les différents régimes d'oxydation en fonction de la température.

1.2.a. Les réactions de basse température

La chimie d'oxydation à basse température est très variée et complexe. De nombreuses familles d'espèces sont impliquées dans ce mécanisme dont certaines, très instables et fragiles, sont difficiles à mesurer voire même à détecter. Ceci rend l'étude expérimentale de ce régime de température plus délicate à étudier. Cependant des progrès ont été obtenus avec l'utilisation de la spectrométrie de masse à photo-ionisation par rayonnement synchrotron [9] qui permet de détecter ces espèces instables non observables avec les appareils de mesures conventionnels.

Le mécanisme d'oxydation débute par une étape d'initiation. Les molécules d'O_2 du milieu réactionnel vont arracher un atome d'hydrogène du réactif hydrocarboné RH pour former des radicaux alkyles R. Cette réaction devient très vite négligeable devant les réactions de métathèse par lesquelles l'atome d'hydrogène est arracher par de petits radicaux X (X = OH, O, HO_2, O …) formés dans au cours de la réaction.

$$RH + O_2 \leftrightharpoons R + HO_2$$

$$RH + X \leftrightharpoons R + HX$$

S'en suit le schéma classique d'oxydation à basse température décrit par Benson et al. [10]. Les molécules d'oxygène O_2 s'additionnent ensuite sur le site radicalaire pour produire des radicaux peroxyalkyles RO_2 qui peuvent à leur tour réagir selon plusieurs voies :

• une réaction de dismutation avec un autre radical peroxyalkyle $R'O_2$ formant des radicaux alkoxy RO et de l'oxygène

$$RO_2 + R'O_2 \leftrightharpoons RO + R'O + O_2$$

• une réaction d'arrachement d'un hydrogène d'une molécule R'H menant à la formation d'une molécule hydroperoxyalkyle ROOH qui se décompose ensuite en radicaux alkoxy et hydroxyle OH

$$RO_2 + R'H \leftrightharpoons R' + ROOH$$

$$ROOH \leftrightharpoons RO + OH$$

• une réaction d'isomérisation via un état de transition cyclique pour former des radicaux hydroperoxyalkyle QOOH

$$RO_2 \leftrightharpoons QOOH$$

La vitesse de cette réaction dépend de la taille du cycle de l'état de transition impliqué. En effet, l'énergie de cyclisation diminue lorsque la taille du cycle augmente à cause des tensions sur les liaisons des atomes d'un si petit cycle. Cependant, un état de transition comportant un trop grand nombre d'atomes signifie que beaucoup de liaisons sont bloquées. Compte tenu de ces contraintes, un état de transition cyclique à 6 centres est favorisé. Puis, ces radicaux, par décomposition, sont à l'origine de la production d'une oléfine et d'un radial hydroperoxy HO_2, ou bien d'un radical OH et de différents produits tels que des éthers cycliques et autres composés oxygénés.

$$QOOH \leftrightharpoons \text{produits oxygénés} + OH$$

$$QOOH \leftrightharpoons \text{oléfines} + HO_2$$

Le radical QOOH peut également subir une seconde addition d'oxygène O_2 sur son site radicalaire, formant un radical O_2QOOH. L'isomérisation de ce dernier par transfert d'un atome d'hydrogène et la rupture de la liaison O-OH mène à la formation d'un cétohydroperoxyde qui est très instable à ces températures (~600K). La dégradation de cette espèce libère un nouveau radical hydroxyle OH. Cette voie réactionnelle, qui à partir d'un radical initiant les réactions de métathèse, engendre la production de deux radicaux hydroxyles pouvant initier à leur tour ces réactions d'arrachement d'hydrogène sur le carburant, ce qui provoque donc une augmentation de la réactivité dans le milieu. Les étapes majeures du chemin réactionnel de l'oxydation à basse température sont résumées sur la Figure II. 2.

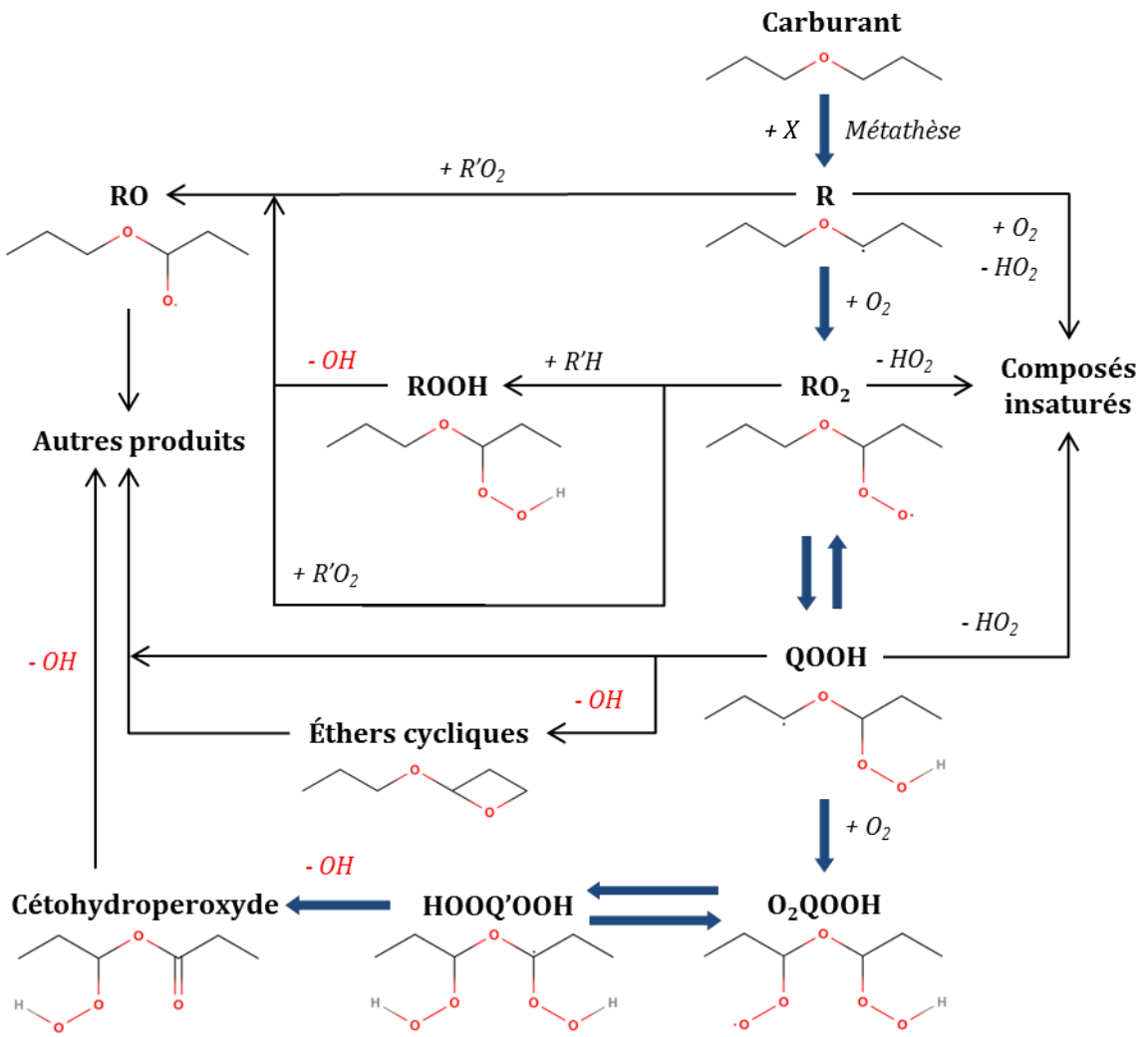

Figure II. 2 : Chemin réactionnel à basse température, exemple de l'oxydation du dipropyl-éther.

1.2.b. La zone du coefficient négatif de température

La compétition entre les réactions menant à la formation des éthers cycliques et celles des cétohydroperoxydes est très importante à basse température. En effet, lorsque la température augmente (T > ~650K), on observe une diminution de la réactivité globale. On appelle cette plage de température, entre le maximum de réactivité de la flamme froide et la zone de haute température, la zone du « coefficient négatif de température » (CNT). Cette chute de réactivité s'explique par un déplacement de l'équilibre des réactions d'addition d'oxygène vers les réactifs, ce qui limite en outre la formation de cétohydroperoxydes. Or cette voie est responsable de l'augmentation de la réactivité à basse température par la production de deux radicaux hydroxyles à chaque réalisation du schéma réactionnel. De plus, les radicaux alkyles ne s'additionnant plus autant sur l'oxygène, ils sont oxydés et forment des radicaux hydroperoxy HO_2 et des oléfines. Ces radicaux HO_2 sont bien moins réactifs que les radicaux OH et réagissent par une réaction de dismutation pour former du peroxyde d'hydrogène inerte à cette température.

$$R + O_2 \rightarrow \text{oléfine} + HO_2$$

$$HO_2 + HO_2 \rightarrow H_2O_2 + O_2$$

1.2.c. Les réactions de haute température

À plus haute température (~800 K), la décomposition du peroxyde d'hydrogène H_2O_2 mène à la formation de deux radicaux hydroxyle OH très réactifs.

$$H_2O_2\ (+\ M) \rightarrow OH + OH\ (+\ M)$$

À cette température, les réactions d'isomérisation et de décomposition des radicaux alkyles prédominent sur les réactions d'addition de l'oxygène. Ces radicaux se décomposent en alcènes et petits radicaux tels que H et CH_3 par des réactions de β-scission. La liaison en position β (liaison C-C, C-O ou C-H) du site radicalaire est rompue et forme une insaturation sur la liaison adjacente au site radicalaire comme l'illustre la Figure II. 3. Ces réactions deviennent de plus en plus importantes lorsque la température augmente.

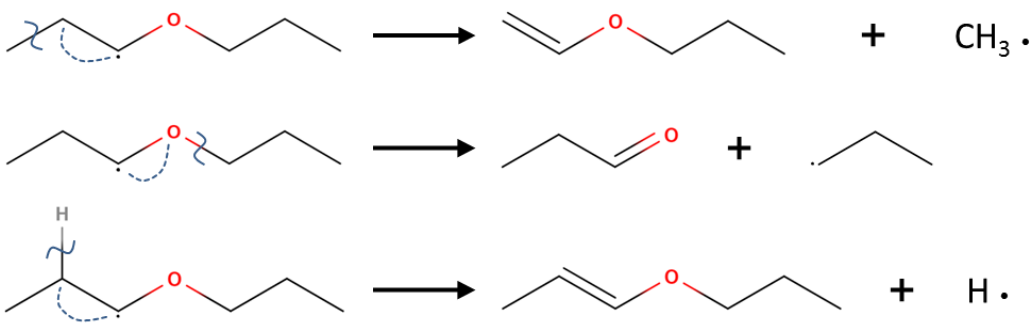

Figure II. 3 : Exemples de réactions de β-scissions dans le cas du dipropyl-éther.

Alors que les radicaux méthyles CH_3 participent à des réactions de terminaisons, les radicaux H eux sont consommés par des réactions de ramification de chaîne avec l'oxygène produisant des radicaux OH.

$$H + O_2 \rightarrow OH + O$$

$$H + O_2 (+ M) \rightarrow HO_2 (+ M)$$

$$CH_3 + R \rightarrow \text{Produits de terminaison}$$

Enfin, avec l'augmentation de la température, les alcènes et radicaux carbonés formés subissent à leur tour ce mécanisme de dégradation ou d'oxydation jusqu'à la formation de monoxyde de carbone CO qui sera à son tour oxydé par les radicaux OH en CO_2.

2. La combustion des éthers

2.1. L'éther diéthylique

Après le diméthyl-éther [11-108], l'éther diéthylique (DEE) est l'éther aliphatique dont l'oxydation a fait l'objet du plus grand nombre d'études, comme présenté dans cette section.

Les études précédentes sur la combustion de l'éther diéthylique liées à la combustion incluent la structure et la vitesse de combustion des flammes laminaires [109-111], les délais d'auto-inflammation [112] et la pyrolyse / oxydation dans un tube à choc et un réacteur agité par jets gazeux [113, 114]. À notre connaissance, la première étude de spéciation sur le DEE a été rapportée dans les années 60 par Agnew et Agnew [115] dans une flamme plate stabilisée

pour les mélanges riches DEE / air à la pression atmosphérique. Ils ont identifié et quantifié un nombre important d'espèces parmi lesquelles l'éther cyclique 2-méthyl-1,3-dioxolane. Yasunaga et al. [114] ont étudié la pyrolyse et l'oxydation d'éther diéthylique derrière des ondes de choc réfléchies au-dessus de 900 K. Tran et ses collaborateurs [110] ont présenté des profils d'espèces dans une flamme prémélangée riche ainsi que des vitesses de flammes laminaires de DEE en chambre cylindrique entre 1 et 5 atm, et ils ont également étudié l'effet du mélange de DEE sur des flammes de n-butane et ont montré une diminution de la formation de précurseurs de suie par rapport à une flamme de n-butane pur [111]. Vin et al. [113] ont étudié la pyrolyse du DEE dans un réacteur agité par jet entre 200 et 800 torrs et entre 600 et 1100 K. Ils ont observé la destruction complète du réactif à 1080 K pour un temps de séjour de 2 s et ont signalé des concentrations de CO, méthane, éthylène et acétaldéhyde comme produits majoritaires. Werler et ses collaborateurs [112] ont mesuré les délais d'auto-inflammation du DEE dans un tube de choc (900–1300 K) et une machine à compression rapide, MCR, (500–1060 K) à haute pression. Ils ont observé un allumage en deux stades dans des expériences en MCR. La vitesse de flamme laminaire du DEE a également été étudiée par plusieurs groupes [109, 116, 117]. Sakai et ses collaborateurs [118, 119] ont récemment effectué des recherches théoriques sur la chimie à basse température du DEE. Ils ont calculé la thermochimie et les constantes de vitesse des espèces et réactions associées, et proposé un mécanisme cinétique.

La présente étude examine l'oxydation du DEE dans un réacteur auto-agité par jets gazeux. Elle couvre un large domaine de température allant des basses températures aux températures pour des mélanges pauvres à riches (φ = 0,5, 1, 2) à 10 atm. Les conditions expérimentales choisies dans cette étude sont les mêmes que dans nos expériences menées avec l'éther de dibutyle (DBE), précédemment publiées [120]. Contrairement au comportement dit de «double-NTC» non conventionnel observé avec le DBE, DEE présente un comportement conventionnel mais avec une flamme froide intense [121].

2.2. L'éther dipropylique

L'éther di-n-propylique (DPE, C_3H_7–O–C_3H_7) n'est pas considéré comme un biocarburant potentiel pour le moment et sa cinétique d'oxydation n'a pas été étudiée. Cependant, en termes de nombre de carbone, cet éther symétrique se situe entre le DEE et le DBE. Les structures de ces éthers sont illustrées dans la figure suivante.

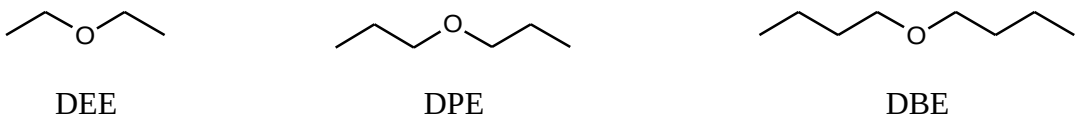

Figure II. 4 : Structure des éthers diéthylique, di-n-propylique and di-n-butylique.

Il est alors fondamental d'étudier son oxydation. Ainsi, l'oxydation du DPE a été étudiée ici dans les mêmes conditions expérimentales que le DEE et le DBE, soit: à 10 atm, entre 470 et 1160 K. Un sous-modèle cinétique a été développé pour ce carburant et comparé aux seules données actuelles, étant donné que cette étude est la première étude de l'oxydation de l'éther di-n-propylique [122, 123].

3. La combustion des di-éthers

Les poly-oxyméthylène diméthyl éthers (POMDME), dont la formule générale est CH_3O (CH_2O) nCH_3, sont des carburants alternatifs attrayants [124] qui peuvent réduire la formation de multiples polluants en rompant le compromis suie-NOx [125-127].

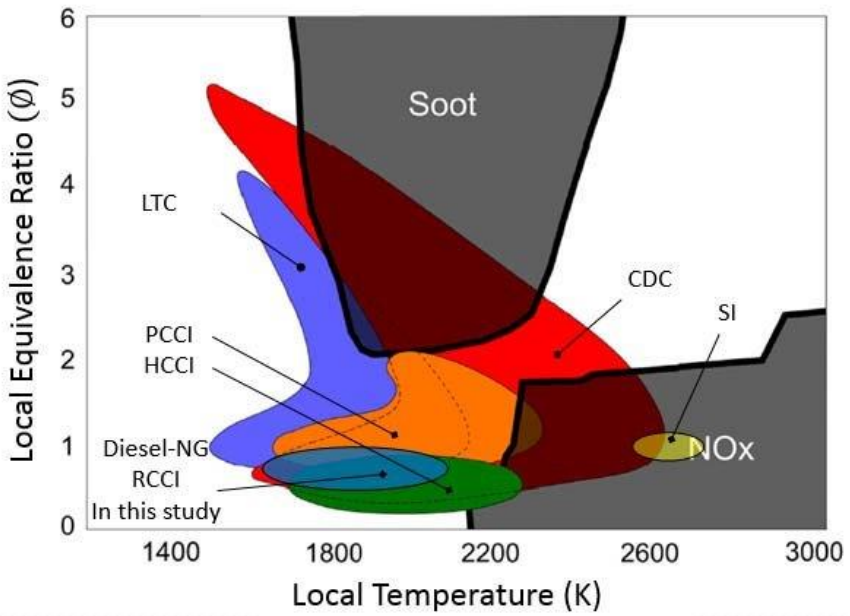

Figure II. 5 : Impact de la richesse et de la température sur les émissions de NOx et de suie [128].

3.1. Le diméthoxy méthane

Le diméthyléther (DME, CH_3OCH_3) et le diméthoxyméthane (DMM, $CH_3OCH_2OCH_3$) peuvent être considérés comme des cas particuliers avec respectivement n = 0 et 1 dans la famille des POMDME. Les deux composés individuels ont été testés en tant qu'additifs diesel, bien qu'ils ne fassent pas partie des mélanges optimaux de carburant POMDME ayant 3 à 4 groupes -CH_2O- [129]. Il est intéressant de noter que le DMM a un indice de cétane CN = 29, beaucoup plus bas que tous les autres composés de la famille des POMDME [117], même en incluant le DME qui est une molécule à chaîne courte (CN = 55). Les indices de cétane reflètent les propriétés d'auto-inflammation du carburant qui sont régies par la cinétique d'oxydation à basse température.

Pour le DME et le DMM, des recherches sur leur cinétique d'oxydation sont nécessaires pour une utilisation dans les moteurs. La connaissance de leurs caractéristiques d'oxydation, en particulier celles liées aux groupes CH_3O- et -OCH_2O- dans les molécules de carburant, peut améliorer la compréhension cinétique de l'oxydation des POMDME plus lourds. Des efforts considérables de recherche ont été consacrés à la chimie d'oxydation responsable de la réactivité à basse température du DME comme indiqué dans un paragraphe précédent [100, 121-126], tandis que la cinétique d'oxydation du DMM n'est pas aussi bien établie que celle du DME. Une première étude de l'oxydation en réacteur agité par jets gazeux [130] du DMM couvrait des températures moyennes à élevées comprises entre 800 et 1 200 K, supérieures au régime typique de réactivité de basse température. Des expériences d'oxydation à haute pression couvrant de larges plages de températures et de richesses ont été réalisées dans un tube à écoulement par Marrodán et al. [131]. Des plateaux de concentrations de carburant ont été observés en conditions oxydantes et les auteurs [131] ont proposé un modèle cinétique incorporant la chimie du radical CH_3OCH_2O afin de prendre en compte de tels phénomènes, mais les réactions de ramification de chaîne liées aux radicaux du DMM n'ont pas été prises en compte. Tout récemment, lors de la préparation de cette thèse, Vermeire et al. [132] ont présenté des spéciations effectuées lors de l'oxydation du DMM dans un JSR à une pression de 1,07 bar et différentes richesses. Ils ont proposé un modèle cinétique basé sur des calculs théoriques au niveau CBS-QB3.

En 2018 et 2019, d’autres travaux ont été publiés alors que notre étude initialement soumise pour une présentation à l’International Symposium on Combustion en 2017 était déjà finalisée [133]. Une étude de la pyrolyse du diméthoxyméthane a été menée à l’Université de Zaragossa en fonction de la température (1075-1475 K) et de la concentration initiale de

carburant (33 333 et 50 000 ppm de DMM) sur la propension du DMM à produire de la suie. Les auteurs ont aussi étudié la réactivité de la suie avec O_2 et NO [134]. Kopp et al. [135] ont étudié la réactivité des groupes (O-CH_2-O) à l'aide de méthodes ab initio. Dans cette étude, ils ont investigué la cinétique et la thermochimie du diméthoxyméthane au niveau CCSD (T) / aug-cc-pV (D + T) MB2PLYPD3BJ / 6-311 ++ g (d, p). Les constantes de vitesse pour l'arrachage d'hydrogène par H et CH_3 ont été calculées montrant que l'arrachage sur le groupe méthylènedioxy est préféré à celle des groupes méthyle terminaux. Peukert et al. [136] ont mené des expériences en tube à choc pour étudier la décomposition thermique du diméthoxyméthane Les principales réactions d'initiation sont : $CH_3OCH_2OCH_3$ -> CH_3O + CH_2OCH_3 (1) et $CH_3OCH_2OCH_3$ -> CH_3 + OCH_2OCH_3 (2). Deux installations de tubes à choc et trois techniques de détection différentes ont été combinées: derrière des ondes de choc réfléchies, les auteurs ont effectué des mesures temporelles de (i) la formation d'atomes H en utilisant le très sensible H-ARAS (spectrométrie d'absorption atomique par résonance) et (ii) la concentration du DMM par spectrométrie de masse temps de vol (HRR-TOF-MS). De plus, (iii) la composition des produits de réaction stables, dépendante de la température, a été mesurée par chromatographie en phase gazeuse (GC / MS) dans des expériences en tube à choc à simple impulsion Les expériences couvrent une plage de température allant de 1100-1430 K, une plage de pression allant de 1,2 à 2,5 bars et des fractions molaires initiales allant de 0,5 ppm (pour les expériences H-ARAS) à 10 000 ppm (pour les expériences HRR-TOF-MS).

Wang et al. ont [137] étudié l'oxydation du diméthoxyméthane à basse température avec un mini réacteur (MCPVT). Les peroxydes générés par l'auto-oxydation du DMM ont été mesurés par iodimétrie et chromatographie en couche mince (TLC). Le peroxyde dominant a été séparé des produits d'oxydation par chromatographie sur colonne, avec une structure caractérisée par spectrométrie de masse (MS), résonance magnétique nucléaire H^1 et C^{13}. Les résultats montrent que l'oxydation est principalement initiée par arrachage d'hydrogène sur le méthylènedioxy (O-CH_2-O) du DMM lorsque la température est supérieure à environ 310 K. Le produit principal de l'hydroperoxyde, l'hydroperoxy (méthoxyméthoxy) méthane, a été observé. La constante de vitesse de la réaction du diméthoxyméthane avec les radicaux OH a été déterminée par Baensch et Olzmann dans un réacteur à écoulement lent par photolyse laser pulsée et fluorescence induite par laser de 297 à 570 K à des pressions nominales de 2, 5 et 10 bars dans l'hélium. Une très faible dépendance à la température de la constante de vitesse a été observée, sans dépendance significative à la pression [138]. Le même groupe a étudié la cinétique de la réaction du DMM + H et de la décomposition

unimoléculaire du DMM avec un tube à choc [139]. Pour les deux réactions, les constantes de vitesse ont été déterminées à partir des profils temporels de concentration de l'atome H mesurés par ARAS.

La pyrolyse du DMM dans le néon a aussi été étudiée en tube à choc avec une détection par spectrométrie de masse à temps de vol (T = 1100–1700 K, p = 0,9–1,3 bar). Les profils temporels de concentration de DMM, CO, CH_2O, C_2H_6, C_2H_4 et CH_4 ont été enregistrés simultanément. L'oxydation du diméthoxyméthanea aussi été étudiée et un modèle cinétique détaillé développé pour une description complète des processus d'oxydation à haute et à basse température par Jacobs et ses collaborateurs [140]. Le sous-mécanisme du DMM a été implémenté dans AramcoMech 2.0. Les constantes de vitesse sont basées sur des analogies avec celles de l'oxydation du diméthyléther, de l'éther diéthylique et du n-pentane. De nouvelles mesures de délais d'auto-inflammation été réalisées dans un tube à choc, une machine à compression rapide et dans un réacteur à flux laminaire couvrant une large gamme de conditions (1-40 bars, 590 -1215 K, $\varphi = 1$). Le modèle cinétique a aussi été validé pour des vitesses de flammes laminaires, en réacteur auto-agité par jets gazeux, et avec d'autres données expérimentales de la littérature (tube à choc, machine à compression rapide).

Dans notre travail [133], l'étude de la réactivité et des spéciations lors de l'oxydation du DMM ont été menées via des approches expérimentales et de modélisation. Des travaux expérimentaux ont été réalisés en combinant les avantages de deux installations de JSR équipées de techniques analytiques différentes. Un mélange DMM / O_2 / Ar a été étudié au Lawrence Berkeley National Laboratory (ALS) dans un JSR fonctionnant à une pression quasi atmosphérique (750 Torr) couplé à un à faisceau moléculaire et un spectromètre de masse à photoionisation (PI-MBMS). Ce système a permis la détection de certains intermédiaires réactifs tels que les peroxydes. Pour répondre aux conditions pratiques de haute pression dans les moteurs, des expériences d'oxydation couvrant différentes richesses (0,2, 0,5 et 1,5) ont également été réalisées avec le JSR d'Orléans à 10 atm, avec des mesures de concentrations d'espèces par spectromètre infrarouge à transformée de Fourier (FTIR) et chromatographie en phase gazeuse (GC). Un nouveau modèle cinétique a été proposé pour décrire l'oxydation du DMM. Le modèle a été testé sur les mesures de spéciation obtenues dans nos travaux ainsi que des résultats de la littérature.

3.2. Le 1,2-diméthoxyéthane

Le 1,2-diméthoxyéthane (1,2-DME, $CH_3OCH_2CH_2OCH_3$) a un indice de cétane élevé (CN = 86 [141]) ; il présente donc un fort potentiel pour favoriser l'auto-inflammation. A notre connaissance, les études pertinentes sur l'oxydation du 1,2-DME se limitent à celle portant sur la structure de flamme présentée par Sun et al. [135]. C'est pourquoi nous avons mené des expériences d'oxydation de mélanges 1,2-DME / O_2 / N_2 pour différentes richesses (0,5, 1,0 et 2,0) dans le réacteur agité par jets gazeux d'Orléans à haute pression (10 atm) sur la plage de températures allant de 450 à 1100 K. Les évolutions de la concentration des espèces en fonction de la température ont été obtenues en ligne par spectrométrie infrarouge à transformée de Fourier (FTIR) et par chromatographie en phase gazeuse (GC). Au Lawrence Berkeley National Laboratory, la technique de spectrométrie de masse à faisceau moléculaire et photoionisation (PI-MBMS) a été combinée à un autre JSR fonctionnant à une pression proche de la pression atmosphérique (700 torr), dans le but de suivre les intermédiaires réactitionnels lors de l'oxydation du 1,2-DME. Un modèle cinétique a été construit sur la base de la stratégie "classes de réaction", qui permet de prédire de manière satisfaisante nos mesures expérimentales. Une réactivité prononcée à basse température du 1,2-DME a été observée dans toutes les conditions étudiées, et des intermédiaires essentiels tels que les cétohydroperoxydes ont été détectés avec le PI-MBMS. Certaines spécificités de l'oxydation du 1,2-DME ont été élucidées par modélisation. Les doubles groupes éthers dans la molécule de carburant facilitent les arrachages d'hydrogène et entravent les éliminations concertées aboutissant à la formation d'espèces stables. La réactivité à basse température commence à des températures relativement basses en comparaison avec le n-hexane par exemple. Les séquences de réactions de ramification de chaîne qui suivent les deuxièmes additions d'O_2 se conduisant à une remarquable réactivité à basse température du 1,2-DME.

III. Dispositif expérimental

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La combustion est un phénomène physico-chimique délicat à étudier. En plus de mettre en jeu des mécanismes chimiques complexes, il intervient sur un large domaine de pression (du mbar au millier de bar) et de température (450 – 2500 K). Son étude nécessite alors un grand nombre de dispositifs expérimentaux différents mais complémentaires. En effet, il est possible de mesurer la vitesse laminaire d'une flamme prémélangée par bombe sphérique ou bien par brûleur. Cette donnée globale sur le comportement de l'oxydation d'un hydrocarbure permet de valider un mécanisme réactionnel mais pas de comprendre la cinétique détaillée à l'œuvre. C'est également le cas du délai d'auto-inflammation mesurable par machine à compression rapide à basse température (T < 1000 K) ou par tube à choc à plus hautes températures. Afin d'élaborer un mécanisme cinétique détaillé, il est nécessaire d'identifier et de quantifier les intermédiaires qui se forment au cours de la réaction. Le dispositif expérimental le plus utilisé pour ce type de mesures est le réacteur parfaitement agité et pour notre étude deux réacteurs auto-agités par jets gazeux ont été utilisé. Le premier, à Orléans, permet une étude cinétique jusqu'à 10 bar, et le deuxième à l'Advanced Light Source du Lawrence Berkeley National Laboratory à Berkeley aux Etats-Unis, fourni une identification plus précise des intermédiaires réactionnels qui interviennent au cours de la réaction.

1. Le réacteur auto-agité par jets gazeux

1.1. Principe de fonctionnement

Le principe du réacteur auto-agité par jets gazeux a été décrit par Matras et Villermaux [142] en 1973. Il s'agit d'une enceinte à volume constant dans laquelle on injecte un mélange combustible, comburant (oxygène) et gaz diluant (azote ou argon). Le mélange est assuré par des injecteurs (Figure III. 1). Ce dispositif opère en régime continu et permet une homogénéité en température et concentration dans la chambre réactionnelle. Ainsi, la conversion des réactifs en produits est uniquement régie par des processus chimiques. Pour cela, il est important que la vitesse de mélange des réactifs soit très rapide par rapport au temps de passage dans le réacteur. Afin d'obtenir un mélange parfait, trois critères doivent être respectés :

• Les jets qui assurent le mélange doivent avoir un nombre de Reynolds supérieur à 800,

• Le taux de recyclage des gaz doit être suffisamment élevé,

• La vitesse de sortie des gaz au niveau des injecteurs doit être inférieure à la vitesse du son dans les conditions de pression et de température du réacteur.

Ce dispositif expérimental permet de suivre l'oxydation d'un composé soit à température constante et temps de passage variable, soit à temps de passage constant et température variable. La deuxième configuration a été préférée car elle permet de garder les mêmes débitmètres tout au long de l'expérience.

Figure III. 1 : Photo de la chambre réactionnelle du réacteur auto-agité d'Orléans.

1.2. Calcul des débits gazeux

Toutes les expériences sont réalisées à temps de passage constant dans notre étude. Seule la température T de la chambre réactionnelle est variable, il est donc nécessaire de modifier les débits des réactifs et du gaz diluant afin de conserver le temps de passage constant. Pour calculer ces débits, on peut partir de l'expression du temps de passage τ (en s) :

$$\tau = \frac{V_r}{Q_{tot}} \times \frac{T_0}{T} \times \frac{P}{P_0}$$

Avec : _ V_r le volume de la chambre réactionnelle en cm^3,

_ Q_{tot} : le débit total de gaz en cm^3/s,

_ T_0 : la température ambiante de la pièce en K,

_ P_0 : la pression ambiante dans la pièce en atm (atmosphère).

On peut alors écrire le débit gazeux de l'espèce i de la façon suivante en utilisant sa fraction molaire X_i.

$$Q_i = X_i \times Q_{tot} = X_i \times \frac{V_r}{\tau} \times \frac{T_0}{T} \times \frac{P}{P_0}$$

Les espèces oxygénées étudiées au cours de ce travail sont à l'état liquide dans les conditions de pression et de température de la salle d'expérimentation. En supposant qu'elles se comportent comme un gaz parfait une fois à l'état gazeux, on peut calculer le débit liquide nécessaire.

$$P_0 \times V = \frac{mRT_0}{M} \leftrightarrow \frac{T_0}{P_0} = \frac{VM}{mR} = \frac{M}{\rho R}$$

Où : _ m est la masse du composé en g,

_ R est la constante des gaz parfaits valant 0,08206 cm^3.atm/mol/K,

_ M est la masse molaire de l'espèce en g/mol,

_ ρ est la masse volumique de l'espèce en g/cm^3.

Enfin :

$$Q_{liquide} = X_{liquide} \times \frac{V_r}{\tau} \times \frac{P}{T} \times \frac{M}{\rho R}$$

Des débitmètres massiques assurent le contrôle des débits des gaz (azote et oxygène). Le débit de liquide peut être injecté par une pompe HPLC (High Performance Liquid Chromatography) ou par seringue selon le dispositif expérimental.

2. Le dispositif d'Orléans

2.1. Description du réacteur

Le réacteur auto-agité d'Orléans a été mis en place par Dagaut et al. [143] en 1986 et la Figure III. 2 schématise le dispositif. La chambre réactionnelle est une sphère de 38 cm^3 en silice fondue transparente afin de limiter les réactions aux parois. Quatre injecteurs opposés deux à deux de façon pyramidale assurent le mélange des gaz. Une sonde de prélèvement des gaz munie d'un thermocouple Pt/Pt-Rh 10% peut se déplacer selon l'axe vertical afin de vérifier l'homogénéité en concentration et température dans le réacteur.

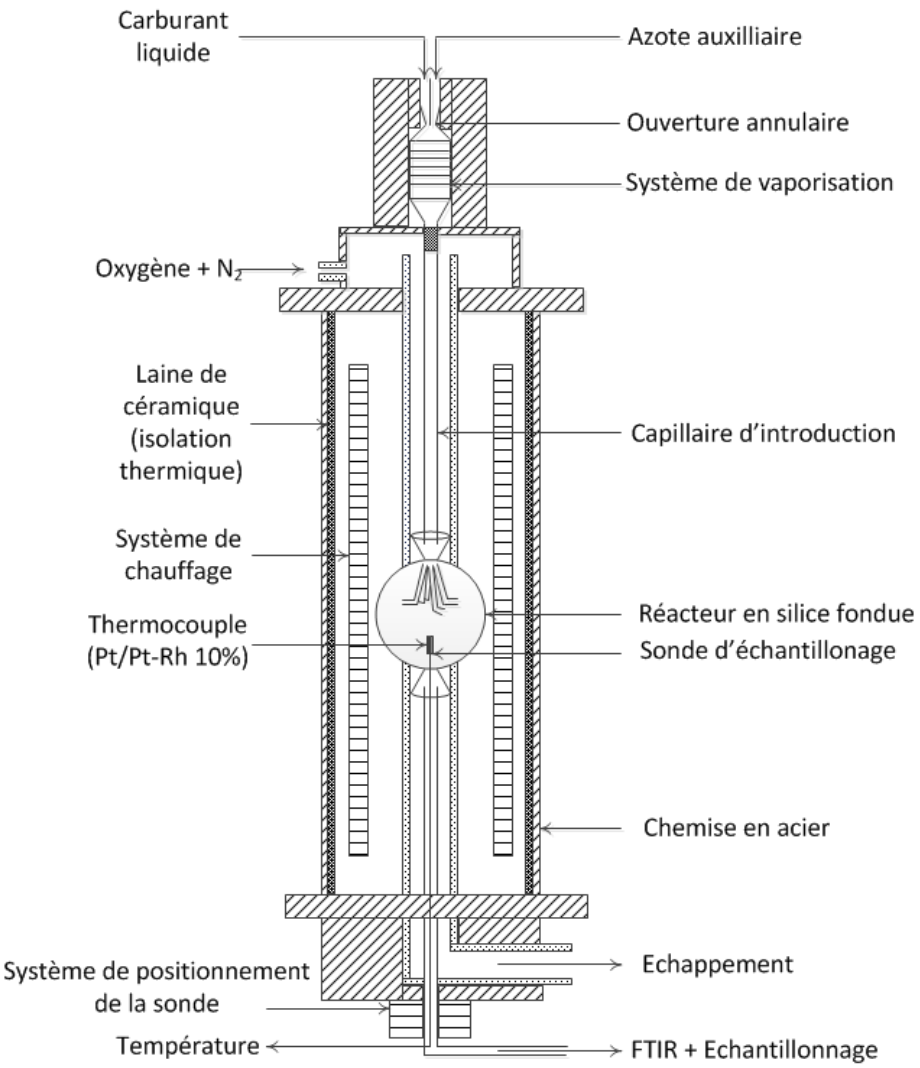

Figure III. 2 : Schéma du réacteur auto-agité d'Orléans.

Deux éléments chauffants disposés autour du réacteur permettent de contrôler la température dans la chambre réactionnelle. Ils sont pilotés par un PID (Proportionnel Intégral et Dérivé) connecté à deux thermocouples placés entre l'élément chauffant et le réacteur. Il est possible de suivre l'oxydation d'un composé jusqu'à une température de 1300K. Une couche de laine céramique permet de limiter les pertes thermiques aux parois de l'enceinte métalliques assurant une pressurisation pouvant aller jusqu'à 10 atm. Afin de diminuer les dégagements de chaleur trop importants des réactions d'oxydation exothermiques, les expériences sont faites en milieu très dilué par de l'azote (1000 ppm de fraction molaire initiale de composé à oxyder).

Le carburant étudié, initialement liquide, est acheminé au réacteur par une pompe HPLC jusqu'au système d'atomisation/vaporisation constitué de grilles. Un flux auxiliaire d'azote, constant, aide à l'atomisation du liquide et au transport du réactif jusqu'à la chambre réactionnelle par un capillaire. C'est au niveau de l'entrée du réacteur que ce flux rencontre le flux principal d'azote et d'oxygène, ce dernier étant acheminé à l'extérieur du capillaire pour éviter une oxydation prématurée avant le réacteur.

Afin de quantifier de manière précise les fractions molaires des espèces présentes dans le réacteur, une sonde sonique basse pression est employée. Le passage rapide de l'échantillon gazeux à basse pression fige les réactions chimiques et limite les évolutions du mélange du réacteur aux appareils de mesure. Les gaz sont ensuite acheminés par une ligne chauffée à 150°C, pour éviter toute condensation, jusqu'au spectromètre InfraRouge à Transformée de Fourier (IRTF) ou bien stockés dans des ballons en Pyrex à température ambiante en attendant leur analyse par chromatographie en phase gazeuse (CPG). La totalité du circuit est maintenue sous vide par une pompe à palette, l'orifice de la sonde étant assez petit pour ne pas perturber les réactions dans le réacteur. L'échantillonnage dans les ballons est réalisé à une pression voisine de 60 torrs afin de limiter d'éventuelles réactions avant l'injection en CPG.

L'oxydation de composés oxygénés entraîne la formation de molécules complexes et variées, surtout à basse température. La combinaison de dispositifs de mesure différents mais complémentaires permet de mieux identifier et quantifier les intermédiaires et produits de la réaction ainsi que de compenser les faiblesses de chaque appareil. Ici, l'IRTF, et la CPG couplée à trois détecteurs différents (à ionisation de flamme, à conductivité thermique et spectromètre de masse) ont été utilisées.

2.2. Analyse par spectrométrie d'absorption InfraRouge à Transformée de Fourier (IRTF)

La spectrométrie d'absorption infrarouge à transformée de Fourier (IRTF) est une technique d'analyse qui repose sur l'interaction entre la lumière et la matière. Une liaison entre deux atomes différents crée un dipôle électrique oscillant pouvant absorber un rayonnement infrarouge. La fréquence des radiations absorbées dépend de la fréquence propre de vibration de la molécule. Ainsi chaque molécule a une signature infrarouge qui lui est propre. L'intensité d'absorption dépend de la variation du moment dipolaire de la molécule, les molécules diatomiques symétriques (O_2, H_2, N_2 …) sont donc transparentes en infrarouge.

L'absorbance d'une substance dans n'importe quel domaine spectroscopique est donné par la loi de Beer-Lambert :

$$A_\lambda = -\log\frac{1}{T_\lambda} = \varepsilon_\lambda \times l \times C$$

Avec : _ A_λ l'absorbance à la longueur d'onde λ,

_ T_λ la transmittance à la longueur d'onde λ,

_ ε_λ le coefficient d'extinction molaire à la longueur d'onde λ,

_ l la longueur du chemin optique dans l'échantillon (10 m),

_ C la concentration molaire de l'espèce absorbant.

Afin de quantifier une espèce, il est nécessaire de la calibrer au préalable. On réalise alors l'acquisition de plusieurs spectres d'absorption d'une espèce à différentes concentrations et on obtient sa courbe d'étalonnage. Lors de la construction de la méthode de mesure, il est nécessaire de déclarer les interférences possibles entre les spectres de plusieurs espèces. En effet, certaines bandes d'absorption sont caractéristiques des liaisons chimiques (C-H, C-O, C=O …) et différentes espèces peuvent fausser la quantification (Figure III. 3). Les hydrocarbures absorbant tous dans les mêmes bandes, on leur préférera plutôt une quantification par chromatographie pour améliorer la précision. Une fois la méthode d'analyse proprement établie, il est possible de quantifier chaque espèce dans un mélange gazeux à partir d'un spectre comme montré sur la Figure III. 4.

L'appareil utilisé au cours de ce travail est un spectromètre Thermo Nexus 670. Le chemin optique est de 10 mètres et 32 scans sont réalisés par mesure avec une résolution de 0,5 cm^{-1} puis moyennés. C'est la quantification de H_2O, CO, CO_2, du formaldéhyde, du

méthanol ou encore des acides qui nous intéresse ici, ces espèces ne pouvant être correctement mesurées avec les autres appareils à notre disposition.

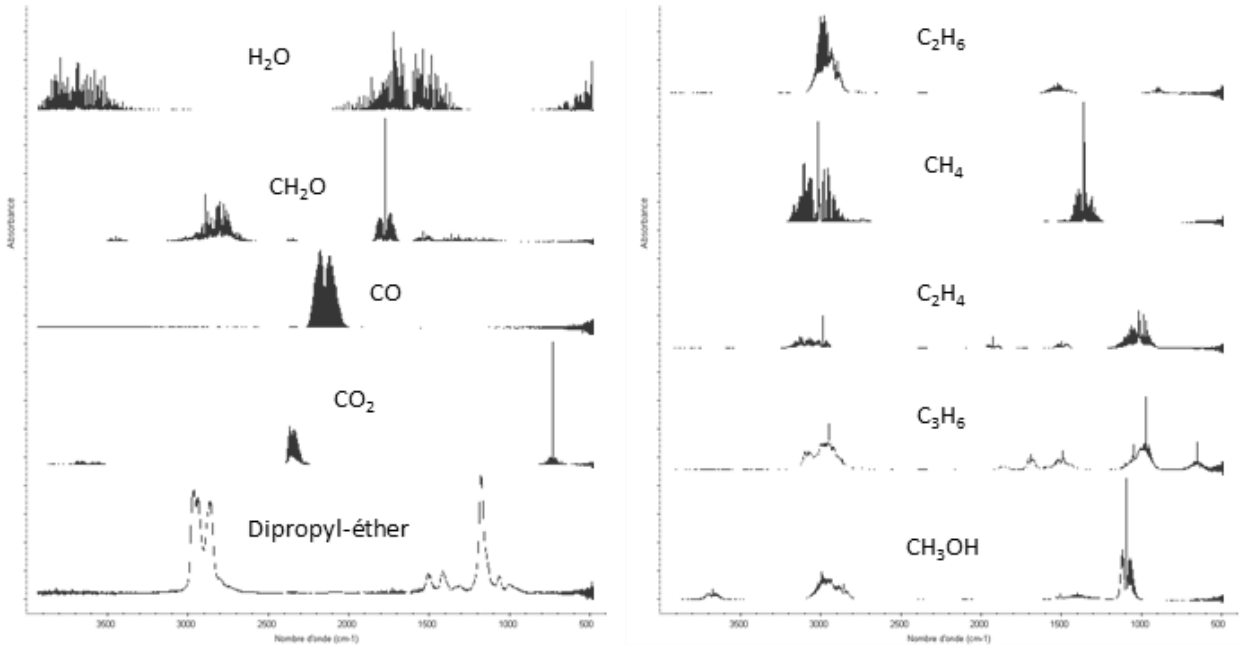

Figure III. 3 : Spectres des espèces mesurées en spectrométrie IRTF.

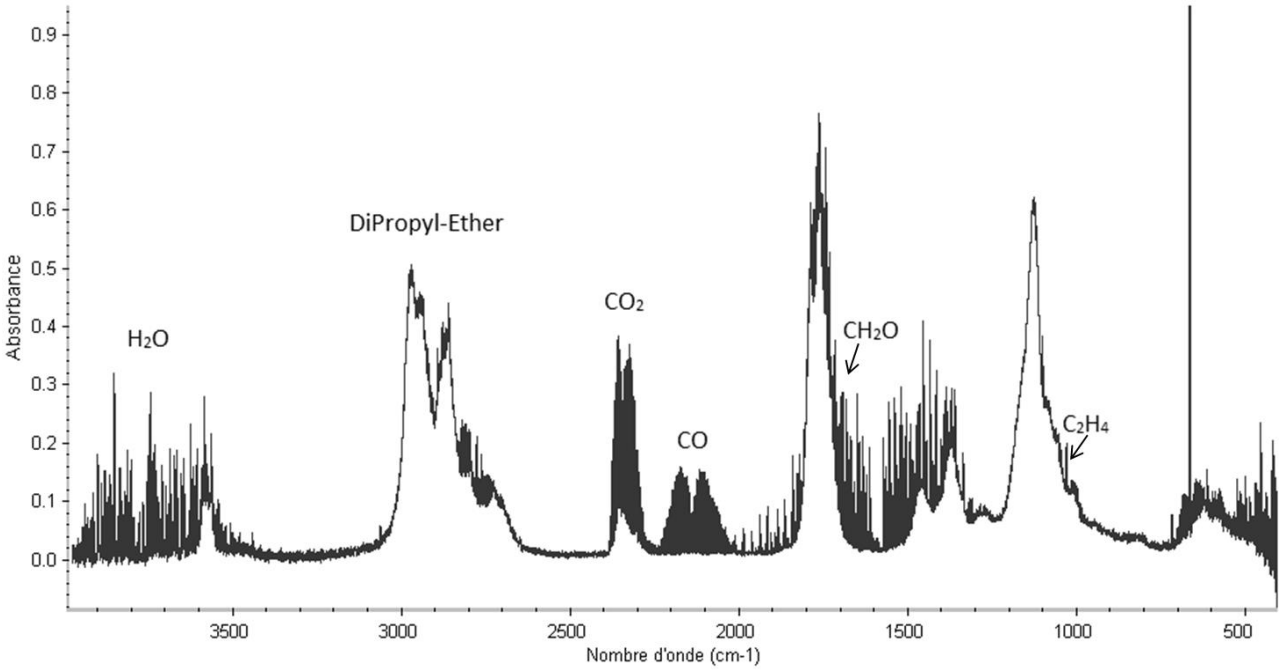

Figure III. 4 : Exemple d'un spectre mesuré lors de l'oxydation de l'éther dipropylique à 570K.

2.3. Analyse par chromatographie en phase gazeuse (CPG)

La chromatographie en phase gazeuse est une technique d'analyse permettant la séparation des espèces chimiques selon leur interaction avec une phase mobile (gaz vecteur) et une phase stationnaire (colonne). Un chromatographe comporte trois éléments : un détecteur, un injecteur et une colonne thermostatée. Les différentes colonnes utilisées sont présentées dans le Tableau III. 1. Toutes les analyses ont été effectuées en phase gazeuse avec trois types de détecteurs :

• le FID (Flame Ionization Detector) : une flamme hydrogène/air détruit l'échantillon et crée des particules chargées formant une différence de potentiel entres les électrodes du détecteur proportionnelle à la concentration de l'espèce le traversant.

• le spectromètre de masse (MS) qui permet d'identifier les espèces. Dans notre cas, une fragmentation en mode impact électronique (70 eV) a été choisie.

• le TCD (Thermal Conductivity Detector) constitué d'un catharomètre qui mesure la différence de conductivité thermique entre l'analyte et le gaz vecteur. Il a été employé pour quantifier H_2 et O_2.

L'interaction d'un composé avec la colonne et le gaz vecteur lui est spécifique. Le temps caractéristique qu'il met à parcourir la colonne est appelé temps de rétention. Il dépend du programme de température imposé à la colonne ainsi que de la nature de cette dernière. Ce paramètre, couplé au spectromètre de masse, permet une identification précise des espèces présentes dans l'échantillon prélevé du réacteur.

Un exemple de chromatogramme obtenu avec le détecteur FID est présenté sur la Figure III. 5. Afin de quantifier les espèces identifiées, les pics de ces espèces sont intégrés. La conversion de l'aire du pic en fraction molaire est possible par calibration avec des étalons préparés manuellement, par injection de composés purs dilués, ou passage d'étalons commerciaux. Nous avons à disposition des standards Scotty II fournis par Supelco pour les alcanes et alcènes linéaires allant de 1 à 6 carbones, un standard Scotty IV du même fournisseur pour les isomères du butène, butane et 1,3-butadiène, et enfin un standard Micro Mat 58 de Matheson Tri Gas qui contient du benzène, toluène, styrène et xylène. Les espèces pour lesquelles il nous est impossible d'obtenir le coefficient de réponse (composé pur indisponible au laboratoire) sont quantifiées en déterminant empiriquement un coefficient à partir de la règle du carbone effectif (ECN) [144], ou bien par analogie avec des composés dont la structure est proche. La méthode du nombre de carbone effectif consiste à découper la

structure de la molécule en différents groupes qui ont chacun une réponse spécifique. Un carbone aliphatique donne une réponse de 1 tandis qu'un carbone d'une fonction nitrile vaut 0,3 par exemple. Cette méthode permet d'estimer en dernier recours le coefficient de réponse d'une espèce dont la calibration n'est pas possible.

Tableau III. 1 : Appareils et colonnes utilisées.

Instrument	Colonne utilisée	Détecteur	Espèces mesurées	Programme de température	Gaz vecteur
Shimadzu QP2010-SE	CP-SIL 5CB L = 25 m D_{int} = 0,32 mm D_f = 1,2 µm Couplée à DB1 L = 30 m D_{int} = 0,53 mm D_f = 3 µm	FID/MS	Hydrocarbures	Variable selon les espèces étudiées afin d'optimiser la séparation	He 0,7 mL/mn
Shimadzu QP2010-SE	CP-AL_2O_3/KCl L = 50 m D_{int} = 0,32 mm D_f = 5 µm	FID/MS	Hydrocarbures non-oxygénés	T_0 = 70°C Isotherme : 10 mn ΔT = 7°C/mn T_f = 200°C Isotherme : 2 mn	He 0,7 mL/mn
Varian 3300	CP-Carboplot P7 L = 25 m D_{int} = 0,32 mm D_f = 1,2 µm	FID	O_2 et H_2	T_0 = 50°C Isotherme : 5 mn	N_2 15 mL/mn

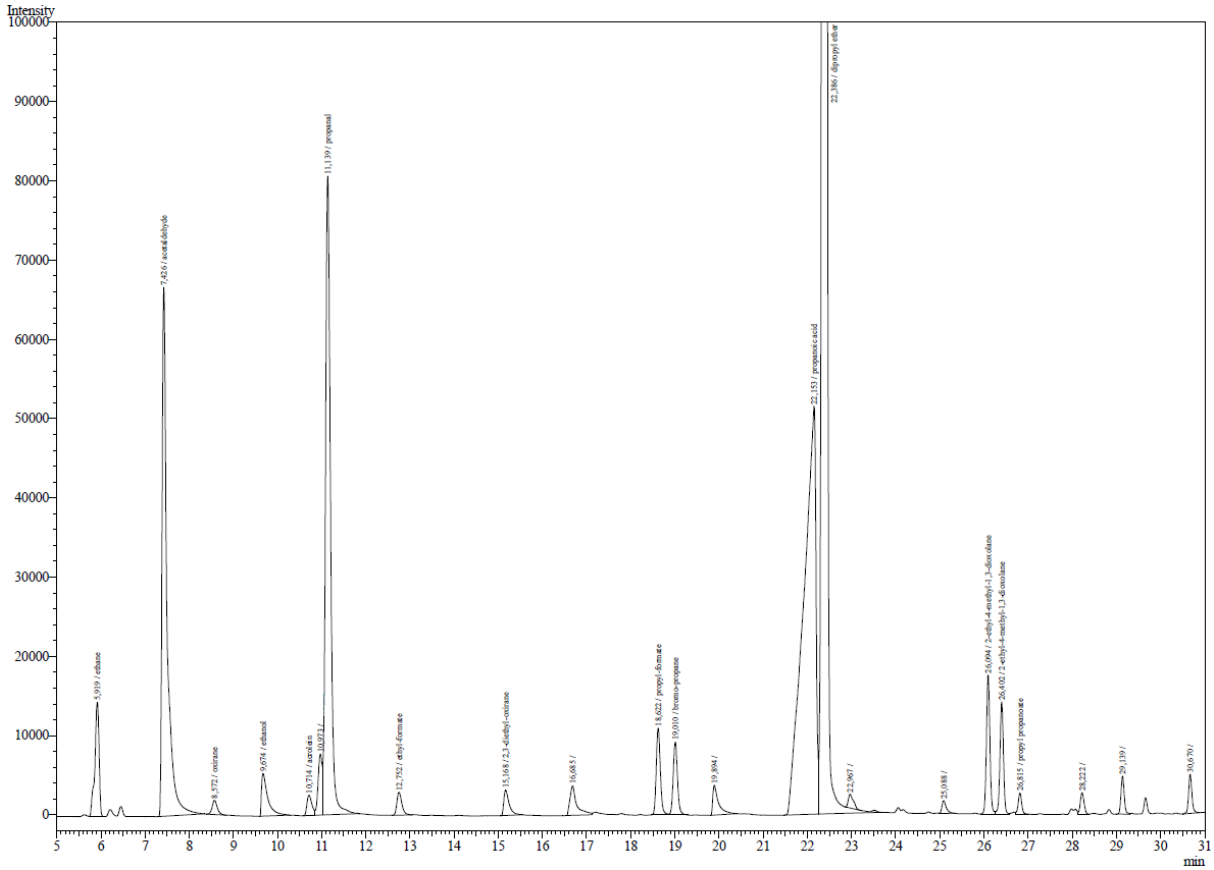

Figure III. 5 : Exemple d'un chromatogramme obtenu lors de l'oxydation du DiPropyl-Ether à 540K en FID.

2.4. Estimation des incertitudes

Les données expérimentales obtenues en réacteur auto-agité étant utilisée dans le but de valider un modèle cinétique, il est important d'évaluer leurs incertitudes. Dans ces expériences, les sources d'incertitudes sont nombreuses et proviennent du dispositif expérimental ainsi que du système analytique.

L'incertitude liée à la mesure de la température est de l'ordre de 5 K (incertitude du thermocouple et de l'homogénéité dans le réacteur). De plus, la composition réelle du mélange gazeux est dépendante des débits des réactifs et du gaz diluant. Bien que les contrôleurs de débit soient régulièrement calibrés et que les coefficients de corrélation des courbes d'étalonnage soient supérieurs à 0,995, il existe toujours des erreurs liées à la conversion des débits en tension de consigne. Ces incertitudes se répercutent sur le temps de passage et sur la composition des gaz en sortie du réacteur.

Concernant le système analytique, la principale source d'erreur provient des coefficients de réponse convertissant l'aire des pics en fraction molaire. Pour les espèces dont la calibration directe est possible (Figure III. 6), l'incertitude est faible. Cependant, la fiabilité des résultats des espèces pour lesquelles il est nécessaire de faire appel à la règle du nombre de carbone effectif (ECN) est moins grande. En effet, comme le montre la Figure III. 7, cette corrélation n'est pas toujours fiable et des erreurs de mesure peuvent être introduites.

L'incertitude totale est ainsi difficile à quantifier mais peut être évaluée à environ 15%.

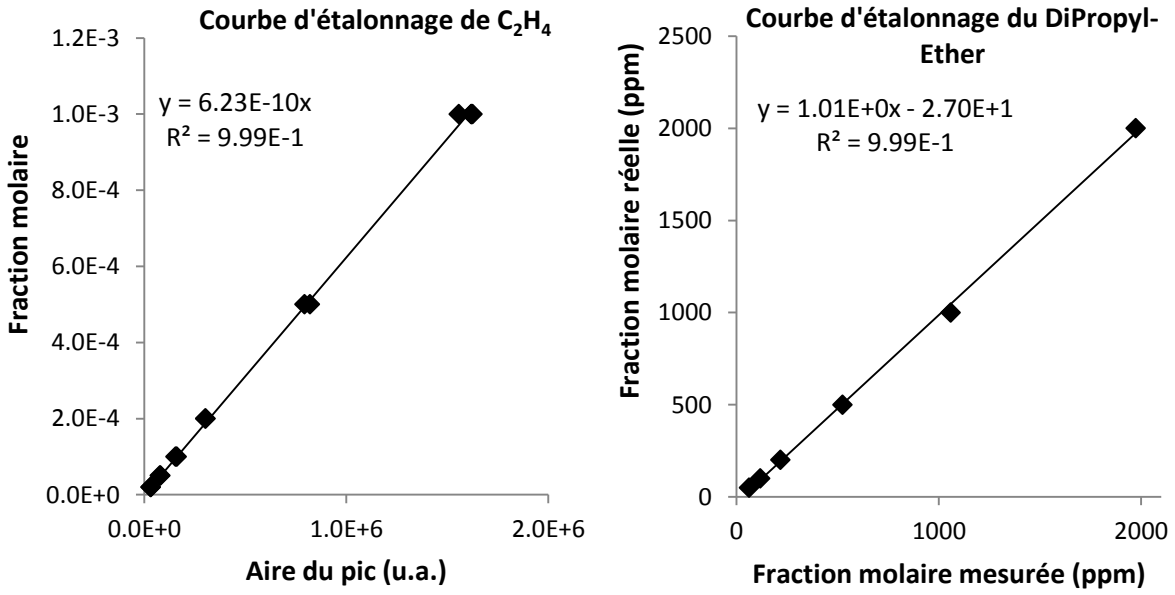

Figure III. 6 : Exemples de courbes d'étalonnage en CPG (C_2H_4) et IRTF (dipropyl-éther).

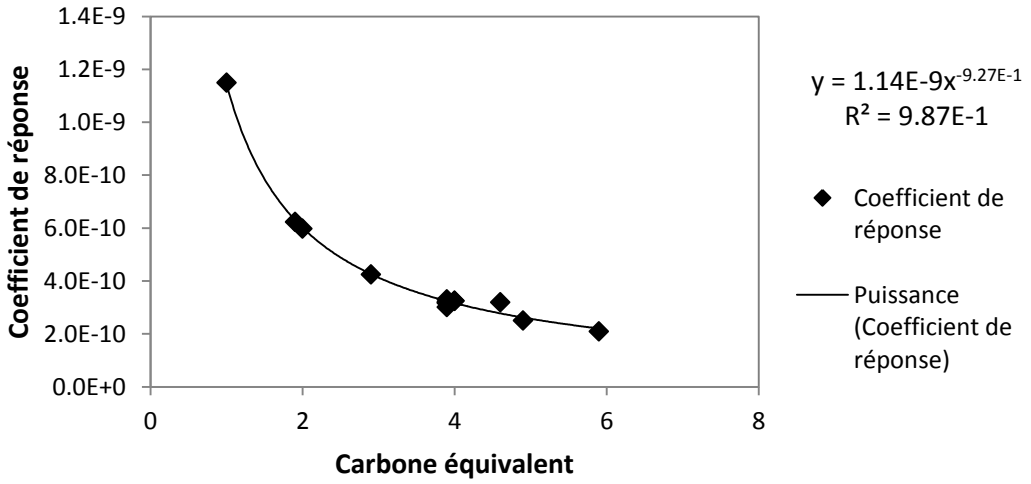

Figure III. 7 : Coefficient de réponse d'alcanes et d'alcènes en fonction du nombre de carbone équivalent.

3. Le dispositif de l'Advanced Light Source (ALS) à Berkeley

3.1. Description du réacteur

Les expériences en JSR à pression quasi atmosphérique ont été réalisées à l'Advanced Light Source (ALS) du Laboratoire National Lawrence Berkeley. Le système expérimental comprend un réacteur sphérique en silice fondue de 33,5 cm^3, un système d'échantillonnage par faisceau moléculaire et un spectromètre de masse à temps de vol (TOF) décrit sur la Figure III. 8.

De façon similaire au réacteur d'Orléans, le carburant liquide est au préalable vaporisé avant d'être introduit par un capillaire dans la chambre réactionnelle où il rencontre l'oxygène. Ici, le gaz diluant utilisé est l'argon (l'azote crée des perturbations avec le système analytique de ce dispositif expérimental). Les débits sont également ajustés afin de maintenir le temps de passage constant tout au long de l'expérience. Des éléments chauffants autour de la chambre réactionnelle permettent de faire varier la température du réacteur et la température est contrôlée par un thermocouple de type K.

Les gaz dans le JSR sont échantillonnés via un cône en silice fondue formant un faisceau moléculaire par deux successives décompressions. Ces échantillons sont ensuite analysées par spectromètrie de masse à photoionisation avec une résolution de masse $m / \Delta m = 4000$.

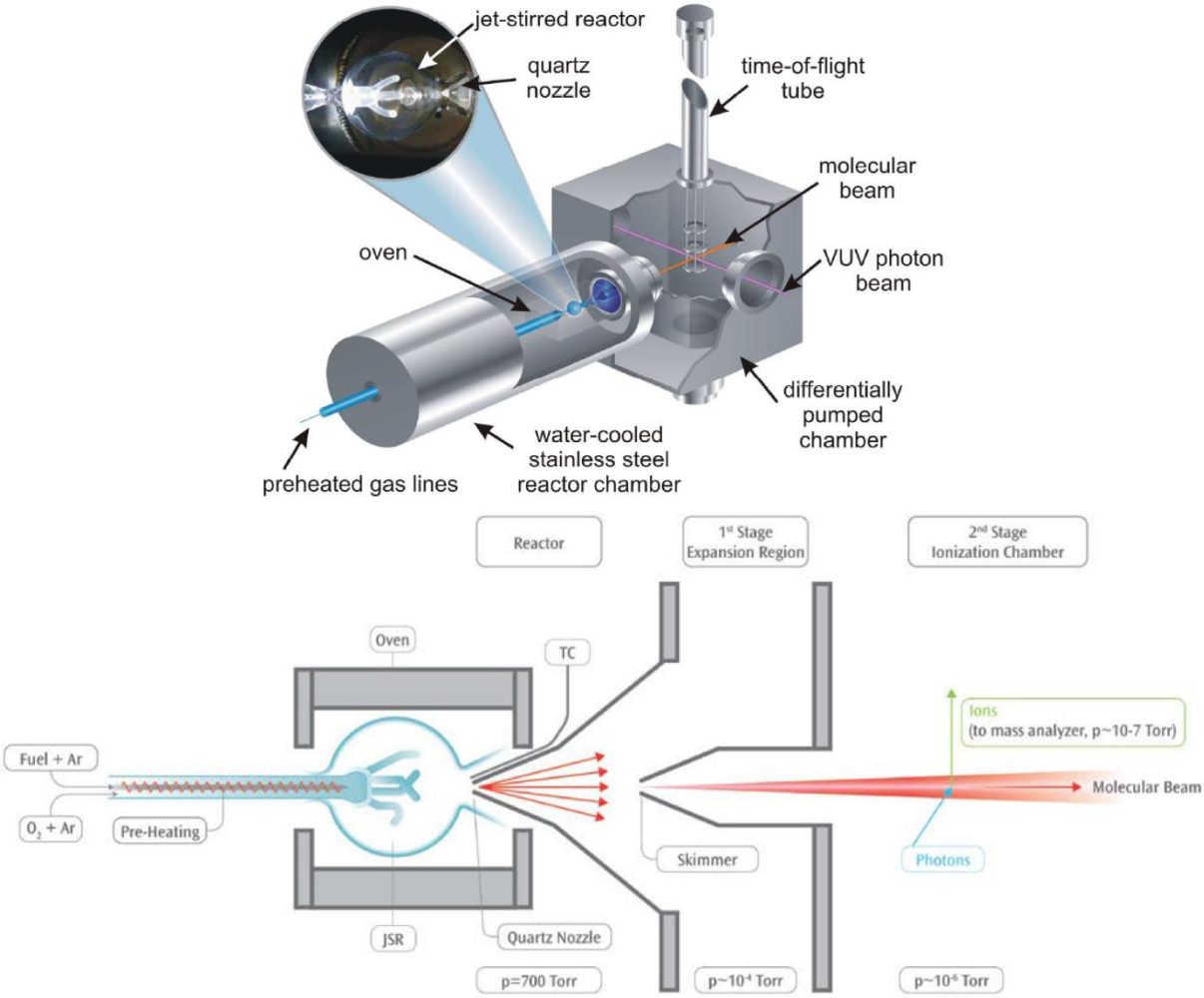

Figure III. 8 : Schéma du JSR de l'ALS [9, 45].

3.2. Analyse par spectrométrie de masse à photo-ionisation par rayonnement synchrotron

Le faisceau moléculaire issu de la chambre réactionnelle rencontre le rayonnement photo-ionisant dans la chambre d'ionisation très basse pression. Un champ électrique permet alors d'envoyer les ions formés dans le spectromètre de masse à temps de vol qui permet de séparer les ions selon leur masse. Un détecteur mesure alors un signal en fonction du temps de vol dans le spectromètre. La Figure III. 9 présente un exemple de ces signaux.

Deux types de mesures sont alors possible :

• Afin d'identifier les espèces intermédaires mises en jeu au cours de l'oxydation du carburant étudié, on se place à une température intéressante en terme de production d'espèces clés liées à la réactivité de basse température. Un balayage de l'énergie du faisceau photo-

ionisant est ensuite effectué au cours duquel le signal est enregistré à chaque énergie (de 10eV à 13eV par exemple). En calibrant au préablable (Figure III. 10) la conversion du temps de vol en masse, il est alors possible d'extraire le signal en fonction de l'énergie du faisceau à une masse donnée. L'identification des isomères se fait alors par comparaison avec des données de la littérature, comme sur la Figure III. 11 : Comparaison de la courbe d'énergie mesurée à la masse de l'ion $C_4H_{10}O$ en condition expérimentales, cercles noirs, avec celle du diéthyl éther dans la littérature [145], ligne rouge., ou bien juste avec son énergie d'ionisation (trouvée dans la littérature ou estimée par calcul théorique avec le code de calcul Gaussian par exemple).

• Si l'objectif est d'observer l'évolution de la réactivité du mélange introduit en fonction de la température, on choisit d'enregistrer des signaux à différentes énergies choisies précisément afin de séparer certains isomères. Il est important de noter que les espèces ne sont pas séparées avant d'entrer dans le spectromètre de masse comme dans le cas de la chromatographie en phase gazeuse. Un pic à la masse 15.0345 correspond donc à un ion CH_3 pouvant être aussi bien issu de la fragmentation du méthane comme celle de toute espèce ayant un groupement CH_3 dans sa structure. Afin de quantifier au mieux des espèces présentant un intérêt particulier, il convient donc de choisir avec précision l'énergie du rayonnement (au plus proche de l'énergie d'ionisation de l'espèce considérée afin d'éviter sa

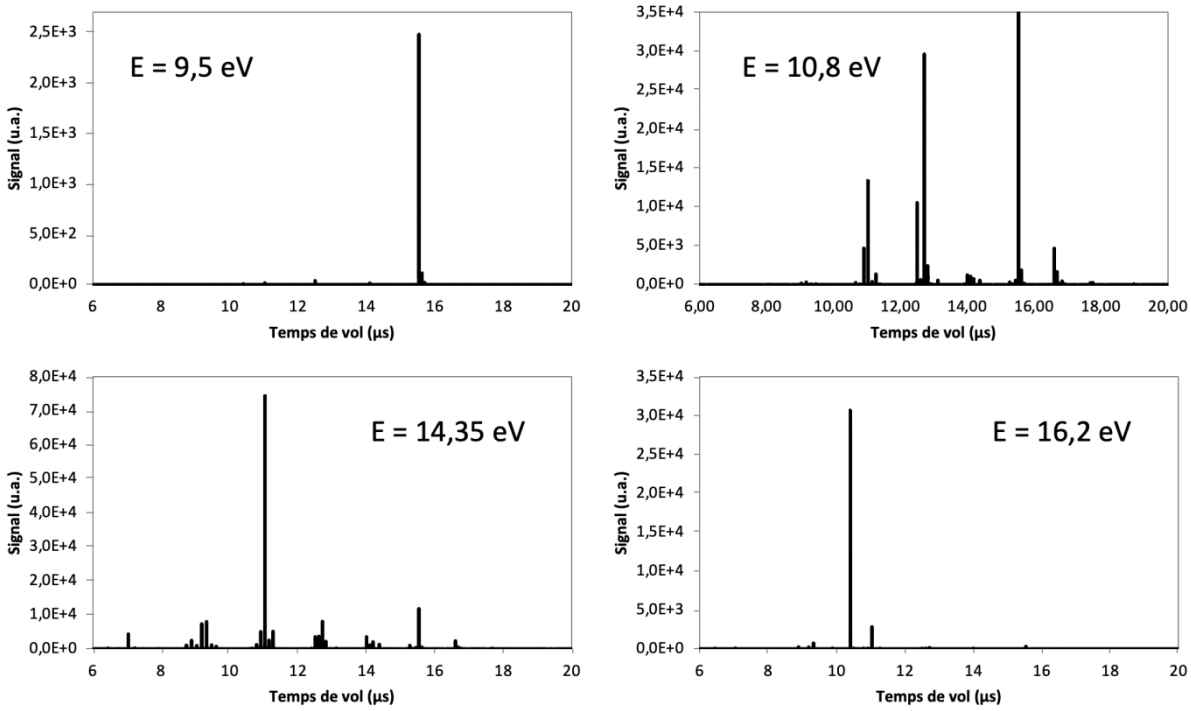

Figure III. 9 : Signal brut mesuré à différentes énergies dans le cas de l'oxydation du diméthoxy éthane dans les conditions stœchiométriques à T = 525 K, 700 Torr et 1s de temps de passage.

fragmentation). Avec l'exemple de la Figure III. 9 on préfèrera donc quantifier le diméthoxy éthane à 9,5eV plutôt qu'à 10,8eV où une fragmentation s'opère, tandis que le diazote sera quantifié préférentiellement à 16,2eV.

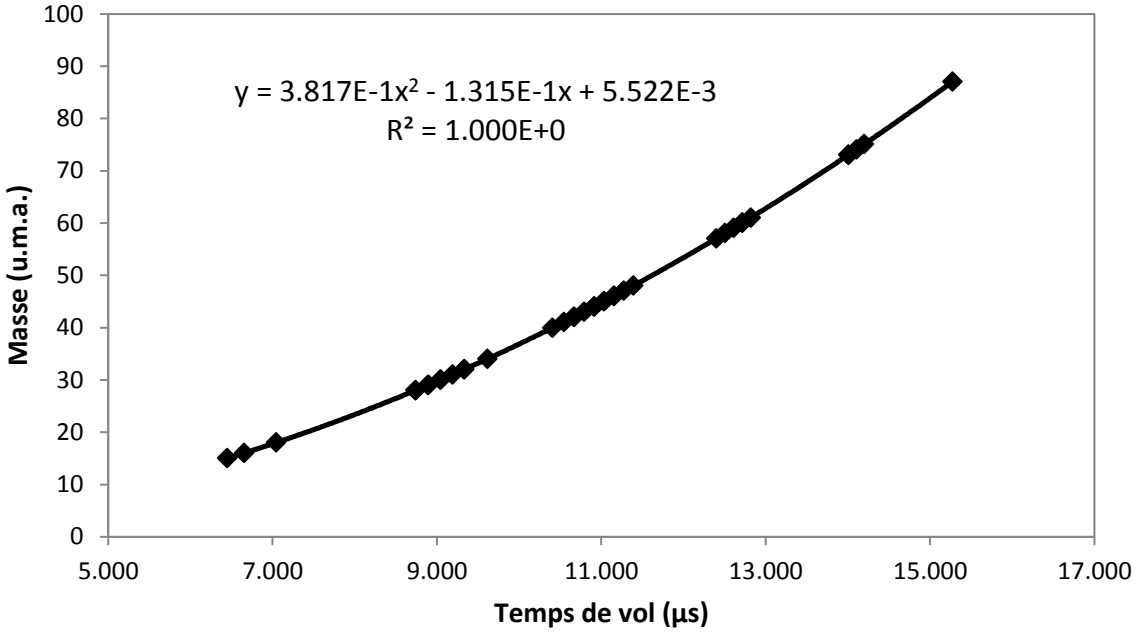

Figure III. 10 : Calibration de la masse des fragments en fonction du temps de vol dans le spectromètre.

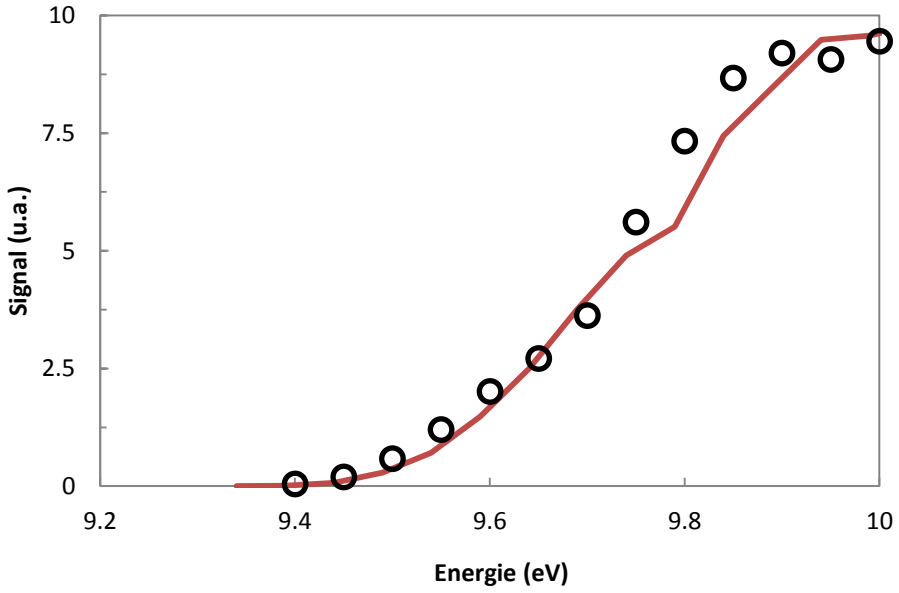

Figure III. 11 : Comparaison de la courbe d'énergie mesurée à la masse de l'ion $C_4H_{10}O$ en condition expérimentales, cercles noirs, avec celle du diéthyl éther dans la littérature [145], ligne rouge.

La quantification des espèces est alors possible en utilisant la relation suivante :

$$S_j(T) = C\ P_j(T)\ \sigma_j(E)\ D_j\ \Phi_p(E)\ F(k,T,P)$$

Avec : _ S_j : le signal de l'espèce j mesuré par le détecteur du spectromètre à temps de vol,

_ C : une constante,

_ P_j : la pression partielle de l'espèce j à la température T ($P_j = X_j\ P_{totale}$, X_j étant la fraction molaire de l'espèce j),

_ σ_j : la PICS (PhotoIonization Cross-Section) dépendant de l'énergie et de l'espèce,

_ D_j : le facteur de discrimination de masse (facteur MD) dépendant de l'espèce j,

_ Φ_p : le flux de photon dépendant uniquement de l'énergie,

_ F : un paramètre dépendant de la géométrie du dispositif expérimental et des conditions thermodynamiques, mais invariant selon l'espèce considérée pour des expériences de réacteur auto-agité.

En prenant une espèce en référence (l'argon car le signal est le plus intense et il n'est pas réactif donc sa fraction molaire peut être estimée de façon plus fiable) on peut obtenir alors la fraction molaire d'une espèce avec le rapport suivant, le flux de photon, le paramètre F et la constante C étant indépendant de l'espèce considérée.

$$X_j(T) = X_{ref}(T)\frac{\sigma_{ref}D_{ref}}{\sigma_j D_j}\frac{S_j(T)}{S_{ref}(T)}$$

3.3. Estimation des incertitudes

Comme indiqué dans de précédentes publications [146, 147], les incertitudes de mesure quantitative obtenues avec la technique PI-MBMS proviennent de nombreux facteurs: les effets de sonde, les facteurs de discrimination de masse, les contrôleurs de débits, le flux de photons (étalonnage de la photodiode), les sections efficaces (PICS) des espèces mesurées et les procédures d'évaluation des données, y compris l'identification des fragments. Les incertitudes de mesures varient donc selon l'espèce. On note cependant la précision de

l'identification des fragments sur la Figure III. 12 en comparant le temps de vol réel mesuré des espèces ionisées détectées au temps de vol obtenu par la calibration de la Figure III. 10.

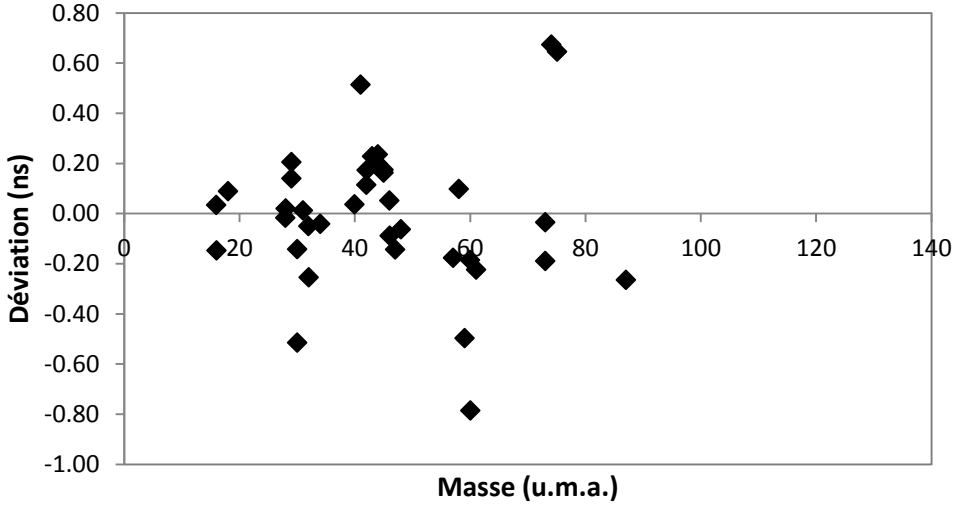

Figure III. 12 : Déviation par rapport à la courbe de calibration.

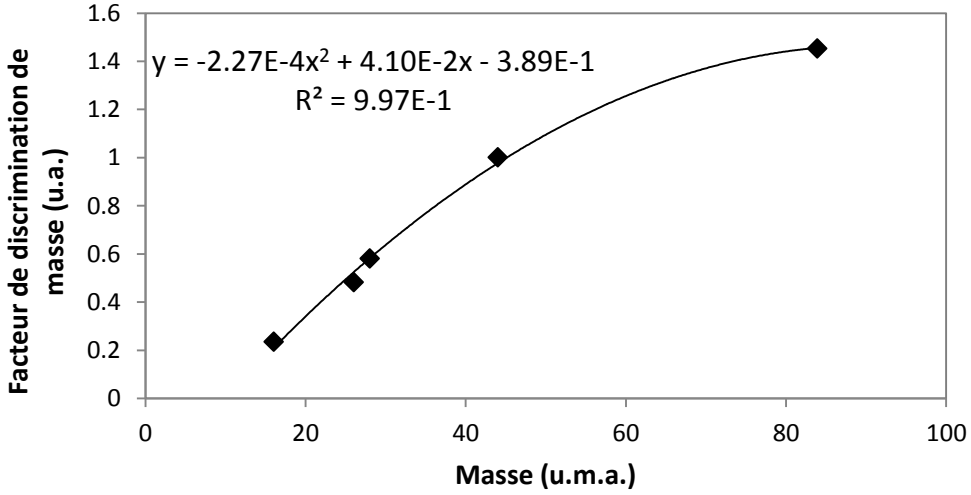

Figure III. 13 : Calibration du facteur de discrimination de masse.

Le thermocouple utilisé pour mesurer la température des gaz a été placé à la sortie du réacteur près de la pointe de la sonde de prélèvement dont la base a été refroidie à l'eau. Les valeurs enregistrées doivent donc être inférieures aux températures réelles car la sonde est un dissipateur de chaleur [148]. Dans des travaux antérieurs [148, 149], des corrections ont été apportées en décalant linéairement les températures enregistrées vers des valeurs plus élevées et cette pratique s'est avérée raisonnable. Pour chaque expérience, l'étendue du décalage dépend principalement de l'emplacement réel du thermocouple. Après avoir testé la

configuration avec différents carburants [148-150], le facteur correctif variait entre 5% et 10%. Ici, une valeur de 6% a été choisie pour faire correspondre les profils expérimentaux et simulés du carburant. L'incertitude sur les températures corrigées a été estimée à ± 5%.

IV. Modélisation et outils numérique

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2.3.a. Fichier d'entrée 51

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Afin de simuler la cinétique d'oxydation des carburants sélectionnés pour cette étude, nous avons utilisé la bibliothèque du logiciel CHEMKIN II [151] dont la structure est présentée dans la Figure IV. 1. Ce logiciel développé par Sandia National Laboratory dans les années 1980 est largement utilisé pour modéliser la cinétique chimique dans des réacteurs idéaux et des flammes. Il permet d'interpréter un mécanisme cinétique constitué de deux fichiers. Le premier fichier « chem.inp » contient toutes les réactions chimiques et leurs constantes de vitesse, les élements chimiques présents, ainsi que la liste des espèces mises en jeu. Le second fichier « therm.dat » contient, sous forme de polynômes, les propriétés thermodynamiques de toutes les espèces présentes dans le mécanisme réactionnel. En utilisant le contenu de ces deux fichiers, le logiciel CHEMKIN II lit les données thermodynamiques de chaque espèce, les réactions chimiques et leurs paramètres cinétiques. Il vérifie la balance atomique de chacune des réactions, calcule les constantes de vitesse inverses à partir de la constante d'équilibre et écrit un fichier de liaison binaire « chem.bin » utilisé par les codes de calcul PSR [152], SENKIN [153], PREMIX [154]. Ces codes de calcul permettent de résoudre les équations de conservation de matière et d'énergie propres. Les résultats de la modélisation générés par ces codes sont répertoriés dans des fichiers de sortie (binaire et texte). Ces fichiers contiennent toutes les informations relatives aux espèces mises en jeu et demandées par l'utilisateur (fractions molaires, vitesse de consommation et de formation des espèces, coefficients de sensibilité).

Ici, le principal code de calcul utilisé est PSR ('Perfectly Stirred Reactor' ou réacteur auto-agité). Le traitement des fichiers de sortie permet d'obtenir les profils de concentration de toutes les espèces intervenant dans le mécanisme cinétique.

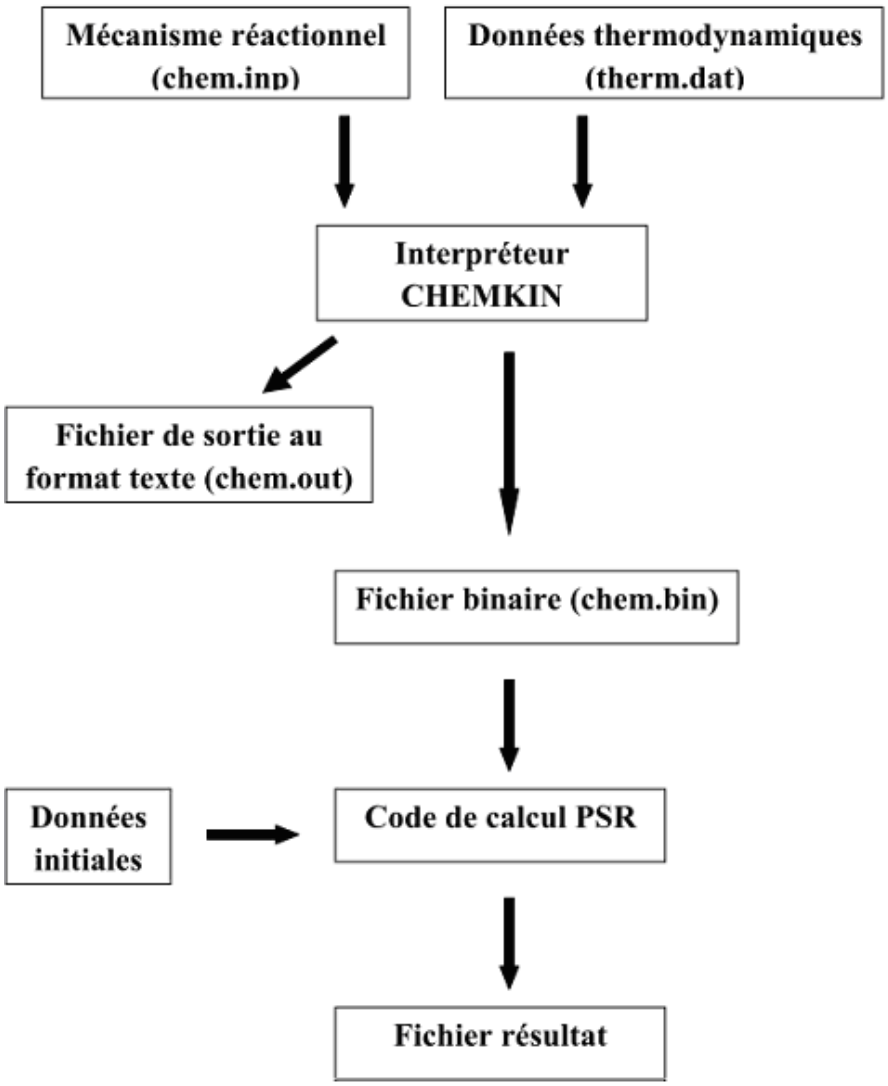

Figure IV. 1 : Structure du logiciel CHEMKIN.

1. Formalisme

1.1. Le mécanisme cinétique

Ce premier fichier contient toutes les informations nécessaires à l'interprétation du mécanisme par CHEMKIN. Il comprend trois parties:

• les éléments chimiques intervenant dans le mécanisme : H, C, O, N, Ar, He.

• la liste des différentes espèces chimiques présentes dans le mécanisme réactionnel.

• les réactions chimiques avec les coefficients de l'équation d'Arrhenius modifiée pour la réaction directe

$$k = A \times T^n \times \exp\left(-\frac{E}{RT}\right)$$

A : le facteur préexponentiel (cm^3, mole, s^{-1})

n : le coefficient correctif de variation préexponentielle avec la température (K).

E : l'énergie d'activation ($cal.mol^{-1}$)

R : la constante des gaz parfaits ($cal.K^{-1}.mol^{-1}$)

Dans le mécanisme les réactions peuvent être réversibles ('=' ou '<=>') ou irréversibles ('-' ou '->').

1.2. Les données thermodynamiques

Les propriétés thermodynamiques des espèces incluses dans le mécanisme réactionnel sont écrites sous forme de polynômes dont le formalisme a été développé par la NASA (Gordon *et al.* [155]). On utilise 2 séries de 7 coefficients ($a_{1,k}...a_{7,k}$) permettant de calculer les propriétés thermodynamiques dans deux domaines de températures successifs : le premier domaine va couramment de 1000 à 5000 K et le deuxième de 300 à 1000 K. Les propriétés thermodynamiques sont calculées à partir des relations ci-dessous :

$$\frac{C_{p,k}}{R} = a_{1,k} + a_{2,k}T + a_{3,k}T^2 + a_{4,k}T^3 + a_{5,k}T^4$$

$$\frac{H_k^{\,0}}{RT} = a_{1,k} + a_{2,k}\frac{T}{2} + a_{3,k}\frac{T^2}{3} + a_{4,k}\frac{T^3}{4} + a_{5,k}\frac{T^4}{5} + a_{6,k}\frac{1}{T}$$

$$\frac{S_k^{\,0}}{R} = a_{1,k}\ln T + a_{2,k}T + a_{3,k}\frac{T^2}{2} + a_{4,k}\frac{T^3}{3} + a_{5,k}\frac{T^4}{4} + a_{7,k}$$

avec C_p : la capacité calorifique à pression constante,

H : l'enthalpie,

S : l'entropie.

L'enthalpie libre G^0 est calculée à partir de : $G^0 = H^0 - TS^0$, en connaissant l'enthalpie et l'entropie de l'espèce *k*. On peut alors calculer la constante d'équilibre des réactions chimiques, ainsi que les constantes de vitesse des réactions inverses :

$$\Delta G^0 = G^0{}_{produits} - G^0{}_{réactifs} = -RT\ln(K_p)$$

$$K_c = \frac{k_{dir}}{k_{rev}} = K_p\left(\frac{P}{RT}\right)^{\Sigma\nu_{produits}-\Sigma\nu_{réactifs}}$$

avec ν : les coefficients stœchiométriques,

k_{dir} et k_{rev} : les constantes de vitesse dans le sens direct et inverse, respectivement.

2. Les différents codes de calcul

2.1. Le code de calcul Perfectly Stirred Reactor (PSR)

Le code de calcul PSR a été développé en 1986. Il permet de simuler nos expériences menées en réacteur parfaitement agité.

2.1.a. Équations résolues

Notre réacteur agité sphérique est caractérisée par un volume V, un temps de passage moyen τ, un flux massique $\dot{m}$ et la fraction massique des espèces Y_k. Le débit massique dans le réacteur est considéré constant. Dans la relation suivante on exprime le temps de passage τ en fonction du flux massique, du volume et de la masse volumique ρ.

$$\tau = \rho\left(\frac{V}{\dot{m}}\right) \qquad \text{où} \qquad \rho = \frac{P\bar{M}}{RT}$$

Ce réacteur est un volume thermiquement isolé dans lequel un flux stationnaire prémélangé de réactifs est introduit. Le milieu réactionnel est fortement turbulent afin d'assurer l'homogénéité en température et en composition dans l'ensemble du réacteur. Le régime étant stationnaire, les principes qui régissent le fonctionnement des réacteurs auto-agité sont :

La conservation de la masse: $\dot{m}\left(Y_{k,S} - Y_{k,E}\right) - \dot{\omega} M_k V = 0$

La conservation de l'énergie: $\dot{m}\sum_{k=1}^{K}\left(Y_{k,S}h_{k,S} - Y_{k,E}h_{k,E}\right) + Q = 0$

avec $Y_{k,E}$: fraction massique de l'espèce k à l'entrée du réacteur

$Y_{k,S}$: fraction massique de l'espèce k en sortie de réacteur

$\dot{\omega}_k$: vitesse nette de production de l'espèce k

M_k : masse molaire de l'espèce k

Q : perte thermique du réacteur

$h_{k,E}$: enthalpie massique de l'espèce k à l'entrée du réacteur

$h_{k,S}$: enthalpie massique de l'espèce k en sortie de réacteur

Les équations de conservation de la masse et de l'énergie décrivent un système de K+1 équations algébriques non linéaires. Leurs solutions sont les fractions massiques des espèces incluses dans le mécanisme cinétique et la température de réaction. La résolution de ce système nécessite de connaitre les concentrations initiales des réactifs, le temps de passage et la pression de travail. Ici, nous ne résolvons pas l'équation d'énergie car la température des gaz dans le milieu réactionnel est mesurée et utilisée comme donnée d'entrée dans nos simulations.

2.1.b. Résolution du système d'équation

La méthode de Newton-Raphson résoud le système de K+1 équations. Cette technique de résolution a besoin d'une bonne estimation de la solution (température et concentration) pour converger. La première estimation de la solution est obtenue par le programme STANJAN de Reynolds (1986), qui détermine la composition à l'équilibre thermodynamique (pression et température constantes). Cette première solution est obtenue en minimisant l'enthalpie libre de Gibbs. Dans certains cas, cette estimation ne permet pas d'obtenir une solution. Alors on procède à l'intégration numérique des équations en régime transitoire. L'estimation de la solution obtenue est utilisée pour tenter de résoudre une nouvelle fois le système algébrique par la méthode de Newton-Raphson.

2.1.c. Analyse de voies réactionnelles

L'analyse des voies réactionnelles permet de déterminer les principales voies de consommation et de formation de l'espèce k dans le mécanisme réactionnel. Les vitesses globales de formation $V_{f,k}$ et de consommation $V_{c,k}$ de l'espèce k sont calculées par PSR :

$$V_{f,k} = \sum_{i=1}^{I} v_{f,k,i} \qquad V_{c,k} = \sum_{i=1}^{I} v_{c,k,i}$$

Les réactions qui forment et qui consomment chaque espèce chimique ainsi identifiées. La vitesse nette de chaque processus est calculée ainsi que sa contribution à la production et la consommation de l'espèce considérée.

2.1.d. Analyse de sensibilité

Des analyses de sensibilité sont effectuées sur une espèce k du mécanisme dans des conditions données. On peut déterminer l'influence des constantes de vitesse de chaque réaction chimique sur la formation et la consommation de l'espèce k considérée. Le coefficient de sensibilité $S_{k,i}$ pour une espèce k et une réaction i est donné par la relation suivante:

$$S_{k,i} = \frac{\partial \ln Y_k}{\partial \ln k_i} = \frac{k_i}{Y_k}\left(\frac{\partial Y_k}{\partial k_i}\right)$$

Un coefficient de sensibilité positif indique que la concentration de l'espèce k augmente avec la constante de vitesse k_i. Inversement, un coefficient de sensibilité négatif indique que la concentration de l'espèce k diminue lorsque la vitesse augmente.

2.2. Le code de calcul SENKIN

Le code de calcul SENKIN permet de modéliser l'évolution temporelle d'un mélange réactif homogène dans un réacteur clos:

- Un système fermé adiabatique à volume constant
- Un système fermé adiabatique à pression constante
- Un système fermé adiabatique à pression et volume constant
- Un système où la pression et la température sont constantes

- Un système où le volume et la pression sont constants
- Un système où pression et température dépendent du temps.

Ici, SENKIN a été utilisé pour modéliser un système fermé adiabatique et à volume constant afin de simuler des expériences en tube à onde de choc réfléchie.

Dans le fichier d'entrée de SENKIN on indique la pression et la température initiale du système ainsi que la composition du mélange initial. Le mot clef « TIME » indique la durée de la simulation. Le mot clef « CONV » indique que le système est adiabatique à volume constant. On indique ensuite des critères de convergence.

On suppose que la masse totale du mélange reste constante pendant toute la durée du processus :

$$m = \sum_{k=1}^{K} m_k = cte$$

$$\frac{dm}{dt} = 0$$

avec : m : la masse totale du système,

m_k : la masse de l'espèce k.

L'évolution de la masse de chaque espèce k est définie par :

$$\frac{dm_k}{dt} = V\dot{\omega}_k W_k$$

La masse du système étant constante, on peut écrire cette relation en termes de fractions massiques :

$$\frac{dY_k}{dt} = v\dot{\omega}_k W_k$$

avec v le volume massique.

À cette équation de conservation de la masse on ajoute une équation décrivant l'évolution de l'énergie dans le système :

$$c_v \frac{dT}{dt} + v \sum_{k=1}^{K} u_k \dot{\omega}_k W_k = 0$$

Le solveur DASAC est utilisé pour résoudre l'équation d'énergie ainsi que les équations régissant la chimie au sein du réacteur fermé. Le code de calcul SENKIN dispose

des mêmes fonctions analytiques que PSR lui permettant de mener des analyses de voies réactionnelles ou de sensibilité.

2.3. Le code de calcul PREMIX

PREMIX est utilisé pour simuler des flammes laminaires prémélangées 1D. Il permet de calculer la structure d'une flamme (concentration des espèces et température en fonction de la distance au brûleur) ou encore la vitesse de flammes laminaires non-étirées. Ce code fonctionne sur le même principe que PSR et SENKIN mais nécessite de fournir les propriétés de transport des espèces chimiques impliquées pour la prise en compte les phénomènes de diffusion.

2.3.a. Fichier d'entrée

Le fichier d'entrée pour le code PREMIX contient des informations liées au maillage, nécessaires à la simulation. Le mot clef « FREE » est utilisé pour simuler une flamme adiabatique se propageant librement. La définition du domaine de calcul est ensuite fournie en utilisant les mots clef suivants :

- « XEND » indique le domaine de calcul.
- « XCEN » est une estimation du point où se situe le centre de la flamme.
- « WMIX » est une estimation de la largeur de la flamme.
- « NPTS indique le nombre initial de points pour initier le calcul.
- « NADP » indique le nombre de points de calcul maximum ajouté à chaque itération.
- « NTOT » est le nombre maximal de points dans le calcul.

La définition d'un profil de température pour le domaine de calcul utilise le mot clef « TEMP » :

	Distance au brûleur (cm)	tempétrature (K)
TEMP	0.00	300
TEMP	0.40	800
TEMP	0.80	1600
TEMP	2.00	2000

Le premier nombre indique la distance, et le second la température. Il est possible d'ajouter autant de températures que l'on souhaite. Cette section du fichier permet aussi de fixer la température des gaz frais. Elle correspond celle indiquée pour une distance nulle (ici 298 K). On fourni aussi une estimation des fractions molaires des produits en utilisant le mot clef « PROD », suivi du nom de l'espèce et de sa fraction molaire.

Des paramètres liés au solveur sont aussi disponibles utilisable comme dans les autres codes du package CHEMKIN. Les réactifs et la pression sont indiqués comme dans les deux codes présentés précédemment.

2.3.b. Résolution des équations

Comme pour SENKIN, une première estimation de la solution est indiquée dans le fichier d'entrée. Chemkin permet d'estimer le profil de température à partir de la température adiabatique de flamme. PREMIX résout ensuite le problème à l'aide d'un maillage, dans un premier temps sans résoudre l'équation de conservation de l'énergie mais seulement les équations de conservation des espèces :

$$\dot{m}\frac{dY_k}{dx} + \frac{d}{dx}(\rho A Y_k V_k) - A\dot{\omega}_k W_k = 0$$

où :

- $\dot{m}$ est le débit massique en g.s^{-1} et qui vaut :

$$\dot{m} = \rho u A$$

(où u est la vitesse du flux en cm.s^{-1})

- Y_k est la fraction molaire de l'espèce k
- ρ est la masse volumique en g.cm^{-3} et qui vaut :

$$\rho = \frac{P\bar{M}}{RT}$$

(où $\bar{M}$ est la masse molaire moyenne du mélange)

- A est la surface de la section de la flamme en cm^2
- V_k est la vitesse de diffusion de k (cm.s^{-1})
- $\dot{\omega}_k$ est la vitesse molaire nette de réaction de l'espèce k, en mol.cm^{-2}.s^{-1}
- x représente les coordonnées spatiales en cm

PREMIX procède par itérations et affine le maillage de la flamme jusqu'à converger vers une solution correspondant aux critères définis dans le fichier d'entrée. Une fois ces premières

équations résolues, la solution obtenue est utilisée comme première estimation pour résoudre le système complet combinant les équations de conservation de l'énergie et de la masse :

$$\dot{M}\frac{dT}{dx} - \frac{1}{C_p}\frac{d}{dx}\left(\lambda A\frac{dT}{dx}\right) + \frac{A}{C_p}\sum_{k=1}^{K}\rho Y_k V_k c_{p,k}\frac{dT}{dx} + \frac{A}{C_p}\sum_{k=1}^{K}\dot{\omega}_k h_k W_k = 0$$

où :

- T est la température en K
- C_p est la capacité calorifique massique à pression constante du mélange en $J.g^{-1}K^{-1}$
- λ est la conductivité thermique du mélange en $J.cm^{-1}.K^{-1}.s^{-1}$
- $C_{p,k}$ est la capacité calorifique massique à pression constante de l'espèce k en $J.g^{-1}K^{-1}$
- W_k est la masse molaire de l'espèce k en $g.mol^{-1}$

Le calcul se poursuit en complétant le maillage jusqu'à obtenir une solution dans tout le domaine défini dans le fichier d'entrée.

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Cette partie présente les résultats expérimentaux et modélisations numériques de l'oxydation des éthers symétriques : les éthers diéthylique et dipropylique. La construction des mécanismes réactionnels y est détaillée et leur performance est confrontée aux données obtenues en réacteur agité ainsi que d'autres trouvées dans la littérature.

1. L'éther diéthylique

1.1. Construction du mécanisme

Un sous-mécanisme cinétique représentant la chimie de l'éther diéthylique (DEE) à basse température et à haute température a été développé, car aucun des modèles de la littérature ne pouvait représenter le comportement expérimental observé (flamme froide et zone du « coefficient négatif de température (CNT) »). Le mécanisme de base est le mécanisme de l'éther dibutylique (DBE) publié par Thion [120] auquel un sous-mécanisme du DEE a été ajouté. Les constantes de vitesse des réactions principales intervenant dans ce sous-mécanisme ont été adoptées de la littérature :

• Les réactions d'arrachement d'un atome d'hydrogène du carburant par les radicaux H et OH sont analogues au système de l'éthanol proposé par Sivaramakrisnan et al. [156] pour le site primaire. Pour la liaison C – H adjacente à la fonction éther, les constantes de vitesse sont adoptées à partir de Zhou et al. [85] pour les réactions avec les radicaux OH, et d'après Ogura et al. [128] pour celles avec les radicaux H.

• Les constantes de vitesse d'arrachement de H par les radicaux HO_2 et CH_3 ont été adoptées à partir des études théoriques de Mendes et al. [157] et Xu et al. [158], respectivement.

• Pour les réactions $R + O_2 \rightleftharpoons RO_2$, tant pour la première que pour la seconde addition, les constantes sont celles de Goldsmith et al. [159].

• Pour les réactions $RO_2 \leftrightharpoons QOOH$ et $QOOH \leftrightharpoons$ éthers cycliques + OH, les constantes sont celles de Villano et al. [160], [161].

• Les réactions de β-scission des radicaux R et QOOH sont tirées des calculs CBS-QB3 de Sakai et al. [119], et des calculs sur le DBE [120]. Parmi ces dernières réactions, seule la décomposition du radical QOOH résultant de l'isomérisation du radical RO_2 secondaire semble avoir une influence importante sur l'étendue du CNT.

• D'autres réactions liées à la chimie à basse température sont analogues à celles du DBE [120].

• Les réactions de décomposition unimoléculaire du DEE proviennent de l'étude de Yasunaga et al. [162].

La thermochimie du carburant, de ses radicaux ainsi que de toutes les espèces apparentées à la zone réactive de basse température sont tirées de l'étude théorique de Sakai et al. [119]. Pour les autres espèces dont les données sont indisponibles dans la littérature, elles ont été calculées à l'aide de Thergas [163], qui utilise les méthodes d'additivité de groupe proposées par Benson [164]. Le mécanisme comprenant 470 espèces et 2859 réactions est donné en **Annexe 2**.

1.2. Étude en réacteur parfaitement agité

L'oxydation de l'éther diéthylique a été étudiée à pression atmosphérique et à haute pression (10 atm) pour trois conditions de richesse (stœchiométrie, milieu riche et pauvre). Les conditions opératoires sont résumées dans le Tableau V. 1.

Tableau V. 1 : Conditions expérimentales de l'étude de l'éther diéthylique.

Pression (atm)	X_{DEE} initiale	X_{O_2} initiale	X_{N_2} initiale	Temps de passage (s)	Richesse	Plage de température (K)
10	$1{,}0.10^{-3}$	$12{,}0.10^{-3}$	$9{,}87.10^{-1}$	0,7	0,5	450-1160
	$1{,}0.10^{-3}$	$6{,}0.10^{-3}$	$9{,}93.10^{-1}$		1	
	$1{,}0.10^{-3}$	$3{,}0.10^{-3}$	$9{,}96.10^{-1}$		2	
1	$1{,}0.10^{-3}$	$12{,}0.10^{-3}$	$9{,}87.10^{-1}$	0,07	0,5	450-1250
	$1{,}0.10^{-3}$	$6{,}0.10^{-3}$	$9{,}93.10^{-1}$		1	
	$1{,}0.10^{-3}$	$3{,}0.10^{-3}$	$9{,}96.10^{-1}$		2	

Les Figure V. 1-3 montrent l'évolution des espèces intermédiaires et des produits de la réaction en fonction de la température du réacteur à 10atm. En raison de sa structure symétrique et de la présence de groupes éthyle courts, la quantité d'intermédiaires observés dans l'oxydation du DEE est limitée. Les produits principaux sont le monoxyde de carbone, le dioxyde de carbone, le dihydrogène, l'eau, le formaldéhyde, l'acétaldéhyde, l'acide acétique (uniquement à basse température), l'éthylène et le méthane (haute température). D'autres produits en plus petite concentration tels que l'éthane, le propène et le propane ont été observés.

A cette pression, la réactivité commence à très basses températures (10% de conversion de combustible à 480 K, $\varphi = 0,5$) et atteint son maximum autour de 510 K. Une telle réactivité élevée a également été observée précédemment avec l'oxydation de l'éther dibutylique [120] réalisée dans des conditions expérimentales similaires. Bien que la réactivité du carburant revienne à zéro autour de 700 K pour le mélange $\varphi = 2$, une conversion de carburant de 7% est observée à 750 K pour le mélange $\varphi = 0,5$. Ces comportements sont correctement capturés par le modèle cinétique, à l'exception de l'étendue de la région NTC du mélange pauvre qui est sous-estimée. En outre, il convient de noter que la flamme froide / CNT est observée pendant un intervalle de température plus long pour le mélange pauvre (510–750 K) par rapport au mélange riche (510–700 K).

Les Figure V. 4-6 illustrent les résultats expérimentaux et les comparaisons avec le modèle pour les expériences à 1 atm. À la pression atmosphérique, on observe beaucoup moins de réactivité à basse température que les expériences à plus haute pression. En fait, cette faible réactivité n'est observée expérimentalement que pour les mélanges $\varphi = 0,5$ et 1 et non pour le mélange riche. Le début de la réactivité à haute température est également supérieur à celui des cas 10 atm; environ 950 K pour $\varphi = 0,5$ et 1 000 K pour le mélange riche en carburant. Les espèces intermédiaires sont similaires à l'exception de l'éthanol observé à la suite de la réaction moléculaire du DEE donnant de l'éthanol et de l'éthylène. Cette réaction moléculaire n'apparaît qu'à cette pression étant donné que les réactions bimoléculaires sont favorisées aux pressions élevées.

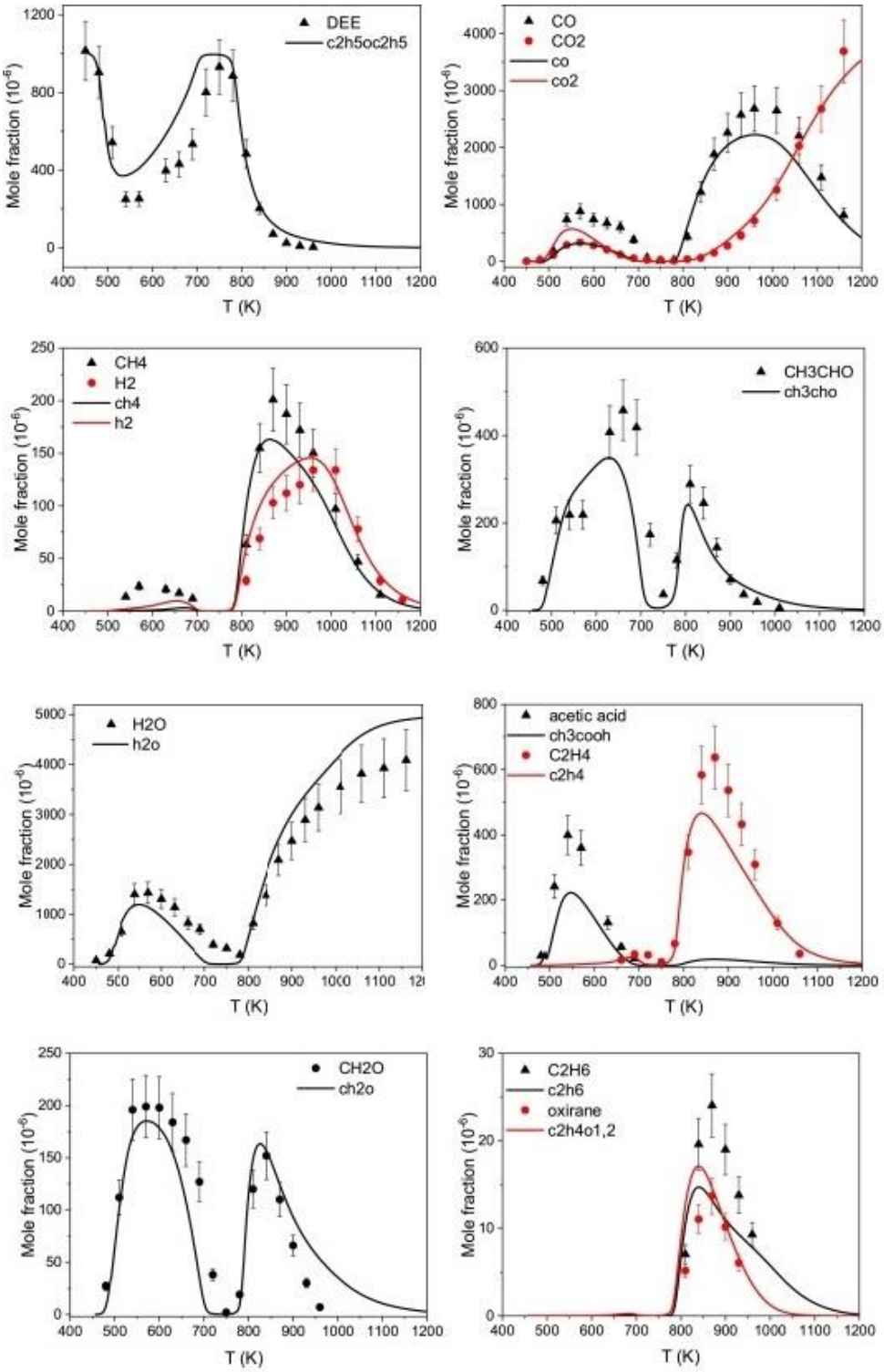

Figure V. 1 : Résultats obtenus pour l'oxydation de l'éther diéthylique à 10 atm et τ = 0,7s pour 1000ppm de DEE initial à φ = 0,5.

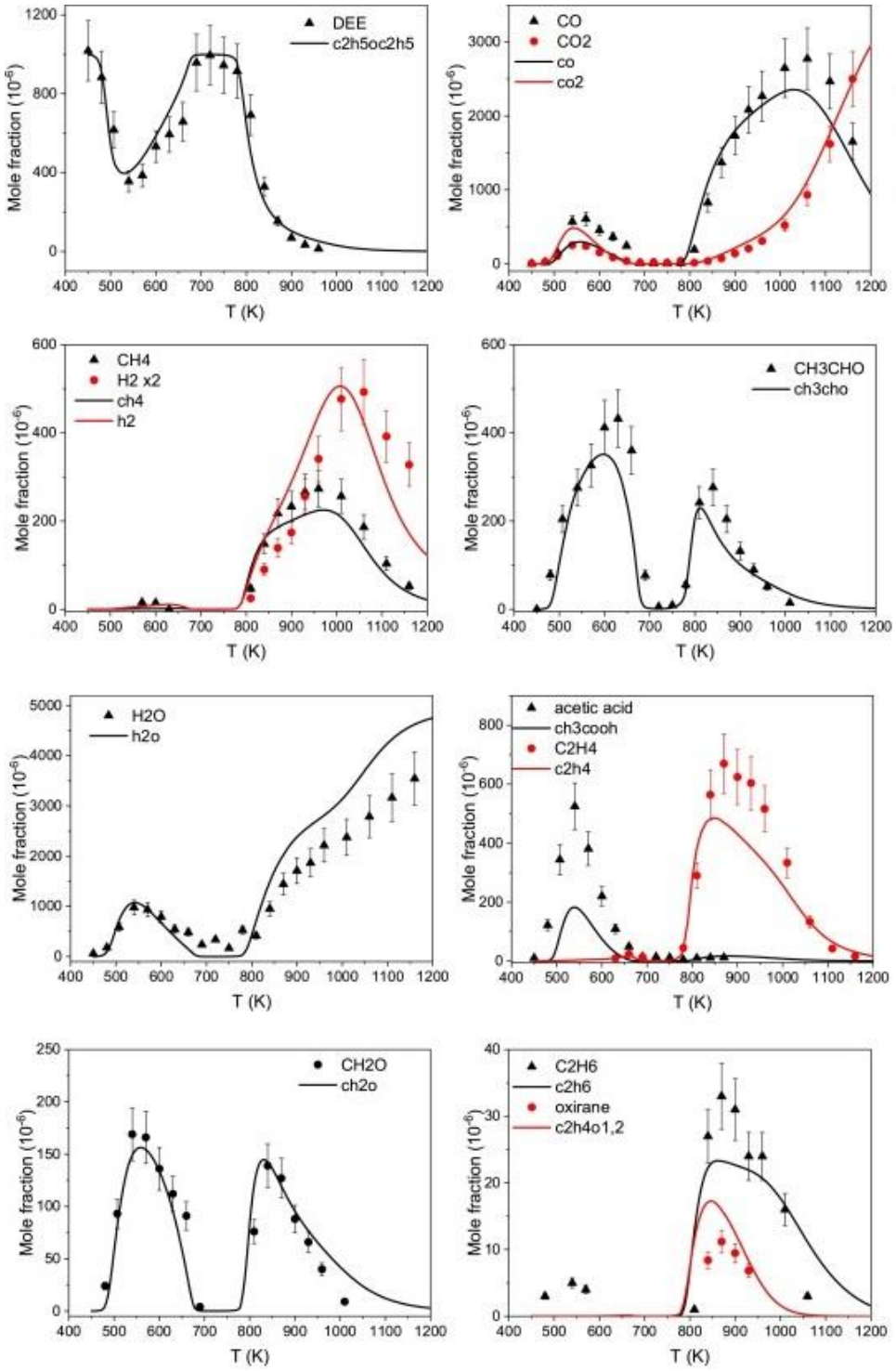

Figure V. 2 : Résultats obtenus pour l'oxydation de l'éther diéthylique à 10 atm et τ = 0,7s pour 1000ppm de DEE initial à φ = 1.

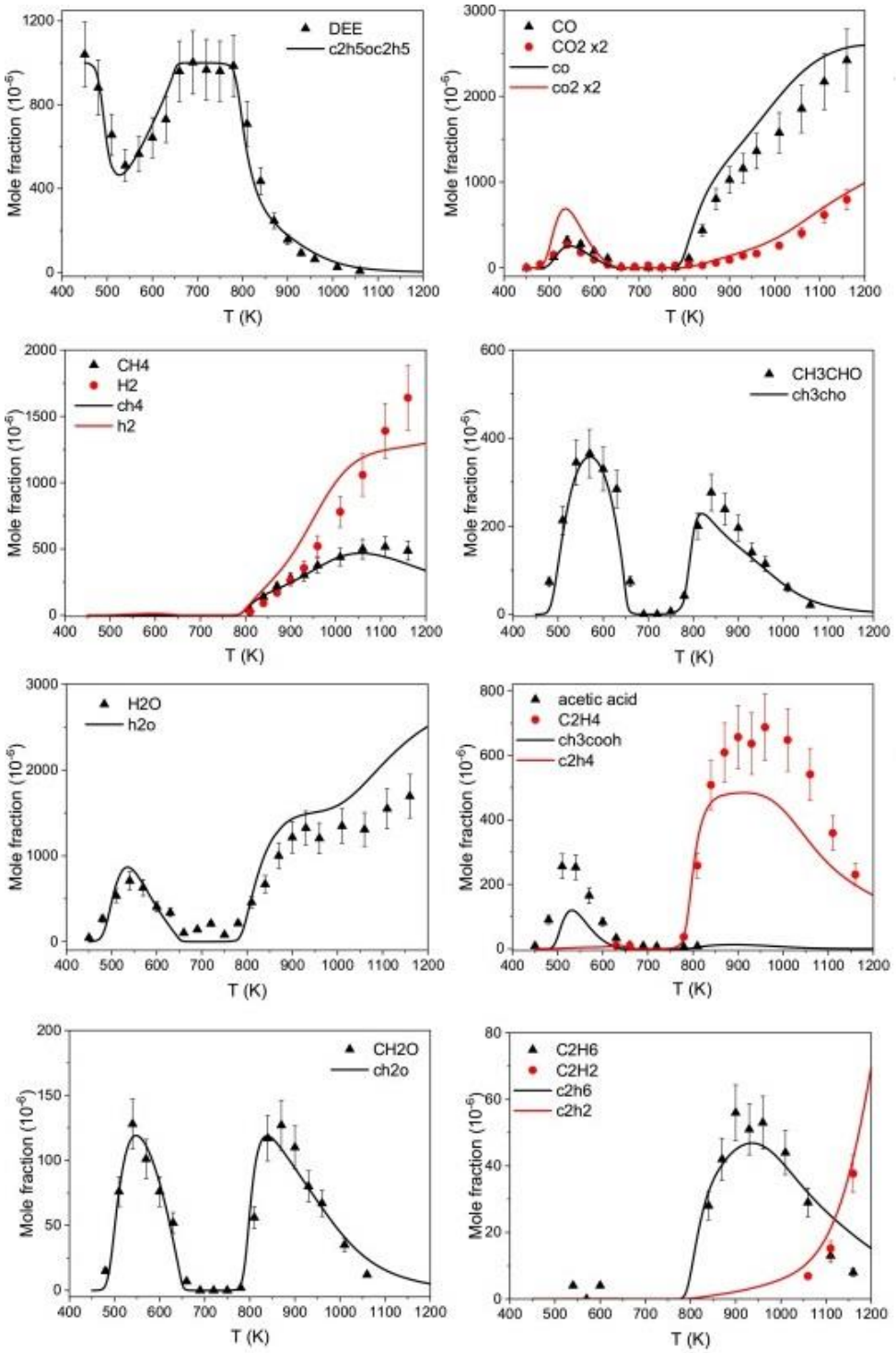

Figure V. 3 : Résultats obtenus pour l'oxydation de l'éther diéthylique à 10 atm et τ = 0,7s pour 1000ppm de DEE initial à φ = 2.

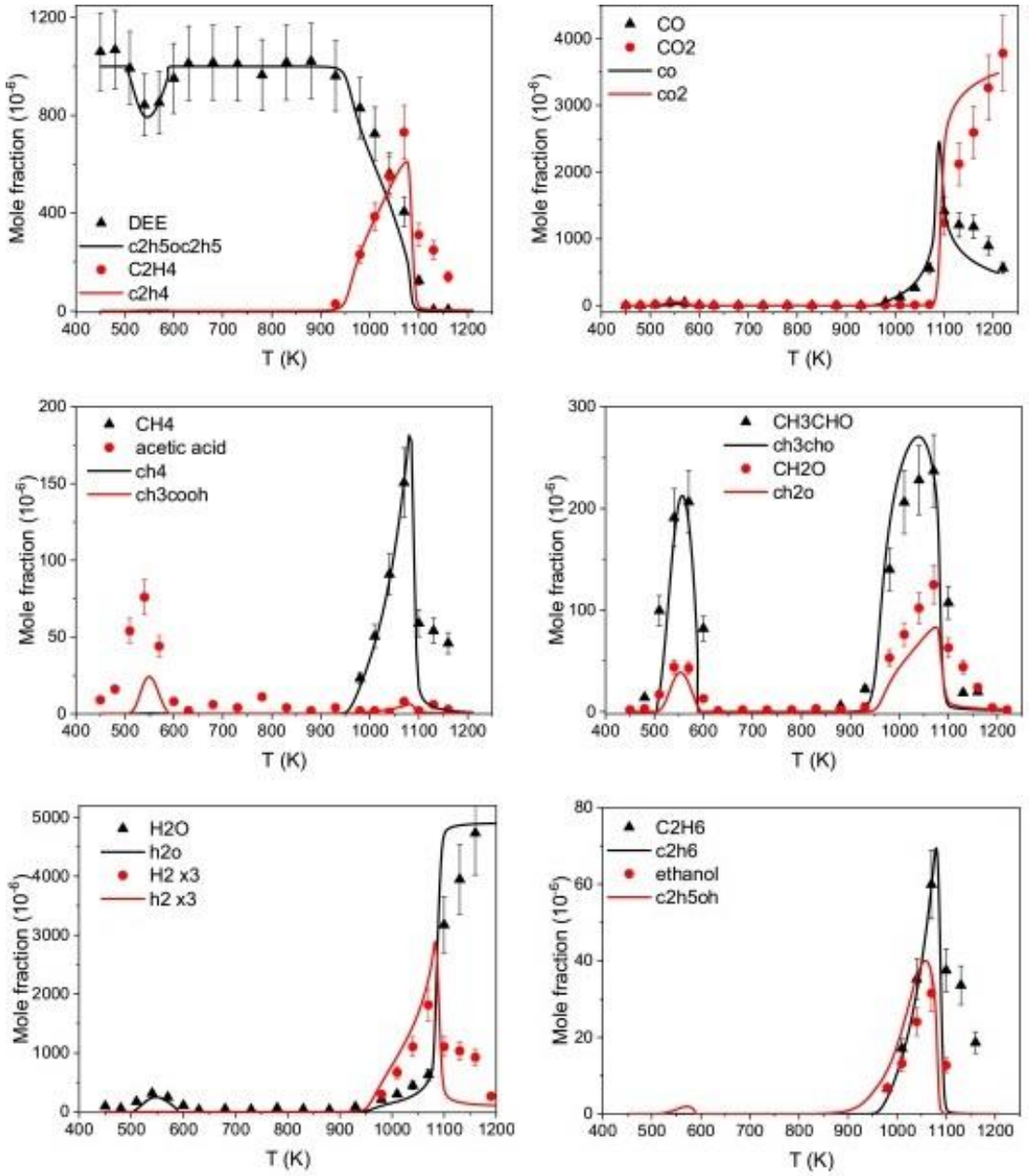

Figure V. 4 : Résultats obtenus pour l'oxydation de l'éther diéthylique à 1 bar et τ = 0,07s pour 1000ppm de DEE initial à φ = 0,5.

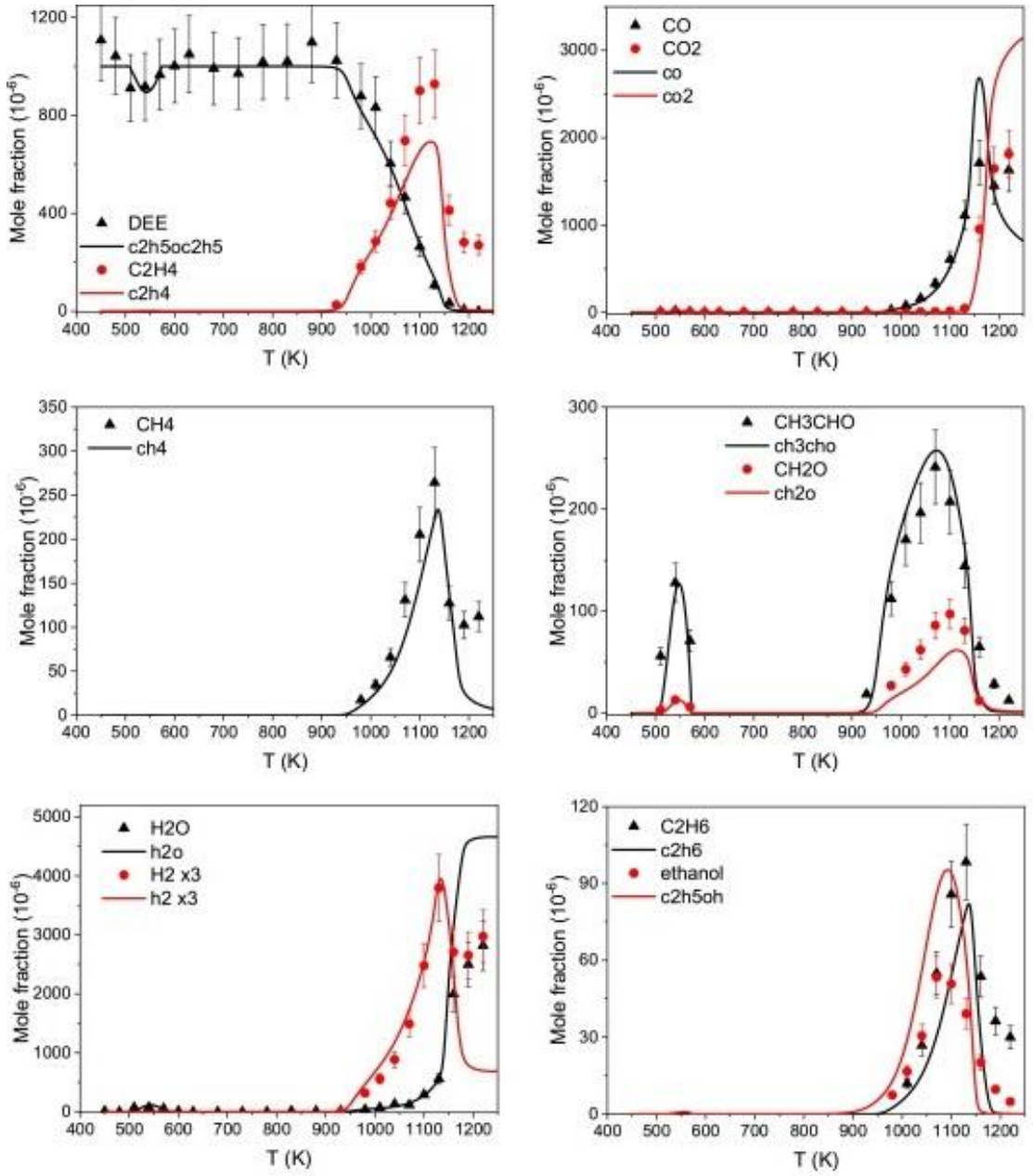

Figure V. 5 : Résultats obtenus pour l'oxydation de l'éther diéthylique à 1 bar et τ = 0,07s pour 1000ppm de DEE initial à φ = 1.

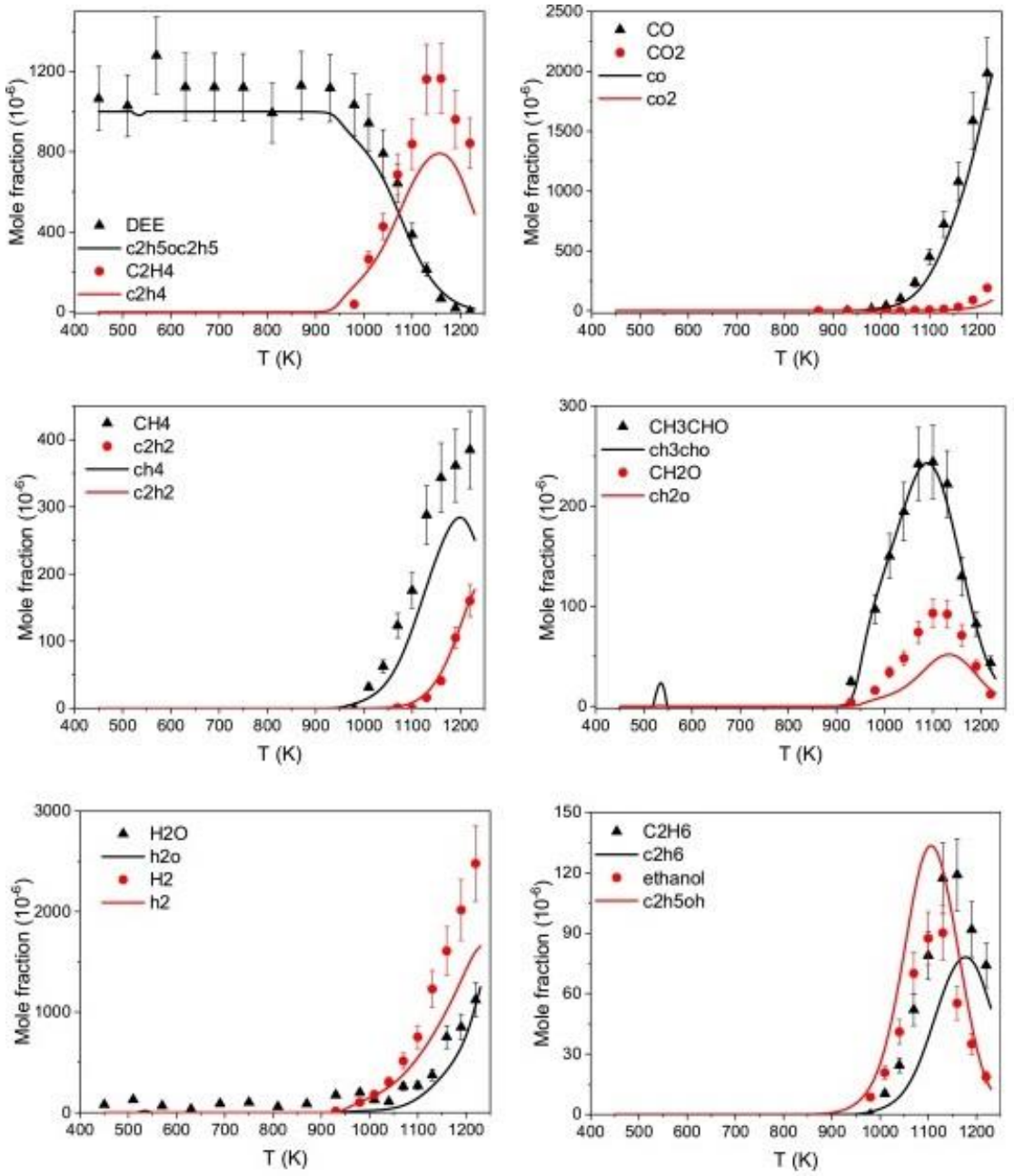

Figure V. 6 : Résultats obtenus pour l'oxydation de l'éther diéthylique à 1 bar et τ = 0,07s pour 1000ppm de DEE initial à φ = 2.

1.3. Analyse de voies réactionnelles

Les voies de réaction du DEE lors de son oxydation à 10 atm sont présentées sur la Figure V. 7 dans des conditions de mélange pauvre, à 510 et 690 K. A ces températures, la conversion du carburant est d'environ 46%.

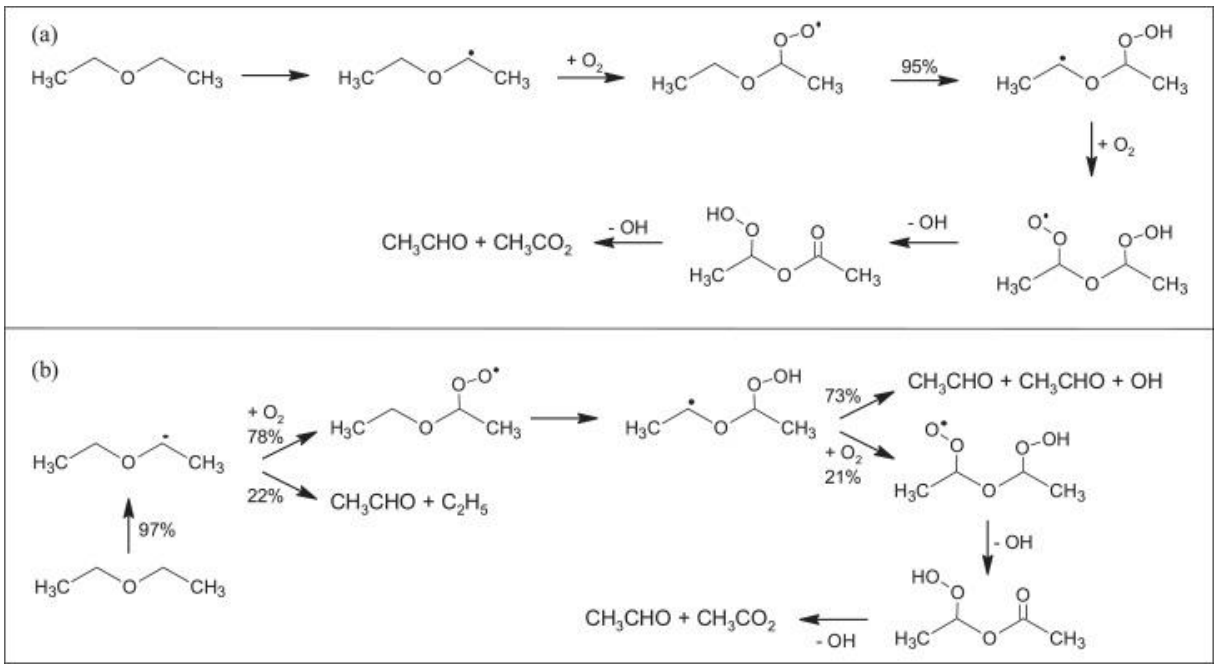

Figure V. 7 : Voies réactionnelles du DEE à (a) 510K et (b) 690K à 10 atm et φ = 0,5.

À 510 K, le carburant est consommé par les radicaux OH qui arrachent un atome d'hydrogène, donnant le radical α CH_3 – • CH – O – CH_2CH_3. Ce radical s'ajoute à l'oxygène moléculaire formant le radical RO_2. Le radical QOOH, CH_3 – • CH – O – CH (OOH) – CH_3, résulte de l'isomérisation via un état de transition cyclique à 6 atomes. C'est le QOOH le plus favorable sur le plan énergétique. Ce radical subit ensuite une seconde addition de O_2, une isomérisation et une élimination de OH donnant finalement le cétohydroperoxyde correspondant. Sa décomposition donne de l'acétaldéhyde observé en dessous de 500K.

À 690K, dans la zone du « coefficient négatif de température », 97% du carburant produit le radical α, tandis qu'environ 3% du flux produit le radical primaire. Le radical α CH_3 – • CH – O – CH_2CH_3 s'ajoute à O_2 (78% du flux réactionnel) formant le RO_2 puis le radical QOOH, CH_3 – • CH – O – CH (OOH) – CH_3 par isomérisation. D'autre part, 22% du flux provenant du radical α conduit à la formation d'acétaldéhyde via une réaction de β-scission. On peut d'ailleurs noter que la valeur maximale de la production d'acétaldéhyde se situe autour de cette température (φ = 0,5; Figure V. 1). À des températures plus élevées, le

rapport de ramification entre ces deux réactions favorise la β -scission. Par exemple, à 800K, 87% du flux donnent de l'acétaldéhyde et des radicaux éthyles.

L'acide acétique, qui est un intermédiaire majeur à basse température, est sous-estimé par le modèle (environ un facteur 2 à = 0,5). Les principales voies de formation de l'acide acétique à 550 K sont les suivantes:

- $CH_3CO + O_2 \rightleftharpoons CH_3CO_3$
- $CH_3CO_3 + (HO_2, CH_3O_2) \rightarrow CH_3COOH + O_2 + (O, CH_2O)$
- $CH_3CHO + OH \rightleftharpoons CH_3COOH + H$, dans une moindre mesure.

Les coefficients de vitesse pour les réactions $CH_3CO_3 + (HO_2, CH_3O_2)$ ont été adoptés à partir de Atkinson et al. [165], [166]. La réaction $CH_3CO_3 + HO_2$ conduit à la formation d'ozone qui est ici remplacé par $O + O_2$. Les voies considérées ci-dessus sous-estiment les quantités importantes d'acide acétique obervées expérimentalement, ce qui peut être dû en partie aux incertitudes sur le devenir des radicaux méthylperoxy (CH_3O_2) ainsi qu'aux voies manquantes du mécanisme réactionnel. Les radicaux méthyles sont produits par la décomposition des radicaux acétyloxyle (CH_3CO_2) abondants à basses températures qui sont le produit de la décomposition du principal cétohydroperoxyde, comme illustré à la Figure V. 7. À ces basses températures, $CH_3 + O_2 \rightleftharpoons CH_3O_2$ s'effectue dans le sens direct. Alors que les radicaux CH_3O_2 interviennent dans de nombreuses voies, selon le modèle actuel, 25% de sa consommation forme de l'acide acétique ($CH_3CO_3 + CH_3O_2 \rightarrow CH_3COOH + O_2 + CH_2O$).

De l'éthane et de petites quantités de propane (pic à 15 ppm, φ = 2) sont observées avec des valeurs maximales à 950 K; il s'agit de produits de recombinaison des réactions $CH_3 + CH_3$ (+ M) ⇌ C2H6 (+ M) et $CH_3 + C_2H_5$ (+ M) ⇌ C_3H_8 (+ M). Un maximum de 10 ppm de propène a été observé. Il est formé par l'élimination de HO_2 du radical isopropylperoxyde ainsi que par l'oxydation des radicaux n- et isopropyle. Du point de vue cinétique, l'éther cyclique principal devrait être le 2,4-diméthyl-1,3-dioxétane, mais cette espèce n'a pas encore été identifiée, probablement en raison de son instabilité relative.

A pression atmosphérique, une faible réactivité de basse température a été observée pour les conditions stœchiométrique et pauvre, qui est bien simulée par le modèle. La principale différence avec la réactivité à 10 atm est l'importance de la réaction moléculaire du DEE donnant de l'éthanol et de l'éthylène dans la zone de haute température, 18% du flux réactionnel à 1050K et dans les conditions stœchiométriques (Figure V. 8). Il convient de

noter que la principale voie de production d'éthylène à 1 atm reste la scission C – H de radicaux éthyles.

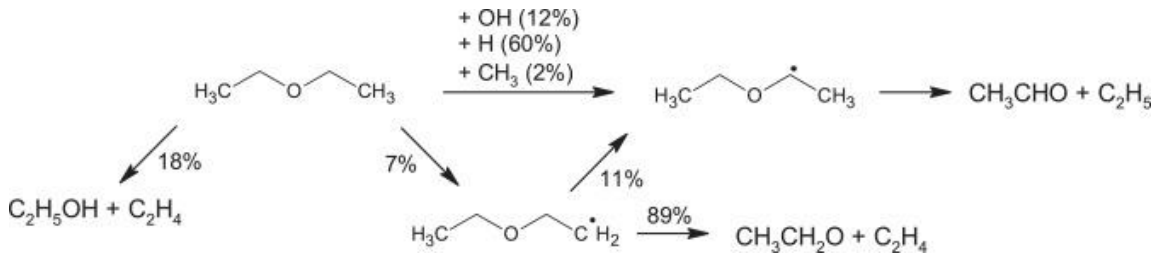

Figure V. 8 : Voies de décomposition du carburant à pression atmosphérique à 1050K et φ = 1.

1.4. Validation supplémentaire

Le modèle a également été testé sur les données disponibles dans la littérature, à savoir des vitesses laminaire de flamme et des délais d'auto-inflammation. La Figure V. 9 compare les délais d'auto-inflammation de divers mélanges de DEE dans l'argon ou dans l'air, rapportés par Yasunaga et al. [162] et Werler et al. [112] sur différentes plages de températures et de pressions. L'accord du modèle est assez bon avec les données de la littérature, en particulier avec les données du tube de choc de Yasunaga et al. et les données de machine à compression rapide (Rapid Compression Machine RCM) à haute pression (a) de Werler et al. (b). La concordance avec les données à 3 bar des expériences RCM (c) est bonne jusqu'à 770 K. Au-dessus de 700 K, le modèle prédit des délais d'auto-inflammation plus longs que ceux rapportés. Les auteurs ont récemment signalé que leurs données à haute température étaient pré-allumées (données en gris) et que les délais étaient en conséquence raccourcis.

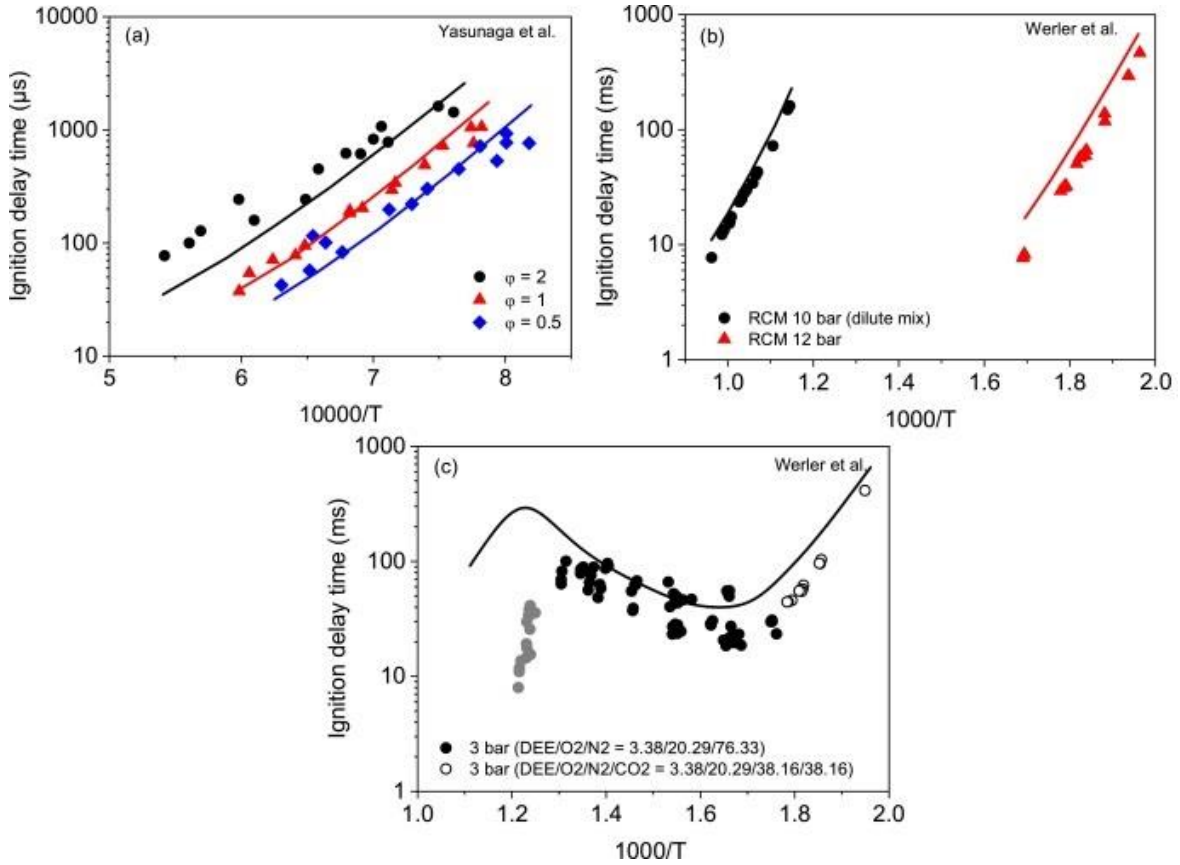

Figure V. 9 : Comparaison du modèle (lignes) avec les délais d'auto-inflammation (points) obtenus pour : (a) 1% DEE dans l'argon à pression atmosphérique en tube à choc [162] (b) 0.698% DEE dans l'argon à la stœchiométrie, P = 10–12 bar, en tube à choc [112] (c) DEE à la stœchiométrie dans l'air en machine à compression rapide [112].

La Figure V. 10 montre les vitesses de flamme laminaire de mélanges DEE / air en fonction de la richesse [109] et en fonction de la pression pour une mélange richesse de richesse 1,4 [110]. Le modèle est en bon accord avec les données présentées en (a), l'écart pour la valeur maximale à 398K est de 5%. On remarque par contre une sous-estimation considérable du modèle par rapport aux données de la figure (b), environ 20%. Cette divergence, qui se produit également avec le modèle des auteurs, a été expliquée par des incertitudes dans la base du mécanisme ou des incertitudes dans l'expérience.

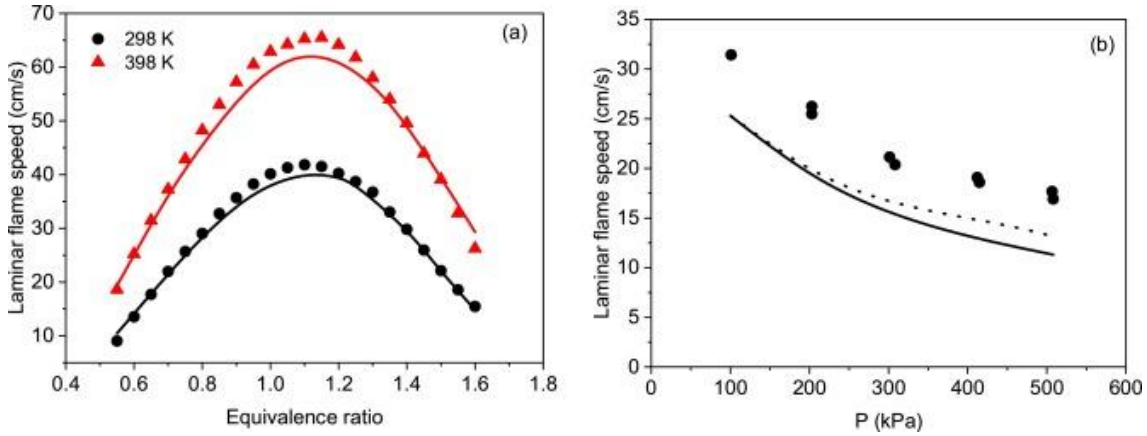

Figure V. 10 : Vitesse de flamme laminaire d'un mélange DEE/air (a) en fonction de la richesse à 1 atm, T_u = 298 et 398 K [109] (b) en fonction de la pression à φ = 1,4, T_u = 298 K [110], les lignes plaines sont les résultats simulés avec le mécanisme tandis que les lignes en pointillés sont celles obtenus avec le mécanisme de Tran et al. [110].

2. L'éther dipropylique

2.1. Construction du mécanisme

Le sous-mécanisme de l'éther dipropylique (DPE) a été développé de la même façon que celui du DEE. Des analogies similaires avec les études précédentes sur le DEE et sur le DBE ont été faites. Les constantes de vitesse des réactions principales ont été tirées de la littérature :

• Les réactions de métathèse du carburant par les radicaux OH sont extraites de Zhou et al. [167] pour le site alpha (liaison C – H la plus proche du groupement éther). Pour le site beta C – H, la constante de vitesse est évaluée en ajustant les calculs théoriques effectués par [168-170] sur le site beta C – H du n-butanol. Pour le site gamma C – H, la constante de vitesse est également attribuée en ajustant les calculs de [168-170] et les mesures de Droege et Tully [171] pour la liaison delta C – H du n-butanol, car celle-ci est la plus éloigné du carbone portant la fonction alcool.

• Les réactions de métathèse du carburant par les radicaux H sont extraites de l'étude théorique de Ogura et al. [128] pour le site alpha. Pour les liaisons C – H bêta et gamma, les constantes sont tirées de Tsang [172].

• Les constantes de vitesse d'arrachement de H par les radicaux HO_2 et CH_3 sont adoptées à partir des études théoriques de Mendes et al. [157] et Xu et al. [158], respectivement.

• Les constantes de vitesse pour les réactions R + O_2 ⇌ RO_2 sont adoptées par Goldsmith et al. [159], pour les deux additions d'oxygène moléculaire.

• Les constantes de vitesse pour RO_2 ⇌ QOOH et QOOH ⇌ éther cyclique + OH sont tirées de Villano et al. [160], [161].

• les réactions de β-scission des radicaux du carburant et celles de QOOH sont issues des calculs théoriques de Villano et al. [161], Sakai et al. [118], et des calculs sur le DBE [120].

• Les réactions de décomposition unimoléculaire du DPE ont été extraites de l'étude de Yasunaga et al. [162] en analogie avec celle du DEE. Ces réactions n'ont aucune importance dans les conditions expérimentales actuelles.

La thermochimie du carburant, de ses radicaux que de toutes autres espèces apparentées aux réactions de basse température a été calculée à l'aide de Thergas [163]. Le mécanisme comprenant 528 espèces et 3062 réactions est donné en **Annexe 3**.

2.2. Étude en réacteur parfaitement agité

L'oxydation de l'éther dipropylique a été étudiée à haute pression (10 atm) pour quatre conditions de richesse (stœchiométrie, deux milieux riche et une milieu pauvre). Les conditions opératoires sont résumées dans le Tableau V. 2.

Tableau V. 2 : Conditions expérimentales de l'étude de l'éther dipropylique.

Pression (atm)	X_{DPE} initiale	X_{O_2} initiale	X_{N_2} initiale	Temps de passage (s)	Richesse	Plage de température (K)
10	$1{,}0.10^{-3}$	$18{,}0.10^{-3}$	$9{,}81.10^{-1}$	0,7	0,5	450-1160
	$1{,}0.10^{-3}$	$9{,}0.10^{-3}$	$9{,}9.10^{-1}$		1	
	$1{,}0.10^{-3}$	$4{,}5.10^{-3}$	$9{,}945.10^{-1}$		2	
	$1{,}0.10^{-3}$	$2{,}25.10^{-3}$	$9{,}9675.10^{-1}$		4	

Les principaux produits identifiés et mesurés lors de l'oxydation de l'éther dipropylique sont le monoxyde de carbone, le dioxyde de carbone, l'eau, le dihydrogène, le formaldéhyde, le propanal, l'acétaldéhyde et l'acide propanoïque. Le formaldéhyde est un marqueur typique de la réactivité à basse température de nombreux carburants et se forme également en grande quantité lors de l'oxydation du DPE. L'intermédiaire oxygéné typique dans le cas du DPE est le propanal.

Les Figure V. 11-14 montrent l'évolution des espèces intermédiaires et des produits de la réaction en fonction de la température du réacteur à 10 atm ainsi que les simulations du mécanisme réactionnel dans ces conditions. Comme pour le DEE, la réactivité du DPE à basse température commence très tôt (480K) et est très marquée notament pour le mélange pauvre (plus de 60% du carburant est converti au maximum de réactivité).Il est intéressant de noter que la réactivité du carburant revient à zéro pour les mélanges riches autour de 740K contrairement au mélanges stœchiométrique et pauvre. Pour ces deux dernières conditions, la région CNT commence aux alentours de 530K et atteint un plateau sur une fenêtre de température de près de 200K. Ce comportement ressemble au double CNT observé pour le DBE [120]. Il n'est cependant pas possible de conclure la même chose du DPE, les seuls points décrivant ce comportement dans ces conditions étant compris dans les incertitudes de mesure.

De manière générale, dans toutes les conditions, le modèle cinétique s'accorde assez bien avec les données, à l'exception de ce comportment de « second CNT ». Ces incertitudes cinétiques sont dues aux constantes de vitesse adoptées dans le mécanisme d'oxydation à basse température. Souvent, ces constantes de vitesse sont plus appropriées pour l'oxydation d'alcanes et des analogies doivent être établies dans le développement de mécanismes pour les composés oxygénés. Enfin, une différence de facteur de 1,5 à 2 est observée avec la valeur maximale de l'éthylène et du méthane et le CO est légèrement sur-prédit dans les mélanges riches.

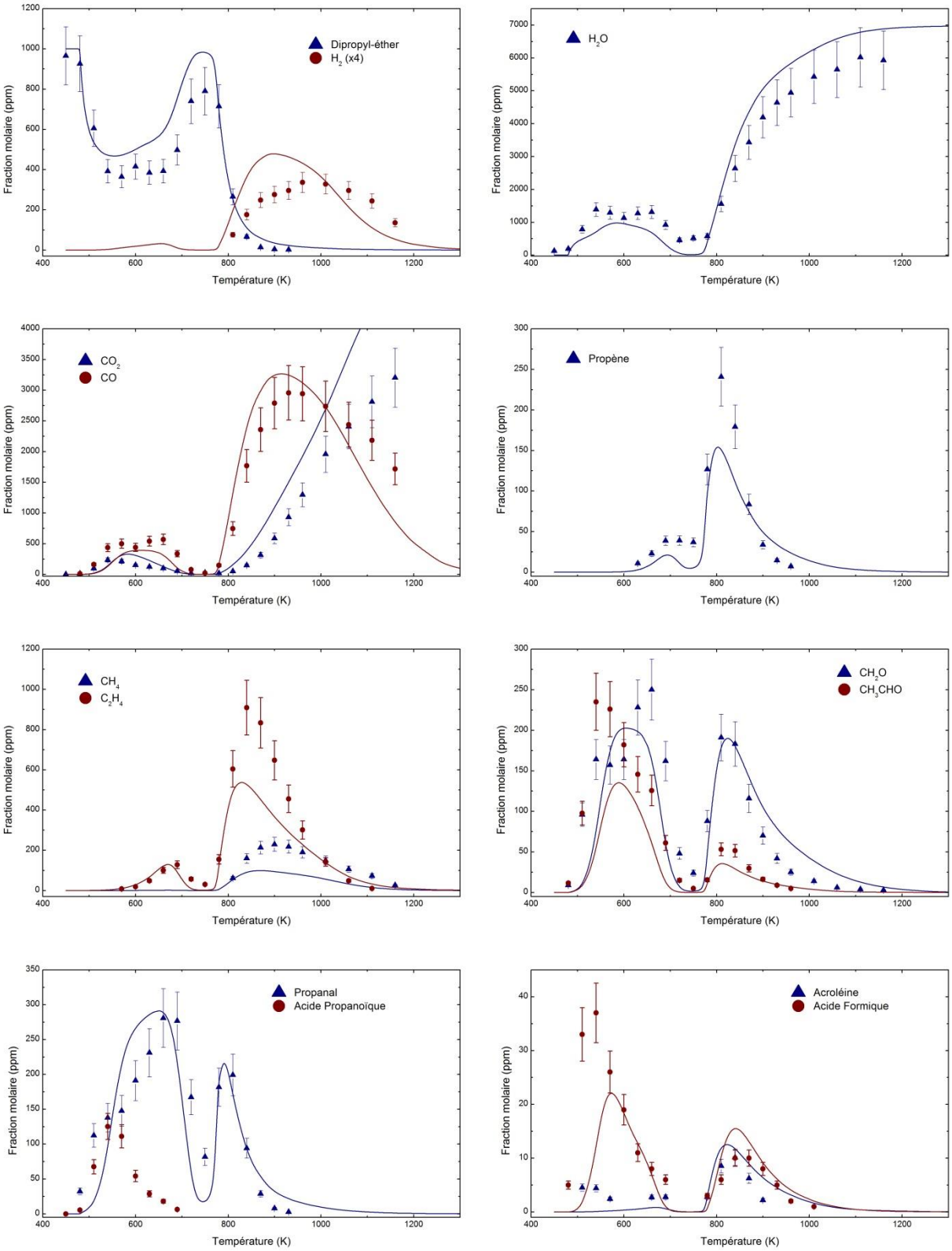

Figure V. 11 : Résultats obtenus pour l'oxydation de l'éther dipropylique à 10 atm et τ = 0,7s pour 1000ppm de DPE initial à φ = 0,5.

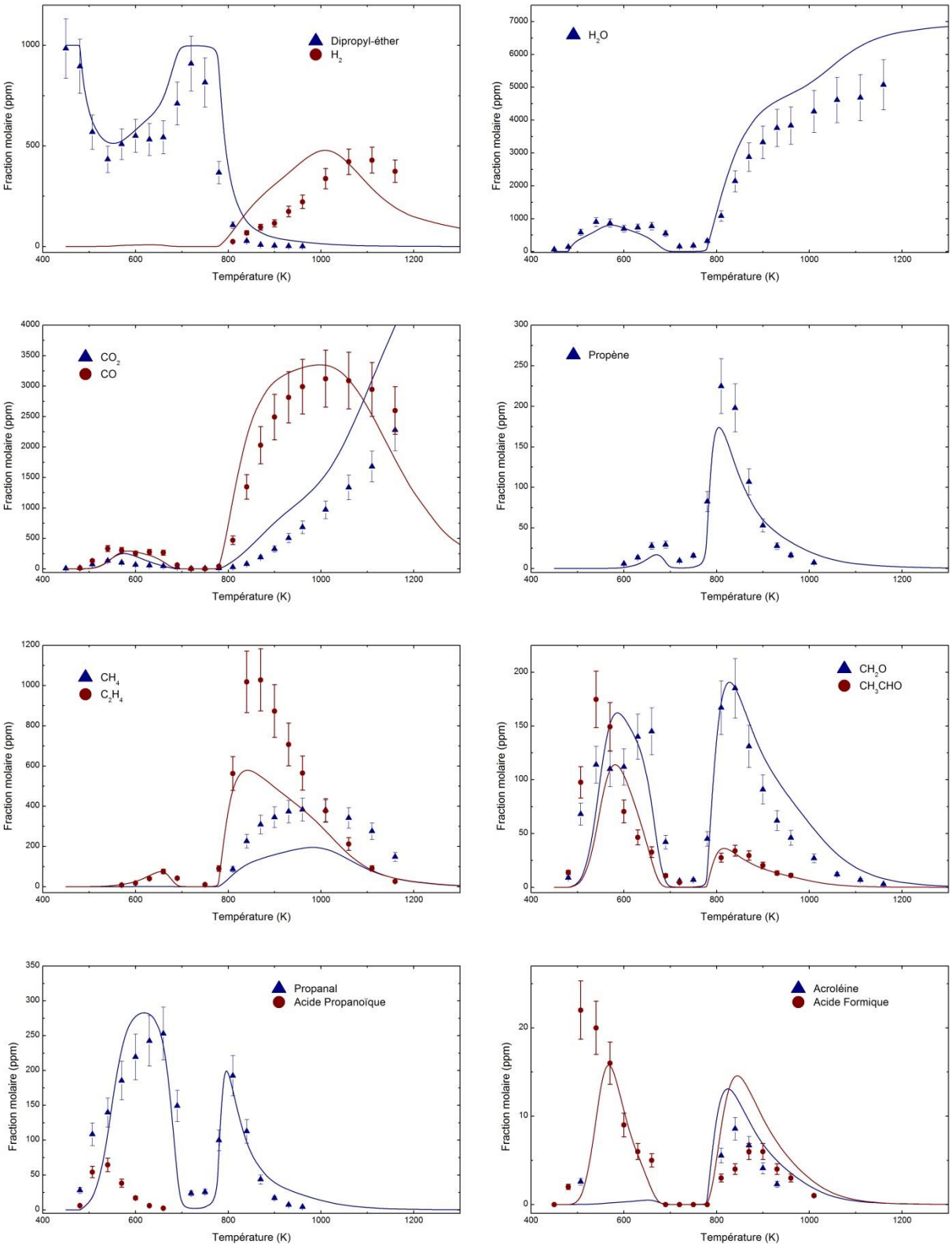

Figure V. 12 : Résultats obtenus pour l'oxydation de l'éther dipropylique à 10 atm et τ = 0,7s pour 1000ppm de DPE initial à φ = 1.

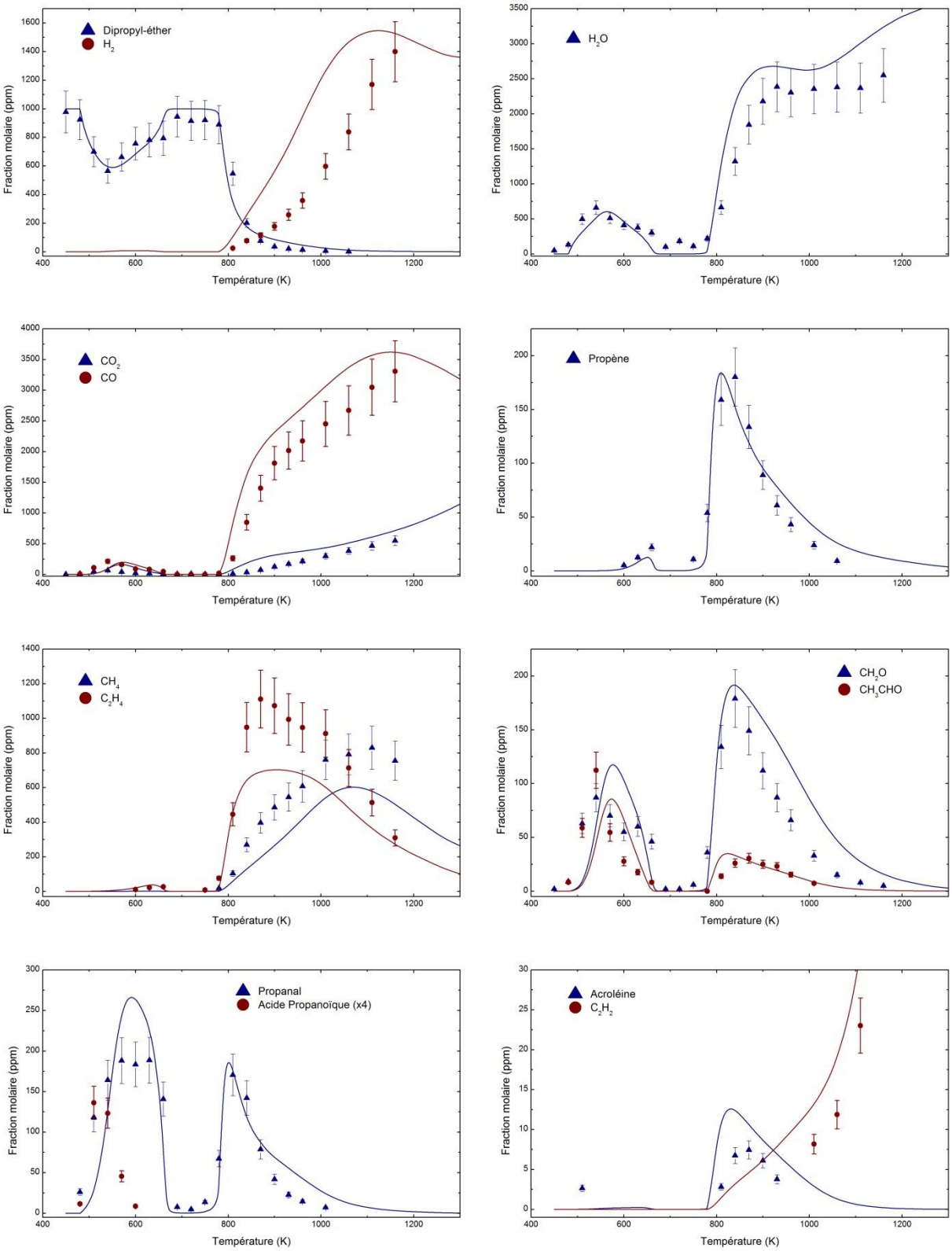

Figure V. 13 : Résultats obtenus pour l'oxydation de l'éther dipropylique à 10 atm et τ = 0,7s pour 1000ppm de DPE initial à φ = 2.

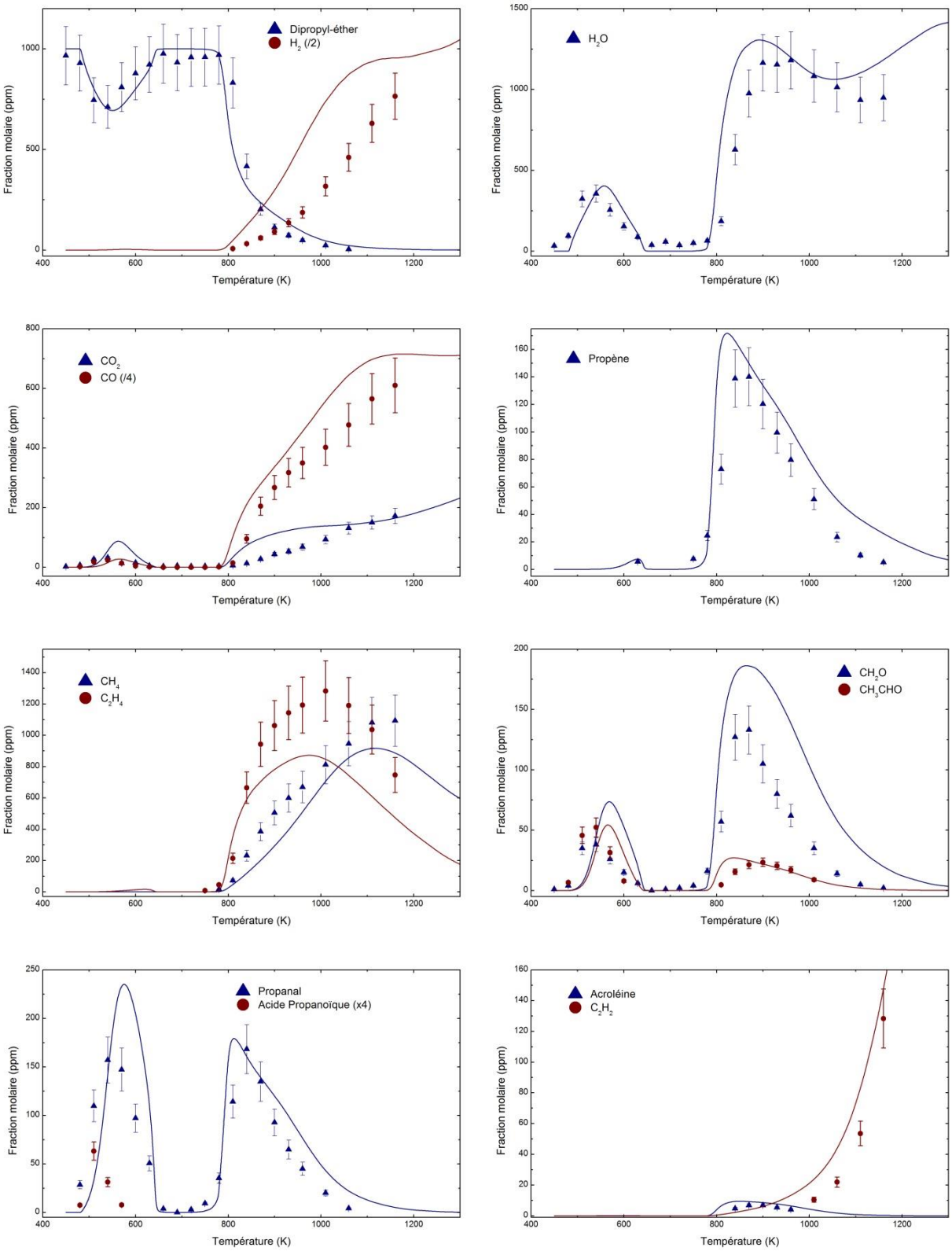

Figure V. 14 : Résultats obtenus pour l'oxydation de l'éther dipropylique à 10 atm et τ = 0,7s pour 1000ppm de DPE initial à φ = 4.

2.3. Analyse de voies réactionnelles

Le DPE peut former trois radicaux spécifiques au carburant distincts par arrachement d'un atome d'hydrogène, les radicaux α-dpe1 (résultant de l'arrachement d'un atome H de la liaison alpha secondaire C – H), β-dpe2 (liaison bêta secondaire) et γ-dpe3 (liaison gamma primaire). Les énergies de dissociation des liaisons C – H pour ont été calculées avec les méthodes composites G3B3 et CBS-QB3 à l'aide de Gaussian09 [173] et sont présentées sur la Figure V. 15 ci-dessous. La liaison alpha C – H est la plus faible et donc le radical dpe1 est favorisé. Il est bon de noter que l'énergie de la liaison gamma C – H (101,7 kcal/mol) est similaire à une liaison primaire C – H dans un alcane, ce qui confirme le choix de l'analogie.

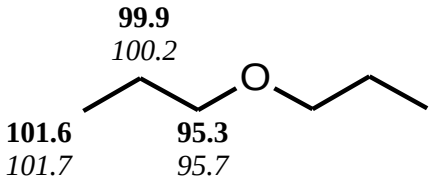

Figure V. 15 : Energie de dissociation des liaisons C – H du DPE, calculées avec G3B3 (en gras) et la méthode CBS-QB3 (en italique).

Les principales voies de réaction sont présentées à la Figure V. 16 pour l'oxydation à basse température du DPE, qui est principalement consommée par les réactions d'abstraction de H par les radicaux OH, et ce à toutes les températures.

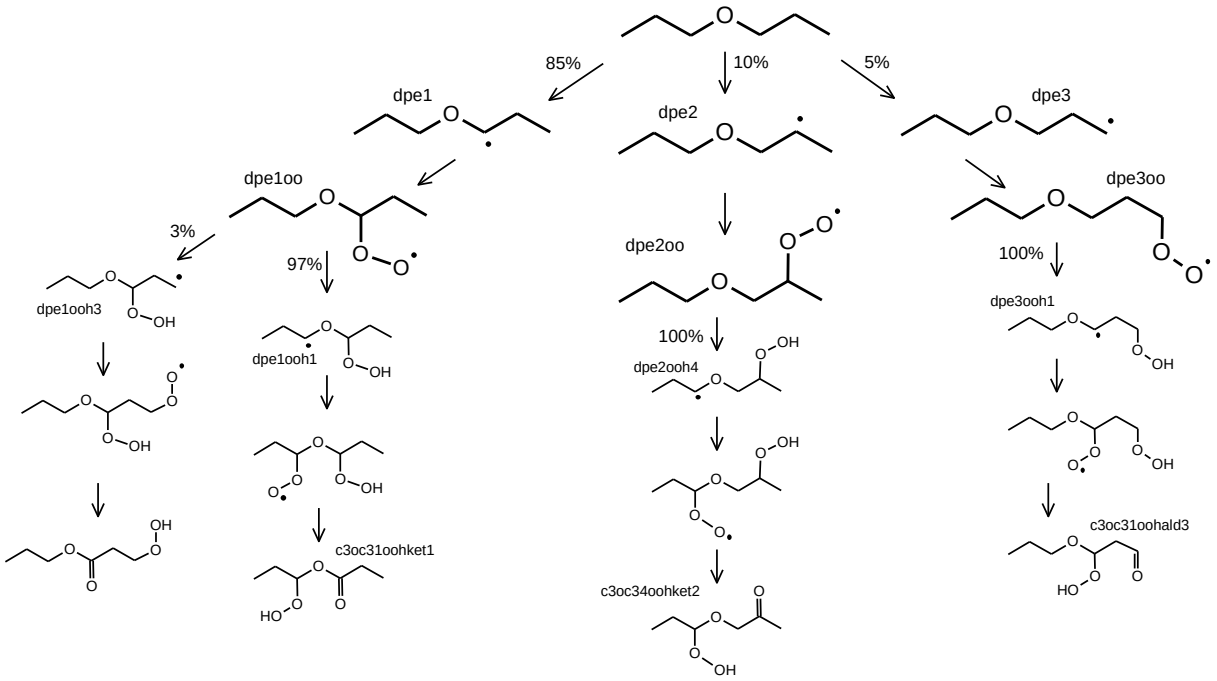

Figure V. 16 : Voies réactionnelles principales à 500K et dans les conditions stœchiométriques.

À basse température, l'addition de l'oxygène moléculaire sur les radicaux du carburant est dominante, ce qui forme les radicaux RO_2. Ces radicaux peuvent subir une isomérisation pour former des radicaux QOOH. Dans ces conditions, le QOOH produit par l'intermédiaire d'un état de transition à six atomes est privilégié (100% des flux réactionnels sur la Figure V. 16). La formation de propanal à basse température se fait par la décomposition des cétohydroperoxydes, qui est probablement la voie principale à basse température. Cette réaction est souvent écrite en une étape avec comme produits des fragments de ramification de chaîne et un radical OH. La constante de vitesse de cette réaction utilisée dans divers mécanismes provient d'une étude expérimentale de Sahetchian et al. [174], pouvant s'écrire approximativement $k = 1x10^{16}\ exp\ (-43\ kcal\ /\ RT)$. Un facteur pré-exponentiel ou une énergie d'activation légèrement différents peuvent être trouvés dans divers mécanismes de la littérature.

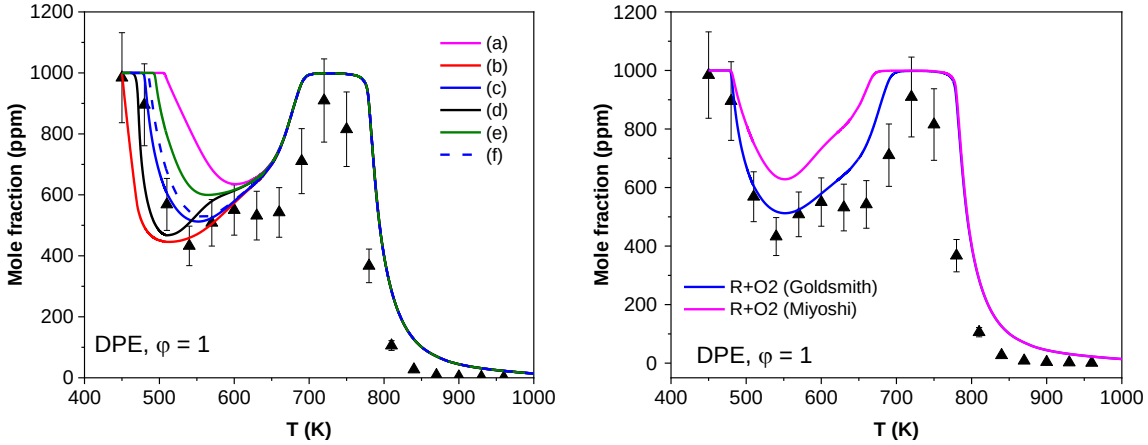

Figure V. 17 : Effet du choix des paramètres d'Arrhénius pour la réaction R + O_2 ⇌ RO_2 à droite et de la décomposition des cétohydroperoxydes (CHP) à gauche, (a) avec E_a = 43 kcal/mol pour tous les CHP, (b) E_a = 37 kcal/mol pour tous les CHP, (c) E_a = 40 kcal/mol pour tous les CHP, (d) Ea = 37 kcal/mol sauf pour c3oc31ohhket1, (e) Ea = 40 kcal/mol sauf pour c3oc31ohhket1, (f) en utilisant la constante de Goldsmith et al. [175] pour la réaction $HOOCH_2CH_2CHO \rightarrow {}^{\bullet}OCH_2CH_2CHO + {}^{\bullet}OH$.

La Figure V. 17 montre l'effet de cette constante de vitesse sur les prévisions de la fraction molaire du carburant. L'énergie d'activation de la décomposition des CHP a été modifiée jusqu'à 6 kcal/mol. Cette très faible énergie d'activation a été proposée dans le modèle cinétique de Cai et al. [176] sur l'oxydation du DBE pour tous les KHP possibles. L'effet considérable de cette constante de vitesse sur les profils des fractions molaires peut être clairement observé. Une comparaison avec l'étude théorique de Goldsmith et al. [175] sur la décomposition de $HOOCH_2CH_2CHO$. Cette constante de vitesse semble être très proche de

celle obtenue en réduisant l'énergie d'activation d'origine de 3 kcal, ce qui a donc été adoptée ici. De plus, afin de mettre en évidence l'effet de la constante de vitesse $R + O_2 \rightleftharpoons RO_2$, les prédictions utilisant deux constantes de vitesse calculées théoriquement par Goldsmith [159] et Miyoshi [177], deux constantes très souvent utilisées dans les mécanismes cinétiques. En réalité, cette réaction réversible est très sensible à la thermochimie des espèces mises en jeu et que pour beaucoup d'espèces, la théorie d'additivité des groupes a été utilisée pour la calculer. De même, comme dans le cas des constantes de vitesse adoptées par Villano et al. [160] [161] pour cette classe de réactions, très souvent, ces calculs sont effectués pour les alcanes. Les analogies sont donc faites par rapport aux alcanes bien que le carburant soit un éther. Cela ajoute probablement une incertitude supplémentaire aux résultats simulés.

3. Comparaison de la réactivité des éthers symétriques

La Figure V. 18 illustre la conversion du DEE, DPE et DBE dans les mêmes conditions expérimentales afin de comparer leur réactivité relative. Sur cette figure, des différences et similitudes sont notables. Les trois éthers sont très réactifs, la conversion commence à une température juste au-dessus de 450 K et ils présentent tous une forte réactivité à basse température et une zone de CNT. Tandis que le DBE présente un comportement à double CNT, cet effet est moins prononcé dans l'oxydation du DPE et semble être absent dans le cas du DEE. Parmi les trois, le DBE se distingue par une conversion très élevée, même dans les deux régions CNT (conversion toujours supérieure à 60% dans les conditions de richesse pauvre).

Cette particularité observable lors de l'oxydation du DBE provient du fait que, malgré la longueur de la chaîne de cette espèce, la formation de petits radicaux est possible à basse température. Son oxydation peut produire des radicaux tels que le n-propyle, principalement à partir de la décomposition du cétohydroperoxyde $C_3H_7C(=O)OCH(OOH)C_3H_7$. La décomposition de ce cétohydroperoxyde produit également du butanal, dont l'alpha-scission de son radical acyle produit des radicaux n-propyle à basse et moyenne températures, et des radicaux n-butyle aux températures intermédiaires. Par conséquent, le régime à basse température du DBE est également contrôlé par les voies suivies par les plus petits radicaux qui ont leur propre réactivité. Par contre, dans le cas du DEE, les chaînes à deux atomes de carbone ne permettent pas ce genre d'interactions. Le DPE se situe toutefois à mi-chemin

entre le DEE et le DBE et produit des radicaux éthyles en abondance lors de son oxydation. Les radicaux éthyles s'aadditonnent à l'oxygène moléculaire à des températures plus basses et suivent plutôt des voies de dismutation (produisant de l'éthanol, par exemple). Ils ne déclenchent pas une chimie de type CNT comme dans le cas du DBE, mais ils sont plus réactifs que les radicaux méthyles produits lors de l'oxydation du DEE. Il convient de noter que ces observations valent pour les conditions étudiées de 1 000 ppm de fraction molaire de carburant initiale, 10 atm et pour un temps de passage de 700 ms et que, dans d'autres conditions, ces profils de réactivité peuvent être différents.

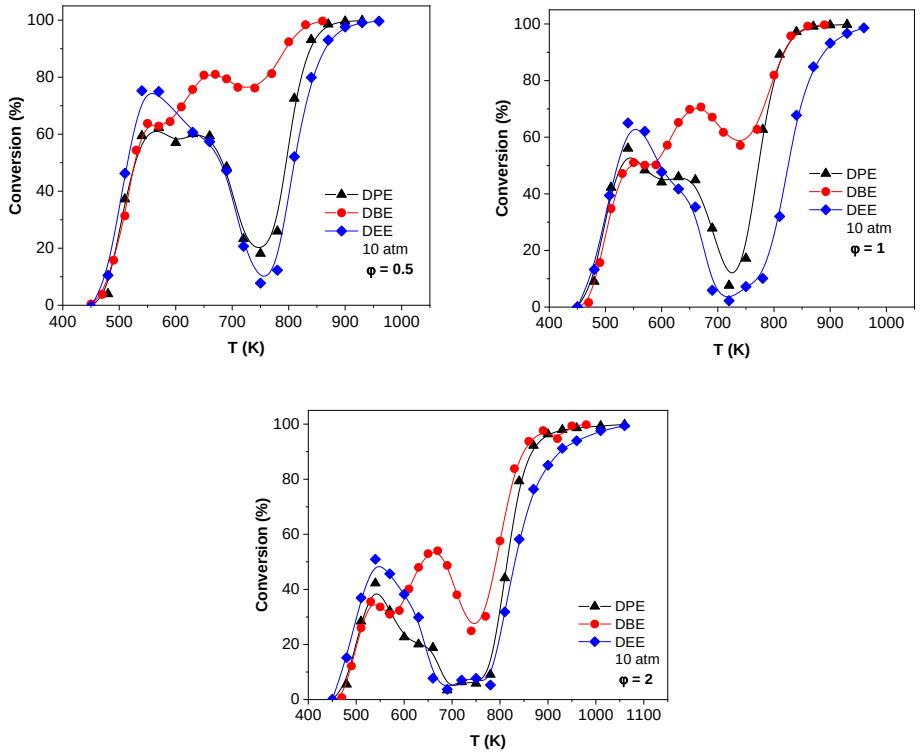

Figure V. 18 : Comparaison de la récativité du DEE, DPE et DBE dans les mêmes conditions expérimentales pour les trois richesses étudiées (les lignes aident à la visibilité).

Enfin, à ces températures, la thermochimie a une importance cruciale. Par conséquent, les valeurs des données thermodynamiques (notamment celles de RO_2, QOOH et OOQOOH) doivent être aussi précises que possible en plus de celles des constantes de vitesse. La méthode d'additivité de groupe peut avoir ses limites avec de tels radicaux complexes.

4. Conclusion

L'oxydation du DEE et du DPE a été étudiée expérimentalement dans un réacteur auto-agité par jets gazeux dans les mêmes conditions que dans une précédente étude du DBE [120]. Ces trois éthers symétriques présentent une réactivité précoce, autour de 470K dans les conditions étudiées. À 10 atm, l'oxydation du DEE et du DPE est marquée par une flamme froide importante suivie d'une zone de CNT. Dans le cas du DEE, la réactivité retombe à zéro entre le CNT et la zone de haute température, ce qui n'est pas le cas pour le DPE et le DBE. Le DPE semble présenter un comportement à double CNT, bien que celui-ci soit bien moins important que dans le cas du DBE.

Ces molécules étant symétriques et ayant des chaînes carbonnées relativement courtes, le nombre d'espèces stables mesurables en GC est limitée. On note toutefois une importante production d'acides carboxyliques pour ces trois éthers. Bien que des voies réactionnelles possibles aient été proposées, les simulations produites par le mécanisme réactionnel sous-estiment la concentration de ces espèces. Dans l'ensemble, on observe cependant un assez bon accord entre le modèle et les résultats expérimentaux pour les autres espèces.

VI. Les di-éthers

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1. Le diméthoxy méthane

1.1. Etude expérimentale

Deux réacteurs auto-agités par jets gazeux ont été utilisés dans cette étude. Les expériences en réacteur auto-agité (JSR) à pression quasi atmosphérique ont été réalisées à l'Advanced Light Source (ALS) du Laboratoire National Lawrence Berkeley. Ce système expérimental est couplé en ligné à un spectromètre de masse à temps de vol (TOF). Une description détaillée des ces éléments a déjà été présentée dans le Chapitre III. Un mélange pauvre en carburant (ϕ = 0,5) dilué avec de l'argon (Ar) contenant 2% molaire de DMM et 16% d'O_2 a été introduit dans le JSR, à l'intérieur duquel la pression a été maintenue constante à 750 torr (99991,8 Pa). La concentration initiale relativement élevée en carburant a été choisie pour générer des signaux puissants pour une meilleure détection et identification des intermédiaires d'oxydation à basse température. La température contrôlée par un thermocouple de type K a été variée de 460 à 820 K avec un incrément de 20 K. Les débits ont été ajustés pour maintenir un temps de passage de 3 s.

En balayant l'énergie des photons de 9,6 à 11,2 eV à une température contrôlée à 600 K, des spectres d'efficacité de photoionisation (PIE) ont été obtenus pour l'identification des espèces [178, 179]. À chaque température de fonctionnement, les spectres de masse ont été enregistrés à des énergies de photons de 16,65 eV, 14,35 eV, 13,20 eV, 11,50 eV, 11,00eV et 10,80 eV, afin de calculer les fractions molaires des espèces en fonction de la température. Pour les concentrations des principales espèces (DMM, O_2, Ar, CO_2, CO, H_2O), l'erreur de mesure a été estimée à ± 20%, et des facteurs d'incertitude compris entre 1,3 et 3 sont attendus pour les intermédiaires moléculaires stables, principalement en fonction de la fiabilité des sections efficaces de photoionisation (PICS) adoptées. Pour les intermédiaires réactionnels, des incertitudes supplémentaires peuvent découler des pertes potentielles au cours du processus d'échantillonnage. Les facteurs d'incertitude pour les espèces individuelles, ainsi que les facteurs PICS et de discrimination de masse (DM) utilisés dans la quantification, sont fournis dans le Tableau VI. 1 suivant.

Tableau VI. 1 : Paramètres utilisés pour la détermination des fractions molaires lors de l'oxydation du DMM.

m/z	Espèces	IE/AE (eV)	PICS		MD	*UF*[a]
			Valeur (Mb)	Ref.		
16.03	CH_4	12.6	4.72 (13.2 eV)	[180]	0.18	1.3
18.01	H_2O	12.6	8.75 (13.2 eV)	[181]	0.22	1.3
27.99	CO	14.01	16.94 (16.65 eV)	[182]	0.47	1.3
28.03	C_2H_4	10.5	8.02 (11.5 eV)	[145]	0.47	1.3
30.01	CH_2O	10.88	10.13 (11.5 eV)	[183]	0.53	1.3
30.05	C_2H_6	11.5	14.14 (13.2 eV)	[180]	0.53	1.3
31.99	O_2	12.07	5.96 (13.2 eV) 17.44 (16.65 eV)	[184]	0.59	1.2
32.02	CH_3OH	10.84	9.53 (11.5 eV)	[145]	0.59	1.3
34.01	H_2O_2		4.48 (11.5 eV)	[185]	0.65	2
39.96	Ar		32.24 (16.65 eV)	[186]	0.85	1.2
43.99	CO_2	13.78	27.26 (16.65 eV)	[187]	0.99	1.3
45.03	CH_3OCH_2	10.7	1.17 (11 eV) 10.87 (11.5 eV)	[188]	1.03	1.2
46.01	HOCHO	10.03	5.04 (11.5 eV)	[145]	1.06	1.3
47.01	CH_3O_2	11.0	5 (11.5 eV)	b	1.10	3
48.02	CH_3O_2H	9.84	6.02 (11 eV)	[148]	1.14	2
60.02	CH_3OCHO (methyl formate)	9.7	8.82 (11.5 eV)	[189]	1.60	1.3
90.03	$(CH_2O)_3$ (1,3,5-trioxane)	10.3	5 (11 eV)[b]	b	2.81	3

Notes :

[a] L'incertitude sur la fraction molaire *x* d'une espèce est entre $x \cdot UF$ et x/UF

[b], PICS estimés.

Le système expérimental haute pression d'Orléans présenté au Chapitre III a également été utilisé. Les incertitudes expérimentales sont de l'ordre de 10% maximum au vu des espèces identifiées et quantifiées. Des mélanges fortement dilués dans l'azote (0.1% molaire de DMM molaire) ont été étudiés pour minimiser les gradients de température dans le réacteur. Des expériences ont été effectuées pour trois mélanges avec différentes richesses (0,2, 0,5 et 1,5) dans une plage de températures allant de 500 à 1200 K.

1.2. Modélisation

Un sous-mécanisme cinétique d'oxydation du DMM à basse température en utilisant la stratégie des classes de réaction [190-192] a été développé. Les voies réactionnelles principales sont présentées sur la Figure VI. 1.

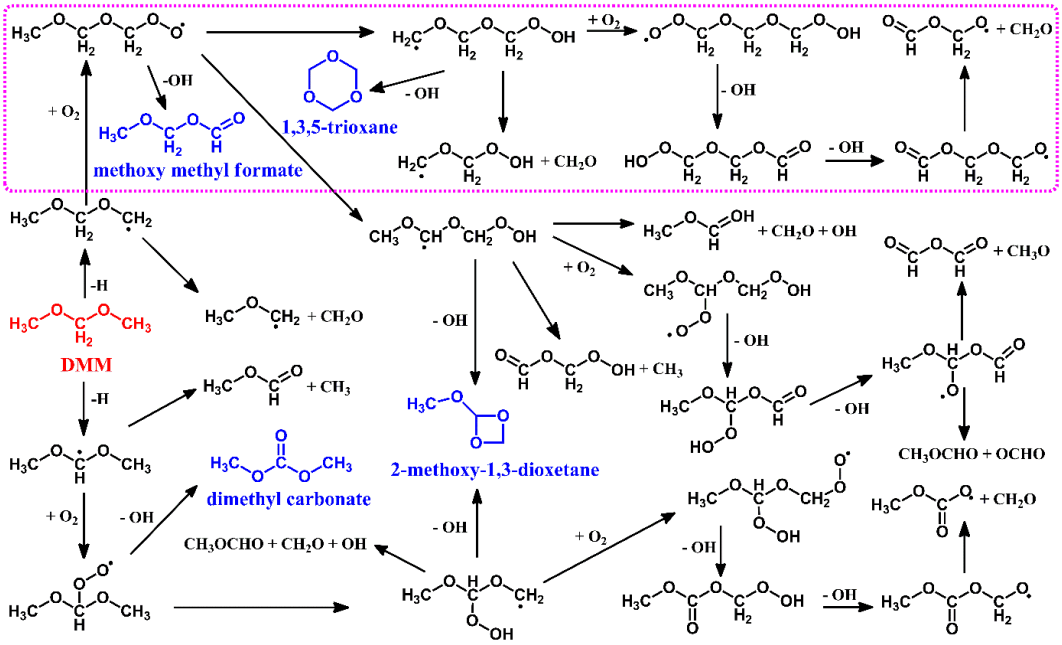
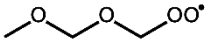
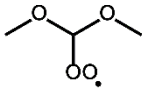
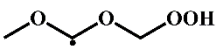
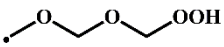
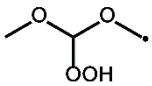
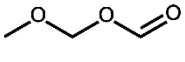
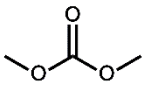
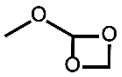
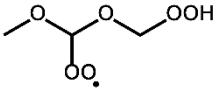
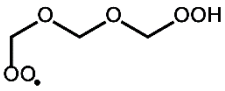
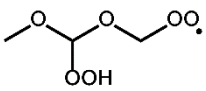
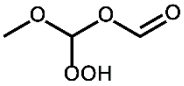
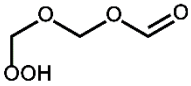
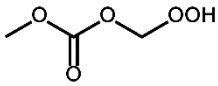
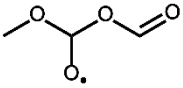
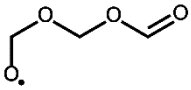
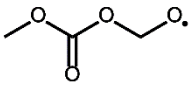
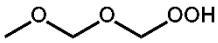
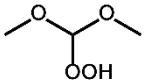
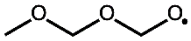
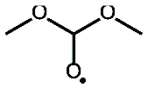


Figure VI. 1 : Schema d'oxydation du DMM. Les espèces en bleu sont les isomères possibles correspondant à *m/z* 90.03.

Le Tableau VI. 3 contient la cinétique de réactions appartenant au sous-mécanisme d'oxydation du DMM ; la nomenclature utilisée pour les espèces issues de l'oxydation du DMM aparaissent dans le Tableau VI. 2.

Tableau VI. 2 : Nomenclature des espèces liées à l'oxydation du DMM.

 COCOCO$_2$J	 COCO$_2$JOC	 COCJOCO$_2$H	 CJOCOCO$_2$H
 COCO$_2$HOCJ	 COCOC*O	 COC*OOC	 CO-cy-COCO
cy-COCOCO	 COCO$_2$JOCO$_2$H	 O$_2$JCOCOCO$_2$H	 COCO$_2$HOCO$_2$J
 COCO$_2$HOC*O	 HO$_2$COCOC*O	 COC*OOCO$_2$H	 COCOJOC*O
 OJCOCOC*O	 COC*OOCOJ	 COCOCO$_2$H	 COCO$_2$HOC
 COCOCOJ	 COCOJOC		

Les chemins réactionnels représentés sur la Figure VI. 1 sont initiés par l'arrachement d'hydrogène sur le DMM conduisant aux deux radicaux $CH_3OCH_2O\dot{C}H_2$ et $CH_3O\dot{C}HOCH_3$. Kopp et al. [193] ont calculé la cinétique de ces arrachements par H et CH_3. Les constantes de vitesse ont été intégrées à notre modèle. Les constantes de vitesse globales pour les arrachements d'hydrogène sur le DMM par OH dans les modèles précédents [131, 132, 194, 195] sont comparées à la Figure VI. 2.

Tableau VI. 3 : Constantes de vitesse ($k = A \times T^n \times e^{-Ea/RT}$) du-sous-mécanisme d'oxydation de basse température du DMM. (Unités, $cm^3/s/mol/cal$).

No.	Reaction		*A*	*n*	E_a	Ref.
R1	$CH_3OCH_2OCH_3+OH = CH_3OCH_2OCH_2+H_2O$		1.08×10^{3}	3.12	-1.73×10^{3}	[132, 133, 194]
R2	$CH_3OCH_2OCH_3+OH = CH_3OCHOCH_3+H_2O$		5.31×10^{8}	1.38	3.06×10^{2}	[132, 133, 194]
R3	$CH_3OCH_2OCH_3+CH_3O_2 = CH_3OCH_2OCH_2+CH_3O_2H$		1.32×10^{1}	3.56	1.27×10^{4}	[132, 133]
R4	$CH_3OCH_2OCH_3+CH_3O_2 = CH_3OCHOCH_3+ CH_3O_2H$		2.26×10^{2}	3.16	1.18×10^{4}	[132, 133]
R5	$CH_3OCH_2OCH_2+O_2 = COCOCO_2J$	1 atm	4.11×10^{19}	-2.45	1.14×10^{3}	[196, 197]
		10 atm	1.12×10^{14}	-0.58	-1.64×10^{2}	
R6	$COCOCOOJ = CJOCOCO_2H$		6.70×10^{7}	0.59	1.41×10^{4}	[132]
R7	COCOCOOJ = COCOC*O+OH		2.82×10^{6}	1.97	3.49×10^{4}	[132]
R8	$CJOCOCO_2H$ = cy-COCOCO+OH		2.51×10^{16}	-1.45	1.56×10^{4}	[132]
R9	$CJOCOCO_2H = CH_2O+CH_2OCH_2O_2H$	1 atm	4.75×10^{48}	-11.15	3.71×10^{4}	[193]
		10 atm	2.46×10^{40}	-8.33	3.55×10^{4}	
R10	$CJOCOCO_2H+O_2 = O_2JCOCOCO_2H$		7.00×10^{11}	0.00	0.00	[196, 198, 199]
R11	$O_2JCOCOCO_2H = HO_2COCOC*O+OH$		5.68×10^{11}	-0.04	1.84×10^{4}	[132]
		dupliquée	1.55×10^{2}	3.31	3.42×10^{4}	
R12	$HO_2COCOC*O = OJCOCOC*O+OH$		1.50×10^{16}	0.00	4.29×10^{4}	[132]

R13	OJCOCOC*O = CH_2O+OCH_2OCHO	2.33×10^{13}	0.16	2.34×10^{4}	[132]
R14	cy-COCOCO = CH_2O+CH_2O+CH_2O	1.91×10^{15}	0.00	4.75×10^{4}	[200]
R15	cy-COCOCO+OH => H_2O+CH_2O+CH_2O+HCO	8.19×10^{12}	0.00	4.60×10^{2}	[200]
R16	cy-COCOCO+H => H_2O+CH_2O+CH_2O+H_2	1.72×10^{8}	1.90	6.75×10^{3}	[200]
R17	cy-COCOCO+O => H_2O+CH_2O+CH_2O+OH	5.43×10^{13}	0.00	7.08×10^{3}	[200]
R18	cy-COCOCO+HO_2 => H_2O_2+CH_2O+CH_2O+HCO	1.23×10^{4}	2.50	1.42×10^{4}	[200]
R19	cy-COCOCO+O_2 => HO_2+CH_2O+CH_2O+HCO	3.69×10^{6}	3.00	5.60×10^{4}	[200]
R20	cy-COCOCO+CH_3 => CH_4+CH_2O+CH_2O+HCO	1.09×10^{-6}	5.42	5.00×10^{3}	[200]

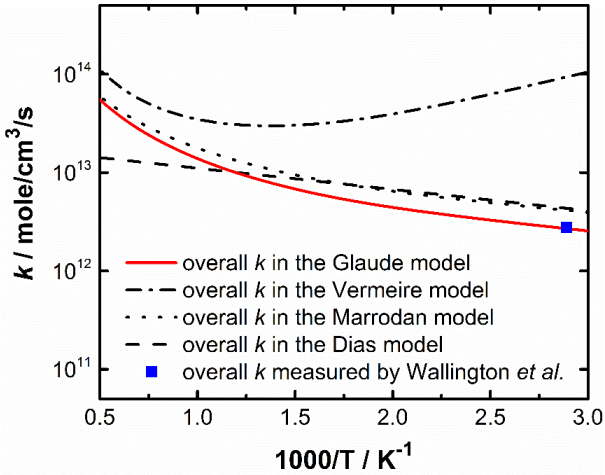


Figure VI. 2 : Constante de vitesse globale pour la réaction OH + DMM dans les modèles de la litérature [131, 132, 194, 195] et mesure expérimentale par Wallington et al. [201].

La constante de vitesse [194] respectant la mesure expérimentale [201] a été adoptée ici. Le taux de branchement théorique [132] a été utilisé pour calculer la cinétique des réactions R1 et R2 du Tableau VI. 3. Pour les arrachages d'hydrogène par O, O_2, CH_3O et HO_2, les cinétiques théoriques fournies par Vermeire et al. [132] ont été utilisées. Les arrachages d'hydrogène par CH_3O_2 (R3 et R4), qui n'ont pas été pris en compte par Vermeire et al. ont été introduits dans le modèle actuel avec les mêmes cinétiques que pour les arrachements par HO_2.

Les radicaux $CH_3OCH_2OCH_2O\dot{O}$ et $CH_3OCH(O\dot{O})OCH_3$ sont formés par addition d'O_2 sur les radicaux issus du DMM. Leur réarangement intramoléculaire mène à la formation d'hydroperoxyalkyles (QOOH). Deux réactions ont lieu avec $CH_3OCH_2OCH_2O\dot{O}$ et une seule avec $CH_3OCH(O\dot{O})OCH_3$. La première addition d'O_2 qui est couramment dépendante de la pression et de la température est une étape crutiale [192] à basse température. Généralement, des méthodes variationnelles, coûteuses en temps, sont nécessaires pour calculer des cinétiques précises pour cette étape d'addition sans barrière [192, 202]. Pour l'addition d'O_2 à $CH_3OCH_2O\dot{C}H_2$, la réaction du DME correspondante ($CH_3O\dot{C}H_2 + O_2 \rightleftharpoons CH_3OCH_2O\dot{O}$) sert d'analogue puisqu'on a une similarité structurelle et que cette réaction a été étudiée de manière approfondie par des approches expérimentales et théoriques. Les incertitudes sont grandes puiqu'on observe 3 ordres de grandeur entre les différentes modélisations [203-205]

encadrant la mesure de Rosado-Reyes et al. [197]. Cette expression de vitesse, intégrant la dépendance à la pression, a été utilisée pour la réaction (R5) dans notre modèle. Pour les classes de réaction impliquant des états de transition cycliques tendus, à savoir l'isomérisation du RO_2 (R6, R7), la formation d'un éther cyclique à partir de QOOH (R8) et la formation de cétohydroperoxyde (KHP) à partir de O_2QOOH (R11), les paramètres cinétiques théoriques de Vermeire et al. ont été utilisés.

Pour la β-scission de $\dot{C}H_2OCH_2OCH_2O_2H$ (R9), on a supposé que la constante de vitesse était la même que celle de la β-scission de $CH_3OCH_2O\dot{C}H_2$ [193] avec le motif similaire produisant CH_2O par la coupure C-O. Pour la seconde addition d'O_2, les cinétiques de réactions du DME ont été systématiquement adoptées [196, 198, 199]. L'éther cyclique, 1,3,5-trioxane (cy-COCOCO),formé à partir de $\dot{C}H_2OCH_2OCH_2O_2H$, est un précurseur typique du formaldéhyde. Sa cinétique en phase gazeuse a déjà été étudiée [200, 206, 207]. Le sous-mécanisme responsable de sa consommation (R14-R20) est issu du modèle cinétique proposé par Santner et al. [200].

Pour les réactions liées aux deux autres radicaux de type QOOH, $CH_3O\dot{C}HOCH_2OOH$ et $CH_3OCH(OOH)O\dot{C}H_2$, une procédure similaire a été suivie pour déterminer les coefficients de vitesse correspondants. L'AramcoMech 2.0 [208] a été utilisé comme mécanisme de base dans le présent modèle. Les propriétés thermodynamiques calculées par Kopp et al. [175] pour des espèces comprenant le DMM, les radicaux du DMM, les radicaux RO_2 et QOOH ont été adoptées. Pour les autres espèces liées au DMM, THERM [209] a été utilisé pour calculer les données thermochimiques avec les dernières valeurs de groupe [210]. Le modèle complet impliquant 524 espèces et 2821 réactions est fourni en **Annexe 4**.

1.3. Résultats

Environ une douzaine de produits et d'intermédiaires ont été détectés dans l'oxydation du DMM à 750 torr, y compris certaines espèces réactives telles que H_2O_2, CH_3O2 et CH_3O_2H. Cependant, seuls quelques intermédiaires observés dans l'oxydation du DME [150] avec le même système JSR-PI-MBMS étaient présents lors de l'oxydation du DMM. Le

fragment commun aux deux carburants (CH_3OCH_2-) devrait donner de nombreux intermédiaires communs aux deux systèmes chimiques. Toutefois, le nombre d'espèces observé est relativement faible, ce qui indique que le DMM est moins réactif que le DME. Ceci est assez remarquable car, comparé au DME, la chaîne est plus longue, ce qui devrait augmenter la probabilité de réactions d'arrachage d'hydrogène et de transfert d'hydrogène.

La Figure VI. 3 présente les profils de fractions molaires mesurés, ainsi que les prédictions de notre modèle et des modèles de Vermeire [132] et de Marrodán [131]. Notre modèle présente des améliorations par rapport aux deux autres. Les formes et les magnitudes des profils de fractions molaires sont mieux reproduits. En ce qui concerne la conversion du carburant, notre modèle permet de bien simuler la consommation du carburant en trois étapes, tandis que le modèle de Marrodán prédit une zone de coefficient de température négatif (CTN) comprise entre 600 et 700 K, et le modèle de Vermeire surestime la réactivité du carburant à des températures comprises entre 600 et 750 K. Le modèle Vermeire donne des résultas raisonnables, mais ne considère pas les réactions d'arrachage par CH_3O_2.

Les performances prédictives de notre modèle ont également été confrontées aux mesures récentes de Vermeire et al. à une pression de 1,07 bar. Les profils des espèces mesurés par chromatographie en phase gazeuse et les simulations sont présentés sur Figure VI. 4-6. Les deux modèles représentent de manière satisfaisante les fractions molaires mesurées, tandis que notre modèle améliore la prévision des intermédiaires hydrocarbonés, conformément aux observations de la Figure VI. 3.

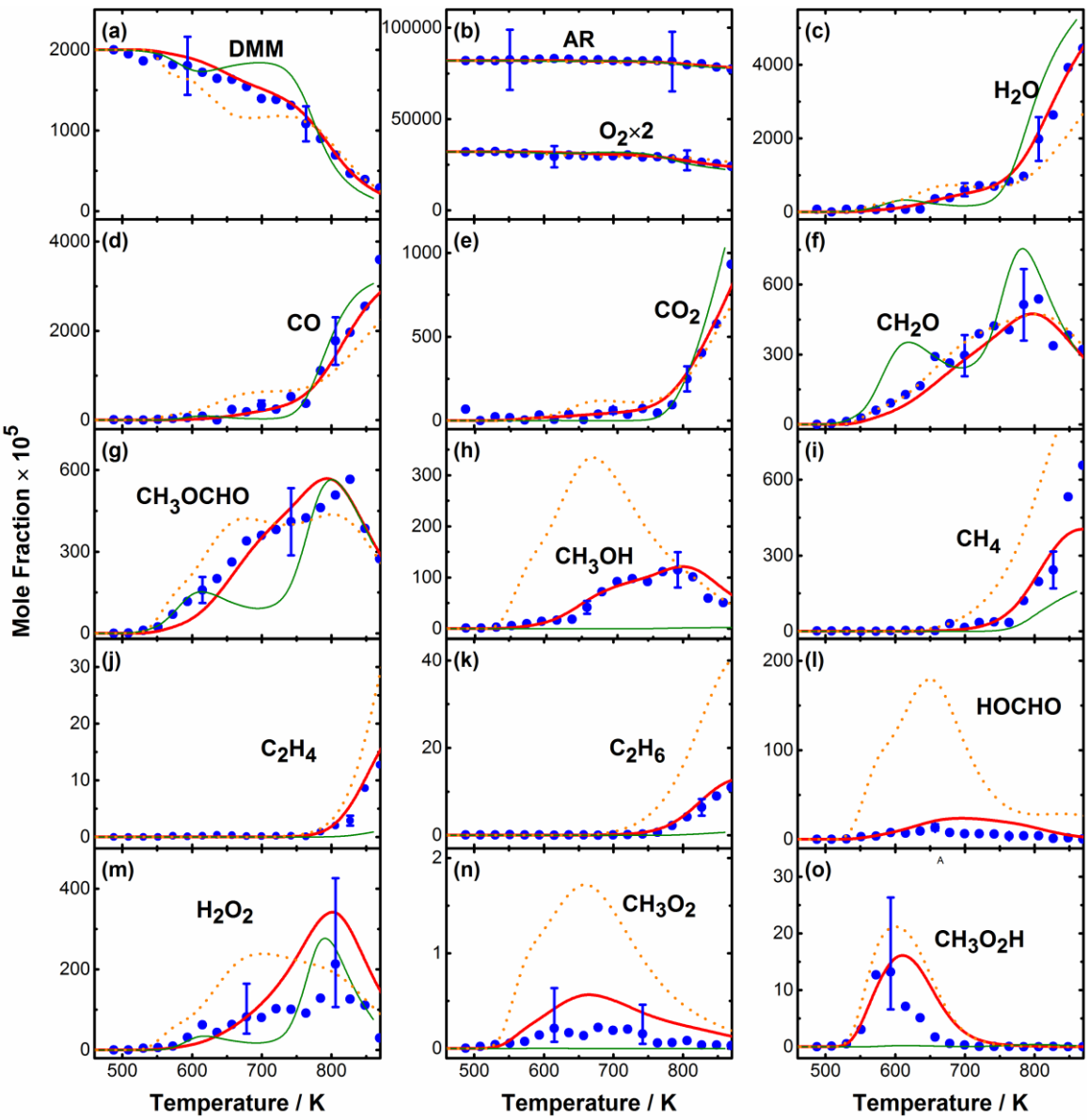


Figure VI. 3 : Fractions molaires mesurées lors de l'oxydation du DMM en JSR à 750 Torr comparées aux prévisions des mécanismes. Symboles: mesures expérimentales; lignes épaisses rouges : ce travail, lignes en pointillé : Vermeire et al.; lignes fines vertes : Marrodán et al.

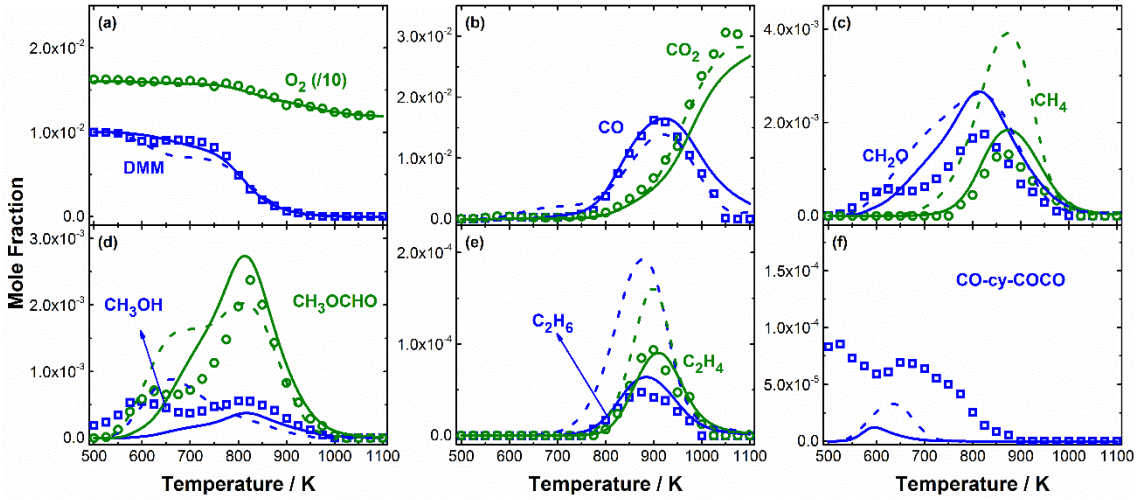


Figure VI. 4 : Comparaison des simulations obtenues avec notre modèle et celui de Vermeire et al. dans les conditions de l'étude de Vermeire et al. [132] en JSR (φ = 0.25, P = 1.07 bar, τ = 2.83 s); Symboles : mesures, lignes continues : notre modèle, lignes discontinues : modèle de Vermeire et al..

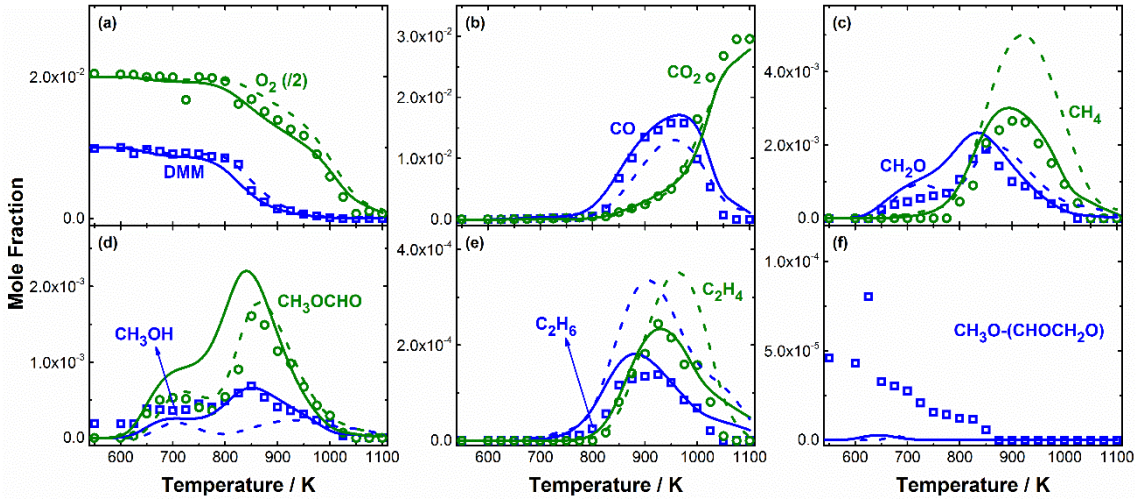


Figure VI. 5 : Comparaison des simulations obtenues avec notre modèle et celui de Vermeire et al. dans les conditions de l'étude de Vermeire et al. [132] en JSR (φ = 1, P = 1.07 bar, τ = 2.83 s); Symboles : mesures, lignes continues : notre modèle, lignes discontinues : modèle de Vermeire et al..

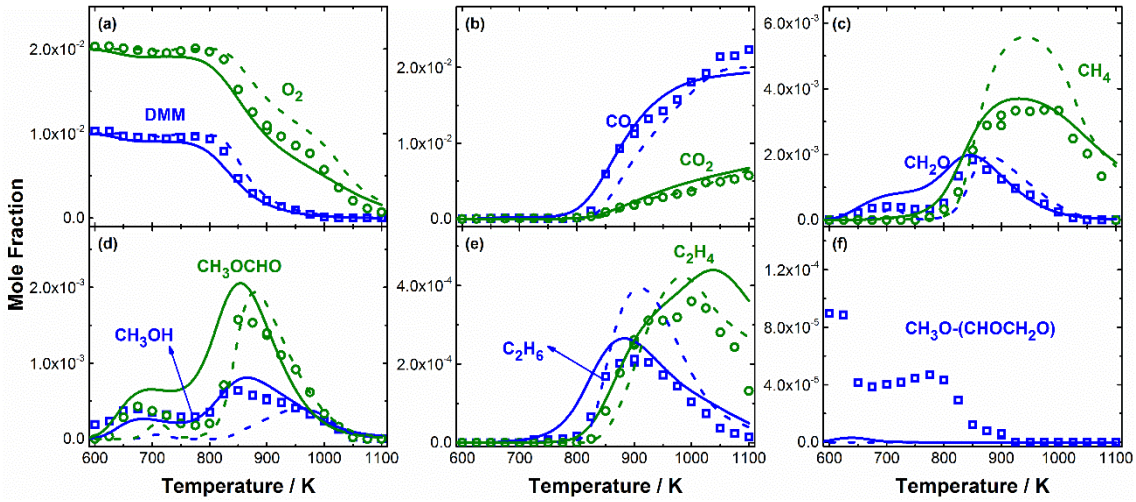


Figure VI. 6 : Comparaison des simulations obtenues avec notre modèle et celui de Vermeire et al. dans les conditions de l'étude de Vermeire et al. [132] en JSR (φ = 2, P = 1.07 bar, τ = 2.83 s); Symboles : mesures, lignes continues : notre modèle, lignes discontinues : modèle de Vermeire *et al.*.

Vermeire et al. ont indiqué avoir détecté un éther cyclique, le méthoxy-1,3-dioxétane (CO-cy-COCO) dans leurs expériences. Mais il semble que ce composé était présent avant le début de la consommation de carburant. En outre les fractions molaires mesurées sont similaires quelle que soit la richesse, ce qui est aussi inattendu. Ce composé n'a pas été mis en évidence dans nos expériences.

Pour comprendre la chimie régissant l'oxydation du DMM, une analyse de voies réactionnelles (ROP) a été effectuée pour OH, le principal agent d'oxydation et est présenté sur la Figure VI. 7 suivante.

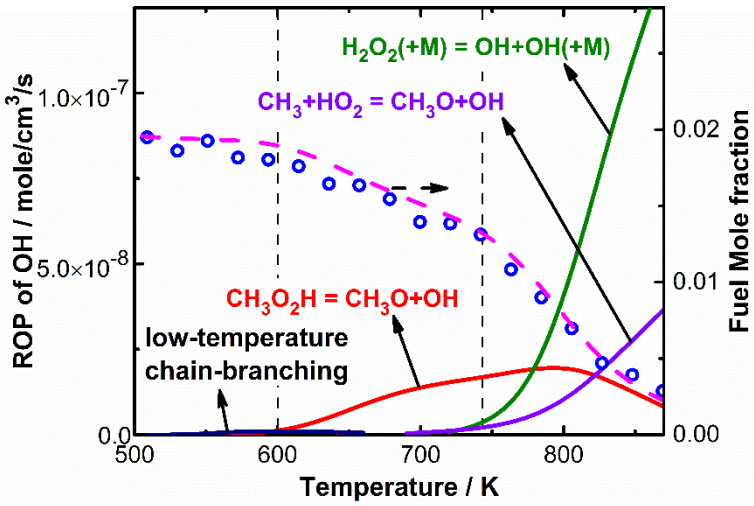


Figure VI. 7 : Analyse des voies réactionnelles du radical OH (lignes continues: ROP). Les fractions molaires du DMM sont aussi présentées (symboles : données expérimentales, pointillés : simulation)

À des températures inférieures à 600 K, où le carburant présente une réactivité négligeable, les réactions de ramification de chaînes (principalement la consommation des radicaux O_2QOOH) ne fournissent qu'une petite quantité de radicaux OH. Ces réactions ont une importance cinétique pour les carburants ayant une réactivité évidente à basse température, comme le DME [148, 150, 196, 198]. À 570 K par exemple, en suivant les voies de consommation du carburant, un rapport d'environ 2:3 est prédit par le modèle entre les arrachages d'hydrogène conduisant respectivement aux radicaux $CH_3OCH_2O\dot{C}H_2$ et $CH_3O\dot{C}HOCH_3$. Le premier réagit presque exclusivement par addition d'O_2, mais environ 50% du radical principal $CH_3O\dot{C}HOCH_3$ se décompose rapidement par β-scission donnant CH_3 et CH_3OCHO, relativement stable. En outre, le radical $CH_3O\dot{C}HOCH_2OOH$, se comporte de manière similaire à $CH_3O\dot{C}HOCH_3$. Il est principalement consommé par les β-scissions et la formation d'éthers cycliques, tandis que la deuxième addition d'O_2 a une contribution limitée (moins de 10% à 570 K).

Le carburant est consommé plus rapidement lorsque la température dépasse 600 K, car la reaction $CH_3O_2H \rightleftharpoons CH_3O + OH$ produit des radicaux OH très réactifs. La concentration maximale de CH_3O_2H mesurée est de 130 ppm (Figure VI. 3 (o)), ce qui est supérieur de plus

d'un ordre de grandeur à celle observée lors de l'oxydation du DME dans des conditions plus pauvres en carburant (φ = 0,35) avec une concentration en carburant plus élevée (2,5% molaire) [150]. Cette concentration maximale élevée résulte de la β-scission significative de $CH_3O\dot{C}HOCH_3$ libérant facilement le radical CH_3 qui se combine presque exclusivement avec O_2 à basses et moyennes températures. Les radicaux CH_3O_2 résultants se convertissent ensuite en CH_3O_2H principalement via $CH_3O_2 + HO_2 \rightleftharpoons CH_3O_2H + O_2$. Dans cette région de température, outre le rôle dominant de la décomposition de CH_3O_2H, la consommation du radical $CH_3O\dot{C}HOCH_2OOH$ contribue également légèrement à la production de radicaux OH par deux voies, à savoir la formation d'éther cyclique et la β-scission.

Les réactions mentionnées ici conduisent à une consommation de carburant modérée jusqu'à ce que OH soit massivement formé par décomposition de H_2O_2 au-dessus de 750 K. Ensuite, la consommation du carburant augmente fortement et les intermédiaires hydrocarbonés tels que CH_4 et C_2H_6 commencent à s'accumuler, marquant le passage à l'oxydation de haute température. La réaction $CH_3 + HO_2 \rightleftharpoons CH_3O + OH$ a une contribution non négligeable à la production de OH à des températures supérieures à 740 K. Ceci indique en outre l'importance de la chimie du radical CH_3 pour l'oxydation du DMM en raison de la β-scission prédominante de $CH_3O\dot{C}HOCH_3$. Sur la totalité de la plage de température étudiée, cette réaction contribue pour plus de 90% à la formation d'un autre intermédiaire crucial, CH_3OCHO, pour lequel des analyses de sensibilité à 620 K et 820 K sont présentées à la Figure VI. 8.

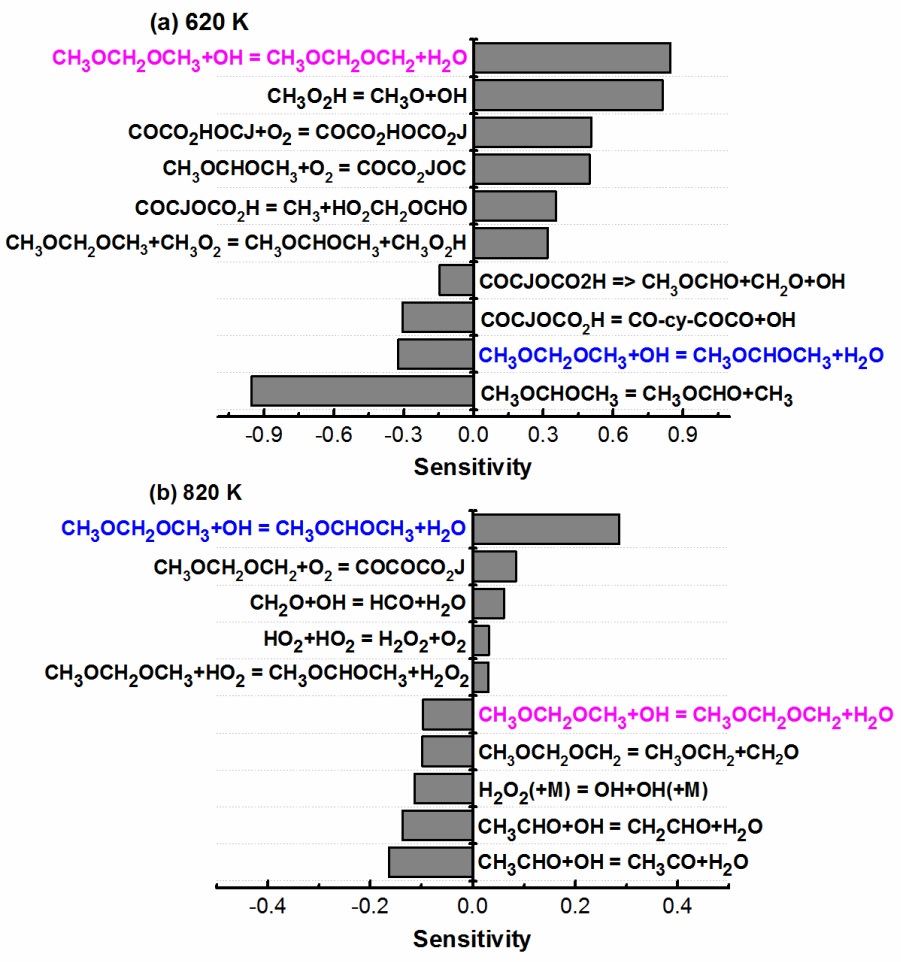


Figure VI. 8 : Analyse de de sensibilité pour CH_3OCHO à (a) 620 K et (b) 820 K.

Les réactions concurrentes d'arrachage d'hydrogène sur le DMM par OH ont un effet opposé sur les concentrations de CH_3OCHO. La réaction générant $CH_3O\dot{C}HOCH_3$ inhibe de manière inattendue la formation de CH3OCHO à 620 K. En effet, à cette température, le taux de radicaux (principalement OH) est relativement faible, ce qui limite la consommation de carburant et la formation d'intermédiaires. Ainsi, la production de $CH_3OCH_2O\dot{C}H_2$, qui peut entraîner une ramification de chaîne comme indiqué plus tôt, montre une sensibilité positive. À des températures plus élevées, la consommation de carburant n'est plus limitée par les concentrations en radicaux OH. Dans ces conditions, la formation de CH_3OCHO est favorisée par la production de son précurseur, $CH_3O\dot{C}HOCH_3$. Notre modèle permet de bien prédire les concentrations de CH_3OCHO à différentes températures, ce qui indique que le rapport de branchement pour l'arrachage d'hydrogène sur DMM est correct.

Les résultats des expériences d'oxydation à haute pression du DMM sont présentés sur les Figure VI. 9-11 pour trois richesses. Les concentrations initiales de carburant ont été mesurées à environ $9,2 \times 10^{-4}$, indiquant une légère décomposition de carburant attribuée à des réactions catalytiques dans le vaporisateur métallique. Pour prendre en compte cette complication, nous avons utilisé les fractions molaires de DMM, de CH_2O et de CH_3OH mesurées aux températures les plus basses comme données d'entrée dans nos simulations. Nos expériences ont été simulées avec notre modèle et les modèles de la littérature [131, 132]. On peut voir que les imprécisions du modèle de Vermeire existent toujours dans des conditions de haute pression. Le modèle Marrodán ne permet pas de bien capter la réactivité du carburant, alors que notre modèle montre des performances satisfaisantes dans toutes les conditions étudiées.

Une réactivité négligeable à basse température a été observée lors de l'oxydation sous haute pression, même dans le cas très pauvre ($\phi = 0,2$). A haute pression, le radical principal du DMM, CH_3OHOCH_3, a une tendance encore plus forte à se décomposer. En effet, aux températures étudiées, la constante de vitesse à 10 atm est plusieurs fois supérieure à celle à 1 atm, selon les travaux théoriques récents de Kopp et al. [193]. La consommation de l'autre radical issu du DMM, $CH_3OCH_2O\dot{C}H_2$, est toujours dominée par l'addition d'O_2 et par son isomérisation ultérieure à basses températures (600-700 K). Mais à 10 atm, le radical dominant de type QOOH résultant, $CH_3O\dot{C}HOCH_2OOH$, a tendance à se décomposer par β-scission plutôt que via une seconde addition d'O_2 ou de la formation d'éther cyclique. Cela concorde avec le fait que les éthers cycliques n'ont pas été observés dans les expériences à haute pression. Selon la prévision du modèle, la fraction molaire maximale en éthers cycliques est de l'ordre de grandeur de 10^{-8}, en dessous de notre limite de détection de 10^{-6}.

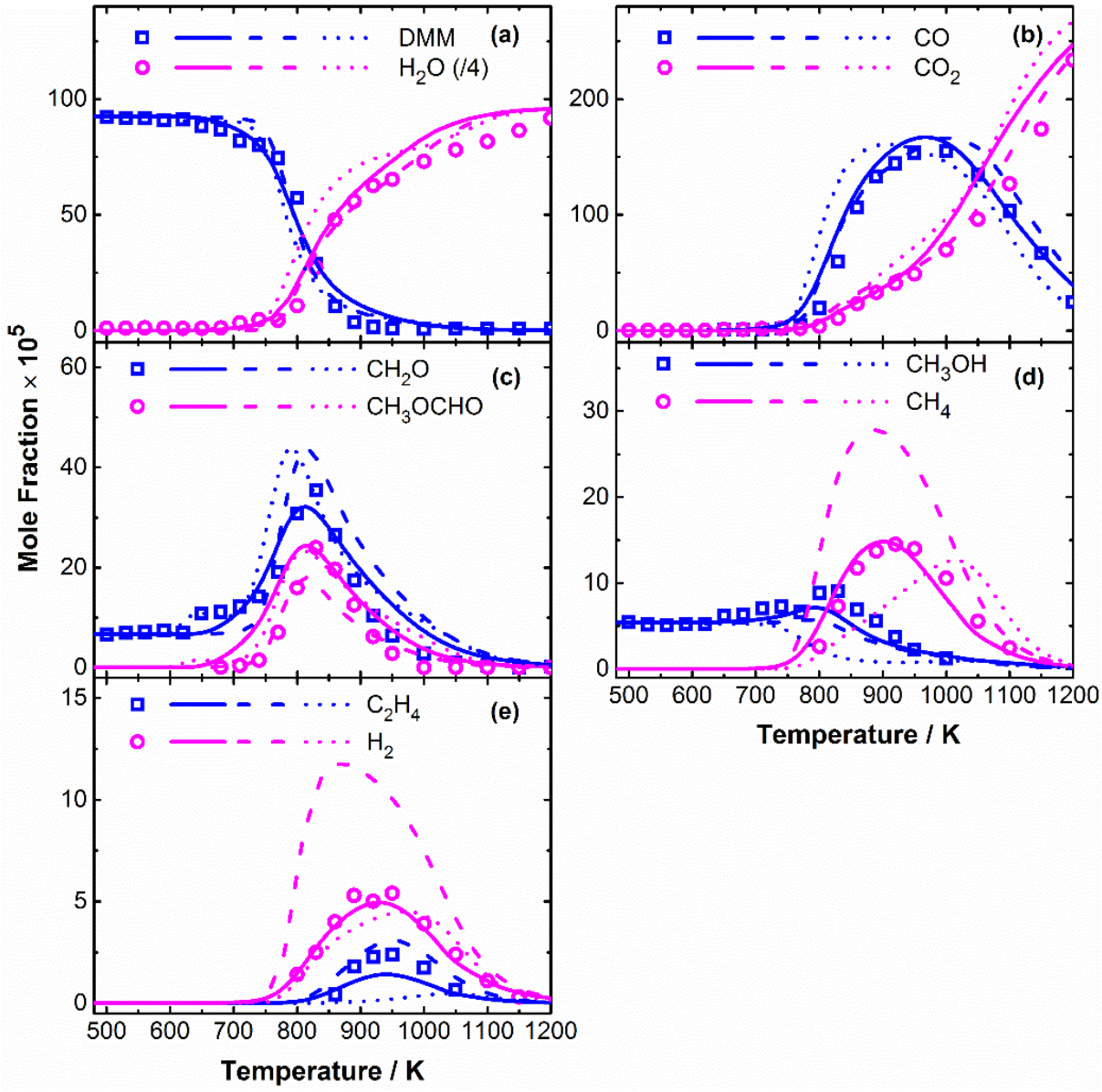


Figure VI. 9 : Résultats obtenus pour l'oxydation du diméthoxy méthane à 10 atm et τ = 0,7s pour 1000ppm de DMM initial à φ = 0,2. Symboles : mesures, lignes continues : notre modèle, lignes discontinues : modèle de Vermeire et al., pointillés : modèle de Marrodán.

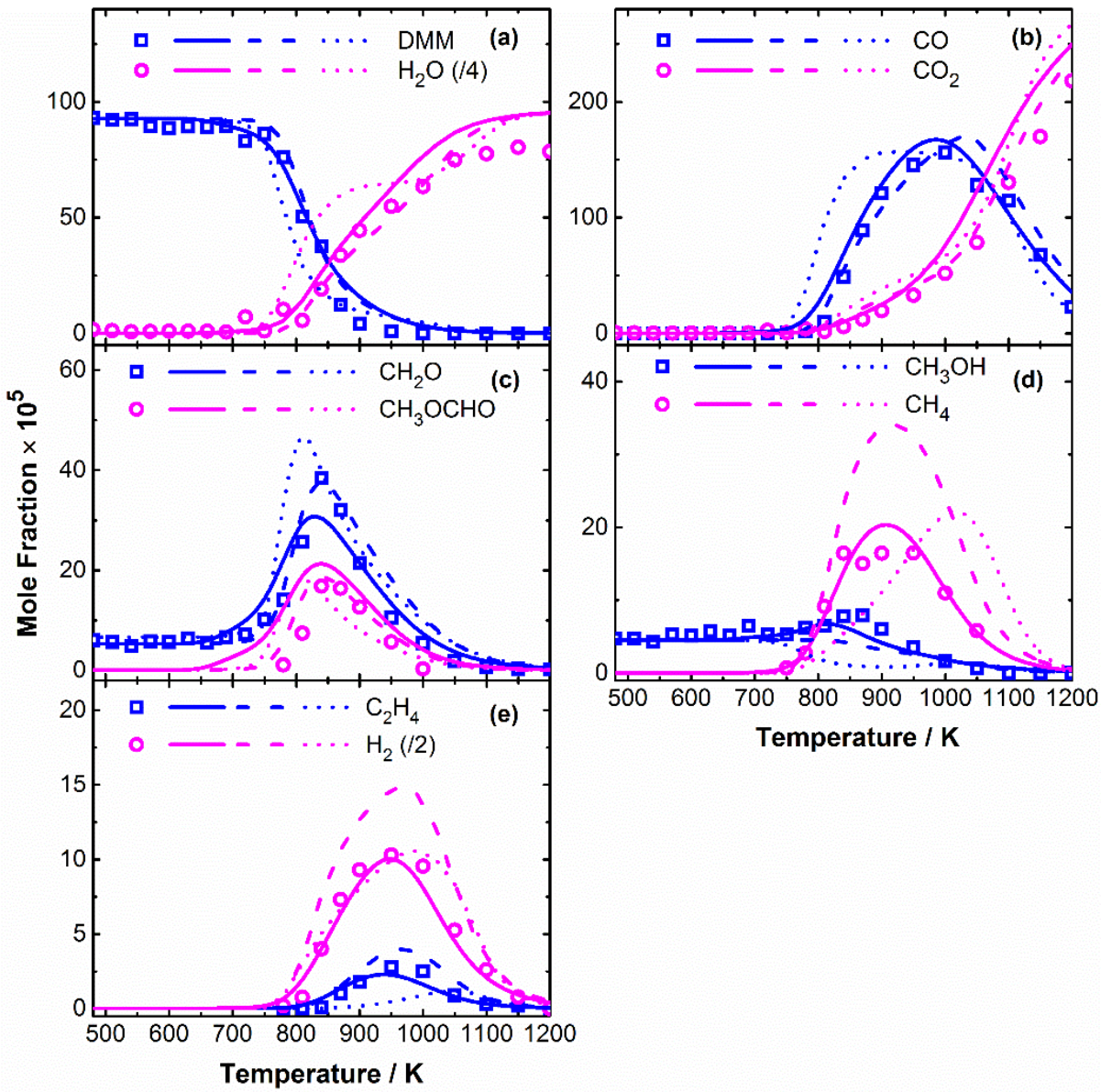


Figure VI. 10 : Résultats obtenus pour l'oxydation du diméthoxy méthane à 10 atm et τ = 0,7s pour 1000ppm de DMM initial à φ = 0,5. Symboles : mesures, lignes continues : notre modèle, lignes discontinues : modèle de Vermeire et al., pointillés : modèle de Marrodán.

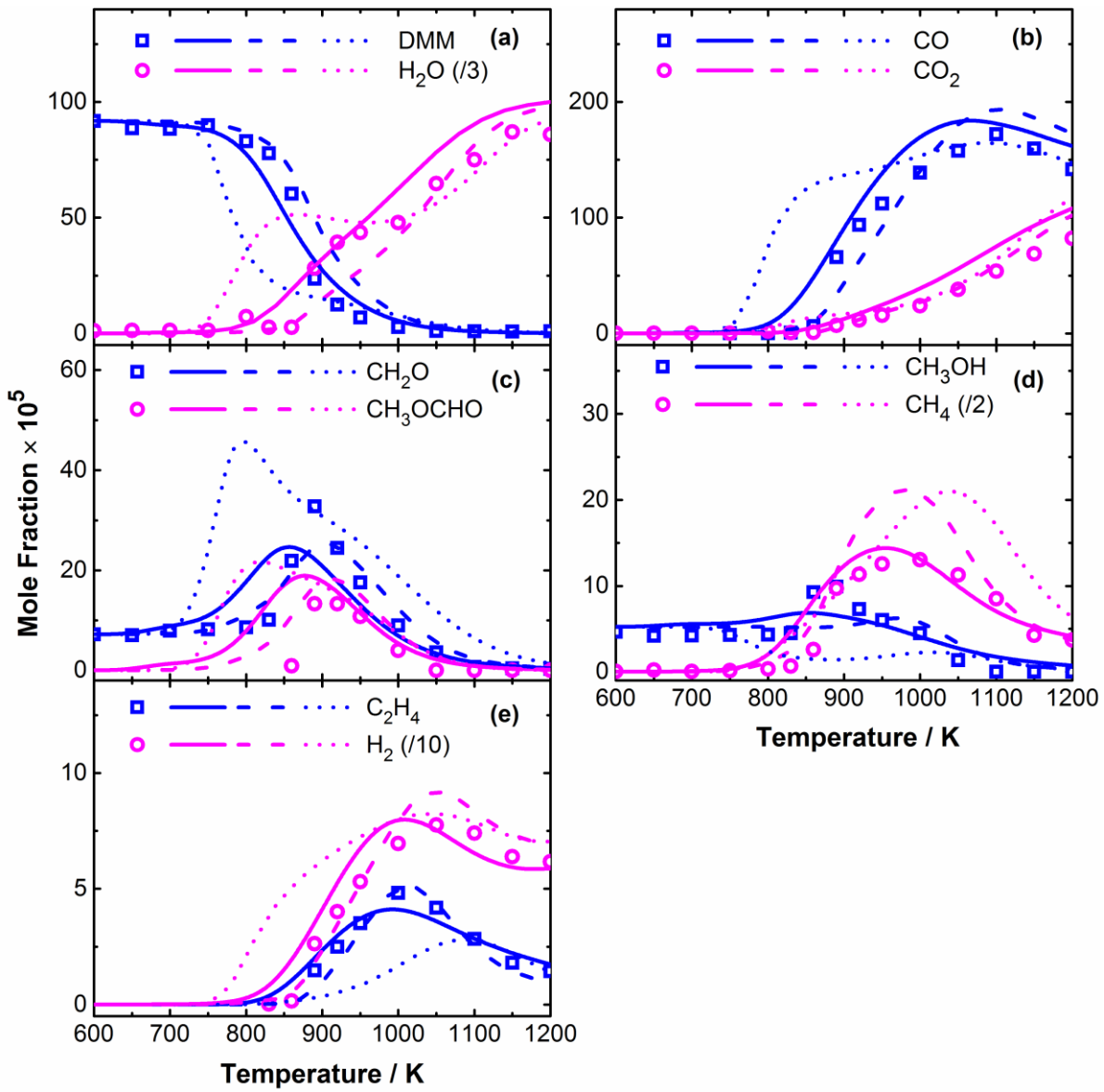


Figure VI. 11 : Résultats obtenus pour l'oxydation du diméthoxy méthane à 10 atm et τ = 0,7s pour 1000ppm de DMM initial à φ = 1,5. Symboles : mesures, lignes continues : notre modèle, lignes discontinues : modèle de Vermeire et al., pointillés : modèle de Marrodán.

L'influence de la richesse sur les voies de consommation de DMM a été explorée en effectuant des analyses ROP à 700 K. Les résultats sont présentés sur la Figure VI. 12. Lorsque la richesse augmente, une différence notable apparaît sur le rapport de branchement entre la réaction d'addition d'O_2 et la β-scission du radical $CH_3OCH_2O\dot{C}H_2$. L'importance relative de l'addition d'O_2 est moindre. Cela entraîne non seulement une réactivité réduite du carburant, mais aussi une modification des voies de formation des deux intermédiaires clés,

CH_2O et CH_3OCHO, dont les principaux chemins de production sont résumés dans le Tableau VI. 4, basé sur les résultats d'analyses ROP. Deux produits issus des réactions de basse température, $CH_3O\dot{C}HOCH_2OOH$ et CO-cy-COCO, peuvent se décomposer et libérer simultanément du CH_2O et CH_3OCHO. Ces deux réactions contributent fortement à la formation de CH_2O et CH_3OCHO à basses températures, mais leur importance diminue si la richesse augmente. Bien que le rapport de branchement entre les arrachages d'hydrogène sur les différents sites du DMM reste presque identique aux différentes richesses, l'importance relative des différentes espèces dans les métathèses se modifie. En milieu pauvre (φ = 0,2 et 0,5), les métathèses par HO_2 et CH_3O_2 jouent un rôle important. En milieu riche (φ = 1,5), CH_3O devient le deuxième radical le plus important après OH. Ainsi la voie de formation de CH_3OH dominante devient la réaction $CH_3O + HO_2 \rightleftharpoons CH_3OH + O_2$.

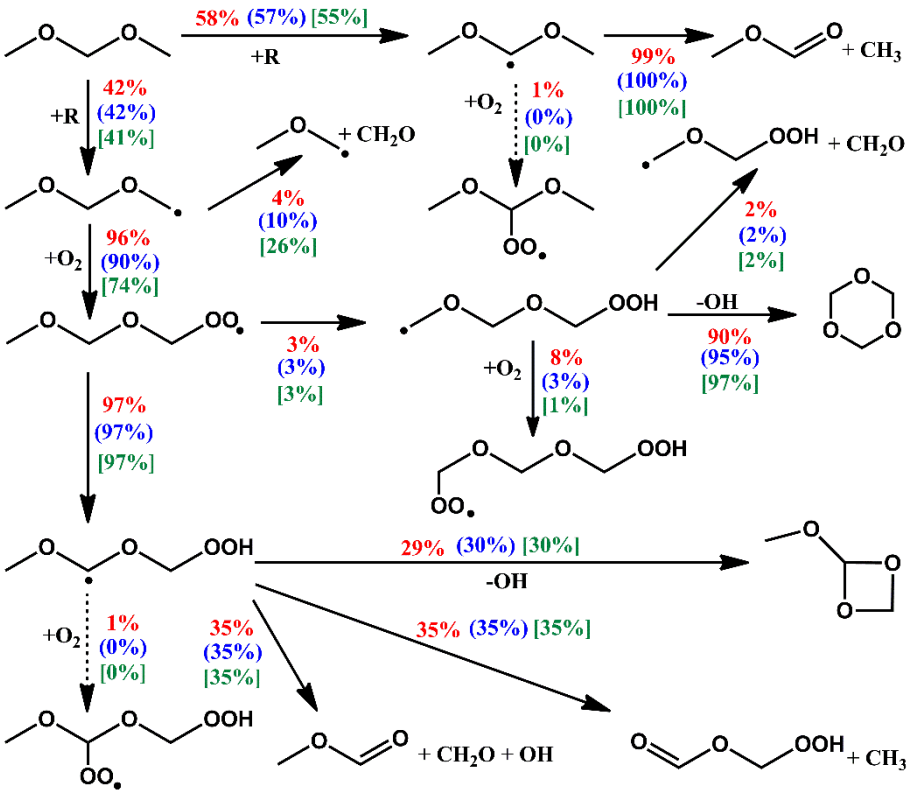


Figure VI. 12 : Voies principales d'oxydation du DMM en JSR à 700 K et 10 atm. Les chiffres indiquent lla contribution à la comsommation des espèces sources à φ = 0.2, 0.5 (parenthèses) et 1.5 (crochets).

Tableau VI. 4 : Principales voies réactionnelles pour CH_2O, CH_3OCHO et CH_3OH à 10 atm, 700 K et 3 richesses.

	φ = 0.2	φ = 0.5	φ = 1.5
CH_2O	$CH_3O+O_2 = CH_2O+HO_2$ (54%) $COCJCO_2H = CH_3OCHO+CH_2O+OH$ (14%) CO-cy-COCO = $CH_3OCHO+CH_2O$ (12%) $CH_3O(+M) = CH_2O(+M)+H$ (6%)	$CH_3O+O_2 = CH_2O+HO_2$ (42%) $COCJCO_2H = CH_3OCHO+CH_2O+OH$ (14%) $CH_3O(+M) = CH_2O(+M)+H$ (12%) CO-cy-COCO = $CH_3OCHO+CH_2O$ (11%)	$CH_3O+O_2 = CH_2O+HO_2$ (23%) $CH_3O(+M) = CH_2O(+M)+H$ (19%) $CH_3OCH_2OCH_2 = CH_3OCH_2+CH_2O$ (11%) $COCJCO_2H = CH_3OCHO+CH_2O+OH$ (11%) $CH_2OCH_2O2H \Rightarrow CH_2O+CH_2O+OH$ (9%) CO-cy-COCO = $CH_3OCHO+CH_2O$ (9%)
CH_3OCHO	$CH_3OCHOCH_3 = CH_3OCHO+CH_3$ (69%) $COCJCO_2H = CH_3OCHO+CH_2O+OH$ (16%) CO-cy-COCO = $CH_3OCHO+CH_2O$ (14%)	$CH_3OCHOCH_3 = CH_3OCHO+CH_3$ (71%) $COCJCO_2H = CH_3OCHO+CH_2O+OH$ (16%) CO-cy-COCO = $CH_3OCHO+CH_2O$ (13%)	$CH_3OCHOCH_3 = CH_3OCHO+CH_3$ (75%) $COCJCO_2H = CH_3OCHO+CH_2O+OH$ (14%) CO-cy-COCO = $CH_3OCHO+CH_2O$ (11%)
CH_3OH	$CH_3O+HO_2 = CH_3OH+O_2$ (33%) $CH_3OCH_2OCH_3+CH_3O = CH_3OCH_2OCH_2+H_2O$ (19%) $CH_3OCH_2OCH_3+CH_3O = CH_3OCHOCH_3+H_2O$ (15%) $CH_2O+CH_3O = HCO+CH_3OH$ (15%) $CH_3O_2+CH_3O_2 \Rightarrow CH_2O+CH_3OH+O_2$ (9%)	$CH_3O+HO_2 = CH_3OH+O_2$ (32%) $CH_3OCH_2OCH_3+CH_3O = CH_3OCH_2OCH_2+H_2O$ (23%) $CH_3OCH_2OCH_3+CH_3O = CH_3OCHOCH_3+H_2O$ (19%) $CH_2O+CH_3O = HCO+CH_3OH$ (15%) $CH_3O_2+CH_3O_2 \Rightarrow CH_2O+CH_3OH+O_2$ (5%)	$CH_3OCH_2OCH_3+CH_3O = CH_3OCH_2OCH_2+H_2O$ (27%) $CH_3O+HO_2 = CH_3OH+O_2$ (26%) $CH_3OCH_2OCH_3+CH_3O = CH_3OCHOCH_3+H_2O$ (23%) $CH_2O+CH_3O = HCO+CH_3OH$ (19%)

Le cheminement réactionnel à basse température consiste donc principalement en un arrachement d'hydrogène sur le site central (-OCH_2O-) produisant le radical $CH_3O\dot{C}HOCH_3$ qui se décompose immédiatement, privant le système de la voie d'addition d'O_2 responsable de la réactivité à basse température par production de radicaux OH. La ramification de la chaîne peut se produire via l'autre radical $CH_3OCH_2O\dot{C}H_2$ qui n'est produit qu'en petite quantité. Les comportements distincts des deux types de radicaux peuvent être utilisés pour prédire la réactivité de POMDME plus lourds. En augmentant le nombre d'unités (-CH_2O-), la possibilité d'arrachage d'hydrogène sur les groupes (CH_3O-) est encore réduite. Pour les principaux radicaux liés au carburant ayant la structure $CH_3O(CH_2O)_o\dot{C}HO(CH_2O)_pCH_3$ ($o+p\geq1$, $o\geq0$, $p\geq0$), les β-scissions rapides l'emporteront sur les additions d'O_2. Cependant, un radical ayant la structure $CH_3(OCH_2)_q$ ($q\geq1$) peut en plus se former par la scission β d'une molécule carbonylée stable. Comme les radicaux $CH_3O\dot{C}H_2$ [196, 198] et $CH_3OCH_2O\dot{C}H_2$ [193], ces radicaux ont une certaine stabilité thermique à basse température, permettant ainsi l'addition d'O_2. De plus, leurs produits de décomposition, les radicaux $CH_3(OCH_2)_{q-1}$ ($q\geq2$), devraient présenter des comportements cinétiques similaires. De cette manière, la réactivité à basse température devrait augmenter avec l'allongement de la chaîne (-CH_2O-) pour les composés POMDME.

Le modèle cinétique du DMM développé dans nos travaux a montré des performances satisfaisantes dans des conditions d'oxydation à basse température. Pour tester davantage ce modèle à des températures plus élevées, le modèle a également été utilisé pour simuler la structure chimique d'une flamme de DMM prémélangée laminaire [211]. Comme démontré sur les Figure VI. 13-14, un bon accord a été obtenu entre les profils expérimentaux et simulées d'espèces.

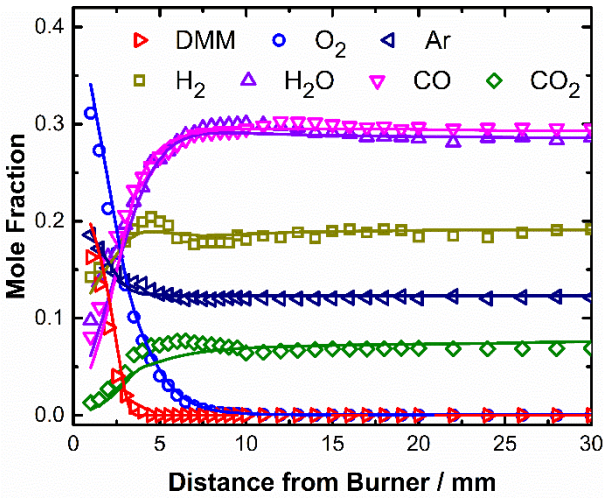


Figure VI. 13 : Comparison des résultats expérimentaux (symboles) [211] et simulés (lignes) pour les produits majoritaires mesurés dans une flamme laminaire de prémélange DMM/O_2/Ar à basse pression.

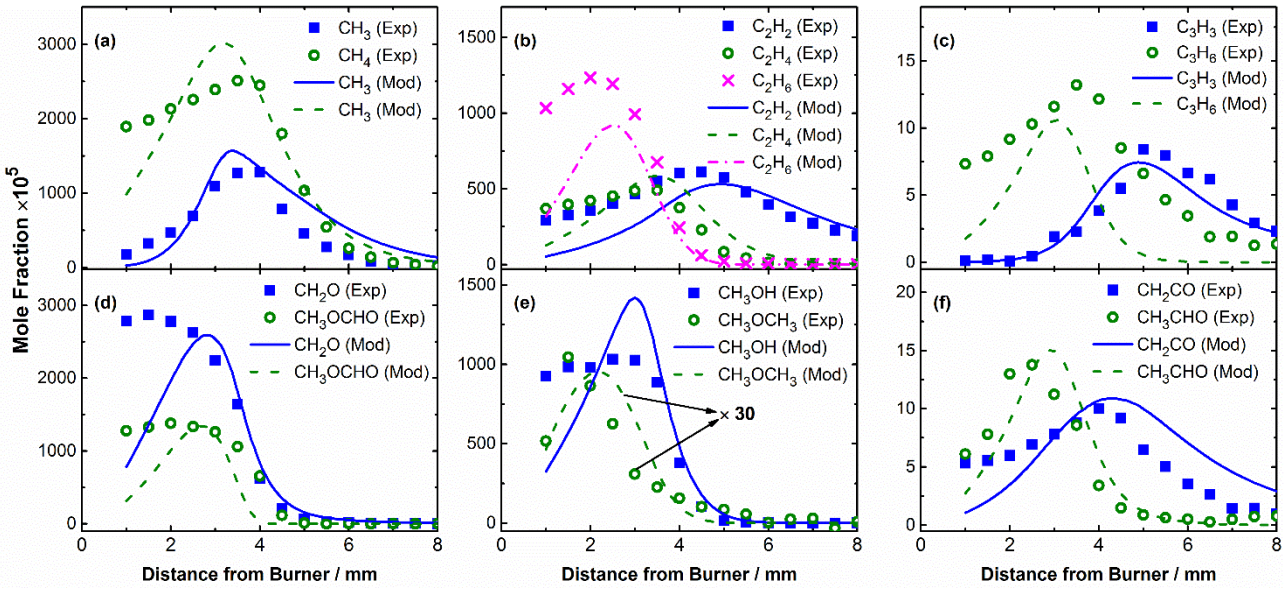


Figure VI. 14 : Comparison des résultats expérimentaux (symboles) [211] et calculés (lignes) pour les produits intermédiaires mesurés dans une flamme laminaire de prémélange DMM/O_2/Ar à basse pression.

1.4. Conclusions

La cinétique d'oxydation à basse température du DMM a été explorée dans ce travail en combinant des travaux expérimentaux et de modélisation. Les mesures de fractions molaires en fonction de la température ont été obtenues pour l'oxydation du DMM dans deux installations JSR fonctionnant à des pressions différentes. Un nouveau modèle cinétique a été proposé, basé sur la stratégie des «classes de réaction», qui permet de bien capturer la consommation du carburant et la formation d'intermédiaires mesurés dans toutes les conditions étudiées. La réactivité du carburant semble être régie par deux paires de réactions compétitives, d'un côté les métathèses d'hydrogène les deux sites différents et d'un autre côté l'addition d'O_2 par rapport à la β-scission du radical majoritaire issu du DMM. Le principal flux réactif via $CH_3OCH_2OCH_3 \rightarrow CH_3O\dot{C}HOCH_3 \rightarrow CH_3OCHO + CH_3$ empêche l'addition d'O_2 au radical $CH_3O\dot{C}HOCH_3$ et les processus de ramification de chaîne ultérieurs, expliquant la faible réactivité du DMM aux basses températures. En raison de la prédominence de la β-scission de $CH_3O\dot{C}HOCH_3$, la chimie du radical CH_3 est cruciale pour la description de l'oxydation du DMM. La décomposition de CH_3O_2H ($CH_3O_2H \rightleftharpoons CH_3O + OH$) engendre une consommation de carburant lente avant d'etre initiée par la réaction H_2O_2 (+ M) → OH + OH (+ M) à plus haute température.

2. Le diméthoxy éthane

2.1. Étude expérimentale en réacteur auto-agité

Comme pour l'étude du DMM, deux réacteurs auto-agités par jets gazeux ont été utilisés dans cette étude. Les expériences en JSR à pression quasi atmosphérique ont été réalisées à l'Advanced Light Source (ALS) du Laboratoire National Lawrence Berkeley et celles effectuées à 10 atm ont utilisé un JSR du CNRS d'Orléans.

Un mélange gazeux stœchiométrique 1,2-DME (1%) / O_2 (5,5%) / Ar (93,5%) a été oxydé. La pression à l'intérieur du réacteur a été maintenue à 700 torr; les températures allant de 460 à 900 K et le temps de séjour fixe à 1,0 s. Comme pour le DMM, le mélange réactionnel a été échantillonné via un cône de prélèvement en silice fondue située à la sortie du réacteur, puis analisé par PI-MBMS. Les spectres d'efficacité de photoionisation (PIE) ont été obtenus pour l'identification des espèces en balayant l'énergie des photons avec une température contrôlée à 550 K. Les signaux dépendant de la température ont été convertis en profils de fractions molaires pour les principales espèces (1,2-DME, O_2, CO, CO_2, H_2O) et les intermédiaires avec des sections efficaces de photoionisation (PICS) connues. Les facteurs d'incertitude (UF) pour les fractions molaires d'intermédiaires quantifiés distincts sont fournis dans le Tableau VI. 5, ainsi que les sections efficaces de photoionisation (PICS) utilisés et les facteurs de discrimination de masse (MDF). Les températures mesurées ont été décalées linéairement de 6% vers des valeurs plus élevées, en tenant compte des effets de sonde [148].

Tableau VI. 5 : Paramètres utilisés pour la quantification d'espèces par PI-MBMS.

Masse	Espèce	EI (eV)	PICS		MDF	UF
			Valeur	Ref.		
16	CH_4 (methane)	12.6	4.72 (13.2 eV);	[180]	0.16	1.5
18	H_2O (water)	12.6	15.72 (16.65 eV); 9.07 (13.2 eV)	[212]	0.22	1.3
26	C_2H_2 (acetylene)	11.4	39.1 (13.2 eV)	[145]	0.44	1.5
28	CO (carbon monoxide)	14.01	16.92 (16.65 eV); 22.57 (14.35 eV)	[213]	0.51	1.3
28	C_2H_4 (ethylene)	10.5	8.02 (11.5 eV); 6.54 (10.8 eV) ;	[145]	0.51	1.5
30	CH_2O (formaldehyde)	10.88	10.13 (11.5 eV)	[214]	0.57	1.5
32	O_2 (oxygen)	12.07	14.88 (16.65 eV)	[215]	0.63	1.3
32	CH_3OH (methanol)	10.84	9.53 (11.5 eV)	[145]	0.63	1.5
34	H_2O_2	10.58	4.48 (11.5 eV)	[216]	0.70	3.0
40	Ar (argon)	15.76	32.24(16.65 eV)	[217]	0.91	1.3
42	CH_2CO (ketene)	9.62	21.26 (10 eV)	[218]	0.98	1.7
42	C_3H_6 (propene)	9.73	7.05 (10 eV)	[219]	0.98	1.5
44	CO_2 (carbon dioxide)	13.78	21.97 (16.65 eV); 18.22 (14.35 eV)	[220]	1.05	1.3
44	CH_3CHO (acetaldehyde)	10.23	7.44 (10.5 eV)	[219]	1.05	2.0
44	C_2H_3OH (ethenol)	9.33	6.38 (10 eV)	[219]	1.05	1.7
46	HCOOH (formic acid)	11.33	5.04 (11.5 eV)	[145]	1.04	1.5
46	CH_3OCH_3 (dimethyl ether)	10.03	8.22 (10.5 eV)	[145]	1.04	1.5
48	CH_3O_2H (methyl hydroperoxide)	9.83	2.42 (10.5 eV)	[148]	1.21	3.0
58	$C_2H_3OCH_3$ (methyl vinyl ether)	8.95	3 (9.5 eV)	[221]	1.62	3.0
60	CH_3COOH (acetic acid)	10.65	2.02 (10.8 eV)	[222]	1.70	1.7
60	CH_3OCHO (methyl formate)	10.84	8.30 (11.5 eV)	[189]	1.70	2.0
74	CH_3OCH_2CHO (methoxy acetaldehyde)	9.53	3 (10 eV)	[221]	2.36	3.0
90	$CH_3OCH_2CH_2OCH_3$ (1,2-DME)	9.3			2.87	1.3

Des expériences sous haute pression (10 atm) ont été menées avec des mélanges 1,2-DME / O_2 fortement dilués dans l'azote (0.1% molaire de carburant) pour trois richesses (0,5, 1,0 et 2,0). Le temps de passage a été fixé à une valeur constante de 0,7 s et la température variée entre 450 K et 1100 K.

2.2. Modélisation

Le modèle cinétique utilise comme base le mécanisme Aramco 2.0 [223], récemment mis à jour et bien validé. Des classes de réactions élémentaires complètes à basse température [171, 203] ont été ajoutées au modèle de combustion à haute température proposé précédemment [224]. Les voies principales d'oxydation de carburant sont présentées à la Figure VI. 15.

A notre connaissance, aucun paramètre cinétique n'est disponible pour les réactions à basse température du 1,2-DME. Nous avons donc estimé la cinétique sur la base de nos connaissances pour les alcanes [225-228]. Les constantes de vitesse adoptées pour les réactions sélectionnées sont énumérées dans le Tableau VI. 7 et un glossaire des espèces est fourni dans le Tableau VI. 6.

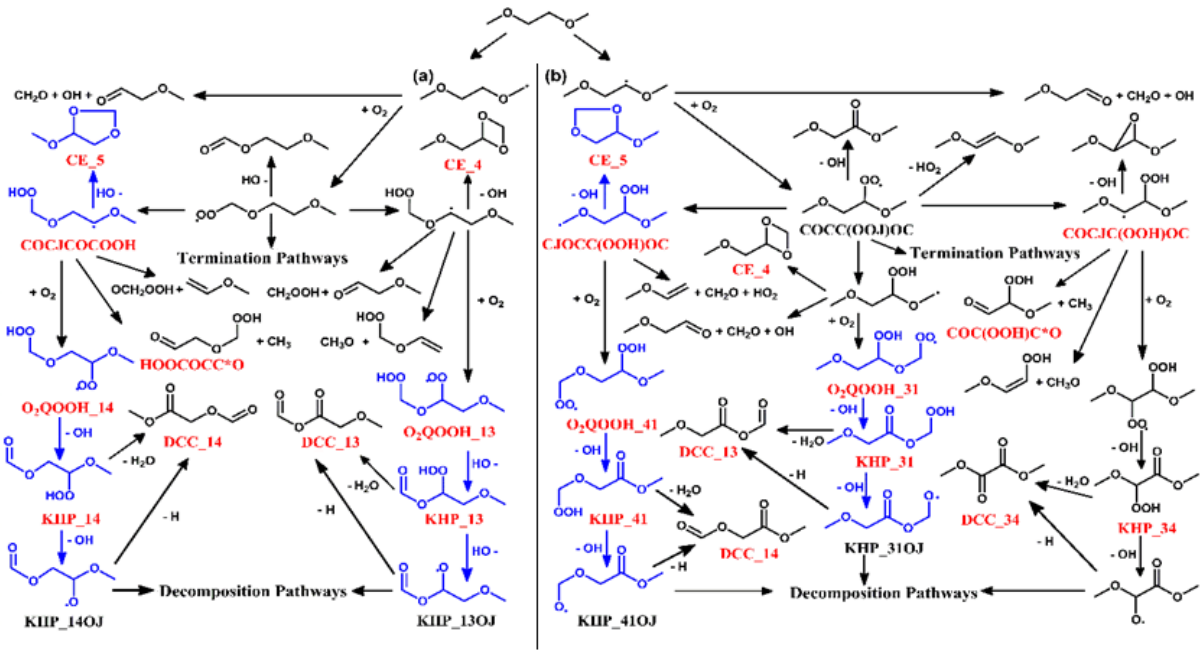
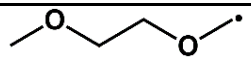
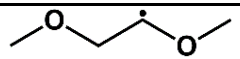
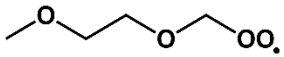
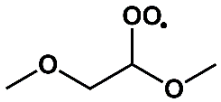
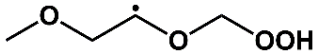
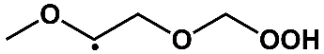
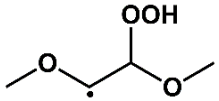
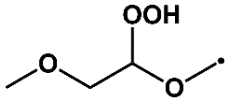
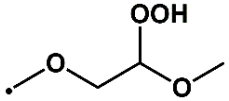
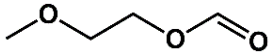
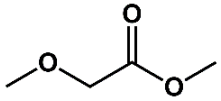
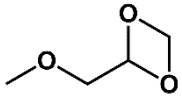
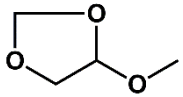
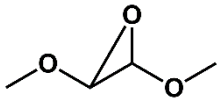
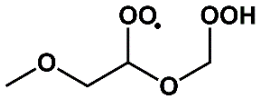
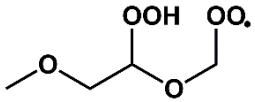
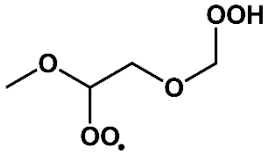
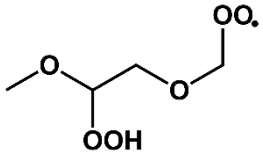
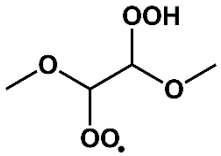
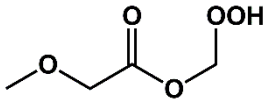
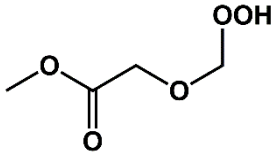
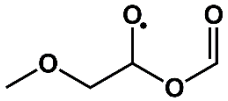
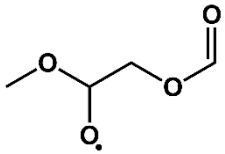
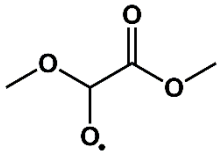
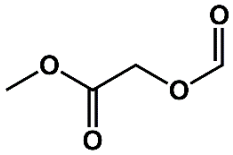
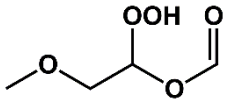
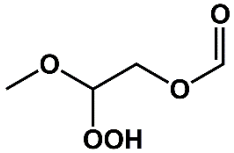
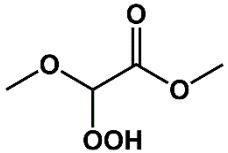
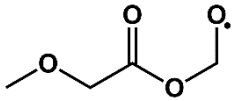
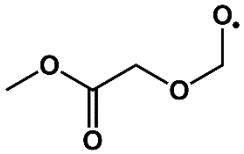
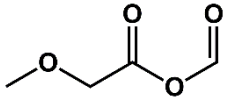
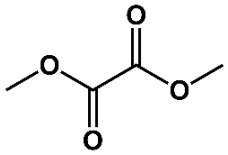


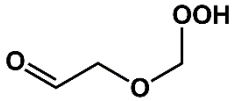
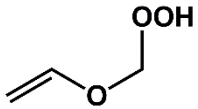
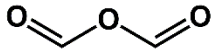
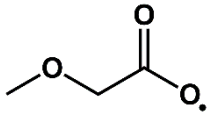
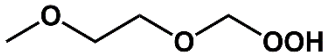
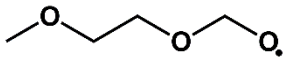
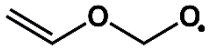
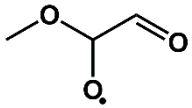
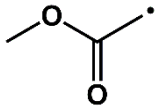
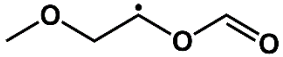
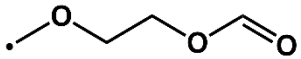
Figure VI. 15 : Schéma d'oxydation à basse température du 1,2-diméthoxy méthane avec (a) le radical primaire du carburant et (b) le radical secondaire (les réactions en bleu signifient une production de radical OH, les noms des espèces en rouge sont la nomenclature adoptée dans le mécanisme).

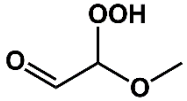
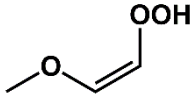
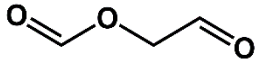
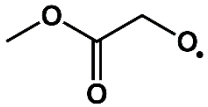
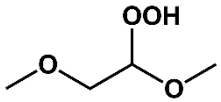
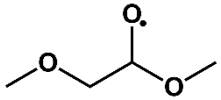
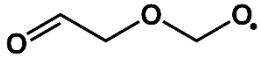
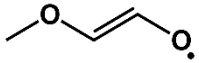
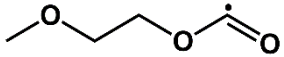
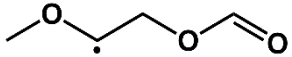
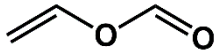
Tableau VI. 6 : Nomenclature des espèces impliquées dans l'oxydation du 1,2-DME.

Code	Formule	Structure	Code	Formule	Structure
COCCOCJ	$C_4H_9O_2$		COCCJOC	$C_4H_9O_2$	
COCCOCOOJ	$C_4H_9O_4$		COCC(OOJ)OC	$C_4H_9O_4$	
COCCJOCOOH	$C_4H_9O_4$		COCJCOCOOH	$C_4H_9O_4$	
COCJC(OOH)OC	$C_4H_9O_4$		COCC(OOH)OCJ	$C_4H_9O_4$	
CJOCC(OOH)OC	$C_4H_9O_4$		COCCOC*O	$C_4H_8O_3$	
COCC*OOC	$C_4H_8O_3$		CE-4	$C_4H_8O_3$	
CE-5	$C_4H_8O_3$		CE-3	$C_4H_8O_3$	
O_2QOOH_13	$C_4H_9O_6$		O_2QOOH_31	$C_4H_9O_6$	
O_2QOOH_14	$C_4H_9O_6$		O_2QOOH_41	$C_4H_9O_6$	

O_2QOOH_34	$C_4H_9O_6$	
KHP_31	$C_4H_8O_5$	
KHP_41	$C_4H_8O_5$	
KHP_13OJ	$C_4H_7O_4$	
KHP_14OJ	$C_4H_7O_4$	
KHP_34OJ	$C_4H_7O_4$	
DCC_14	$C_4H_6O_4$	

KHP_13	$C_4H_8O_5$	
KHP_14	$C_4H_8O_5$	
KHP_34	$C_4H_8O_5$	
KHP_31OJ	$C_4H_7O_4$	
KHP_41OJ	$C_4H_7O_4$	
DCC_13	$C_4H_6O_4$	
DCC_34	$C_4H_6O_4$	

HOOCOCC*O	$C_3H_6O_4$	
C*COCOOH	$C_3H_6O_3$	
C*OOC*O	$C_2H_2O_3$	
COCC*OOJ	$C_3H_5O_3$	
COCCOCOOH	$C_4H_{10}O_4$	
COCCOCOJ	$C_4H_9O_3$	
C*COCOJ	$C_3H_5O_2$	
COC(OJ)C*O	$C_3H_5O_3$	
COC*OCJ	$C_3H_5O_2$	
COCCJOC*O	$C_4H_7O_3$	
CJOCCOC*O	$C_4H_7O_3$	

COC(OOH)C*O	$C_3H_6O_4$	
COC*COOH	$C_3H_6O_3$	
C*OOCC*O	$C_3H_4O_3$	
COC*OCOJ	$C_3H_5O_3$	
COCC(OOH)OC	$C_4H_{10}O_4$	
COCC(OJ)OC	$C_4H_9O_3$	
OJCOCC*O	$C_3H_5O_3$	
COC*COJ	$C_3H_5O_2$	
COCCOCJ*O	$C_4H_7O_3$	
COCJCOC*O	$C_4H_7O_3$	
C*COC*O	$C_3H_4O_2$	

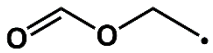
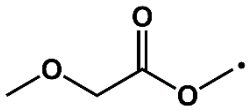
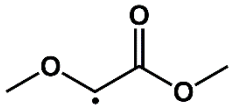
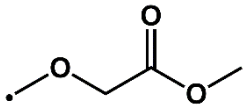
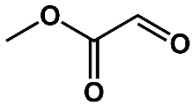
C*OOCCJ	$C_3H_5O_2$		COCC*OOCJ	$C_4H_7O_3$	
COCJC*OOC	$C_4H_7O_3$		CJOCC*OOC	$C_4H_7O_3$	
COC*OC*O	$C_3H_4O_3$				

Tableau VI. 7 : Réactions ajoutées au sous-mécanisme d'oxydation du 1,2-DME.
Les constantes de vitesse $k = AT^n\exp(-Ea/RT)$ sont exprimées en s^{-1}, cm^3 and cal/mol.

Classe de réaction	Réaction		*A*	*n*	*E*a	Ref.
$R+O_2 = RO_2$	$COCCOCJ+O_2 = COCCOCOOJ$	1 atm	1.37×10^{19}	-2.45	1.14×10^{3}	[50, 229] [a]
		10 atm	3.73×10^{13}	-0.58	-1.64×10^{2}	
	$COCCJOC+O_2 = COCC(OOJ)OC$	1 atm	2.06×10^{19}	-2.45	1.14×10^{3}	
		10 atm	5.60×10^{13}	-0.58	-1.64×10^{2}	
$RO_2 = QOOH$	$COCCOCOOJ = COCCJOCOOH$		9.30×10^{7}	1.11	1.52×10^{4}	[230] [a]
	$COCC(OOJ)OC = COCJC(OOH)OC$		9.56×10^{7}	1.36	2.56×10^{4}	
RO_2 élimination concertée	$COCC(OOJ)OC = COC^*COC+HO_2$		3.68×10^{9}	0.96	3.00×10^{4}	[230]
QOOH = éther cyclique + OH	$COCJCOCOOH = CE\text{-}5+OH$		4.73×10^{5}	1.24	8.13×10^{3}	[228]
	$CJOCC(OOH)OC = CE\text{-}5+OH$		3.79×10^{5}	1.28	1.02×10^{4}	
Décomposition thermique QOOH	$COCCJOCOOH = COCC^*O+CH_2O_2H$	10 atm	4.03×10^{43}	-9.32	3.45×10^{4}	[224] [b]
$QOOH+O_2 = O_2QOOH$	$COCCJOCOOH+O_2 = O2QOOH_13$		7.00×10^{11}	0.00	0.00	[93, 231] [c]
	$COCC(OOH)OCJ+O_2 = O2QOOH_31$		7.00×10^{11}	0.00	0.00	
$O_2QOOH = KHP+OH$	$O_2QOOH_13 = KHP_13+OH$		5.49×10^{3}	2.40	1.99×10^{4}	[226]
	$O_2QOOH_31 = KHP_31+OH$		5.79×10^{2}	2.90	1.70×10^{4}	
Consommation des KHP	$KHP_13 = KHP_13OJ+OH$		3.00×10^{16}	0.00	4.20×10^{4}	[225] [a]
	$KHP_13 = DCC_13+H_2O$		1.28×10^{7}	2.25	4.50×10^{4}	[222]
Réactions de terminaisons	$COCCOCOOJ+HO_2 = COCCOCOOH+O_2$		1.75×10^{10}	0.00	-3.28×10^{3}	[225]
	$COCCOCOOJ+COCCOCOOJ = COCCOCOJ+COCCOCOJ+O_2$		1.40×10^{16}	-1.61	1.86×10^{3}	[225]
$RO_2H=RO+OH$	$COCCOCOOH = COCCOCOJ+OH$		1.26×10^{16}	0.00	4.25×10^{4}	[225]

Notes: [a] Modifiée; [b], Analogie avec la β-scission $COCCJOC = COCC^*O+CH_3$; [c] Analogie avec la 2nde addition d'O_2 pour le DME.

Les réactions des radicaux du carburant ($\dot{R}$) avec O_2 [192] sont au cœur de la chimie de basse température conduisant à l'auto-inflammation. Pour cette classe de réactions, des analogies ont été établies avec les réactions correspondantes du diméthyléther (CH_3OCH_3) sur la base de leur similarité structurelle. En effet, la molécule de 1,2-DME peut être vue comme étant composée de deux radicaux du DME ($CH_3O\dot{C}H_2$). Selon Wang et al. [50], les valeurs de constante de vitesse de la réaction $CH_3O\dot{C}H_2 + O_2 \rightarrow CH_3OCH_2O\dot{O}$ varient de trois ordres de grandeur autour de la mesure de Rosado-Reyes et al. [229]. Les constantes de vitesse proposées par Wang et al. ont été adoptées pour le 1,2-DME et le facteur A a été divisé par trois et deux pour les additions d'O_2 à $CH_3OCH_2CH_2O\dot{C}H_2$ et $CH_3OCH_2HOCH_3$, respectivement, afin d'obtenir de meilleures performances du modèle. Les paramètres cinétiques précis et la dépendance à la pression pour ces réactions cruciales nécessitent encore des études théoriques. Pour les isomérisations de RO_2 à QOOH, seules les migrations d'hydrogène passant par des états de transition de 5 à 8 atomes ont été prises en compte. Les énergies d'activation ont été réduites de 3 kcal / mol car les énergies de déformation cyclique peuvent être abaissées par la présence d'atomes d'oxygène dans le 1,2-DME (par rapport aux alcanes). Une attention particulière a été portée aux conversions de cétohydroperoxydes (KHP) en composés dicarbonylés, car les deux espèces réactives ont été détectées avec la méthode de PI-MBMS. Les constantes de vitesse [205] pour la coupure de la liaison CO-OH dans les KHP ont été multipliées par deux pour tenir compte du fait que les atomes d'oxygène voisins dans le carburant affaiblissent les liaisons voisines. Les éliminations directes de H_2O dans les KHP produisant des composés dicarbonylés ont également été considérées avec les constantes de vitesse de réactions analogues dans un modèle d'oxydation précédent au n-heptane [222]. Pour les espèces liées au carburant non incluses dans le mécanisme principal, les propriétés thermochimiques ont été calculées avec le programme THERM [209] avec les valeurs de groupe récemment mises à jour [232]. Le modèle complet impliquant 570 espèces et 2960 réactions est fourni dans l'**Annexe 5**.

2.3. Résultats

Les évolutions des concentrations de 1,2-DME avec la température dans toutes les conditions étudiées sont illustrées à la Figure VI. 16. Des comportements évidents de réactivité à basse température et de coefficient de température négatif ont été observés pour le 1,2-DME. Des taux de conversion maximaux distincts (a) ont été observés autour de 580 K, indiquant que la réactivité à basse température du 1,2-DME est sensible à la richesse. Notre

modèle rend bien compte de la réactivité globale de tous les mélanges avec différentes richesses à 10 atm. C'est aussi le cas à 700 Torr.

Selon l'analyse de voies réactionnelles (ROP), le carburant est principalement consommé par métathèse avec OH à toutes les températures étudiées. La Figure VI. 17 montre les voies de formation des radicaux OH dans les conditions stœchiométriques à 10 atm. Dans le régime d'oxydation à basse température (500-660 K), trois catégories de réactions contribuent principalement à la formation de ces radicaux, à savoir la décomposition des radicaux O_2QOOH en cétohydropéroxydes et OH, la décomposition des KHP et la formation d'éthers cycliques à partir des radicaux QOOH. Les voies impliquées sont présentées sur la Figure VI. 15. Des résultats similaires ont été obtenus dans d'autres conditions étudiées et les interprétations du modèle peuvent être étayées par certaines preuves expérimentales, qui seront présentées dans la suite de ce mémoire.

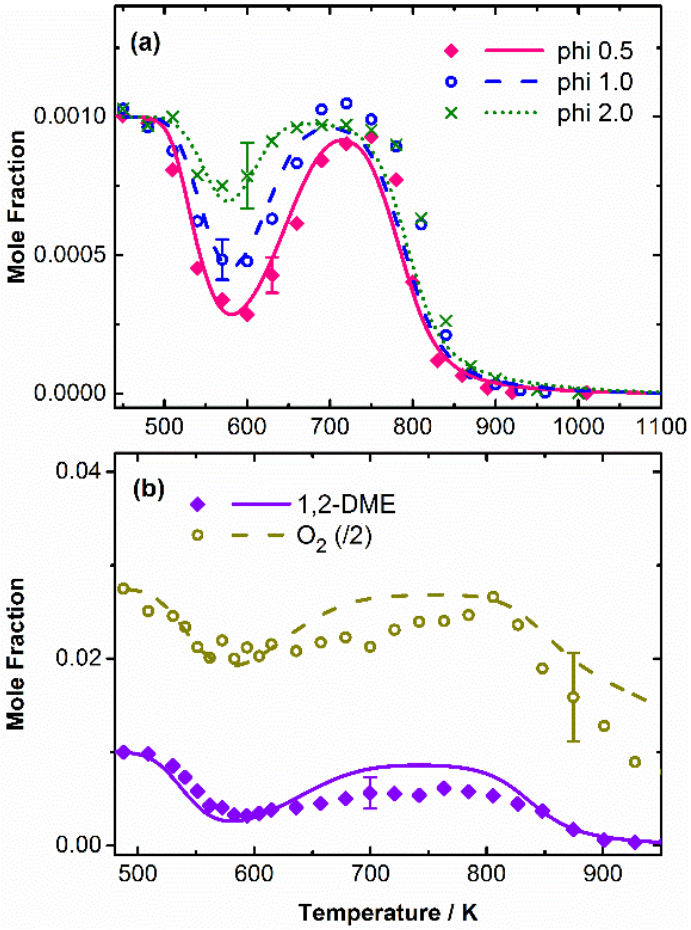


Figure VI. 16 : Comparaison des résultats expérimentaux (symboles) et des simulations (lignes) pour l'oxydation du 1,2-DME (a) à 10 atm et (b) à 700 torr en JSR.

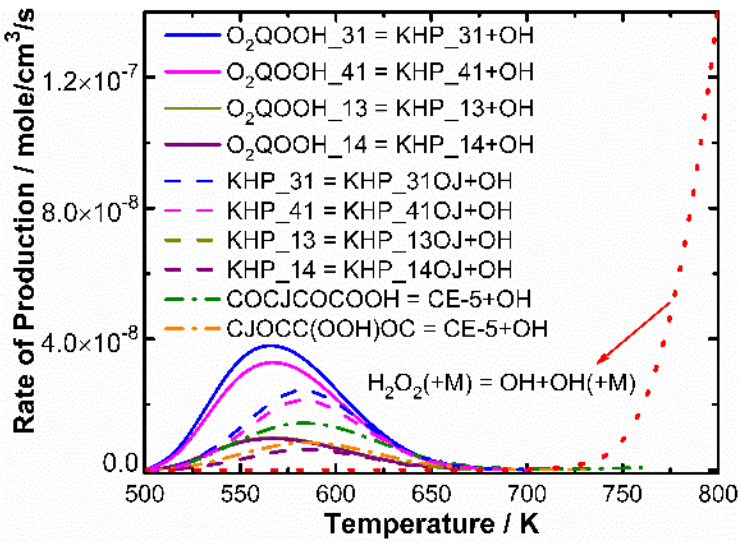


Figure VI. 17 : Prévision par la modélisation de la production du radical OH par différentes reactions dans l'oxydation du 1,2-DME dans les conditions stœchiométriques à 10atm.

2.3.a. Résultats à la pression quasi-atmosphérique

La technique PI-MBMS a permis la détection de certaines espèces réactives lors de l'oxydation du 1,2-DME à 700 Torr. Les spectres de masse enregistrés à 550 K et 800 K à une énergie photonique de 10,8 eV sont comparés sur la Figure VI. 18. Comme on le verra plus loin, les pics spécifiques (en bleu et rose) du régime à basse température correspondent à des espèces résultant de réations à basse température et conduisant à des ramifications de chaîne.

Les fractions molaires pour les principaux produits (H_2O, CO_2, CO) et les intermédiaires avec des PICS connus, y compris certains peroxydes tels que H_2O_2 [216] et CH_3O_2H [148], sont présentées à la Figure VI. 19. Un bon accord général entre les mesures et les simulations a été observé, bien que les performances du modèle ne soient pas aussi bonnes que celles à 10 atm comme on le verra par la suite. La dépendance du modèle à la pression doit être affinée. Les énergies d'ionisation adiabatiques d'isomères possibles pour les pics d'intérêt ont été calculés par W. Sun avec la méthode CBS-QB3 [233] en utilisant Gaussian 09 [173]. Les résultats, avec des incertitudes estimées à ± 0,05 eV en négligeant les effets de conformation [234], sont présentés dans le Tableau VI. 8.

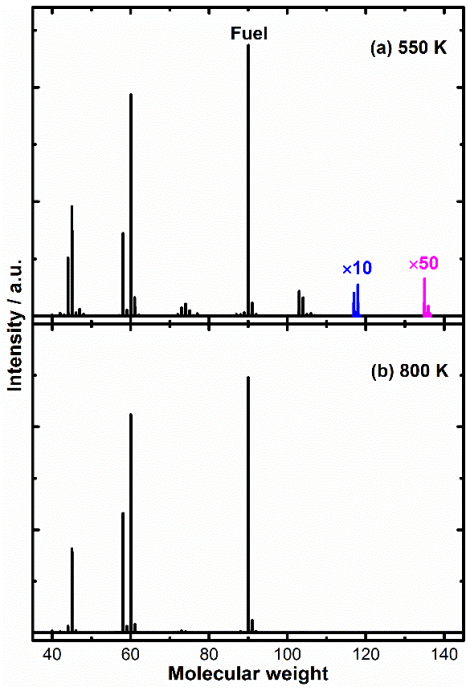


Figure VI. 18 : Spectres de masse enregistrés à 10.8 eV pour une température de (a) 550 K et (b) 800 K lors de l'oxydation du 1,2-DME en JSR à 700 torr.

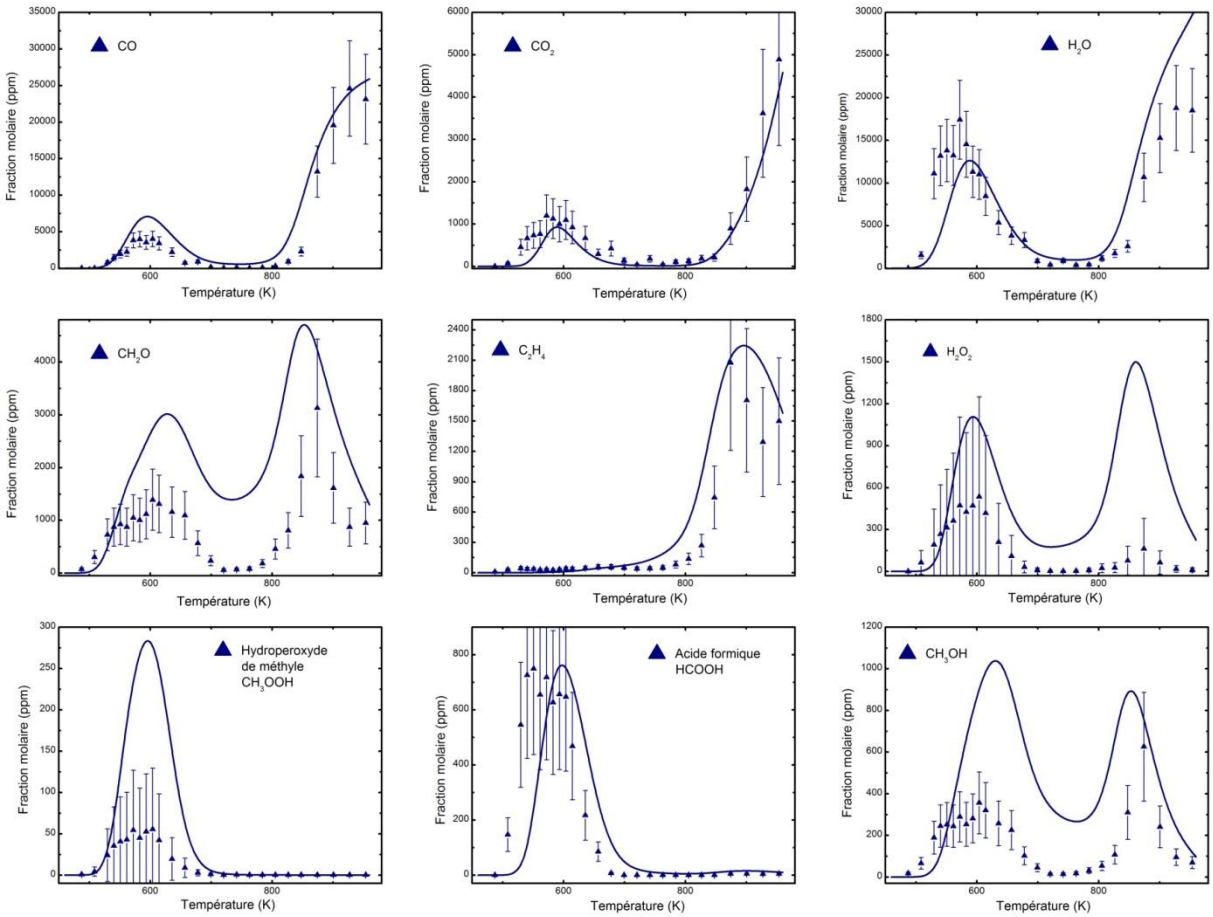
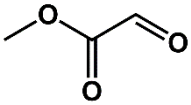
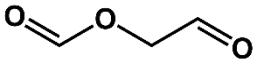
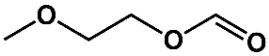
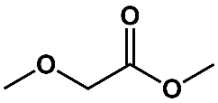
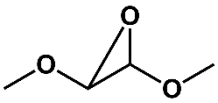
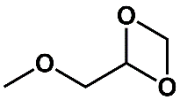
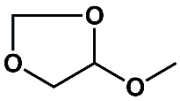
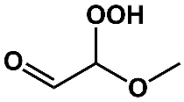
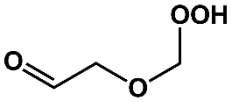
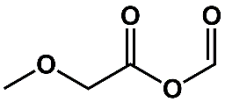
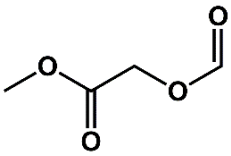
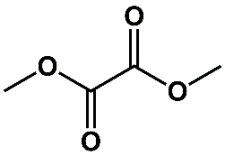
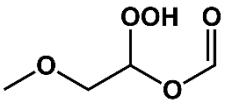
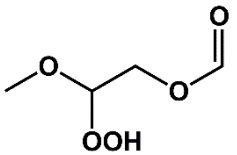
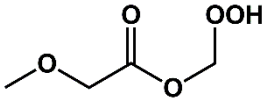
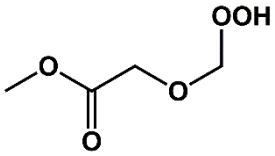
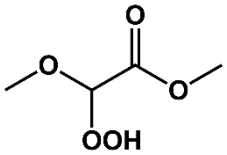


Figure VI. 19 : Résultats obtenus pour l'oxydation du diméthoxy éthane à 700 torr et τ = 1s pour 1% de 1,2-DME initial à φ = 1 dans l'argon comparés aux simulations issues du modèle.

Tableau VI. 8 : Structures et énergies d'ionisation calculées au niveau de théorie CBS-QB3 des espèces impliquées dans l'oxydation à basse temperature du 1,2-DME.

Formule, Masse moléculaire	Nomenclature	Structure	IE calculé (eV)
$C_4H_8O_3$, 88.02	COC*OC*O		10.07
	C*OOCC*O		10.36
$C_4H_8O_3$, 104.05	COCCOC*O		10.08
	COCC*OOC		9.48
	CE-3		8.65 (syn)
	CE-4		9.06
	CE-5		9.68
$C_3H_6O_4$, 106.03	COC(OOH)C*O		9.46
	HOOCOCC*O		9.47
$C_4H_6O_4$, 118.03	DCC_13		9.81
	DCC_14		10.14
	DCC_34		10.05
$C_4H_8O_5$, 136.04	KHP_13		9.42

KHP_14		9.76
KHP_31		9.55
KHP_41		9.51
KHP_34		9.73

Compte tenu de la résolution de masse élevée du spectromètre de masse et des connaissances accumulées dans des travaux analogues [222, 234-236], les deux pics ayant des m/z de 136.04 et 118.03 ont été attribués respectivement aux cétohydropéroxydes ($C_4H_8O_5$) et dicarbonyle ($C_4H_6O_4$). La Figure VI. 20 montre leurs signaux mesurés en fonction de l'énergie et de la température. Les profils prédits par le modèle pour les isomères possibles sont également présentées à titre de référence. Le signal autour de 9,4 eV suggère la présence de KHP_13, alors que l'existence d'autres KHP avec des énergies d'ionisation plus élevées ne peut pas être prouvée. Néanmoins, tous les KHP, à l'exception de KHP_34, ont des fractions molaires maximales simulées non négligeables (> 10^{-4}). Pour les deux étapes réactionnelles $RO_2 \rightarrow QOOH$ et $O_2QOOH \rightarrow KHP + OH$, des migrations intramoléculaires d'hydrogène avec des intermédiaires à six et sept atomes sont impliquées dans la formation de KHP_13 et KHP_31, et la formation de KHP_14 et KHP_41, respectivement. Cependant, KHP_34 est relativement difficile à produire avec un état de transition à cinq atomes. Les atomes d'hydrogène dans la structure ($-CH_2CH_2-$) sont plus faciles à arracher que ceux des groupes ($-CH_3O$), ce qui conduit à une production de $CH_3OCH_2\dot{C}HOCH_3$ plus importante que celle de $CH_3OCH_2CH_2O\dot{C}H_2$. Ceci induit des concentrations prédites plus élevées de KHP_31 et KHP_41 par rapport à KHP_13 et KHP_14.

Les deux groupes (C = O) des DCC peuvent être adjacents ou séparés par un atome d'oxygène ou une structure ($-CH_2O-$), en fonction de la nature de leurs KHP précurseurs. DCC_13 peut être formé à partir de la consommation de KHP_13 et KHP_31, tandis que les décompositions de KHP_14 et KHP_41 sont responsables de la production de DCC_14

(Figure VI. 15). Les énergies d'ionisation calculées pour DCC_13 (9,81 eV) et DCC_14 (10,14 eV) correspondent respectivement aux deux seuils du spectre PIE mesuré (c). Les expériences ne peuvent pas prouver la présence d'un autre isomère DCC_34 (IE = 10,05 eV) provenant du KHP_34 qui a une concentration négligeable, comme mentionné ci-dessus.

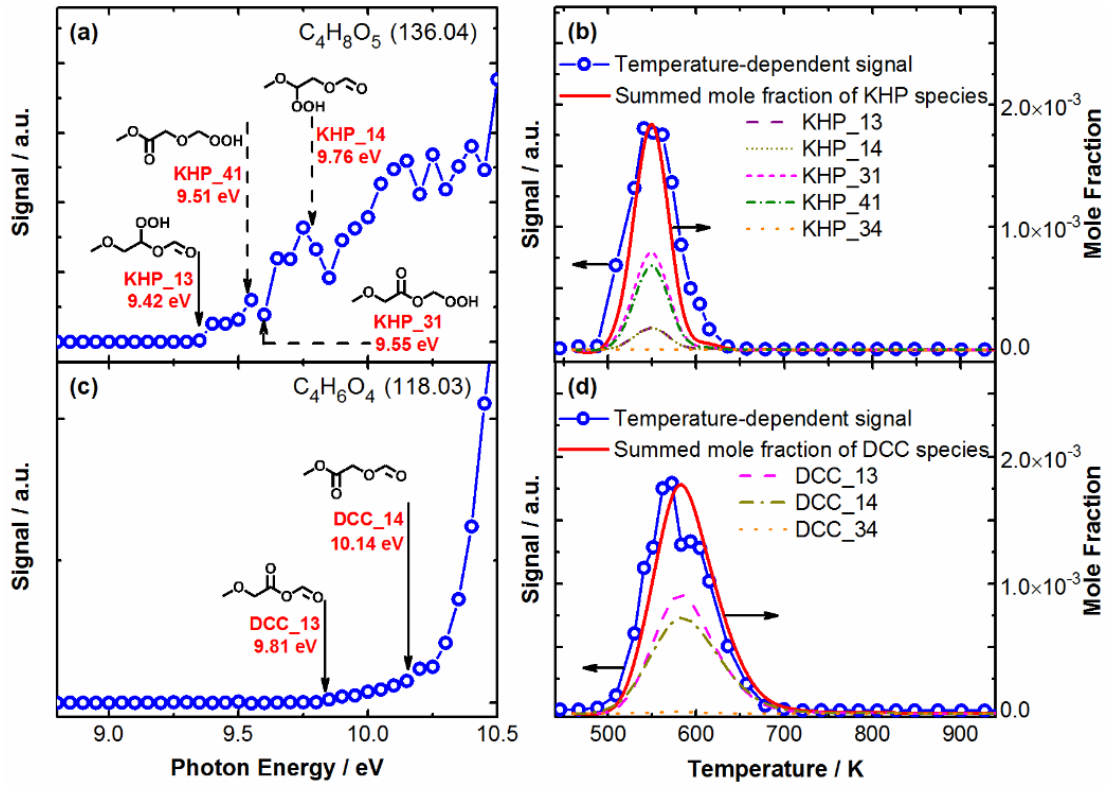


Figure VI. 20 : Evolution du signal avec l'énergie de photionisation à 550 K (gauche) et dépendence à la température du signal à 10.8 eV ($C_4H_8O_5$ et $C_4H_6O_4$) lors de l'oxydation du 1,2-DME à 700 Torr. Les fractions molaires simulées sont présentées à droite en normalisant sur le maximum d'intensité.

L'espèce $C_4H_8O_3$ désignée par CE-5 est l'éther cyclique à cinq atomes. Son énergie d'ionisation calculée (9,68 eV) correspond à la valeur mesurée, comme le montre la Figure VI. 21. Les éthers cycliques CE-4 et le CE-5 sont tous deux des produits possibles des réactions présentées sur la Figure VI. 15. Cependant, la formation d'éther cyclique via un intermédiaire à cinq atomes est favorisée cinétiquement par rapport à celle passant par un intermédiaire à quatre atomes, ce qui rend la formation de CE-5 relativement plus facile. La détection de CE-5 est une preuve indirecte de l'existence des espèces QOOH correspondantes, COCJCOCOOH et CJOCC(OOH)OC. Par conséquent, l'espèce ($C_3H_6O_4$, m/z 106.03) représentée sur la Figure VI. 21 (c) est susceptible d'être HOOCOCC*O (IE = 9,47 eV) produite à partir de la β-scission de COCJCOCOOH. Un autre isomère, COC(OOH)C*O, a

une énergie d'ionisation similaire (9,46 eV), mais serait moins probable, car son précurseur COCJC(OOH)OC est issu d'une isomérisation à cinq atomes moins favorable que celles à six ou sept.

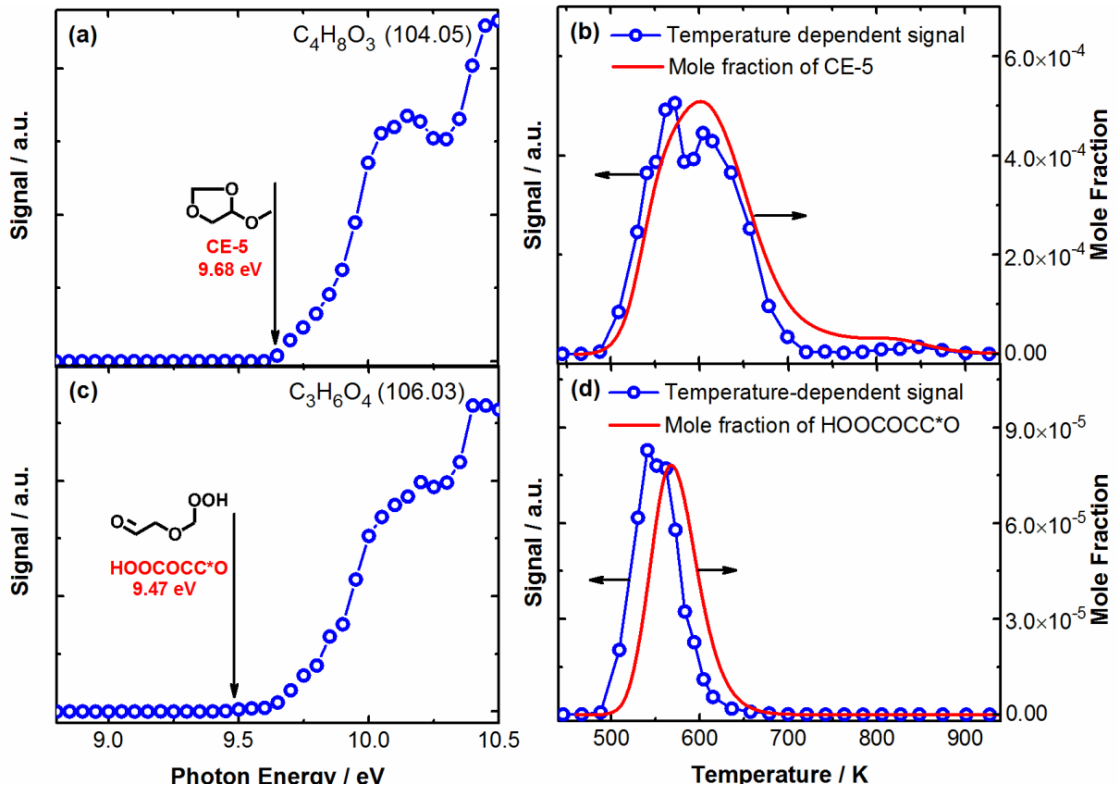


Figure VI. 21 : Evolution du signal avec l'énergie de photionisation à 550 K (gauche) et dépendence de la température du signal à 10.8 eV ($C_4H_8O_3$ et $C_3H_6O_4$) lors de l'oxydation du 1,2-DME à 700 Torr. Les fractions molaires simulées sont présentées à droite en normalisant sur le maximum d'intensité.

Les radicaux QOOH et O_2QOOH sont très réactifs et rarement détectés [237]. Mais leurs produits de consommation tels que les éthers cycliques et les cétohydroperoxydes ont été observés lors de l'oxydation du 1,2-DME. Ceci conforte l'existence des voies incluses dans le modèle conduisant à la production de OH et donc à la forte réactivité du 1,2-DME dans le régime à basse température.

2.3.b. Résultats à haute pression (10 atm)

Les Figure VI. 22 à 21 VI-6 présentent l'ensenble des résultats expérimentaux et numériques pour l'oxydation du 1,2-DME à 10 atm. Ici, les simulations sont en bon accord avec nos mesures pour toutes les espèces quantifiables. Dans l'ensemble, le modèle actuel reproduit de manière satisfaisante les mesures. Les deux maxima de concentration séparés par la zone NTC peuvent être observés pour la plupart des espèces, alors que leurs formations résultent de réactions différentes dans des régions de température différentes. Par exemple, pour les trois richesses, le méthylvinyléther (MVE, $CH_3OCH = CH_2$), intermédiaire spécifique au carburant, provient principalement de la décomposition d'un radical QOOH ($CH_3O\dot{C}HCH_2OCH_2OOH \rightarrow CH_3OCH = CH_2 + \dot{O}CH_2OOH$) aux basses températures tandis qu'à plus haute température il se forme principalement par β-scission du radical $CH_3O\dot{C}HCH_2OCH_3$, comme dans une flamme [224]. Les effets de la richesse sur les concentrations d'espèces ont été étudiés et une figure en **Annexe 1** permet de rendre compte de cette influence. Pour les concentrations d'intermédiaires oxygénés (formaldéhyde, méthanol et MVE), les deux pics présentent une corrélation différente selon la richesse. À basse température, les concentrations maximales diminuent clairement lorsque la richesse augmente, alors qu'à des températures plus élevées, les concentrations maximales ne diffèrent que très peu entre les trois mélanges. Des pics uniques apparaissent à haute température pour les intermédiaires hydrocarbonés, y compris l'éthylène formée par β-scission $CH_3OCH_2CH_2O\dot{C}H_2 \rightarrow CH_3O + C_2H_4 + CH_2O$). Cela indique qu'à basse température, les additions d'O_2 sont plus importantes que les décompositions pour la consommation des radicaux du 1,2-DME.

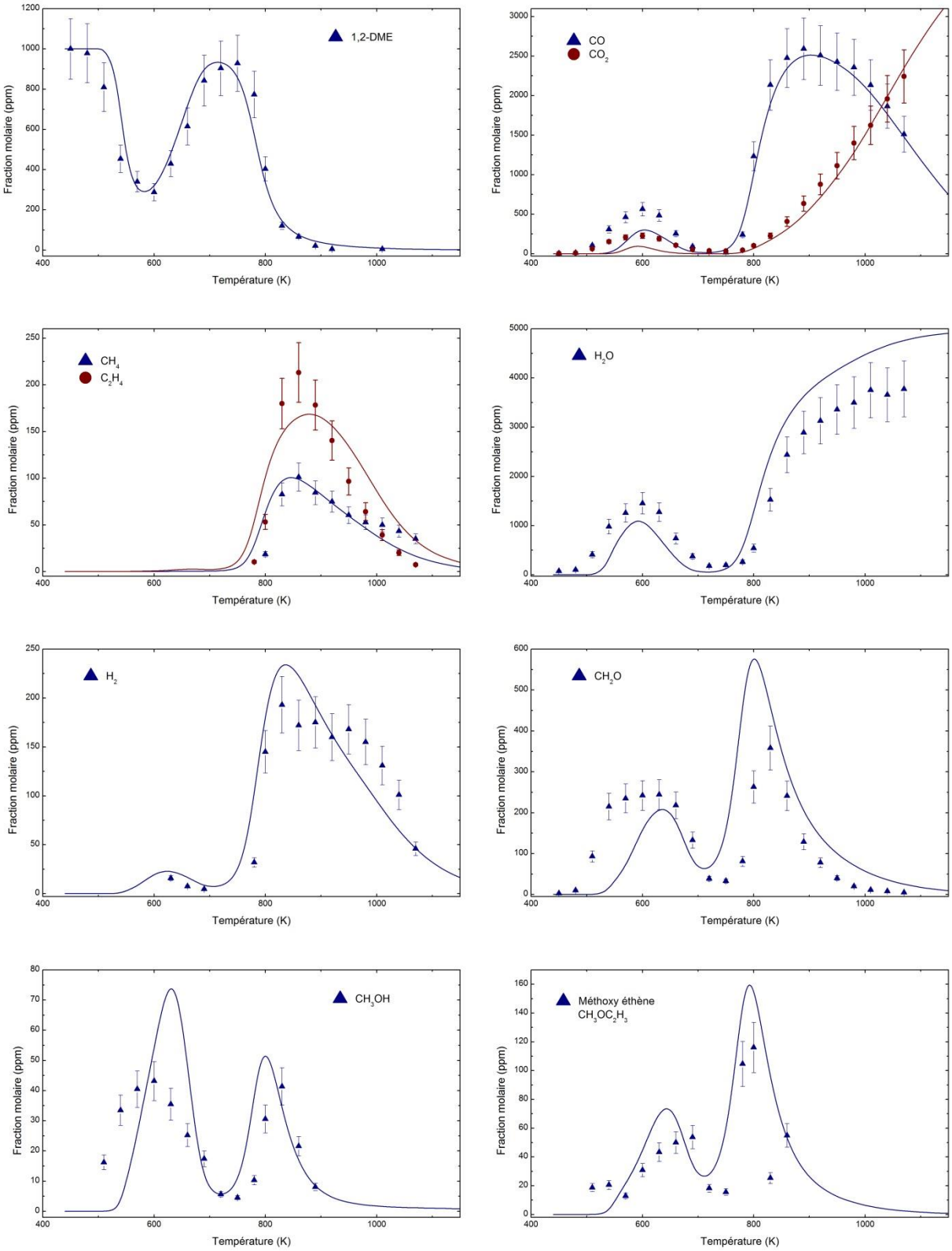


Figure VI. 22 : Résultats obtenus pour l'oxydation du diméthoxy éthane à 10 atm et τ = 0,7s pour 1000ppm de 1,2-DME initial à φ = 0,5.

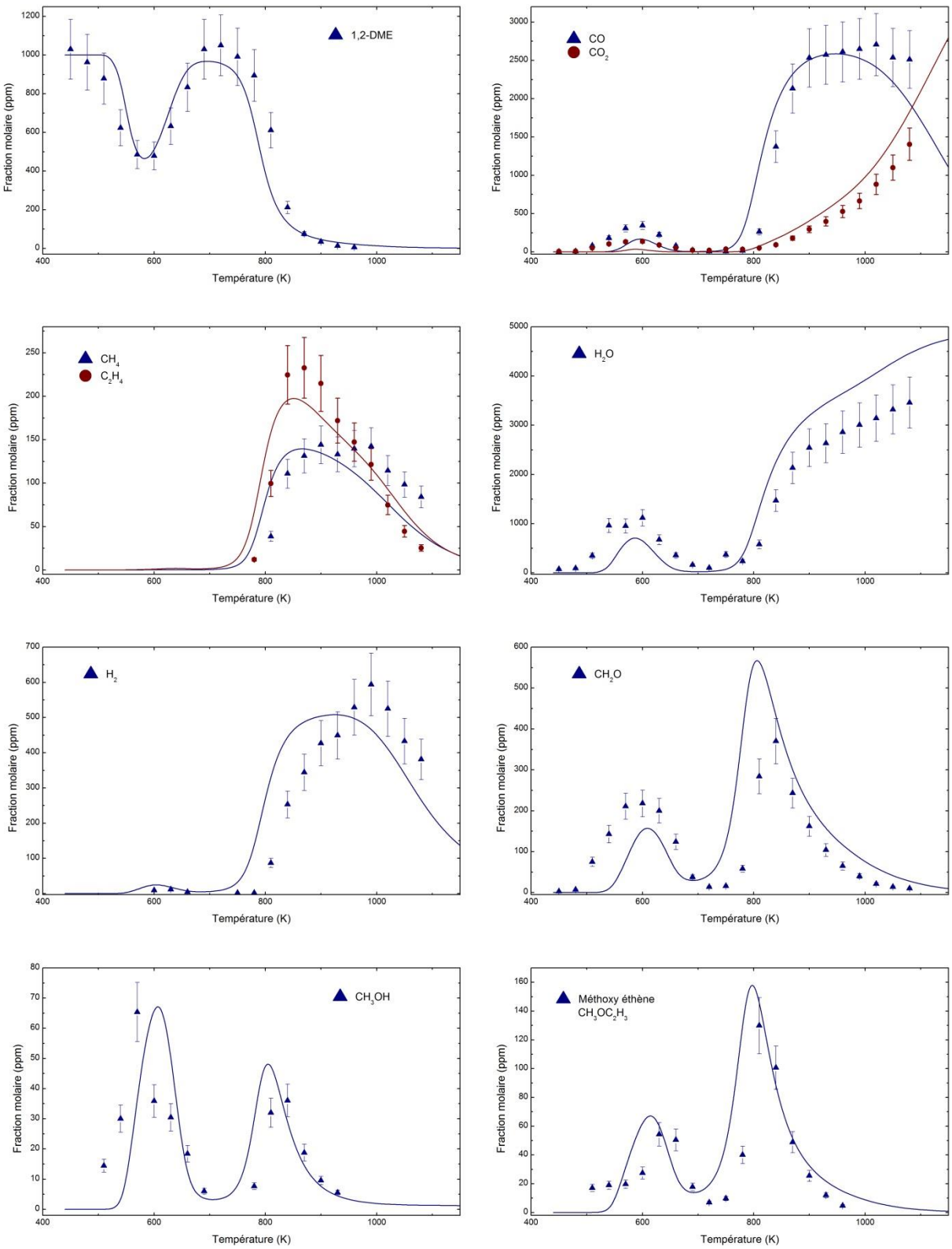
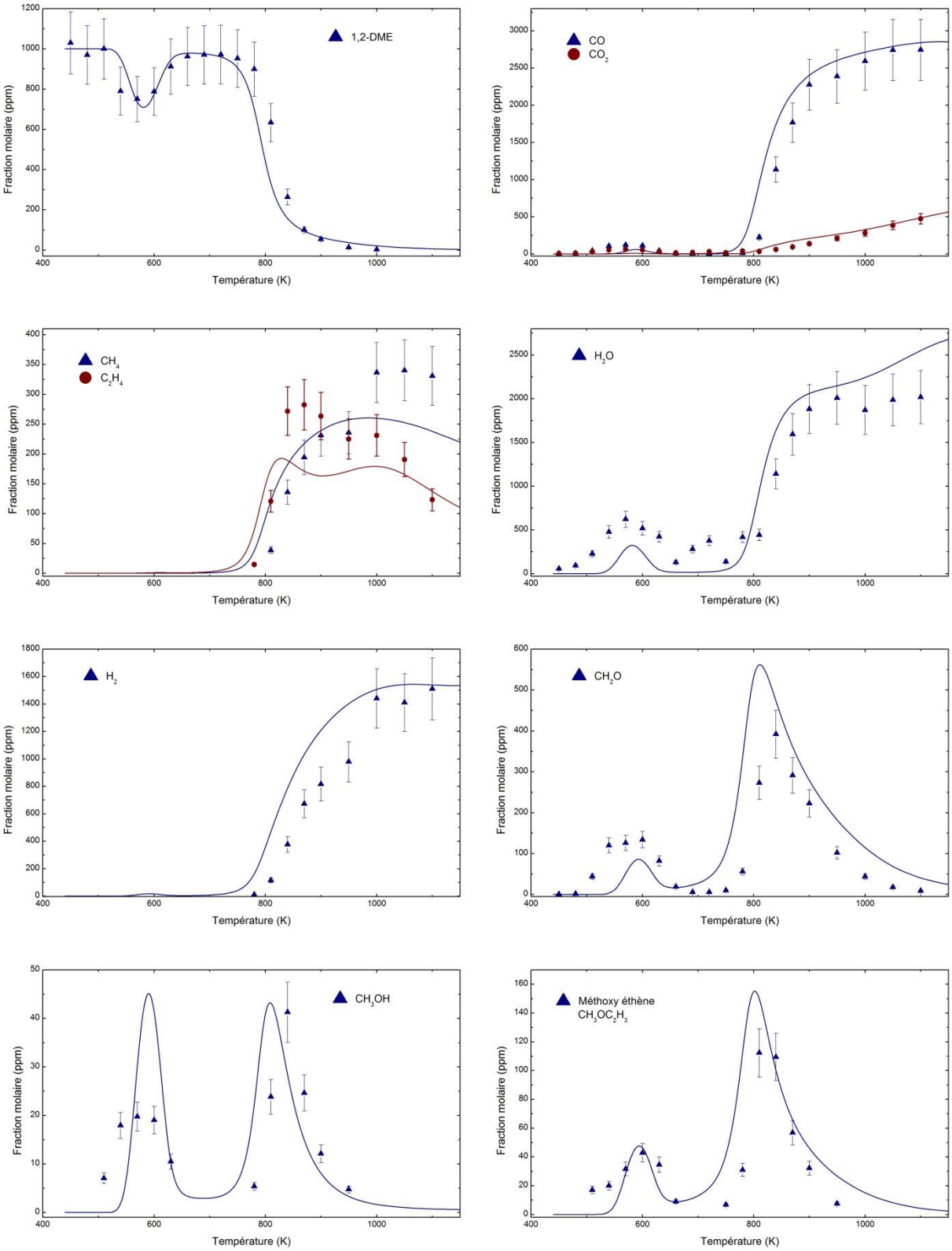


Figure VI. 23 : Résultats obtenus pour l'oxydation du diméthoxy éthane à 10 atm et τ = 0,7s pour 1000ppm de 1,2-DME initial à φ = 1.



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2.4. Comparaison avec le n-hexane

Les réactivités du 1,2-DME et celle du n-hexane ont été comparées afin de mieux comprendre les effets des atomes d'oxygène dans la molécule de carburant (ces deux carburants ne sont pas ramifiés et ont la même longueur de squelette). Les concentrations de carburant mesurées lors de l'oxydation des deux carburants (n-hexane de [238]) dans les mêmes conditions stoechiométriques avec le même JSR sont illustrées à la Figure VI. 25. Il est notable que la consommation du 1,2-DME commence environ 100 K avant celle du n-hexane. Les deux combustibles sont principalement consommés via des métathèses avec OH dans le régime d'oxydation à basse température selon les résultats analysés par ROP. Les constantes de vitesse globales de OH avec le 1,2-DME [224] sont environ deux fois plus élevées que celles avec le n-hexane [238], comme le montre la Figure VI. 26, bien que davantage d'atomes d'hydrogène soient disponibles pour les métathèses dans le n-hexane.

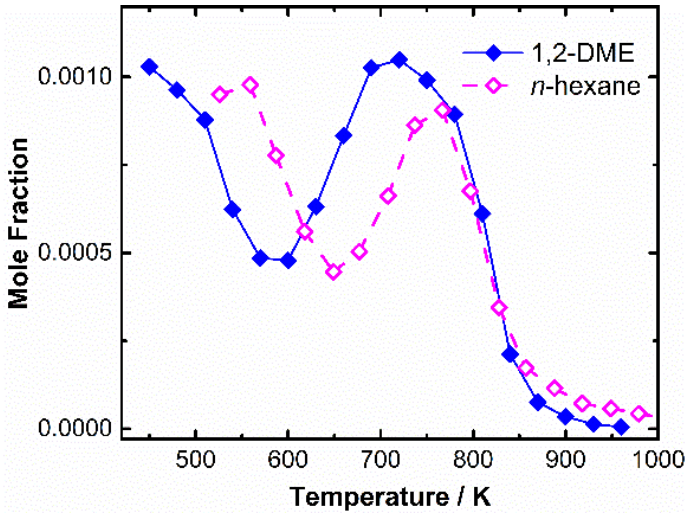


Figure VI. 25 : Fractions molaires mesurées lors de l'oxydation en JSR du 1,2-DME et du *n*-hexane [238] dans les mêmes conditions: ϕ=1.0, p=10 atm, τ=0.7 s.

Les atomes d'oxygène dans le 1,2-DME affaiblissent les liaisons carbone-hydrogène adjacentes (96,1 contre 94,4 kcal/mol [203] pour les liaisons CH primaire et secondaire, respectivement), de sorte que les métathèses commencent à consommer le combustible à des températures inférieures. De plus, dans le schéma d'oxydation du 1,2-DME, un seul radical RO_2, COCC(OOJ)OC, peut conduire à une réaction de terminaison produisant une oléfine et HO_2 (voir la Figure VI. 15). Ces deux raisons peuvent expliquer la réactivité précoce du 1,2-DME. L'augmentation de la température intensifie progressivement les décompositions thermiques des radicaux du combustible et des radicaux QOOH, supprimant ainsi les

ramifications de chaînes et la production de radicaux OH supplémentaires (voir Figure VI. 17). Dans la région de transition (environ 720 K), H_2O_2 est toujours thermiquement stable, ce qui limite la production d'OH et la consommation de carburant.

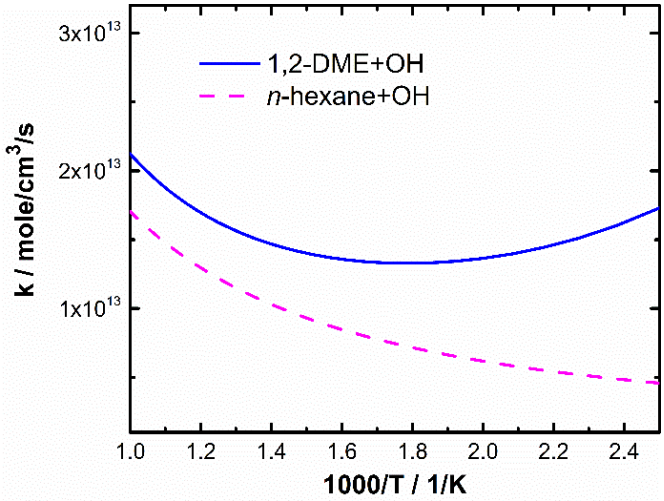


Figure VI. 26 : Constante globale pour les métathèses OH + 1,2-DME et *n*-hexane +OH de 400 à 1000 K.

2.5. Conclusions

L'oxydation du 1,2-DME, a été étudiée dans deux JSR fonctionnant à des pressions différentes (700 torr et 10 atm) et équipés de différents diagnostics de mesure. Des tentatives de modélisation ont été effectuées sur la base des schémas d'oxydation et des règles cinétiques généralement acceptés pour les hydrocarbures. Le modèle prédit de manière satisfaisante nos mesures. Une forte réactivité à basse température a été observée ainsi qu'un phénomène de coefficient négatif de température bien prédit par le modèle proposé dans toutes les conditions étudiées. Le caractère pro-cétane du 1,2-DME est lié à ses caractéristiques structurelles: les atomes d'oxygène incorporés dans la molécule affaiblissent les liaisons C-H adjacentes, facilitant ainsi les métathèses. La seule liaison C-C à un rôle négligeable limité à l'élimination concertée de RO_2 produisant HO_2. De plus, dans la région des basses températures, il se produit des réactions de ramification de chaîne consécutives au second ajout d'O_2, ce qui entraîne une forte réactivité du 1,2-DME.

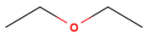
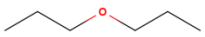
VII. Conclusion et Perspectives

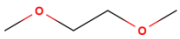
Ce travail de thèse avait pour objectif d'étudier la cinétique d'oxydation d'éthers et de polyéthers, considérés comme de potentiels additifs ou carburants issus de sources renouvelables telles que la biomasse ou des déchets. Des composés représentatifs ont été choisis : l'éther diéthylique, l'éther dipropylique, le diméthoxyméthane et le 1,2-diméthoxyéthane.

D'un point de vue global, la fonction éther tend à diminuer les énergies des liaisons C – H voisines. Ceci engendre généralement une réactivité accrue de ces composés oxygénés par rapport aux alcanes correspondants.

Des études expérimentales en réacteur auto-agité par jets gazeux ont été menées pour chaque carburant dans une large gamme de température, pour des mélanges de richesse variable (pauvre, stoechiométrique, riche) et pour des pressions de 1 et 10 atm. Des échantillons de mélanges réactifs ont été prélevés du réacteur au moyen d'une sonde sonique. De nombreux intermédiaires, les réactifs et produits finaux ont été identifiés et quantifiés à l'aide de dispositifs analytiques complémentaires. Les conditions expérimentales étudiées sont résumées dans le Tableau VII. 1 suivant.

Tableau VII. 1 : Conditions expérimentales en réacteur auto-agité par jets gazeux.

Composé	Structure	Pression	Richesse	τ (s)	$X_{carburant}$	T (K)
Ether diéthylique		1 atm	0,5 / 1 / 2	0,07	1000 ppm	890 – 1220
		10 atm	0,5 / 1 / 2	0,7	1000 ppm	730 – 1240
Ether dipropylique		10 atm	0,5 / 1 / 2 /4	0,7	1000 ppm	740 – 1280
Diméthoxy méthane		10 atm	0,2 / 0,5 / 1,5	0,7	1000 ppm	740 - 1220

1,2-diméthoxy éthane		700 Torr	1	1	1%	470 - 1280
		10 atm	0,5 / 1 / 2	0,7	1000 ppm	450 - 1160

Les données expérimentales obtenues ont été utilisées pour développer et valider des mécanismes cinétiques détaillés. L'accord entre les simulations et les résultats expérimentaux est généralement bon. L'analyse des voies réactionnelles a permis d'identifier les voies de consommation majoritaires des différents carburants dans les conditions étudiées.

Les éthers symétriques diétylique et dipropylique ont montré expérimentalement une forte réactivité à basse température dans nos conditions d'études. Une production d'acides carboxyliques en forte quantité a été constatée et expliquée par la décomposition des cétohydroperoxydes. Un comportement de double zone de coefficient négatif de température similaire au DBE, bien que moins marqué, a été mis en évidence dans le cas de l'oxydation du DPE.

L'étude de la cinétique du diméthoxy méthane a montré une compétitivité entre les réactions de métathèse sur les deux sites de ce carburant d'une part, et entre les réactions d'addition d'O_2 et de β-scission sur les radicaux du DMM d'autre part. Ces dernières provoquent une faible réactivité de basse température dans nos conditions d'étude.

Enfin, une très forte réactivité à basse température suivie d'une zone de coefficient négatif de température a été observée lors de l'oxydation du diméthoxy éthane. La présence de deux atomes d'oxygène dans la molécule affaiblit les liaisons C – H adjacentes rendant les réactions de métathèses très favorables du point de vue cinétique. Cette forte réactivité justifie son utilisation en tant qu'additif d'amélioration d'indice de cétane dans le commerce.

Les informations présentées dans ce mémoire de thèse seront utiles pour mieux comprendre l'oxydation des biocarburants de type éther.

Toutefois, des mesures expérimentales supplémentaires obtenues avec des systèmes expérimentaux complémentaires sont souhaitables pour améliorer les modèles cinétiques proposés ici.

Aussi, il serait utile de poursuivre les études récemment initiées visant à identifier et mesurer les différents isomères de produits intermédiaires tels que les cétohydropéroxides, les hydropéroxides, et des composés plus fortement oxygénés provenant d'addition d'oxygène moléculaire au-delà de la seconde addition menant aux cétohydropéroxides [165, 166].

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Annexes

Annexe 1 : Influence de la richesse sur les profils des espèces intermédiaires de l'oxydation du 1,2-DME à 10atm

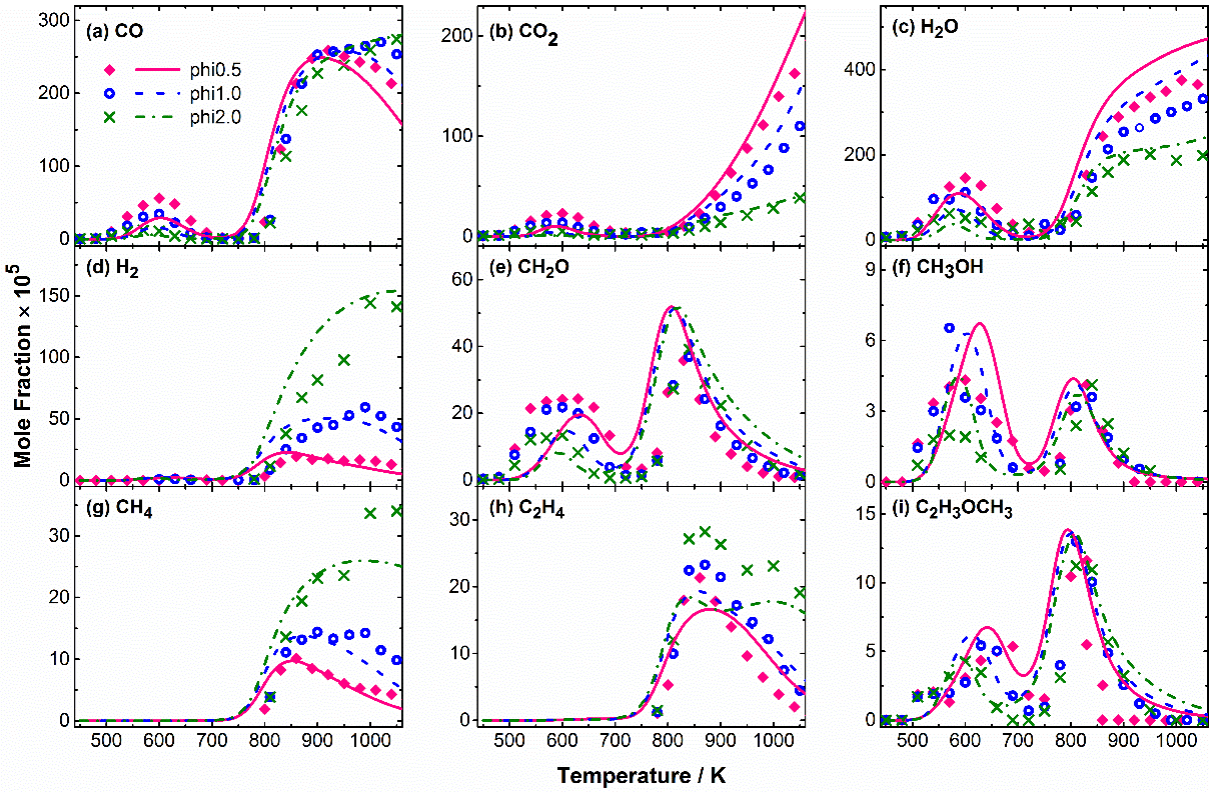

Figure : Données expérimentales (symboles) et simulés (lignes) des espèces produites lors de l'oxydation du 1,2-DME en JSR à φ = 0.5, 1.0 et 2.0, P = 10 atm, τ = 0.7 s.

Annexe 2 : Mécanisme d'oxydation du DEE

	REACTIONS	A	b	E
		(k = A T**b exp(-E/RT))		
1.	ch3+oh=ch2oh+h	1.99E+19	-1.7	11157.0
2.	ch3+oh=ch3o+h	9.95E+14	-0.8	16872.0
3.	ch3+oh=ch2(s)+h2o	6.37E+18	-1.7	11141.0
4.	ch3+oh=ch2o+h2	7.39E+14	-1.1	14551.0
5.	c2h3+o2=ch2cho+o	3.81E+17	-1.4	5580.0
6.	c2h3+o2=ch2o+hco	3.71E+25	-4.0	7043.0
7.	c2h3+o2=chocho+h	7.78E+20	-2.9	5541.0
8.	c2h3+o2=c2h2+ho2	3.25E+19	-2.3	7932.0
9.	ch2cho+o2<=>ch2co+ho2	7.05E+07	1.6	25290.0
10.	ch2cho+o2=>ch2o+co+oh	8.95E+13	-0.6	10120.0
11.	c3h4-p+h=c2h2+ch3	1.72E+14	0.0	7134.0
12.	c3h4-a+h=c2h2+ch3	1.68E+16	-0.6	14754.0
	Declared duplicate reaction...			
13.	c3h4-a+h=c2h2+ch3	3.31E+08	1.1	8886.0
	Declared duplicate reaction...			
14.	c2h2+ch3=c3h5-s	6.02E+43	-9.7	20561.0
	Declared duplicate reaction...			
15.	c2h2+ch3=c3h5-s	3.03E+32	-7.0	12357.0
	Declared duplicate reaction...			
16.	c3h4-a=c3h4-p	4.79E+48	-10.0	88685.0
17.	c3h4-a+h=c3h5-t	7.95E+51	-11.8	18286.0
	Declared duplicate reaction...			
18.	c3h4-a+h=c3h5-t	2.59E+35	-7.6	7147.0
	Declared duplicate reaction...			
19.	c3h4-a+h=c3h5-a	3.75E+48	-10.3	22511.0
	Declared duplicate reaction...			
20.	c3h4-a+h=c3h5-a	2.29E+26	-4.3	6163.0
	Declared duplicate reaction...			
21.	c3h4-a+h=c3h4-p+h	2.35E+25	-3.2	13165.0
	Declared duplicate reaction...			
22.	c3h4-a+h=c3h4-p+h	1.74E+07	2.0	4521.0
	Declared duplicate reaction...			
23.	c3h4-p+h=c3h5-t	9.51E+51	-11.7	18331.0
	Declared duplicate reaction...			
24.	c3h4-p+h=c3h5-t	6.81E+34	-7.3	6722.0
	Declared duplicate reaction...			
25.	c3h4-p+h=c3h5-s	3.88E+50	-11.9	16915.0
	Declared duplicate reaction...			
26.	c3h4-p+h=c3h5-s	4.33E+40	-9.6	9401.0
	Declared duplicate reaction...			
27.	c3h5-a+c3h5-a=c3h4-a+c3h6	4.07E+28	-5.5	7410.0
28.	c3h5-a+o2=c3h5-aoo	2.43E+39	-9.0	8620.0
29.	c3h5-a+o2=c2h3cho+oh	3.36E+05	1.8	19190.0
30.	c3h5-a+o2=c3h4-a+ho2	2.06E+04	2.2	17590.0
31.	c3h5-a+o2=ch2cho+ch2o	3.08E+09	0.4	16910.0
32.	c3h5-a+o2=>c2h2+ch2o+oh	9.71E+20	-2.7	24980.0
33.	c3h6+h=c2h4+ch3	3.30E+24	-3.0	15610.0
34.	c3h6+oh=c3h61oh	5.03E+53	-12.2	22976.0
	Declared duplicate reaction...			
35.	c3h6+oh=c3h61oh	4.28E+41	-9.3	8921.0
	Declared duplicate reaction...			
36.	c3h6+oh=c3h62oh	5.03E+53	-12.2	22976.0
	Declared duplicate reaction...			
37.	c3h6+oh=c3h62oh	4.28E+41	-9.3	8921.0
	Declared duplicate reaction...			
38.	c3h6+oh=c3h5oh+h	1.25E+23	-2.7	20993.0
	Declared duplicate reaction...			
39.	c3h6+oh=c3h5oh+h	3.66E+05	2.1	10410.0
	Declared duplicate reaction...			
40.	c3h6+oh=c2h3oh+ch3	2.27E-02	4.0	1952.0
	Declared duplicate reaction...			
41.	c3h6+oh=c2h3oh+ch3	2.42E+19	-1.7	13107.0
	Declared duplicate reaction...			
42.	c3h6+oh=c2h5cho+h	4.51E+19	-1.9	15763.0
	Declared duplicate reaction...			
43.	c3h6+oh=c2h5cho+h	3.40E-02	3.9	4390.0
	Declared duplicate reaction...			
44.	c3h6+oh=ch3coch3+h	1.47E-05	4.8	2168.0
	Declared duplicate reaction...			
45.	c3h6+oh=ch3coch3+h	2.64E+15	-0.8	12728.0
	Declared duplicate reaction...			
46.	c3h6+oh=ch3cho+ch3	5.13E+18	-2.1	12359.0
	Declared duplicate reaction...			
47.	c3h6+oh=ch3cho+ch3	7.59E-06	4.5	-680.0
	Declared duplicate reaction...			
48.	c2h3+c2h2=c4h4+h	4.90E+16	-1.1	11800.0
49.	nc4h5=c2h3+c2h2	1.00E+14	0.0	43920.0
50.	c2h3+c2h2=ic4h5	5.10E+53	-12.6	28800.0
51.	c2h3+c2h3=ic4h5+h	1.20E+22	-2.4	13654.0
52.	c2h3+c2h3=nc4h5+h	2.40E+20	-2.0	15361.0
53.	c4h6=ic4h5+h	5.70E+36	-6.3	112353.0
54.	c4h6=nc4h5+h	5.30E+44	-8.6	123608.0
55.	c4h4+h=nc4h5	6.20E+45	-10.1	15800.0
56.	c4h4+h=ic4h5	1.50E+48	-10.6	18800.0
57.	nc4h3+h=c2h2+h2cc	6.30E+25	-3.3	10014.0
58.	ic4h3+h=c2h2+h2cc	2.80E+23	-2.5	10780.0
59.	ic4h3+h=c4h4	3.40E+43	-9.0	12120.0

```
60. nc4h3+h=c4h4                                2.00E+47  -10.3    13070.0
61. nc4h3=ic4h3                                 4.10E+43   -9.5    53000.0
62. nc4h3+h=ic4h3+h                             2.50E+20   -1.7    10800.0
63. c2h4+c2h3<=>c4h714                          2.99E+36   -7.4    15480.0
64. c4h714<=>c4h6+h                             1.85E+48  -10.5    51770.0
65. h+o2<=>o+oh                                 1.04E+14    0.0    15286.0
66. o+h2<=>h+oh                                 5.08E+04    2.7     6292.0
67. oh+h2<=>h+h2o                               4.38E+13    0.0     6990.0
68. o+h2o<=>oh+oh                               2.97E+06    2.0    13400.0
69. h2+M<=>h+h+M                                4.58E+19   -1.4   104400.0
      h2              Enhanced by    2.500E+00
      h2o             Enhanced by    1.200E+01
      co              Enhanced by    1.900E+00
      co2             Enhanced by    3.800E+00
      he              Enhanced by    8.300E-01
70. o+o+M<=>o2+M                                6.16E+15   -0.5        0.0
      h2              Enhanced by    2.500E+00
      h2o             Enhanced by    1.200E+01
      ar              Enhanced by    8.300E-01
      co              Enhanced by    1.900E+00
      co2             Enhanced by    3.800E+00
      he              Enhanced by    8.300E-01
71. o+h+M<=>oh+M                                4.71E+18   -1.0        0.0
      h2              Enhanced by    2.500E+00
      h2o             Enhanced by    1.200E+01
      ar              Enhanced by    7.500E-01
      co              Enhanced by    1.500E+00
      co2             Enhanced by    2.000E+00
      he              Enhanced by    7.500E-01
72. h+oh+M<=>h2o+M                              3.50E+22   -2.0        0.0
      h2              Enhanced by    7.300E-01
      h2o             Enhanced by    3.650E+00
      ar              Enhanced by    3.800E-01
73. h+o2(+M)<=>ho2(+M)                          4.65E+12    0.4        0.0
    Low pressure limit:  0.17370E+20 -0.12300E+01  0.00000E+00
    TROE centering:      0.67000E+00  0.10000E-29  0.10000E+31  0.10000E+31
      h2              Enhanced by    1.300E+00
      co              Enhanced by    1.900E+00
      co2             Enhanced by    3.800E+00
      h2o             Enhanced by    1.000E+01
      ar              Enhanced by    0.000E+00
      he              Enhanced by    0.000E+00
74. h+o2(+ar)<=>ho2(+ar)                        4.65E+12    0.4        0.0
    Low pressure limit:  0.68100E+19 -0.12000E+01  0.00000E+00
    TROE centering:      0.70000E+00  0.10000E-29  0.10000E+31  0.10000E+31
75. h+o2(+he)<=>ho2(+he)                        4.65E+12    0.4        0.0
    Low pressure limit:  0.91920E+19 -0.12000E+01  0.00000E+00
    TROE centering:      0.59000E+00  0.10000E-29  0.10000E+31  0.10000E+31
76. ho2+h<=>oh+oh                               7.08E+13    0.0      295.0
77. h2+o2<=>h+ho2                               5.18E+05    2.4    53502.0
78. ho2+o<=>oh+o2                               3.25E+13    0.0        0.0
79. ho2+oh<=>h2o+o2                             1.93E+20   -2.5      584.0
    Declared duplicate reaction...
80. ho2+oh<=>h2o+o2                             1.21E+09    1.2    -1307.0
    Declared duplicate reaction...
81. ho2+ho2<=>h2o2+o2                           1.30E+11    0.0    -1630.0
    Declared duplicate reaction...
82. ho2+ho2<=>h2o2+o2                           3.66E+14    0.0    12000.0
    Declared duplicate reaction...
83. h2o2(+h2o)<=>oh+oh(+h2o)                    2.00E+12    0.9    48749.0
    Low pressure limit:  0.18660E+26 -0.23000E+01  0.48749E+05
    TROE centering:      0.51000E+00  0.10000E-29  0.10000E+31
84. h2o2(+he)<=>oh+oh(+he)                      2.00E+12    0.9    48749.0
    Low pressure limit:  0.16090E+25 -0.23000E+01  0.48749E+05
    TROE centering:      0.37000E+00  0.10000E-29  0.10000E+31
85. h2o2(+M)<=>oh+oh(+M)                        2.00E+12    0.9    48749.0
    Low pressure limit:  0.36580E+25 -0.23000E+01  0.48749E+05
    TROE centering:      0.43000E+00  0.10000E-29  0.10000E+31
      h2o             Enhanced by    0.000E+00
      co2             Enhanced by    1.060E+00
      n2              Enhanced by    1.000E+00
      o2              Enhanced by    7.900E-01
      h2o2            Enhanced by    7.700E+00
      he              Enhanced by    0.000E+00
      ar              Enhanced by    6.800E-01
      h2              Enhanced by    3.700E+00
      co              Enhanced by    2.800E+00
86. h2o2+h<=>h2o+oh                             2.41E+13    0.0     3970.0
87. h2o2+h<=>h2+ho2                             2.15E+10    1.0     6000.0
88. h2o2+o<=>oh+ho2                             9.55E+06    2.0     3970.0
89. h2o2+oh<=>h2o+ho2                           1.74E+12    0.0      318.0
    Declared duplicate reaction...
90. h2o2+oh<=>h2o+ho2                           7.59E+13    0.0     7269.0
    Declared duplicate reaction...
91. co+ho2=co2+oh                               1.15E+05    2.3    17550.0
92. co+o+m=co2+m                                2.83E+13    0.0    -4540.0
      h2o             Enhanced by    1.625E+01
      h2              Enhanced by    2.500E+00
      co              Enhanced by    1.875E+00
      co2             Enhanced by    3.750E+00
      ch4             Enhanced by    1.625E+01
      c2h6            Enhanced by    1.625E+01
      ar              Enhanced by    7.500E-01
93. co+o2=co2+o                                 2.53E+12    0.0    47700.0
```

```
 94. co+oh=co2+h                                  7.05E+04    2.1     -276.2
     Declared duplicate reaction...
 95. co+oh=co2+h                                  5.76E+12   -0.7      331.8
     Declared duplicate reaction...
 96. hco+m=h+co+m                                 1.85E+17   -1.0    17090.0
        h2o              Enhanced by    1.625E+01
        h2               Enhanced by    1.900E+00
        co               Enhanced by    1.875E+00
        co2              Enhanced by    3.750E+00
        ch4              Enhanced by    1.625E+01
        c2h6             Enhanced by    1.625E+01
        ar               Enhanced by    1.000E+00
        he               Enhanced by    1.250E+00
 97. hco+oh=co+h2o                                1.00E+14    0.0        0.0
 98. hco+o=co+oh                                  3.00E+13    0.0        0.0
 99. hco+o=co2+h                                  3.00E+13    0.0        0.0
100. hco+h=co+h2                                  7.22E+13    0.0        0.0
101. hco+o2=co+ho2                                7.58E+12    0.0      410.0
102. hco+ho2=co2+oh+h                             3.00E+13    0.0        0.0
103. hco+hco=ch2o+co                              1.81E+13    0.0        0.0
104. hco+hco=h2+co+co                             3.00E+12    0.0        0.0
105. ch2o+M=hco+h+M                               3.30E+39   -6.3   100000.0
        co               Enhanced by    1.500E+00
        ch2o             Enhanced by    3.000E+00
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    1.200E+01
106. ch2o+M=co+h2+M                               3.10E+45   -8.0    97600.0
        co               Enhanced by    1.500E+00
        ch2o             Enhanced by    3.000E+00
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    1.200E+01
107. ch2o+oh=hco+h2o                              7.82E+07    1.6    -1055.0
108. ch2o+ho2=hco+h2o2                            4.11E+04    2.5    10205.0
109. ch2o+o=hco+oh                                1.81E+13    0.0     3088.0
110. ch2o+h=hco+h2                                5.86E+03    3.1     1514.1
111. ch2o+o2=hco+ho2                              8.07E+15    0.0    53420.0
112. hoch2o=hcooh+h                               1.00E+13    0.0    15900.0
113. hoch2o=ch2o+oh                               8.54E+13   -0.1    17530.0
114. hcooh=hco+oh                                 4.59E+18   -0.5   108300.0
115. hcooh=hoco+h                                 1.00E+17    0.0    97000.0
116. hcooh=co+h2o                                 1.51E+31   -5.1    76324.0
117. hcooh=co2+h2                                 1.88E+28   -4.3    79410.0
118. hcooh+o2=ho2+hoco                            2.00E+13    0.0    49700.0
119. hcooh+o2=ho2+hco2                            2.00E+13    0.0    56000.0
120. hcooh+ho2=hco2+h2o2                          3.90E+01    3.1    25206.0
121. hcooh+ho2=h2o2+hoco                          4.70E-01    4.0    16787.0
122. hcooh+oh=h2o+hoco                            2.20E+00    4.0    -1617.0
123. hcooh+oh=h2o+hco2                            2.59E-05    4.9    -2046.0
124. hcooh+h=h2+hco2                              4.24E+05    2.3    14091.0
125. hcooh+h=h2+hoco                              2.30E+02    3.3     4858.0
126. hcooh+ch3=ch4+hoco                           5.81E+01    3.4    11379.0
127. hcooh+ch3=ch4+hco2                           2.11E+01    3.2    12084.0
128. hoco(+M)<=>oh+co(+M)                         1.19E+14    0.1    36463.0
     Low pressure limit:  0.13710E+26 -0.23960E+01  0.37483E+05
     TROE centering:      0.50000E+00  0.11204E+04  0.11204E+04  0.17203E+04
        ar               Enhanced by    7.000E-01
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    2.000E+00
        co2              Enhanced by    3.000E+00
        c2h6             Enhanced by    3.000E+00
        ch3oh            Enhanced by    3.000E+00
129. hoco(+M)<=>h+co2(+M)                         8.22E+11    0.4    35338.0
     Low pressure limit:  0.59570E+27 -0.31480E+01  0.37020E+05
     TROE centering:      0.44500E+00  0.81980E+03  0.82280E+03  0.52904E+04
        ar               Enhanced by    7.000E-01
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    2.000E+00
        co2              Enhanced by    3.000E+00
        c2h6             Enhanced by    3.000E+00
        ch3oh            Enhanced by    3.000E+00
130. hoco+o2=co2+ho2                              1.10E+10    0.9      127.8
131. hco2+m=>h+co2+m                              2.44E+15   -0.5    27500.0
132. ch3oh(+m)=ch2oh+h(+m)                        7.90E-03    5.0    84467.4
     Low pressure limit:  0.33900E+43 -0.72440E+01  0.10523E+06
     TROE centering:     -0.73910E+02  0.37050E+05  0.41500E+05  0.52200E+04
133. ch3oh(+m)=ch3+oh(+m)                         2.08E+18   -0.6    92540.6
     Low pressure limit:  0.15000E+44 -0.69950E+01  0.97992E+05
     TROE centering:     -0.47480E+00  0.35580E+05  0.11160E+04  0.90230E+04
134. ch3oh(+m)=ch2(s)+h2o(+m)                     3.12E+18   -1.0    91712.0
     Low pressure limit:  0.14300E+48 -0.82270E+01  0.99417E+05
     TROE centering:      0.25450E+01  0.32900E+04  0.47320E+05  0.47110E+05
135. ch3oh+o2=ch2oh+ho2                           2.05E+13    0.0    44910.0
136. ch3oh+o2=ch3o+ho2                            2.50E+12    0.0    55000.0
137. ch3oh+ho2=ch2oh+h2o2                         1.13E+13    0.0    19360.0
138. ch3oh+oh=ch2oh+h2o                           7.10E+06    1.8     -596.0
139. ch3oh+oh=ch3o+h2o                            1.00E+06    2.1      496.7
140. ch3oh+o=ch2oh+oh                             1.63E+13    0.0     5030.0
141. ch3oh+h=ch2oh+h2                             1.44E+13    0.0     6095.0
142. ch3oh+h=ch3o+h2                              3.60E+12    0.0     6095.0
143. ch3oh+h=ch3+h2o                              1.70E+13    0.0     5311.0
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144. ch3oh+ch2o=ch3o+ch3o                          1.55E+12    0.0    79570.0
145. ch3oh+ch3=ch2oh+ch4                           3.57E+11    0.0     8663.0
146. ch3oh+ch3=ch3o+ch4                            4.68E+05    2.3    12764.0
147. ch2oh+m=ch2o+h+m                              1.00E+14    0.0    25100.0
        h2o              Enhanced by    1.000E+00
        co               Enhanced by    1.875E+00
        co2              Enhanced by    3.750E+00
        h2               Enhanced by    2.500E+00
        ch4              Enhanced by    1.625E+01
        c2h6             Enhanced by    1.625E+01
        ar               Enhanced by    7.500E-01
148. ch2oh+h=ch2o+h2                               3.00E+13    0.0        0.0
149. ch2oh+o2=ch2o+ho2                             2.41E+14    0.0     5017.0
     Declared duplicate reaction...
150. ch2oh+o2=ch2o+ho2                             1.51E+15   -1.0        0.0
     Declared duplicate reaction...
151. ch2oh+o=ch2o+oh                               4.22E+13    0.0        0.0
152. ch2oh+oh=ch2o+h2o                             2.41E+13    0.0        0.0
153. ch2oh+ho2=ch2o+h2o2                           1.20E+13    0.0        0.0
154. ch2oh+hco=ch3oh+co                            1.50E+13    0.0        0.0
155. ch2oh+ch2o=ch3oh+hco                          1.29E-01    4.6     6596.0
        Reverse Arrhenius coefficients:            9.63E+03    2.9    13110.0
156. ch2oh+ch3o=ch3oh+ch2o                         4.00E+12    0.0        0.0
157. ch2oh+ch2oh=ch2o+ch3oh                        4.00E+12    0.0        0.0
158. ch3o+m=ch2o+h+m                               4.88E+15    0.0    22773.0
159. ch3o+ho2=ch2o+h2o2                            3.00E+11    0.0        0.0
160. ch3o+oh=ch2o+h2o                              1.00E+13    0.0        0.0
161. ch3o+o=ch2o+oh                                1.30E+13    0.0        0.0
162. ch3o+h=ch2o+h2                                2.00E+13    0.0        0.0
163. ch3o+o2=ch2o+ho2                              2.35E+10    0.0     1788.0
164. ch3o+ch2o=ch3oh+hco                           3.42E+05    2.0       31.2
165. ch3o+h2o2=ch3oh+ho2                           3.42E+04    2.0    -2593.8
166. ch3o+co=ch3+co2                               1.57E+13    0.0    11804.0
167. ch3o+hco=ch3oh+co                             9.00E+13    0.0        0.0
168. ch3o+c2h5=ch2o+c2h6                           2.41E+13    0.0        0.0
169. ch3o+c2h4=ch2o+c2h5                           1.20E+11    0.0     7000.0
170. ch3oh+ch3o=ch3oh+ch2oh                        3.01E+11    0.0     4070.0
171. ch3+ho2=ch4+o2                                1.19E+05    2.2    -3022.0
172. ch4(+m)=ch3+h(+m)                             2.40E+16    0.0   104913.0
     Low pressure limit:  0.45000E+18  0.00000E+00  0.90800E+05
     TROE centering:      0.64000E+00  0.10000E-14  0.31950E+04  0.12126E+05
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
173. ch4+h=ch3+h2                                  4.08E+03    3.2     8760.0
174. ch4+o=ch3+oh                                  1.62E+06    2.3     7094.0
175. ch4+oh=ch3+h2o                                1.00E+06    2.2     2450.0
176. ch4+ch2=ch3+ch3                               4.30E+12    0.0    10038.0
177. ch4+ch2(s)=ch3+ch3                            4.00E+12    0.0        0.0
178. ch4+ho2=ch3+h2o2                              9.04E+12    0.0    24640.0
179. h+ch2(+M)<=>ch3(+M)                           6.00E+14    0.0        0.0
     Low pressure limit:  0.10400E+27 -0.27600E+01  0.16000E+04
     TROE centering:      0.56200E+00  0.91000E+02  0.58360E+04  0.85520E+04
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        ar               Enhanced by    7.000E-01
180. ch+h2(+M)<=>ch3(+M)                           1.97E+12    0.4     -370.0
     Low pressure limit:  0.48200E+26 -0.28000E+01  0.59000E+03
     TROE centering:      0.57800E+00  0.12200E+03  0.25350E+04  0.93650E+04
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        ar               Enhanced by    7.000E-01
181. ch3+ho2=ch3o+oh                               1.00E+12    0.3     -687.5
182. ch3+o=ch2o+h                                  4.54E+13    0.1     -136.0
183. ch3+o=hco+h2                                  1.00E+13    0.1     -136.0
184. ch3+o2=ch2o+oh                                6.38E+11    0.0    13514.0
185. ch3+o2=ch3o+o                                 7.55E+12    0.0    28297.0
186. ch3+ch3=c2h5+h                                6.84E+12    0.1    10600.0
187. ch3+ch3(+m)=c2h6(+m)                          8.88E+16   -1.2      774.5
     Low pressure limit:  0.53120E+51 -0.99300E+01  0.73890E+04
     TROE centering:      0.75480E+00  0.15800E+03  0.32828E+05  0.46564E+05
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    3.000E+00
        c2h6             Enhanced by    3.000E+00
        ar               Enhanced by    7.000E-01
188. ch3+ch3o=ch4+ch2o                             2.41E+13    0.0        0.0
189. ch3+ch2oh=ch4+ch2o                            2.41E+12    0.0        0.0
190. ch3+o2(+m)=ch3o2(+m)                          7.83E+08    1.2        0.0
     Low pressure limit:  0.58000E+26 -0.33000E+01  0.00000E+00
     TROE centering:      0.66400E+00  0.10000E+06  0.10000E+02
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191. ch3+h=ch2+h2                                6.03E+13    0.0    15100.0
192. ch3+hco=co+ch4                              8.48E+12    0.0        0.0
193. ch3+ch2o=hco+ch4                            3.19E+01    3.4     4312.0
194. ch2+oh=ch+h2o                               1.13E+07    2.0     3000.0
195. ch2+oh=ch2o+h                               2.50E+13    0.0        0.0
196. ch2+o=co+h+h                                5.00E+13    0.0        0.0
197. ch2+o=co+h2                                 4.00E+13    0.0        0.0
198. ch2+h=ch+h2                                 1.00E+18   -1.6        0.0
199. ch2+o2=co2+h2                               2.63E+21   -3.3     2860.0
200. ch2+o2=co2+h+h                              3.29E+21   -3.3     2860.0
201. ch2+o2=co+h2o                               2.24E+22   -3.3     2860.0
202. ch2+o2=ch2o+o                               3.29E+21   -3.3     2860.0
203. ch2+co2=ch2o+co                             1.10E+11    0.0     1000.0
204. ch2+ch2=c2h2+h2                             3.20E+13    0.0        0.0
205. ch2+ch2=c2h2+h+h                            4.00E+13    0.0        0.0
206. ch2+ch3=c2h4+h                              4.00E+13    0.0        0.0
207. ch2+ch=c2h2+h                               4.00E+13    0.0        0.0
208. ch2+c2h2=h+c3h3                             1.20E+13    0.0     6620.0
209. ch2+c2h4=c3h6                               4.30E+12    0.0    10038.0
210. ch2+c2h6=ch3+c2h5                           6.50E+12    0.0     7911.0
211. ch2(s)+m=ch2+m                              1.00E+13    0.0        0.0
        h               Enhanced by    0.000E+00
        h2o             Enhanced by    0.000E+00
        co              Enhanced by    1.875E+00
        co2             Enhanced by    3.750E+00
        ch4             Enhanced by    1.625E+01
        c2h6            Enhanced by    1.625E+01
        h2              Enhanced by    2.500E+00
        ar              Enhanced by    7.500E-01
212. ch2(s)+h=ch2+h                              2.00E+14    0.0        0.0
213. ch2(s)+h2o=ch2+h2o                          3.00E+13    0.0        0.0
214. ch2(s)+o2=co+oh+h                           3.00E+13    0.0        0.0
215. ch2(s)+h2=ch3+h                             7.00E+13    0.0        0.0
216. ch2(s)+h=ch+h2                              3.00E+13    0.0        0.0
217. ch2(s)+o=co+h+h                             1.50E+13    0.0        0.0
218. ch2(s)+o=co+h2                              1.50E+13    0.0        0.0
219. ch2(s)+oh=ch2o+h                            3.00E+13    0.0        0.0
220. ch2(s)+ho2=ch2o+oh                          3.00E+13    0.0        0.0
221. ch2(s)+h2o2=ch3o+oh                         3.00E+13    0.0        0.0
222. ch2(s)+ch2o=ch3+hco                         1.20E+12    0.0        0.0
223. ch2(s)+hco=ch3+co                           1.80E+13    0.0        0.0
224. ch2(s)+ch3=c2h4+h                           1.80E+13    0.0        0.0
225. ch2(s)+c2h6=ch3+c2h5                        1.20E+14    0.0        0.0
226. ch2(s)+c2h4=c3h5-a+h                        1.30E+14    0.0        0.0
227. ch2(s)+c2h2=c3h3+h                          1.80E+14    0.0        0.0
228. ch2(s)+co2=ch2o+co                          3.00E+12    0.0        0.0
229. ch2(s)+ch2co=c2h4+co                        1.60E+14    0.0        0.0
230. ch+oh=hco+h                                 3.00E+13    0.0        0.0
231. ch+o=co+h                                   5.70E+13    0.0        0.0
232. ch+h=c+h2                                   1.10E+14    0.0        0.0
233. ch+o2=hco+o                                 1.00E+13    0.0        0.0
234. ch+o2=co+oh                                 1.00E+13    0.0        0.0
235. ch+co2=hco+co                               3.40E+12    0.0      690.0
236. ch+h2o=ch2o+h                               1.71E+13    0.0     -755.0
237. ch+ch4=c2h4+h                               6.00E+13    0.0        0.0
238. ch+ch3=c2h3+h                               3.00E+13    0.0        0.0
239. ch+ch2o=ch2co+h                             9.46E+13    0.0     -515.0
240. c+oh=co+h                                   5.00E+13    0.0        0.0
241. c+o2=co+o                                   1.20E+14    0.0     3990.0
242. ch3o2+ho2=ch3o2h+o2                         2.90E+11    0.0     1552.0
243. ch3o2+ch2o=hco+ch3o2h                       1.99E+12    0.0    11660.0
244. ch3o2+ch4=ch3+ch3o2h                        1.81E+11    0.0    18480.0
245. ch3o2+ho2=ch2o+h2o+o2                       1.80E+10    0.0    -1431.0
246. ch3o2+ch3o2=>ch3oh+ch2o+o2                  1.34E+11    0.0        0.0
247. ch3o2+ch3o2=>ch3o+ch3o+o2                   4.46E+11    0.0     1030.0
248. ch3o2+ch3=ch3o+ch3o                         5.06E+12    0.0    -1411.0
249. ch3o2+oh=ch3oh+o2                           6.03E+13    0.0        0.0
250. ch3o2+h=ch3o+oh                             9.60E+13    0.0        0.0
251. ch3o2+h=ch4+o2                              2.11E+10    1.0    16600.0
252. ch3o2+h2o2=ch3o2h+ho2                       2.41E+12    0.0     9936.0
253. ch3o2+o=ch3o+o2                             3.61E+13    0.0        0.0
254. ch3o2+ch3o=ch3o2h+ch2o                      3.01E+11    0.0        0.0
255. ch3o2+ch2oh=ch2o+ch3o2h                     1.21E+13    0.0        0.0
256. ch3o2+h2=ch3o2h+h                           3.01E+13    0.0    26030.0
257. ch3o2h(+m)=ch3o+oh(+m)                      4.05E+19   -1.2    44250.0
     Low pressure limit:  0.38910E+43 -0.75020E+01  0.46756E+05
     TROE centering:      0.83750E+00  0.36562E+05  0.49880E+03  0.99900E+04
258. ch3o2h+oh=ch3o2+h2o                         1.14E+12    0.0     -380.0
259. ch3o2h+o=oh+ch3o2                           2.00E+13    0.0     4750.0
260. ch3o2h+h=ch3o+h2o                           7.30E+10    0.0     1860.0
261. c2h6+ho2=c2h5+h2o2                          2.61E+02    3.4    15900.0
262. c2h6+ch3o2=c2h5+ch3o2h                      1.94E+01    3.6    17100.0
263. c2h6+c2h5o2=c2h5+c2h5o2h                    8.60E+00    3.8    17200.0
264. c2h6+oh=c2h5+h2o                            5.11E+06    2.1      854.0
265. c2h6+o=c2h5+oh                              9.99E+08    1.5     5803.0
266. c2h6+h=c2h5+h2                              1.44E+09    1.5     7410.0
267. c2h6+o2=c2h5+ho2                            6.03E+13    0.0    51870.0
268. c2h6+ch3o=c2h5+ch3oh                        3.02E+11    0.0     7000.0
269. c2h6+ch3=c2h5+ch4                           7.54E+00    3.7     9883.0
270. c2h6+hco=ch2o+c2h5                          4.70E+04    2.7    18235.0
271. c2h6+ch=c2h5+ch2                            1.10E+14    0.0     -260.0
        Reverse Arrhenius coefficients:          3.83E+10    0.6      440.0
272. c2h5+o2=ch3ch2o+o                           1.10E+13   -0.2    27937.0
273. c2h5+ho2=ch3ch2o+oh                         1.90E+12    0.0    -1200.0
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274. c2h5+ho2=c2h4+h2o2                          1.79E+12    0.0        0.0
275. c2h5+oh=c2h4+h2o                            2.41E+13    0.0        0.0
276. c2h5+oh=>ch3+ch2o+h                         2.41E+13    0.0        0.0
277. c2h5+o=ch2o+ch3                             1.61E+13    0.0        0.0
278. c2h5+o=ch3cho+h                             8.02E+13    0.0        0.0
279. c2h5+o=c2h4+oh                              3.17E+12    0.0     -390.0
280. c2h5+h=c2h4+h2                              1.82E+12    0.0        0.0
281. c2h5+ch3=c2h4+ch4                           1.14E+12    0.0        0.0
282. c2h5+c2h5=c2h4+c2h6                         1.40E+12    0.0        0.0
283. h+c2h5(+m)=c2h6(+m)                         5.21E+17   -1.0     1580.0
     Low pressure limit:  0.19900E+42 -0.70800E+01  0.66850E+04
     TROE centering:      0.84220E+00  0.12500E+03  0.22190E+04  0.68820E+04
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        ch4              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
284. c2h5+hco=c2h6+co                            1.21E+14    0.0        0.0
285. c2h5+o2=c2h5o2                              9.42E+36   -8.0     6098.0
286. c2h5+o2=ch3cho+oh                           1.94E+12   -0.5     7765.0
287. c2h5+o2=c2h4+ho2                            2.43E+17   -1.9     4430.0
     Declared duplicate reaction...
288. c2h5+o2=c2h4o2h                             8.84E+37   -9.3    10159.0
289. c2h5+o2=c2h4+ho2                            1.02E+20   -3.0     8639.0
     Declared duplicate reaction...
290. c2h5+o2=c2h4o1,2+oh                         1.93E+20   -3.1     8636.0
291. c2h5o2=ch3cho+oh                            2.13E+41   -9.8    45919.0
292. c2h5o2=c2h4+ho2                             6.46E+30   -6.1    35147.0
     Declared duplicate reaction...
293. c2h5o2=c2h4o2h                              4.55E+51  -13.3    44125.0
294. c2h5o2=c2h4+ho2                             4.47E+42  -10.1    44734.0
     Declared duplicate reaction...
295. c2h5o2=c2h4o1,2+oh                          3.01E+42  -10.0    44609.0
296. c2h4o2h=ch3cho+oh                           3.10E+37  -10.1    28588.0
297. c2h4o2h=c2h4+ho2                            5.65E+41  -10.9    26490.0
     Declared duplicate reaction...
298. c2h4o2h=c2h4+ho2                            6.58E+41   -9.7    23023.0
     Declared duplicate reaction...
299. c2h4o2h=c2h4o1,2+oh                         1.49E+41   -9.5    22589.0
300. c2h4+h(+m)<=>c2h5(+m)                       5.27E+09    1.2     1272.7
     Low pressure limit:  0.20270E+41 -0.66420E+01  0.57690E+04
     TROE centering:      0.97600E+00  0.99900E+10  0.38400E+03  0.32900E+10
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        ar               Enhanced by    7.000E-01
301. c2h4+ho2=c2h4o1,2+oh                        2.23E+12    0.0    17190.0
        Reverse Arrhenius coefficients:          3.52E+17   -1.2    39670.0
302. c2h4(+M)<=>h2+c2h2(+M)                      8.00E+12    0.4    86770.0
     Low pressure limit:  0.26300E+18  0.00000E+00  0.79350E+05
303. c2h4(+M)<=>h+c2h3(+M)                       8.00E+12    0.4    86770.0
     Low pressure limit:  0.26300E+18  0.00000E+00  0.96560E+05
304. c2h4+oh=c2h3+h2o                            1.31E-01    4.2     -860.0
305. c2h4+oh=c2h3oh+h                            1.94E+08    1.4     7829.0
306. c2h4+oh=ch3cho+h                            8.25E+08    1.0    10507.0
307. c2h4+h=c2h3+h2                              1.27E+05    2.8    11650.0
308. c2h4+o=ch3+hco                              5.88E+17   -1.7     2893.1
309. c2h4+o=ch3co+h                              8.66E+12   -0.5     1957.8
310. c2h4+o=ch2cho+h                             9.15E+09    0.9     1724.3
311. c2h4+o=ch2+ch2o                             6.28E+06    2.0     2859.3
312. c2h4+o=ch2co+h2                             1.12E+17   -1.8     3179.2
313. c2h4+o=c2h3+oh                              1.51E+07    1.9     3740.0
314. c2h4+o2=c2h3+ho2                            4.00E+13    0.0    61500.0
315. c2h4+c2h4=c2h5+c2h3                         5.00E+14    0.0    64700.0
316. c2h4+ch3=c2h3+ch4                           4.15E+12    0.0    11128.0
317. c2h4+ch3o=c2h3+ch3oh                        1.20E+11    0.0     6750.0
        Reverse Arrhenius coefficients:          1.00E+10    0.0     9000.0
318. c2h4+ho2=c2h3+h2o2                          4.80E+04    2.5    27622.0
319. c2h4+oh=pc2h4oh                             6.02E+37   -8.1     8043.0
     Declared duplicate reaction...
320. c2h4+oh=pc2h4oh                             7.29E+31   -6.9     2855.0
     Declared duplicate reaction...
321. pc2h4oh=ch3cho+h                            1.00E+13    0.0    30000.0
322. pc2h4oh+o2=ch3cho+ho2                       1.00E+12    0.0     2500.0
323. pc2h4oh+o2=o2c2h4oh                         1.00E+12    0.0    -1100.0
324. o2c2h4oh=ch2o+ch2o+oh                       5.00E+16   -2.3    17552.0
325. c2h3+ho2=>ch3+co+oh                         3.00E+13    0.0        0.0
326. c2h3+oh=c2h2+h2o                            3.00E+13    0.0        0.0
327. c2h3+h=c2h2+h2                              1.21E+13    0.0        0.0
328. c2h3+o=ch3+co                               1.50E+13    0.0        0.0
329. c2h3+o=ch2co+h                              1.50E+13    0.0        0.0
330. c2h3+ch=ch2+c2h2                            5.00E+13    0.0        0.0
331. c2h3+ch3=c2h2+ch4                           3.91E+11    0.0        0.0
332. c2h3+c2h6=c2h4+c2h5                         1.50E+13    0.0    10000.0
333. c2h3+c2h=c2h2+c2h2                          9.64E+11    0.0        0.0
334. c2h3+hco=c2h4+co                            9.03E+13    0.0        0.0
335. c2h3+ch2o=c2h4+hco                          1.42E+10    0.2     3934.2
336. c2h3+c2h3=c2h2+c2h4                         1.08E+13    0.0        0.0
337. c2h3+ch2=c3h4-a+h                           3.00E+13    0.0        0.0
338. c2h3+ch2oh=c2h4+ch2o                        3.01E+13    0.0        0.0
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339. c2h3+ch3o=c2h4+ch2o                          2.41E+13    0.0        0.0
340. c2h2+oh(+m)=c2h2oh(+m)                       2.29E+13    0.0     1808.0
     Low pressure limit:  0.74400E+27 -0.31000E+01  0.18080E+04
     TROE centering:      0.17000E+00  0.18000E+03  0.50000E+05  0.12772E+05
341. c2h2+o2=hcco+oh                              7.00E+07    1.5    30100.0
342. c2h2+o2=c2h+ho2                              1.21E+13    0.0    74520.0
343. c2h2+ho2=ch2co+oh                            6.09E+09    0.0     7948.0
344. c2h2+oh=c2h+h2o                              3.40E+07    2.0    14000.0
345. c2h2+oh=ch3+co                               4.84E-04    4.0    -2000.0
346. c2h2+oh=ch2co+h                              2.19E-04    4.5    -1000.0
347. c2h2+oh=hccoh+h                              5.06E+05    2.3    13500.0
348. c2h2+o=ch2+co                                4.08E+06    2.0     1900.0
349. c2h2+o=hcco+h                                1.63E+07    2.0     1900.0
350. c2h2+o=c2h+oh                                4.60E+19   -1.4    28950.0
351. c2h2+ch3=c2h+ch4                             1.80E+11    0.0    17290.0
352. c2h3(+m)=c2h2+h(+m)                          3.86E+08    1.6    37048.2
     Low pressure limit:  0.25650E+28 -0.34000E+01  0.35799E+05
     TROE centering:      0.19816E+01  0.53837E+04  0.42932E+01 -0.79500E-01
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        ar               Enhanced by    7.000E-01
        c2h2             Enhanced by    3.000E+00
353. c2h2(+M)=h2cc(+m)                            8.00E+14   -0.5    50750.0
     Low pressure limit:  0.24500E+16 -0.64000E+00  0.49700E+05
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        c2h2             Enhanced by    2.500E+00
        c2h4             Enhanced by    2.500E+00
354. h2cc+h=c2h2+h                                1.00E+14    0.0        0.0
355. h2cc+oh=ch2co+h                              2.00E+13    0.0        0.0
356. h2cc+o2=hco+hco                              1.00E+13    0.0        0.0
357. h2cc+o2=ch2+co2                              3.30E+12    0.0        0.0
358. h2cc+c2h2(+M)=c4h4(+M)                       3.50E+05    2.1    -2400.0
     Low pressure limit:  0.14000E+61 -0.12599E+02  0.74170E+04
     TROE centering:      0.98000E+00  0.56000E+02  0.58000E+03  0.41640E+04
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        c2h2             Enhanced by    3.000E+00
        c2h4             Enhanced by    3.000E+00
359. c2h4+ch2(s)=h2cc+ch4                         5.00E+13    0.0        0.0
360. c2h+h2=c2h2+h                                4.45E+06    2.2      920.0
361. c2h+oh=hcco+h                                2.00E+13    0.0        0.0
362. c2h+o=co+ch                                  1.00E+13    0.0        0.0
363. c2h+o2=co+co+h                               1.80E+13    0.0        0.0
364. h+c2h(+m)=c2h2(+m)                           1.00E+17   -1.0        0.0
     Low pressure limit:  0.37500E+34 -0.48000E+01  0.19000E+04
     TROE centering:      0.64640E+00  0.13200E+03  0.13150E+04  0.55660E+04
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        ar               Enhanced by    7.000E-01
365. c2h4o1,2=ch4+co                              1.21E+13    0.0    57200.0
366. c2h4o1,2+o2=c2h3o1,2+ho2                     4.00E+13    0.0    61500.0
367. c2h4o1,2+h=c2h3+h2o                          5.00E+09    0.0     5000.0
368. c2h4o1,2+h=c2h4+oh                           9.51E+10    0.0     5000.0
369. c2h4o1,2+o=c2h3o1,2+oh                       1.91E+12    0.0     5250.0
370. c2h4o1,2+ch3=ch4+c2h3o1,2                    1.07E+12    0.0    11830.0
371. c2h4o1,2<=>ch3+hco                           3.63E+13    0.0    57200.0
        Reverse Arrhenius coefficients:           1.01E+04    1.5    -2750.0
372. c2h4o1,2<=>ch3cho                            7.41E+12    0.0    53800.0
        Reverse Arrhenius coefficients:           9.01E+10    0.2    80800.0
373. c2h4o1,2+oh<=>c2h3o1,2+h2o                   1.78E+13    0.0     3610.0
        Reverse Arrhenius coefficients:           1.35E+10    0.7    24740.0
374. c2h4o1,2+h<=>c2h3o1,2+h2                     8.00E+13    0.0     9680.0
        Reverse Arrhenius coefficients:           5.71E+09    0.8    15920.0
375. c2h4o1,2+ho2<=>c2h3o1,2+h2o2                 1.13E+13    0.0    30430.0
        Reverse Arrhenius coefficients:           4.67E+11    0.1    20670.0
376. c2h4o1,2+ch3o=c2h3o1,2+ch3oh                 1.20E+11    0.0     6750.0
        Reverse Arrhenius coefficients:           3.61E+09   -0.9    25480.0
377. c2h4o1,2+ch3o2<=>c2h3o1,2+ch3o2h             1.13E+13    0.0    30430.0
        Reverse Arrhenius coefficients:           9.08E+12   -0.3    19070.0
378. c2h4o1,2+c2h5o2<=>c2h3o1,2+c2h5o2h           1.13E+13    0.0    30430.0
        Reverse Arrhenius coefficients:           9.09E+12   -0.3    19080.0
379. c2h5o2+h2o2=c2h5o2h+ho2                      2.41E+12    0.0     9936.0
380. c2h5o2+ch3=ch3ch2o+ch3o                      8.17E+12    0.0     -906.0
381. c2h5o2+ho2=c2h5o2h+o2                        1.75E+10    0.0    -3275.0
382. c2h5o2+ch2o=c2h5o2h+hco                      1.99E+12    0.0    11660.0
383. c2h4+c2h5o2=c2h3+c2h5o2h                     2.23E+12    0.0    17190.0
384. ch4+c2h5o2=ch3+c2h5o2h                       1.81E+11    0.0    18480.0
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385. ch3o2+c2h5o2=o2+ch3o+ch3ch2o	7.74E+10	0.0	-61.0
386. c2h5o2+c2h5o2=ch3ch2o+ch3ch2o+o2	7.74E+10	0.0	-61.0
387. c2h5o2+c2h5o2=c2h5oh+ch3cho+o2	1.34E+11	0.0	0.0
388. c3h6+c2h5o2=c3h5-a+c2h5o2h	3.24E+11	0.0	14900.0
389. c2h5o2+c3h8=c2h5o2h+nc3h7	1.70E+13	0.0	20460.0
390. c2h5o2+c3h8=c2h5o2h+ic3h7	2.00E+12	0.0	17000.0
391. c4h8-1+c2h5o2=c4h713+c2h5o2h	1.40E+12	0.0	14900.0
392. c2h5o2h+o=oh+c2h5o2	2.00E+13	0.0	4750.0
393. c2h5o2h+oh=c2h5o2+h2o	2.00E+12	0.0	-370.0
394. c2h5o2h+h=ch3cho+oh+h2	3.20E+13	0.0	7700.0
395. c2h5o2h+ch3=ch3cho+oh+ch4	5.70E+11	0.0	8700.0
396. c2h5o2h+c2h5=ch3cho+oh+c2h6	3.40E+11	0.0	11400.0
397. c2h5o2h+oh=ch3cho+oh+h2o	5.90E+12	0.0	900.0
398. c2h5o2h+hco=ch3cho+oh+ch2o	1.80E+12	0.0	16700.0
399. c2h5o2h+ch3o=ch3cho+oh+ch3oh	6.30E+11	0.0	5500.0
400. c2h5o2h+ho2=ch3cho+oh+h2o2	8.00E+11	0.0	16200.0
401. c2h5o2h=ch3ch2o+oh	6.31E+14	0.0	42300.0
402. ch3cho=ch3+hco	6.00E+14	0.0	79100.0
403. ch3cho=ch3co+h	5.00E+14	0.0	87900.0
404. ch3cho=ch4+co	1.00E+15	0.0	85000.0
405. ch3cho=ch2co+h2	3.00E+14	0.0	84000.0
406. ch3cho+h=ch3co+h2	1.20E+14	0.0	7000.0
407. ch3cho+h=ch2cho+h2	4.40E+14	0.0	10000.0
408. ch3cho+ch3=ch3co+ch4	1.70E+12	0.0	8440.0
409. ch3cho+ch3=ch2cho+ch4	6.00E+12	0.0	11000.0
410. ch3cho+o2=ch3co+ho2	3.00E+13	0.0	39150.0
411. ch3cho+o=ch3co+oh	5.85E+12	0.0	1808.0
412. ch3cho+o=ch2cho+oh	1.50E+13	0.0	5000.0
413. ch3cho+oh=ch3co+h2o	2.35E+10	0.7	-1113.0
414. ch3cho+oh=ch2cho+h2o	1.55E+06	2.2	1000.0
415. ch3cho+ho2=ch3co+h2o2	3.10E+12	0.0	11920.0
416. ch3cho+ho2=ch2cho+h2o2	1.00E+12	0.0	14000.0
417. ch3cho+c2h5=ch3co+c2h6	1.70E+12	0.0	8440.0
418. ch3co+o=ch3+co2	1.00E+13	0.0	0.0
419. ch3co+oh=ch3+co+oh	3.16E+13	0.0	0.0
420. ch3co+ho2=ch3+co2+oh	3.16E+13	0.0	0.0
421. ch3cho+oh=ch3cooh+h	1.00E+08	1.2	-447.0
422. ch2co+h=ch3co	2.30E+08	1.6	2627.0
423. ch3co<=>ch3+co	8.18E+19	-2.5	17263.0
424. ch3co+o2=ch3co3	3.01E+12	0.0	0.0
425. ch3co3+ho2=ch3co3h+o2	1.75E+10	0.0	-3275.0
426. ch3co3h=ch3co2+oh	5.00E+14	0.0	40142.0
427. ch3co3h+h=ch3co3+h2	5.40E+10	0.0	1860.0
428. ch3co3h+oh=ch3co3+h2o	1.10E+12	0.0	-437.0
429. ch3co3h+ho2=ch3co3+h2o2	4.10E+04	2.5	10206.0
430. ch3co3+h=ch3co2+oh	1.00E+14	0.0	0.0
431. ch3co3+oh=ch3co2+ho2	4.00E+11	0.6	0.0
432. ch3co3+ho2=>ch3cooh+o+o2	1.69E+12	0.0	0.0
433. ch3co3+ch3o2=>ch3cooh+ch2o+o2	3.31E+12	0.0	0.0
434. ch3co2+ho2=ch3cooh+o2	1.75E+10	0.0	-3275.0
435. ch3co3=>ch2co+ho2	3.34E+09	1.0	32500.0
436. ch3co3h=>ch3+co2+oh	1.00E+15	0.0	37400.0
437. ch3co3+ho2=>ch3+co2+o2+oh	1.00E+12	0.0	0.0
438. ch3co+h=ch2co+h2	2.00E+13	0.0	0.0
Reverse Arrhenius coefficients:	7.27E+09	0.0	83040.0
439. ch3co+o=ch2co+oh	2.00E+13	0.0	0.0
Reverse Arrhenius coefficients:	7.27E+09	0.0	83040.0
440. ch3co+ch3=ch2co+ch4	5.00E+13	0.0	0.0
Reverse Arrhenius coefficients:	7.27E+09	0.0	83040.0
441. ch3cooh=ch3co2+h	2.30E+14	0.0	106345.3
442. ch3+hoco+m=ch3cooh+m	1.00E+22	-2.0	0.0
443. ch3co+oh+m=ch3cooh+m	1.00E+22	-2.0	0.0
444. ch3cooh=ch4+co2	3.20E+10	0.9	71963.0
445. ch3cooh=ch2co+h2o	3.58E+10	1.0	74793.0
446. ch3cooh+h=ch2cooh+h2	1.68E+04	2.9	7376.0
447. ch3cooh+h=ch3co2+h2	1.79E+06	2.3	15215.0
448. ch3cooh+o=ch2cooh+oh	2.30E+04	2.9	7040.0
449. ch3cooh+o=ch3co2+oh	8.50E+05	2.1	9880.0
450. ch3cooh+oh=ch2cooh+h2o	2.20E+00	3.8	-725.0
451. ch3cooh+oh=ch3co2+h2o	1.06E-04	4.8	-3949.0
452. ch3cooh+ch3=ch2cooh+ch4	2.14E-01	4.0	8222.0
453. ch3cooh+ch3=ch3co2+ch4	9.30E+01	3.0	10773.0
454. ch3cooh+ho2=ch2cooh+h2o2	4.02E-06	5.3	15153.0
455. ch3cooh+ho2=ch3co2+h2o2	1.41E-02	4.2	20862.0
456. ch3cooh+ch3o2=ch2cooh+ch3o2h	8.40E+12	0.0	20440.0
457. ch3cooh+ch3o=ch2cooh+ch3oh	1.58E+11	0.0	7000.0
458. ch2cooh+h=ch2co+h2o	1.00E+14	0.0	0.0
459. ch2co+oh=ch2cooh	6.35E+30	-6.0	4435.0
460. ch2cooh=>co2+ch3	1.70E+09	1.0	38640.0
461. ch3co2=ch3+co2	7.54E+11	0.9	17058.0
462. ch3co2+h=ch2co+h2o	1.00E+04	0.0	0.0
463. ch2cho+o=ch2o+hco	2.00E+13	0.0	4000.0
464. ch2cho+ho2=ch2o+hco+oh	1.00E+13	0.0	0.0
465. ch2cho+oh=ch2co+h2o	1.00E+13	0.0	2000.0
466. ch2cho+h=ch2co+h2	2.00E+13	0.0	4000.0
467. ch2cho+h=ch3co+h	5.00E+12	0.0	0.0
468. ch2cho+h=ch3+hco	9.00E+13	0.0	0.0
469. ch2cho+ch3=>c2h5+co+h	4.90E+14	-0.5	0.0
470. ch2cho=ch3co	1.00E+13	0.0	47100.0
471. ch2cho<=>h+ch2co	3.46E+36	-6.9	52986.0
472. ch2cho<=>ch3+co	2.15E+35	-6.8	49554.0
473. ch2+co(+M)<=>ch2co(+M)	8.10E+11	0.5	4510.0
Low pressure limit: 0.26900E+34 -0.51100E+01 0.70950E+04			
TROE centering: 0.59070E+00 0.27500E+03 0.12260E+04 0.51850E+04			

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        h2              Enhanced by    2.000E+00
        h2o             Enhanced by    6.000E+00
        ch4             Enhanced by    2.000E+00
        co              Enhanced by    1.500E+00
        co2             Enhanced by    2.000E+00
        c2h6            Enhanced by    3.000E+00
        ar              Enhanced by    7.000E-01
474. ch2co+o2=ch2o+co2                          2.00E+13    0.0    61500.0
475. ch2co+ho2=>ch2o+co+oh                      6.00E+11    0.0    12738.0
476. ch2co+o=ch2+co2                            1.76E+12    0.0     1349.0
477. ch2co+o=hcco+oh                            1.00E+13    0.0     8000.0
478. ch2co+oh<=>ch2oh+co                        2.00E+12    0.0    -1010.0
479. ch2co+oh<=>hcco+h2o                        1.00E+13    0.0     2000.0
480. ch2co+h<=>hcco+h2                          1.40E+15   -0.2     8783.2
481. ch2co+h<=>ch3+co                           7.70E+13   -0.2     4183.2
482. ch2co+ch3=c2h5+co                          9.00E+10    0.0        0.0
483. ch2co+ch3=hcco+ch4                         7.50E+12    0.0    13000.0
484. ch2co+ch2=c2h4+co                          1.00E+12    0.0        0.0
485. ch2co+ch2=hcco+ch3                         3.60E+13    0.0    11000.0
486. chocho(+m)=ch2o+co(+m)                     4.27E+12    0.0    50600.0
     Low pressure limit:  0.89100E+17  0.00000E+00  0.49200E+05
487. chocho(+m)=co+co+h2(+m)                    1.07E+14    0.0    55100.0
     Low pressure limit:  0.25700E+17  0.00000E+00  0.38400E+05
488. chocho+oh=choco+h2o                        1.00E+13    0.0        0.0
489. chocho+o=choco+oh                          7.24E+12    0.0     1970.0
490. chocho+h=ch2o+hco                          1.00E+12    0.0        0.0
491. chocho+ho2=choco+h2o2                      1.70E+12    0.0    10700.0
492. chocho+ch3=choco+ch4                       1.74E+12    0.0     8440.0
493. chocho+o2=hco+co+ho2                       6.30E+13    0.0    30000.0
494. hco+hco=chocho                             1.00E+13    0.0        0.0
495. choco=hco+co                               2.00E+07    0.0        0.0
496. choco+o2=co+co+ho2                         3.98E+12    0.0    30000.0
497. c2h3o1,2=ch2co+h                           4.96E+13    0.0    14860.0
498. c2h3o1,2=ch3+co                            7.31E+12    0.0    14280.0
499. c2h3o1,2=ch3co                             8.51E+14    0.0    14000.0
500. c2h3o1,2=ch2cho                            8.74E+31   -6.9    14990.0
501. c2h2oh=ch2co+h                             5.00E+15    0.0    28000.0
502. c2h2oh+h=ch2co+h2                          2.00E+13    0.0     4000.0
503. c2h2oh+o=ch2co+oh                          2.00E+13    0.0     4000.0
504. c2h2oh+oh=ch2co+h2o                        1.00E+13    0.0     2000.0
505. c2h2oh+o2=>hco+co2+h2                      4.00E+12    0.0     -250.0
506. hccoh+h=ch2co+h                            1.00E+13    0.0        0.0
507. ch+co(+M)<=>hcco(+M)                       5.00E+13    0.0        0.0
     Low pressure limit:  0.26900E+29 -0.37400E+01  0.19360E+04
     TROE centering:      0.57570E+00  0.23700E+03  0.16520E+04  0.50690E+04
        h2              Enhanced by    2.000E+00
        h2o             Enhanced by    6.000E+00
        ch4             Enhanced by    2.000E+00
        co              Enhanced by    1.500E+00
        co2             Enhanced by    2.000E+00
        c2h6            Enhanced by    3.000E+00
        ar              Enhanced by    7.000E-01
508. hcco+oh=c2o+h2o                            3.00E+13    0.0        0.0
509. hcco+oh=hco+co+h                           1.00E+13    0.0        0.0
510. hcco+o=co+co+h                             1.93E+14    0.0      590.0
511. hcco+h=ch2(s)+co                           1.50E+14    0.0        0.0
512. hcco+o2=co+co+oh                           1.60E+12    0.0      854.0
513. hcco+ch2=c2h+ch2o                          1.00E+13    0.0     2000.0
514. hcco+ch2=c2h3+co                           3.00E+13    0.0        0.0
515. hcco+ch=c2h2+co                            5.00E+13    0.0        0.0
516. hcco+hcco=c2h2+co+co                       1.00E+13    0.0        0.0
517. hcco+o=ch+co2                              2.95E+13    0.0     1113.0
518. hcco+c2h2=c3h3+co                          1.00E+11    0.0     3000.0
519. hcco+ch3=c2h4+co                           5.00E+13    0.0        0.0
520. c2o+o2=co+co+o                             2.00E+13    0.0        0.0
521. c2o+oh=co+co+h                             2.00E+13    0.0        0.0
522. c2o+o=co+co                                5.00E+13    0.0        0.0
523. c2o+h=ch+co                                5.00E+13    0.0        0.0
524. c2+o2=co+co                                5.00E+13    0.0        0.0
525. c2+oh=c2o+h                                5.00E+13    0.0        0.0
526. c2+h2=c2h+h                                4.00E+05    2.4     1000.0
527. c2h5oh(+M)=ch3+ch2oh(+M)                   5.94E+23   -1.7    91163.0
     Low pressure limit:  0.28800E+86 -0.18900E+02  0.10991E+06
     TROE centering:      0.50000E+00  0.20000E+03  0.89000E+03  0.46000E+04
        h2o             Enhanced by    5.000E+00
        h2              Enhanced by    2.000E+00
        co2             Enhanced by    3.000E+00
        co              Enhanced by    2.000E+00
528. c2h5oh(+M)=c2h5+oh(+M)                     5.74E+09   -2.2    96578.0
     Low pressure limit:  0.83560E+52 -0.19700E+02  0.11447E+06
     TROE centering:      0.20940E+01  0.16539E+05  0.16136E+03  0.11140E+01
529. c2h5oh(+M)=c2h4+h2o(+M)                    2.79E+13    0.1    66136.0
     Low pressure limit:  0.25700E+84 -0.18850E+02  0.86452E+05
     TROE centering:      0.70000E+00  0.35000E+03  0.80000E+03  0.38000E+04
        h2o             Enhanced by    5.000E+00
530. c2h5oh(+M)=ch3cho+h2(+M)                   7.24E+11    0.1    91007.0
     Low pressure limit:  0.44600E+88 -0.19420E+02  0.11559E+06
     TROE centering:      0.90000E+00  0.90000E+03  0.11000E+04  0.35000E+04
        h2o             Enhanced by    5.000E+00
531. c2h5oh+o2=pc2h4oh+ho2                      2.00E+13    0.0    52800.0
532. c2h5oh+o2=ch3choh+ho2                      1.50E+13    0.0    50150.0
533. c2h5oh+c2h5=pc2h4oh+c2h6                   5.00E+10    0.0    13400.0
534. c2h5oh+c2h5=ch3choh+c2h6                   5.00E+10    0.0    10400.0
535. c2h5oh+oh=pc2h4oh+h2o                      6.20E+03    2.7     -576.0
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536. c2h5oh+oh=ch3choh+h2o                        1.31E+05    2.4    -1457.0
537. c2h5oh+oh=ch3ch2o+h2o                        2.81E+02    3.0     -580.0
538. c2h5oh+h=pc2h4oh+h2                          1.88E+03    3.2     7150.0
539. c2h5oh+h=ch3choh+h2                          1.79E+05    2.5     3420.0
540. c2h5oh+h=ch3ch2o+h2                          5.55E-23   10.6    -4459.0
541. c2h5oh+o=pc2h4oh+oh                          9.69E+02    3.2     4658.0
542. c2h5oh+o=ch3choh+oh                          1.45E+05    2.4      876.0
543. c2h5oh+o=ch3ch2o+oh                          1.46E-03    4.7     1727.0
544. c2h5oh+ch3=pc2h4oh+ch4                       3.30E+02    3.3    12291.0
545. c2h5oh+ch3=ch3choh+ch4                       1.99E+01    3.4     7635.0
546. c2h5oh+ch3=ch3ch2o+ch4                       2.04E+00    3.6     7722.0
547. c2h5oh+ho2=ch3choh+h2o2                      8.20E+03    2.5    10750.0
548. c2h5oh+ho2=pc2h4oh+h2o2                      1.23E+04    2.5    15750.0
549. c2h5oh+ho2=ch3ch2o+h2o2                      2.50E+12    0.0    24000.0
550. ch3ch2o+M=ch3cho+h+M                         2.32E+35   -5.9    25274.0
551. ch3ch2o+M=ch3+ch2o+M                         1.35E+38   -7.0    23800.0
552. ch3ch2o+o2=ch3cho+ho2                        4.00E+10    0.0     1100.0
553. ch3ch2o+h=ch3cho+h2                          1.00E+13    0.0        0.0
554. ch3ch2o+oh=ch3cho+h2o                        1.00E+13    0.0        0.0
555. ch3ch2o+ho2=ch3cho+h2o2                      3.00E+11    0.0        0.0
556. ch3ch2o+co=c2h5+co2                          4.68E+02    3.2     5380.0
557. ch3choh+o2=ch3cho+ho2                        1.00E+13    0.0     5564.0
558. ch3choh+ch3=c3h6+h2o                         1.00E+13    0.0        0.0
559. ch3choh+o=ch3cho+oh                          1.00E+14    0.0        0.0
560. ch3choh+h=c2h4+h2o                           3.00E+13    0.0        0.0
561. ch3choh+h=ch3+ch2oh                          3.00E+13    0.0        0.0
562. ch3choh+ho2=ch3cho+oh+oh                     4.00E+13    0.0        0.0
563. ch3choh+oh=ch3cho+h2o                        5.00E+12    0.0        0.0
564. ch3choh+M=ch3cho+h+M                         1.00E+14    0.0    25000.0
565. ch2+c3h8=ch3+ic3h7                           2.19E+12    0.0     6405.0
566. ch2+c3h8=ch3+nc3h7                           1.79E+12    0.0     6405.0
567. c3h8(+m)<=>c2h5+ch3(+m)                      1.29E+37   -5.8    97380.0
     Low pressure limit:  0.56400E+75 -0.15740E+02  0.98714E+05
     TROE centering:      0.31000E+00  0.50000E+02  0.30000E+04  0.90000E+04
        h2              Enhanced by    2.000E+00
        h2o             Enhanced by    6.000E+00
        ar              Enhanced by    7.000E-01
        co              Enhanced by    1.500E+00
        co2             Enhanced by    2.000E+00
        ch4             Enhanced by    2.000E+00
        c2h6            Enhanced by    3.000E+00
        he              Enhanced by    7.000E-01
568. c3h8=nc3h7+h                                 1.58E+16    0.0    97970.0
569. c3h8=ic3h7+h                                 5.00E+15    0.0    94990.0
570. c3h8+o2=nc3h7+ho2                            4.00E+13    0.0    50872.0
571. c3h8+o2=ic3h7+ho2                            4.00E+13    0.0    47500.0
572. c3h8+ho2=nc3h7+h2o2                          4.76E+04    2.5    16494.0
573. c3h8+ho2=ic3h7+h2o2                          9.64E+03    2.6    13910.0
574. c3h8+oh=nc3h7+h2o                            3.16E+07    1.8      934.0
575. c3h8+oh=ic3h7+h2o                            7.08E+06    1.9     -159.0
576. c3h8+o=nc3h7+oh                              3.72E+06    2.4     5505.0
577. c3h8+o=ic3h7+oh                              5.50E+05    2.5     3140.0
578. c3h8+h=nc3h7+h2                              1.34E+06    2.5     6756.0
579. c3h8+h=ic3h7+h2                              1.01E+04    2.9     2931.0
580. c3h8+ch3=nc3h7+ch4                           3.00E+12    0.0    11710.0
581. c3h8+ch3=ic3h7+ch4                           8.07E+11    0.0    10110.0
582. c3h8+c2h5=nc3h7+c2h6                         3.16E+11    0.0    12300.0
583. c3h8+c2h5=ic3h7+c2h6                         5.01E+10    0.0    10400.0
584. c3h8+c2h3=nc3h7+c2h4                         6.00E+02    3.3    10502.0
585. c3h8+c2h3=ic3h7+c2h4                         1.00E+03    3.1     8829.0
586. c3h8+ic3h7=nc3h7+c3h8                        1.00E+11    0.0    12900.0
587. c3h8+c3h5-a=nc3h7+c3h6                       7.94E+11    0.0    20500.0
588. c3h8+c3h5-a=ic3h7+c3h6                       7.94E+11    0.0    16200.0
589. c3h8+ch3o=nc3h7+ch3oh                        3.18E+11    0.0     7050.0
590. c3h8+ch3o=ic3h7+ch3oh                        7.20E+10    0.0     4470.0
591. nc3h7(+M)=c2h4+ch3(+M)                       1.23E+13   -0.1    30202.0
     Low pressure limit:  0.55450E+50 -0.10000E+02  0.35766E+05
     TROE centering:      0.21700E+01  0.10000E-14  0.25100E+03  0.11850E+04
        h2o             Enhanced by    5.000E+00
        h2              Enhanced by    2.000E+00
        co2             Enhanced by    3.000E+00
        co              Enhanced by    2.000E+00
592. c3h6+h(+m)=nc3h7(+m)                         1.33E+13    0.0     3260.7
     Low pressure limit:  0.62600E+39 -0.66600E+01  0.70000E+04
     TROE centering:      0.10000E+01  0.10000E+04  0.13100E+04  0.48097E+05
        h2o             Enhanced by    6.000E+00
        co              Enhanced by    1.875E+00
        co2             Enhanced by    3.750E+00
        ch4             Enhanced by    1.625E+01
        c2h6            Enhanced by    1.625E+01
593. c3h6+h(+m)=ic3h7(+m)                         5.70E+09    1.2      874.0
     Low pressure limit:  0.16400E+55 -0.11100E+02  0.93640E+04
     TROE centering:      0.10000E+01  0.10000E-14  0.26000E+03  0.30000E+04
        h2o             Enhanced by    1.625E+01
        co              Enhanced by    1.875E+00
        co2             Enhanced by    3.850E+00
594. nc3h7=ic3h7                                  3.56E+10    0.9    37300.0
595. nc3h7+o2=c3h6+ho2                            2.63E+00    3.5     2481.2
596. ic3h7+o2=c3h6+ho2                            4.91E+17   -1.7     6964.0
597. ho2+ic3h7=ic3h7o2h                           4.80E+12    0.0        0.0
598. ho2+nc3h7=nc3h7o2h                           4.80E+12    0.0        0.0
599. nc3h7+o2=nc3h7o2                             1.15E+20   -2.4     2451.3
600. ic3h7+o2=ic3h7o2                             6.74E+27   -4.8     3779.8
601. nc3h7+o2=c3h6o1-2+oh                         3.35E+02    2.6     4697.4
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602. ic3h7+o2=c3h6o1-2+oh	2.81E+18	-2.3	10119.3
603. nc3h7+h=c2h5+ch3	1.00E+14	0.0	0.0
604. ic3h7+h=c2h5+ch3	5.00E+13	0.0	0.0
605. ic3h7+h=c3h6+h2	3.61E+12	0.0	0.0
606. ic3h7+o=ch3coch3+h	4.82E+13	0.0	0.0
607. ic3h7+o=ch3cho+ch3	4.82E+13	0.0	0.0
608. nc3h7+o=ch2o+c2h5	4.82E+13	0.0	0.0
609. nc3h7+o=c2h5cho+h	4.82E+13	0.0	0.0
610. ch3o2+nc3h7=ch3o+nc3h7o	1.90E+12	0.0	-1200.0
611. ic3h7o2+nc3h7=ic3h7o+nc3h7o	1.90E+12	0.0	-1200.0
612. nc3h7o2+nc3h7=nc3h7o+nc3h7o	1.90E+12	0.0	-1200.0
613. nc3h7+ho2=nc3h7o+oh	1.90E+12	0.0	-1200.0
614. ch3o2+ic3h7=ch3o+ic3h7o	1.90E+12	0.0	-1200.0
615. ic3h7o2+ic3h7=ic3h7o+ic3h7o	1.90E+12	0.0	-1200.0
616. nc3h7o2+ic3h7=nc3h7o+ic3h7o	1.90E+12	0.0	-1200.0
617. ic3h7+ho2=ic3h7o+oh	1.90E+12	0.0	-1200.0
618. nc3h7o=c2h5cho+h	1.70E+13	0.0	20510.0
619. nc3h7o=c2h5+ch2o	5.89E+13	0.0	13890.0
620. nc3h7o+o2=c2h5cho+ho2	8.43E+09	0.0	220.0
621. ic3h7o=ch3coch3+h	1.58E+13	0.0	18310.0
622. ic3h7o=ch3+ch3cho	9.12E+13	0.0	14360.0
623. ic3h7o+o2=ch3coch3+ho2	8.43E+09	0.0	420.0
624. ic3h7o2+c2h3cho=c2h3co+ic3h7o2h	2.80E+12	0.0	13600.0
625. ic3h7o2+c2h4=c2h3+ic3h7o2h	1.13E+13	0.0	30430.0
626. ic3h7o2+c2h5cho=ic3h7o2h+c2h5co	2.00E+11	0.0	9500.0
627. ic3h7o2+c2h6=ic3h7o2h+c2h5	1.70E+13	0.0	20460.0
628. ic3h7o2+ch2o=ic3h7o2h+hco	5.60E+12	0.0	13600.0
629. ic3h7o2+ch3cho=ic3h7o2h+ch3co	2.80E+12	0.0	13600.0
630. ic3h7o2+ch4=ch3+ic3h7o2h	1.12E+13	0.0	24640.0
631. ic3h7o2+h2=h+ic3h7o2h	3.01E+13	0.0	26030.0
632. ic3h7o2+ch3oh=ch2oh+ic3h7o2h	6.30E+12	0.0	19360.0
633. ic3h7o2+ho2=ic3h7o2h+o2	2.29E+11	0.0	-1790.0
634. ic3h7o2+c2h5o2=ic3h7o+ch3ch2o+o2	5.00E+10	0.0	0.0
635. ic3h7o2+ic3h7o2=o2+ic3h7o+ic3h7o	5.00E+10	0.0	0.0
636. ic3h7o2+nc3h7o2=ic3h7o+nc3h7o+o2	5.00E+10	0.0	0.0
637. ic3h7o2+ch3co3=ic3h7o+ch3co2+o2	5.00E+10	0.0	0.0
638. ic3h7o2+ch3o2=ic3h7o+ch3o+o2	1.00E+11	0.0	0.0
639. ic3h7o2+ho2=ic3h7o+oh+o2	1.00E+11	0.0	0.0
640. ic3h7o2+c2h5=ic3h7o+ch3ch2o	1.90E+12	0.0	-1200.0
641. ic3h7o2+c3h5-a=ic3h7o+c3h5o	1.90E+12	0.0	-1200.0
642. ic3h7o2+ch3=ic3h7o+ch3o	1.90E+12	0.0	-1200.0
643. ic3h7o2+h2o2=ic3h7o2h+ho2	2.41E+12	0.0	9936.0
644. nc3h7o2+h2o2=nc3h7o2h+ho2	2.41E+12	0.0	9936.0
645. nc3h7o2+c2h3cho=c2h3co+nc3h7o2h	2.80E+12	0.0	13600.0
646. nc3h7o2+c2h4=c2h3+nc3h7o2h	1.13E+13	0.0	30430.0
647. nc3h7o2+c2h5cho=nc3h7o2h+c2h5co	2.00E+11	0.0	9500.0
648. nc3h7o2+c2h6=nc3h7o2h+c2h5	1.70E+13	0.0	20460.0
649. nc3h7o2+ch3cho=nc3h7o2h+ch3co	2.80E+12	0.0	13600.0
650. nc3h7o2+ch4=ch3+nc3h7o2h	1.12E+13	0.0	24640.0
651. nc3h7o2+h2=h+nc3h7o2h	3.01E+13	0.0	26030.0
652. nc3h7o2+ch3oh=ch2oh+nc3h7o2h	6.30E+12	0.0	19360.0
653. nc3h7o2+ho2=nc3h7o2h+o2	2.29E+11	0.0	-1790.0
654. nc3h7o2+c2h5o2=nc3h7o+ch3ch2o+o2	5.00E+10	0.0	0.0
655. nc3h7o2+nc3h7o2=o2+nc3h7o+nc3h7o	5.00E+10	0.0	0.0
656. nc3h7o2+ch3o2=nc3h7o+ch3o+o2	1.00E+11	0.0	0.0
657. nc3h7o2+ho2=nc3h7o+oh+o2	1.00E+11	0.0	0.0
658. nc3h7o2+c2h5=nc3h7o+ch3ch2o	1.90E+12	0.0	-1200.0
659. nc3h7o2+c3h5-a=nc3h7o+c3h5o	1.90E+12	0.0	-1200.0
660. nc3h7o2+ch3=nc3h7o+ch3o	1.90E+12	0.0	-1200.0
661. nc3h7o2=c3h6+ho2	4.16E+08	1.2	29600.0
662. ic3h7o2=c3h6+ho2	8.16E+08	1.3	30000.0
663. nc3h7o2=c2h5cho+oh	3.36E+05	2.3	36900.0
664. ic3h7o2=ch3coch3+oh	5.22E+04	2.5	35700.0
665. nc3h7o2=prooh1-2	2.86E+07	1.5	29100.0
666. nc3h7o2=prooh1-3	2.05E+07	1.3	21700.0
667. ic3h7o2=prooh2-1	1.10E+07	1.8	32300.0
668. nc3h7o2=c3h6o1-2+oh	3.28E+21	-2.9	37342.8
669. ic3h7o2=c3h6o1-2+oh	1.94E+53	-13.0	49382.4
670. prooh1-2=prooh1-3	5.36E-85	31.0	535.8
671. nc3h7o2h=nc3h7o+oh	4.00E+15	0.0	42000.0
672. ic3h7o2h=ic3h7o+oh	2.50E+15	0.0	43000.0
673. prooh1-2=c3h6o1-2+oh	1.21E+09	1.1	11300.0
674. prooh2-1=c3h6o1-2+oh	4.45E+09	0.9	10800.0
675. prooh1-3=c3h6o1-3+oh	2.64E+09	0.7	18500.0
676. c3h6+ho2=c3h6o1-2+oh	1.92E+12	0.1	17384.8
677. prooh1-2=c3h6+ho2	1.16E-09	7.5	14745.7
678. prooh1-3=c3h6+ho2	1.60E+10	-0.4	17531.8
679. prooh2-1=c3h6+ho2	5.04E-23	10.5	2465.0
680. prooh1-3=>oh+ch2o+c2h4	2.89E+09	1.3	26700.0
681. prooh1-2+o2=prooh1-2o2	8.50E+18	-2.5	0.0
682. prooh1-3+o2=prooh1-3o2	4.50E+18	-2.5	0.0
683. prooh2-1+o2=prooh2-1o2	7.50E+17	-2.5	0.0
684. prooh1-2o2=c3ket12+oh	2.54E-01	3.7	22800.0
685. prooh1-3o2=c3ket13+oh	6.36E+04	1.8	17200.0
686. prooh2-1o2=c3ket21+oh	1.20E+01	3.1	22500.0
687. c3ket12=ch3cho+hco+oh	2.50E+15	0.0	43000.0
688. c3ket13=ch2o+ch2cho+oh	2.50E+15	0.0	43000.0
689. c3ket21=ch2o+ch3co+oh	2.50E+15	0.0	43000.0
690. c3h6o1-2+h=>h2+ch3chcho	9.60E+08	1.5	2785.0
691. c3h6o1-2+h=>h2+ch3coch2	4.80E+08	1.5	2005.0
692. c3h6o1-2+oh=>h2o+ch3chcho	4.80E+06	2.0	-1192.0
693. c3h6o1-2+oh=>h2o+ch3coch2	2.40E+06	2.0	-1192.0
694. c3h6o1-2+ho2=>h2o2+ch3chcho	8.00E+12	0.0	14400.0
695. c3h6o1-2+ho2=>h2o2+ch3coch2	4.00E+12	0.0	13260.0

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696. c3h6o1-3+h=>h2+pc2h4cho                      1.92E+09    1.5     2785.0
697. c3h6o1-3+oh=>h2o+pc2h4cho                    9.60E+06    2.0    -1192.0
698. c3h6o1-3+ho2=>h2o2+pc2h4cho                  1.60E+13    0.0    14400.0
699. c3h6o1-2=c2h5+hco                            2.45E+13    0.0    58500.0
700. c3h6o1-2=c2h5cho                             1.11E+14    0.0    55150.0
701. c3h6o1-2=ch3+ch3co                           4.54E+13    0.0    59900.0
702. c3h6o1-2=ch3+ch2cho                          2.45E+13    0.0    58820.0
703. c3h6o1-2=ch3+c2h3o1,2                        8.00E+15    0.0    92010.0
704. c3h5-a+h(+m)=c3h6(+m)                        2.00E+14    0.0        0.0
     Low pressure limit:  0.13300E+61 -0.12000E+02  0.59678E+04
     TROE centering:      0.20000E-01  0.10966E+04  0.10966E+04  0.68595E+04
        h2o              Enhanced by    6.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        ch4              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        h2               Enhanced by    2.000E+00
        ar               Enhanced by    7.000E-01
705. c2h3+ch3(+m)=c3h6(+m)                        2.50E+13    0.0        0.0
     Low pressure limit:  0.42700E+59 -0.11940E+02  0.97698E+04
     TROE centering:      0.17500E+00  0.13406E+04  0.60000E+05  0.10140E+05
        h2o              Enhanced by    6.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        ch4              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        h2               Enhanced by    2.000E+00
        c2h2             Enhanced by    3.000E+00
        c2h4             Enhanced by    3.000E+00
        ar               Enhanced by    7.000E-01
706. c3h5-a+ho2=c3h6+o2                           1.00E+12    0.0        0.0
707. c3h6+o2=c3h5-s+ho2                           1.40E+13    0.0    60200.0
708. c3h6+o2=c3h5-t+ho2                           7.00E+12    0.0    60200.0
709. c3h6+ho2=c3h5-a+h2o2                         2.70E+04    2.5    12340.0
710. c3h6+ho2=c3h5-s+h2o2                         1.80E+04    2.5    27620.0
711. c3h6+ho2=c3h5-t+h2o2                         9.00E+03    2.5    23590.0
712. c3h6+oh=c3h5-a+h2o                           5.27E+04    2.7      312.8
713. c3h6+oh=c3h5-s+h2o                           7.59E+03    2.8     2193.0
     Declared duplicate reaction...
714. c3h6+oh=c3h5-s+h2o                           1.01E+00    3.5     -101.0
     Declared duplicate reaction...
715. c3h6+oh=c3h5-t+h2o                           4.67E+04    2.5     1748.0
     Declared duplicate reaction...
716. c3h6+oh=c3h5-t+h2o                           5.72E-07    2.6    -3086.0
     Declared duplicate reaction...
717. c3h6+o=c2h5+hco                              4.69E+07    1.6     -628.0
718. c3h6+o=ch3+ch2cho                            3.90E+07    1.6     -628.0
719. c3h6+o=c2h4+ch2o                             7.02E+07    1.6     -628.0
720. c3h6+o=c3h5-a+oh                             1.75E+11    0.7     5884.0
721. c3h6+o=c3h5-s+oh                             1.20E+11    0.7     8960.0
722. c3h6+o=c3h5-t+oh                             6.02E+10    0.7     7633.0
723. c3h6+h=c3h5-a+h2                             1.73E+05    2.5     2492.0
724. c3h6+h=c3h5-s+h2                             8.04E+05    2.5    12280.0
725. c3h6+h=c3h5-t+h2                             4.05E+05    2.5     9794.0
726. c3h6+ch3=c3h5-a+ch4                          2.21E+00    3.5     5675.0
727. c3h6+ch3=c3h5-s+ch4                          1.35E+00    3.5    12850.0
728. c3h6+ch3=c3h5-t+ch4                          8.40E-01    3.5    11660.0
729. c3h6+c3h6=c3h5-a+nc3h7                       1.32E+13    0.0    48400.0
730. c3h6+c2h5=c3h5-a+c2h6                        1.00E+11    0.0     9800.0
731. c3h6+c2h3=c4h6+ch3                           7.20E+11    0.0     5008.0
732. c3h6+hco=c3h5-a+ch2o                         1.08E+07    1.9    17010.0
733. c3h5-s+ch2o=c3h6+hco                         5.42E+03    2.8     5862.0
734. c3h6+c2h3=c3h5-a+c2h4                        1.00E+12    0.0     8000.0
735. c3h6+c2h3=c3h5-t+c2h4                        2.21E+00    3.5     4682.0
736. c3h6+c2h3=c3h5-s+c2h4                        2.21E+00    3.5     4682.0
737. c3h61oh2oo=ch3cho+ch2o+oh                    1.00E+12    0.0       30.0
738. c3h62oh1oo=ch3cho+ch2o+oh                    1.00E+12    0.0       30.0
739. c3h61oh+o2=c2h5cho+ho2                       1.50E+12    0.0     5000.0
740. c3h62oh+o2=ch3coch3+ho2                      1.50E+12    0.0     5000.0
741. c3h5-a+ho2=c3h5-aooh                         2.79E+37   -7.9     6497.9
742. c3h5-a+ho2=c2h3cho+h2o                       3.10E+05    1.6     2677.6
743. c3h5-a+ho2=c3h5o+oh                          7.77E+17   -1.5     2379.2
744. c3h5-aooh=c2h3cho+h2o                        1.50E+40   -8.8    53179.2
745. c3h5-aooh=c3h5o+oh                           3.36E+46   -9.8    52468.5
746. c3h5o=c2h4+hco                               1.07E+24   -4.2    18985.0
747. c3h5-a+h<=>c3h4-a+h2                         1.23E+03    3.0     2582.0
748. c3h5-a+oh=c3h4-a+h2o                         6.00E+12    0.0        0.0
749. c2h3+ch3=c3h5-a+h                            1.50E+24   -2.8    18618.0
750. c3h5-a+ch3=c3h4-a+ch4                        1.00E+11    0.0        0.0
751. c3h5-a+ch2=c4h6+h                            3.00E+13    0.0        0.0
752. c3h5-a+c2h5=c3h4-a+c2h6                      4.00E+11    0.0        0.0
753. c3h5-a+c2h3=c3h4-a+c2h4                      1.00E+12    0.0        0.0
754. c3h5-a+o=c2h3cho+h                           6.03E+13    0.0        0.0
755. c3h5-a+hco=c3h6+co                           6.03E+13    0.0        0.0
756. c3h5-a+c2h3=c3h6+c2h2                        4.82E+12    0.0        0.0
757. c3h5-a+c2h5=c2h4+c3h6                        4.00E+11    0.0        0.0
        Reverse Arrhenius coefficients:           6.94E+16   -1.3    52800.0
758. c3h5-aoo+ho2=c3h5-aooh+o2                    3.37E+12    0.0        0.0
759. c3h5-s+o2=>ch3cho+hco                        4.34E+12    0.0        0.0
760. c3h5-s+ho2=>ch2co+ch3+oh                     4.50E+12    0.0        0.0
761. c3h5-s+h=c3h4-p+h2                           3.33E+12    0.0        0.0
762. c3h5-s+o=>ch2co+ch3                          1.81E+14    0.0        0.0
763. c3h5-s+ch3=c3h4-p+ch4                        1.00E+11    0.0        0.0
764. c3h5-s+c2h5=c3h4-p+c2h6                      1.00E+11    0.0        0.0
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765. c3h5-s+c2h3=c3h4-p+c2h4                      1.00E+11    0.0        0.0
766. c3h5-t+o2=>ch3co+ch2o                        1.00E+11    0.0        0.0
767. c3h5-t+ho2=>ch2co+ch3+oh                     2.00E+13    0.0        0.0
768. c3h5-t+o=>ch2co+ch3                          1.81E+14    0.0        0.0
769. c3h5-t+hco=>co+c3h6                          9.00E+13    0.0        0.0
770. c3h5-t+oh=>ch2co+ch3+h                       5.00E+12    0.0        0.0
771. c3h5-t+h=c3h4-p+h2                           1.00E+13    0.0        0.0
772. c3h5-t+ch3=c3h4-a+ch4                        1.00E+11    0.0        0.0
773. c3h5-t+ch3=c3h4-p+ch4                        1.00E+11    0.0        0.0
774. c3h5-t+c2h5=c3h4-a+c2h6                      1.00E+11    0.0        0.0
775. c3h5-t+c2h3=c3h4-a+c2h4                      1.00E+11    0.0        0.0
776. c3h5-t+o2=c3h4-a+ho2                         1.89E+30   -5.6    15540.0
777. c3h3+h(+m)=>c3h4-a(+m)                       2.00E+13    0.0        0.0
     Low pressure limit:  0.22900E+57 -0.12550E+02  0.79340E+04
     TROE centering:      0.23400E+00  0.33000E+03  0.48080E+04  0.72620E+04
778. c3h4-a+o2=c3h3+ho2                           4.00E+13    0.0    39160.0
        Reverse Arrhenius coefficients:           3.17E+11   -0.1      311.0
779. c3h4-a+o2=>ch2co+ch2o                        1.00E+07    1.5    25000.0
780. c3h4-a+ho2=>c3h4o2h                          3.00E+11    0.0     8000.0
781. c3h4-a+ho2=c3h3+h2o2                         1.80E+13    0.0    19000.0
782. c3h4-a+ho2=>ch2co+ch2+oh                     4.00E+12    0.0    19000.0
783. c3h4-a+ho2=>c2h3cho+oh                       5.00E+11    0.0    19000.0
784. c3h4-a+ho2=>c2h2+ch2o+oh                     5.00E+11    0.0    19000.0
785. c3h4-a+oh=ch2co+ch3                          4.07E+25   -3.4    18370.0
     Declared duplicate reaction...
786. c3h4-a+oh=ch2co+ch3                          1.51E+04    2.2     1759.0
     Declared duplicate reaction...
787. c3h4-a+oh=c3h3+h2o                           5.05E+05    2.4     2879.0
     Declared duplicate reaction...
788. c3h4-a+oh=c3h3+h2o                           5.95E+04    2.5      661.1
     Declared duplicate reaction...
789. c3h4-a+o=c2h2+ch2o                           2.50E-03    4.6    -4243.0
790. c3h4-a+o=c2h4+co                             7.80E+12    0.0     1600.0
791. c3h4-a+h=c3h3+h2                             6.62E+03    3.1     5522.0
792. c3h4-a+ch3=c3h3+ch4                          6.61E-04    5.0     8300.0
793. c3h4-a+c3h5-a=c3h3+c3h6                      2.00E+11    0.0     7700.0
        Reverse Arrhenius coefficients:           2.64E+19   -2.7    42140.0
794. c3h4-a+ho2=>c2h4+co+oh                       1.00E+12    0.0    14000.0
795. c3h4-a+c2h=c3h3+c2h2                         1.00E+13    0.0        0.0
796. c3h4-a+c3h4-a=c2h4+c4h4                      1.09E+15    0.0    48090.0
797. c3h4o2h=c2h3cho+oh                           3.10E+37  -10.1    28588.0
798. c3h4o2h=c3h4o+oh                             1.49E+41   -9.5    22589.0
799. c3h4o=>c2h3cho                               2.45E+14    0.0    58485.0
800. c3h4o+o2=>c3h3o+ho2                          4.00E+13    0.0    61500.0
801. c3h4o+ho2=>ch2co+ch2o+oh                     1.00E+12    0.0    14340.0
802. c3h4o+ho2=>c3h3o+h2o2                        4.00E+12    0.0    17000.0
803. c3h4o+oh=>c3h3o+h2o                          4.79E+13    0.0     5955.0
804. c3h4o+h=>c3h3o+h2                            2.00E+13    0.0     8300.0
805. c3h3o=>c2h3co                                8.51E+14    0.0    14000.0
806. c3h3o+o2=>hcco+hco+oh                        5.01E+12    0.0    19192.0
807. c3h3+h(+m)=>c3h4-p(+m)                       3.00E+13    0.0        0.0
     Low pressure limit:  0.16000E+58 -0.12590E+02  0.83760E+04
     TROE centering:      0.24500E+00  0.33000E+03  0.37060E+04  0.67770E+04
808. c3h4-p+o2=c3h3+ho2                           2.00E+13    0.0    41600.0
        Reverse Arrhenius coefficients:           6.37E+11   -0.2     1021.0
809. c3h4-p+o2=>ch3co+hco                         1.00E+07    1.5    25000.0
810. c3h4-p+o2=>hcco+oh+ch2                       1.00E+07    1.5    30100.0
811. c3h4-p+ho2=>c2h4+co+oh                       3.00E+12    0.0    19000.0
812. c3h4-p+ho2=ch3co+ch2o                        3.00E+12    0.0    16000.0
813. c3h4-p+ho2=ch3cho+hco                        4.50E+12    0.0    16000.0
814. c3h4-p+ho2=c3h3+h2o2                         5.00E+11    0.0    19000.0
815. c3h4-p+oh=c3h3+h2o                           3.87E+05    2.3     2173.0
     Declared duplicate reaction...
816. c3h4-p+oh=c3h3+h2o                           4.93E+04    2.5      -62.0
     Declared duplicate reaction...
817. c3h4-p+oh=ch2co+ch3                          4.07E+26   -4.3    12560.0
     Declared duplicate reaction...
818. c3h4-p+oh=ch2co+ch3                          4.68E+06    1.6     3216.0
     Declared duplicate reaction...
819. c3h4-p+o=ch2co+ch2                           6.40E+12    0.0     2100.0
820. c3h4-p+o=c2h3+hco                            3.20E+12    0.0     2100.0
821. c3h4-p+o=hcco+ch3                            9.18E+12    0.0     2100.0
822. c3h4-p+o=ch2o+c2h2                           3.20E+11    0.0     2100.0
823. c3h4-p+h=c3h3+h2                             3.57E+04    2.8     4821.0
824. c3h4-p+ch3=c3h3+ch4                          2.19E-04    5.0     8300.0
825. c3h4-p+c2h3=c3h3+c2h4                        1.00E+12    0.0     7700.0
826. c3h4-p+c2h=c3h3+c2h2                         1.00E+13    0.0        0.0
827. c3h4-p+o=c3h3+oh                             3.44E+04    2.2     4830.0
828. c2h2+ch2=c3h4-p                              4.20E+12    0.0     6620.0
829. c3h4-p+oh=ch3cohch                           5.69E+39   -8.2    14510.0
     Declared duplicate reaction...
830. c3h4-p+oh=ch3cohch                           6.09E+24   -4.3     3734.0
     Declared duplicate reaction...
831. c3h4-p+oh=ch3cchoh                           9.76E+43   -9.5    15070.0
     Declared duplicate reaction...
832. c3h4-p+oh=ch3cchoh                           1.03E+27   -4.8     3902.0
     Declared duplicate reaction...
833. ch3cohch=ch3coch2                            4.07E+51  -11.7    50020.0
     Declared duplicate reaction...
834. ch3cohch=ch3coch2                            4.93E+26   -4.9    32250.0
     Declared duplicate reaction...
835. ch3cohch=ch3+ch2co                           1.17E+41   -8.6    44710.0
     Declared duplicate reaction...
836. ch3cohch=ch3+ch2co                           5.81E+15   -1.7    29940.0
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     Declared duplicate reaction...
837. c3h4-a+oh=ch2cch2oh                          3.26E+39   -8.1    13360.0
     Declared duplicate reaction...
838. c3h4-a+oh=ch2cch2oh                          5.00E+22   -3.5     2109.0
     Declared duplicate reaction...
839. c3h4-a+oh=ch2cohch2                          1.14E+27   -4.0    11210.0
     Declared duplicate reaction...
840. c3h4-a+oh=ch2cohch2                          9.63E+19   -2.6     1696.0
     Declared duplicate reaction...
841. ch2cohch2=ch2co+ch3                          4.36E+31   -5.5    60870.0
     Declared duplicate reaction...
842. ch2cohch2=ch2co+ch3                          2.66E+10    0.1    46020.0
     Declared duplicate reaction...
843. ch2cohch2+ho2=ch2o+ch2cho+oh                 1.00E+12    0.0        0.0
844. c3h3+o2=ch2co+hco                            1.70E+05    1.7     1500.0
845. c3h3+ho2=oh+co+c2h3                          8.00E+11    0.0        0.0
846. c3h3+oh=c3h2+h2o                             2.00E+13    0.0        0.0
847. c3h3+oh=hco+c2h3                             1.33E+13    0.0        0.0
848. c3h3+o=>c2h2+hco                             1.38E+14    0.0        0.0
849. c3h3+o=c2h3+co                               4.62E+13    0.0        0.0
850. c3h3+o=c2h+ch2o                              4.62E+13    0.0        0.0
851. c3h3+o=>c2h2+co+h                            4.62E+13    0.0        0.0
852. c3h3+h=c3h2+h2                               5.00E+13    0.0     3000.0
853. c3h3+ch=ic4h3+h                              7.00E+13    0.0        0.0
854. c3h3+ch=nc4h3+h                              7.00E+13    0.0        0.0
855. c3h3+ch2=c4h4+h                              4.00E+13    0.0        0.0
856. c3h3+ch3=c4h6                                5.00E+12    0.0        0.0
857. c3h3+ch3(+M)=c4h612(+M)                      1.50E+12    0.0        0.0
     Low pressure limit:  0.26000E+58 -0.11940E+02  0.97700E+04
     TROE centering:      0.17500E+00  0.13406E+04  0.60000E+05  0.97698E+04
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        ar               Enhanced by    7.000E-01
858. c3h3+hco=c3h4-a+co                           2.50E+13    0.0        0.0
859. c3h3+hco=c3h4-p+co                           2.50E+13    0.0        0.0
860. c3h3+hcco=c4h4+co                            2.50E+13    0.0        0.0
861. c3h3+ch3=c2h5+c2h                            4.56E+17   -1.1    48730.0
        Reverse Arrhenius coefficients:           1.81E+13    0.0        0.0
862. ch3+c2h=c3h3+h                               2.41E+13    0.0        0.0
863. c2h2+ch=c3h3                                 3.00E+13    0.0        0.0
864. ch+c2h2=c3h2+h                               1.00E+14    0.0        0.0
865. c3h2+o2=hcco+h+co                            2.00E+12    0.0     1000.0
866. c3h2+o=c2h2+co                               6.80E+13    0.0        0.0
867. c3h2+oh=c2h2+hco                             5.00E+13    0.0        0.0
868. c3h2+ch=c4h2+h                               5.00E+13    0.0        0.0
869. c3h2+ch2=nc4h3+h                             5.00E+13    0.0        0.0
870. c3h2+ch3=c4h4+h                              5.00E+12    0.0        0.0
871. c3h2+hcco=nc4h3+co                           1.00E+13    0.0        0.0
872. c3h5o+o2=c2h3cho+ho2                         1.00E+12    0.0     6000.0
873. c3h5o=c2h3+ch2o                              3.39E+14    0.0    22658.0
874. c3h5o=c2h3cho+h                              1.10E+13    0.0    18451.0
875. c2h5cho=c2h5co+h                             5.00E+15    0.0    85000.0
876. c2h5cho=ch3chcho+h                           5.00E+15    0.0    94990.0
877. c2h5cho=pc2h4cho+h                           8.00E+15    0.0    98000.0
878. c2h5cho=c2h5+hco                             6.00E+14    0.0    79100.0
879. c2h5cho=ch2cho+ch3                           1.00E+17    0.0    84650.0
880. c2h5cho+o2=c2h5co+ho2                        3.01E+13    0.0    39150.0
881. c2h5cho+o2=ch3chcho+ho2                      3.97E+13    0.0    47690.0
882. c2h5cho+o2=pc2h4cho+ho2                      1.98E+13    0.0    50870.0
883. c2h5cho+h=c2h5co+h2                          1.20E+14    0.0     7000.0
884. c2h5cho+h=ch3chcho+h2                        1.30E+06    2.4     4471.0
885. c2h5cho+h=pc2h4cho+h2                        9.50E+04    2.8     6280.0
886. c2h5cho+o=c2h5co+oh                          5.85E+12    0.0     1808.0
887. c2h5cho+o=ch3chcho+oh                        4.77E+04    2.7     2106.0
888. c2h5cho+o=pc2h4cho+oh                        9.50E+04    2.7     3716.0
889. c2h5cho+oh=c2h5co+h2o                        2.35E+10    0.7    -1113.0
890. c2h5cho+oh=ch3chcho+h2o                      4.68E+07    1.6      -35.0
891. c2h5cho+oh=pc2h4cho+h2o                      5.25E+09    1.0     1590.0
892. c2h5cho+ho2=c2h5co+h2o2                      3.10E+12    0.0    11920.0
893. c2h5cho+ho2=ch3chcho+h2o2                    5.60E+12    0.0    17690.0
894. c2h5cho+ho2=pc2h4cho+h2o2                    8.50E+12    0.0    20440.0
895. c2h5cho+ch3=c2h5co+ch4                       1.70E+12    0.0     8440.0
896. c2h5cho+ch3=ch3chcho+ch4                     2.70E+04    2.3     7287.0
897. c2h5cho+ch3=pc2h4cho+ch4                     4.50E-02    3.6     7154.0
898. c2h5cho+hco=c2h5co+ch2o                      1.70E+12    0.0     8440.0
899. c2h5cho+ch3o=c2h5co+ch3oh                    1.15E+11    0.0     1280.0
900. c2h5cho+ch3o2=c2h5co+ch3o2h                  1.00E+12    0.0     9500.0
901. c2h5cho+c2h5=c2h5co+c2h6                     1.70E+12    0.0     8440.0
902. c2h5cho+c2h3=c2h5co+c2h4                     1.70E+12    0.0     8440.0
903. c2h5co+m=c2h5+co+m                           8.64E+15    0.0    14400.0
904. pc2h4cho=c2h4+hco                            8.25E+12   -0.2    21900.0
905. pc2h4cho+o2=o2pc2h4cho                       9.00E+18   -2.5        0.0
906. o2pc2h4cho+ho2=c3ket13+o2                    2.29E+11    0.0    -1790.0
907. o2pc2h4cho+h2o2=c3ket13+ho2                  2.41E+12    0.0     9936.0
908. o2pc2h4cho+ho2=>opc2h4cho+oh+o2              1.40E+16   -1.6     1860.0
909. o2pc2h4cho+ch3o2=>opc2h4cho+ch3o+o2          1.40E+16   -1.6     1860.0
910. opc2h4cho=ch2o+ch2cho                        2.00E+13    0.0    20000.0
911. opc2h4cho+o2=choch2cho+ho2                   8.43E+09    0.0      220.0
912. c2h3+hco=c2h3cho                             1.80E+13    0.0        0.0
913. c2h3cho=c2h4+co                              3.90E+14    0.0    69000.0
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914. c2h3cho+o=oh+c2h3co                          5.01E+12    0.0     1790.0
915. c2h3cho+h=c2h3co+h2                          1.20E+14    0.0     7000.0
916. c2h3cho+oh=c2h3co+h2o                        2.35E+10    0.7    -1113.0
917. c2h3cho+ho2=c2h3co+h2o2                      3.10E+12    0.0    11920.0
918. c2h3cho+ch3=c2h3co+ch4                       1.70E+12    0.0     8440.0
919. c2h3cho+c2h5=c2h3co+c2h6                     5.01E+10    0.0     6280.0
920. c2h3cho+c2h3=c2h4+c2h3co                     1.74E+12    0.0     8440.0
921. c2h3co+m=>c2h3+co+m                          8.60E+15    0.0    23000.0
        h2o              Enhanced by    1.625E+01
        co               Enhanced by    1.875E+00
        co2              Enhanced by    3.750E+00
        ch4              Enhanced by    1.625E+01
        c2h6             Enhanced by    1.625E+01
922. c2h3+ch3co=ch3+c2h3co                        1.81E+13    0.0        0.0
923. ch3coch3(+M)=ch3co+ch3(+M)                   7.02E+21   -1.6    84680.0
     Low pressure limit:  0.70130E+90 -0.20380E+02  0.10722E+06
     TROE centering:      0.86000E+00  0.10000E+11  0.41600E+03  0.32900E+10
924. ch3coch3+o2=ch3coch2+ho2                     6.03E+13    0.0    48500.0
925. ch3coch3+o2=>ch3co+ch3o2                     3.00E+13    0.5    42200.0
926. ch3coch3+o=ch3coch2+oh                       5.13E+11    0.2     4890.0
927. ch3coch3+o=ch3co+ch3o                        5.01E+12    0.0     1800.0
928. ch3coch3+h=ch3coch2+h2                       9.80E+05    2.4     5160.0
929. ch3coch3+oh=ch3coch2+h2o                     3.44E+05    2.4      815.0
930. ch3coch3+oh=ch3co+ch3oh                      1.50E+12    0.0        0.0
931. ch3coch3+ho2=ch3coch2+h2o2                   1.70E+13    0.0    20460.0
932. ch3coch3+ch3=ch3coch2+ch4                    3.96E+11    0.0     9784.0
933. ch3coch3+ch3=ch3co+c2h6                      7.94E+10    0.0     6000.0
934. ch3cho+ch3=h+ch3coch3                        1.66E+10    0.0    12420.0
935. ch3coch2=ch2co+ch3                           1.74E+46   -9.5    58370.0
     Declared duplicate reaction...
936. ch3coch2=ch2co+ch3                           3.96E+24   -3.6    43740.0
     Declared duplicate reaction...
937. ch3coch2+o2=acetoo2                          1.20E+11    0.0    -1100.0
938. acetoo2+ho2=c3ket21+o2                       2.29E+11    0.0    -1790.0
939. acetoo2+h2o2=c3ket21+ho2                     2.41E+12    0.0     9936.0
940. acetoo2+ho2=>acetoo+oh+o2                    1.40E+16   -1.6     1860.0
941. acetoo2+ch3o2=>acetoo+ch3o+o2                1.40E+16   -1.6     1860.0
942. acetoo=ch2o+ch3co                            3.73E+20   -2.2    17260.0
943. acetoo+o2=ch3cocho+ho2                       8.43E+09    0.0      220.0
944. ch3coco+o2=co2+co2+ch3                       3.00E+10    0.0     2870.0
945. ch3coco+ho2=oh+co2+ch3co                     2.00E+13    0.0        0.0
946. ch3co+hco=ch3cocho                           1.00E+13    0.0        0.0
947. ch3cocho+h=ch3coco+h2                        4.00E+13    0.0     4200.0
948. ch3cocho+oh=ch3coco+h2o                      2.69E+10    0.8     -340.0
949. ch3cocho+o=ch3coco+oh                        5.00E+12    0.0     1790.0
950. ch3cocho+ch3=ch3coco+ch4                     1.70E+12    0.0     8440.0
951. ch3cocho+ho2=ch3coco+h2o2                    2.80E+12    0.0    13600.0
952. ch3co+co=ch3coco                             1.50E+11    0.0     3000.0
953. ch2cco+h=c2h3co                              8.00E+11    0.0     2000.0
954. ch2cco+oh=>hccco+h2o                         2.20E+06    2.0     2780.0
955. ch2cco+h=>hccco+h2                           8.20E+05    2.5    12280.0
956. hccco+o2=>hco+co+co                          4.60E+16   -1.4     1010.0
957. choch2cho+o2=choch2co+ho2                    4.00E+13    0.5    42200.0
958. choch2cho+oh=choch2co+h2o                    5.40E+10    0.8     -340.0
959. choch2cho+h=choch2co+h2                      8.00E+13    0.0     4200.0
960. choch2cho+o=choch2co+oh                      1.00E+13    0.0     1790.0
961. choch2cho+ho2=choch2co+h2o2                  5.60E+12    0.0    13600.0
962. choch2cho+ch3o=choch2co+ch3oh                2.30E+11    0.0     1280.0
963. choch2cho+ch3o2=choch2co+ch3o2h              2.00E+12    0.0     9500.0
964. choch2co=>ch2cho+co                          1.83E+15   -0.7    12910.0
965. ch2chchco+h=cjhchchco+h2                     4.21E-03    4.6     2583.0
966. ch2chchco+oh=cjhchchco+h2o                   1.01E+13    0.0     5955.0
967. ch2chchco+ch3=cjhchchco+ch4                  3.31E+00    3.7     9500.0
968. ch2chchco+o=cjhchchco+oh                     1.20E+11    0.7     8959.0
969. ch2chchco+ho2=cjhchchco+h2o2                 8.50E+13    0.0    30430.0
970. ch2chchco+h=co+c3h5-a                        1.10E+13    0.0     3400.0
971. ch2chchco+h=c2h4+hcco                        1.10E+13    0.0     3400.0
972. c2h2+hcco=cjhchchco                          1.61E+40   -8.6    20331.0
973. c2h3+hcco=ch2chchco                          8.00E+12    0.0        0.0
974. ch3+c2h3co=c2h5chco                          1.00E+13    0.0        0.0
975. c4ald3oxo+o2=mecomeco+ho2                    2.00E+13    0.5    42200.0
976. c4ald3oxo+oh=mecomeco+h2o                    2.69E+10    0.8     -340.0
977. c4ald3oxo+h=mecomeco+h2                      4.00E+13    0.0     4200.0
978. c4ald3oxo+o=mecomeco+oh                      5.00E+12    0.0     1790.0
979. c4ald3oxo+ho2=mecomeco+h2o2                  2.80E+12    0.0    13600.0
980. c4ald3oxo+ch3o=mecomeco+ch3oh                1.15E+11    0.0     1280.0
981. c4ald3oxo+ch3o2=mecomeco+ch3o2h              1.00E+12    0.0     9500.0
982. mecomeco=>ch3coch2+co                        1.83E+15   -0.7    12910.0
983. c4ald2oxo+o2=c2h5coco+ho2                    2.00E+13    0.5    42200.0
984. c4ald2oxo+oh=c2h5coco+h2o                    2.69E+10    0.8     -340.0
985. c4ald2oxo+h=c2h5coco+h2                      4.00E+13    0.0     4200.0
986. c4ald2oxo+o=c2h5coco+oh                      5.00E+12    0.0     1790.0
987. c4ald2oxo+ho2=c2h5coco+h2o2                  2.80E+12    0.0    13600.0
988. c4ald2oxo+ch3o=c2h5coco+ch3oh                1.15E+11    0.0     1280.0
989. c4ald2oxo+ch3o2=c2h5coco+ch3o2h              1.00E+12    0.0     9500.0
990. c2h5coco=>c2h5co+co                          1.83E+15   -0.7    12910.0
991. nc4h10=pc4h9+h                               1.58E+16    0.0    97970.0
992. nc4h10=sc4h9+h                               1.00E+16    0.0    94990.0
993. nc4h10+o2=pc4h9+ho2                          3.97E+13    0.0    50870.0
994. nc4h10+o2=sc4h9+ho2                          7.94E+13    0.0    47690.0
995. nc4h10(+M)=c2h5+c2h5(+M)                     2.72E+15    0.0    75610.0
     Low pressure limit:  0.47200E+19  0.00000E+00  0.49576E+05
     TROE centering:      0.72000E+00  0.15000E+04  0.10000E-09  0.10000E+11
996. nc4h10(+M)=nc3h7+ch3(+M)                     4.28E+14    0.0    69900.0
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      Low pressure limit:  0.53400E+18  0.00000E+00  0.42959E+05
      TROE centering:      0.72000E+00  0.15000E+04  0.10000E-09  0.10000E+11
 997. nc4h10+h=pc4h9+h2                          1.88E+05    2.8     6280.0
 998. nc4h10+h=sc4h9+h2                          2.60E+06    2.4     4471.0
 999. nc4h10+o=pc4h9+oh                          1.93E+05    2.7     3716.0
1000. nc4h10+o=sc4h9+oh                          9.54E+04    2.7     2106.0
1001. nc4h10+oh=pc4h9+h2o                        2.73E+07    1.8      868.0
1002. nc4h10+oh=sc4h9+h2o                        1.41E+10    0.9      505.0
1003. nc4h10+ho2=pc4h9+h2o2                      1.68E+13    0.0    20440.0
1004. nc4h10+ho2=sc4h9+h2o2                      1.12E+13    0.0    17690.0
1005. nc4h10+ch3=pc4h9+ch4                       6.00E-01    4.0     8200.0
1006. nc4h10+ch3=sc4h9+ch4                       4.00E+11    0.0     9600.0
1007. nc4h10+ch3o=pc4h9+ch3oh                    4.34E+11    0.0     6460.0
1008. nc4h10+ch3o=sc4h9+ch3oh                    2.90E+11    0.0     4570.0
1009. nc4h10+ch2oh=pc4h9+ch3oh                   1.98E+02    3.0    13970.0
1010. nc4h10+ch2oh=sc4h9+ch3oh                   1.21E+02    3.0    11980.0
1011. nc4h10+ch3o2=pc4h9+ch3o2h                  1.39E+00    4.0    18280.0
1012. nc4h10+ch3o2=sc4h9+ch3o2h                  2.04E+01    3.6    14810.0
1013. nc4h10+c2h3=pc4h9+c2h4                     1.02E+12    0.0    18000.0
1014. nc4h10+c2h3=sc4h9+c2h4                     8.00E+11    0.0    16800.0
1015. nc4h10+c2h5=pc4h9+c2h6                     1.02E+11    0.0    13400.0
1016. nc4h10+c2h5=sc4h9+c2h6                     1.00E+11    0.0    10400.0
1017. nc4h10+c3h5-a=pc4h9+c3h6                   2.40E+02    3.3    19840.0
1018. nc4h10+c3h5-a=sc4h9+c3h6                   1.60E+02    3.3    18170.0
1019. nc4h10+c4h713=pc4h9+c4h8-1                 8.00E+01    3.3    19840.0
1020. nc4h10+c4h713=sc4h9+c4h8-1                 5.33E+01    3.3    18170.0
1021. nc4h10+c4h713=pc4h9+c2c4h8                 8.00E+01    3.3    19840.0
1022. nc4h10+c4h713=sc4h9+c2c4h8                 5.33E+01    3.3    18170.0
1023. nc4h10+c4h713=pc4h9+t2c4h8                 8.00E+01    3.3    19840.0
1024. nc4h10+c4h713=sc4h9+t2c4h8                 5.33E+01    3.3    18170.0
1025. nc4h10+pc4h9o=pc4h9+pc4h9oh                3.16E+11    0.0     7000.0
1026. nc4h10+pc4h9o=sc4h9+pc4h9oh                2.19E+11    0.0     5000.0
1027. nc4h10+sc4h9o=pc4h9+sc4h9oh                3.16E+11    0.0     7000.0
1028. nc4h10+sc4h9o=sc4h9+sc4h9oh                2.19E+11    0.0     5000.0
1029. pc4h9=sc4h9                                3.80E+10    0.7    36600.0
1030. pc4h9=c2h5+c2h4                            3.58E+12    0.5    29480.0
1031. pc4h9=c4h8-1+h                             2.65E+12    0.2    35710.0
1032. pc4h9+o2=c4h8-1+ho2                        5.32E+01    2.8     2086.0
      Declared duplicate reaction...
1033. pc4h9+o2=c4h8-1+ho2                        1.42E+37   -7.3    20864.0
      Declared duplicate reaction...
1034. pc4h9+o2=c4h8-1+ho2                        1.31E-09    5.7     6060.0
      Declared duplicate reaction...
1035. pc4h9+o2=c4h8-1+ho2                        8.06E+00    3.3    12856.0
      Declared duplicate reaction...
1036. pc4h9+ho2=c4h8-1+h2o2                      2.41E+13    0.0        0.0
1037. pc4h9+oh=c4h8-1+h2o                        2.40E+13    0.0        0.0
1038. pc4h9+h=c4h8-1+h2                          1.25E+13    0.0        0.0
1039. pc4h9+ch3=c4h8-1+ch4                       2.00E+12    0.0        0.0
1040. pc4h9+c2h5=c4h8-1+c2h6                     1.60E+12    0.0        0.0
1041. pc4h9+c3h5-a=c4h8-1+c3h6                   1.00E+12    0.0        0.0
1042. pc4h9+c4h713=c4h8-1+c4h8-1                 1.00E+12    0.0        0.0
1043. sc4h9+o=c2h5coch3+h                        4.82E+13    0.0        0.0
1044. sc4h9+o=ch3cho+c2h5                        4.82E+13    0.0        0.0
1045. pc4h9+o=ch2o+nc3h7                         4.82E+13    0.0        0.0
1046. pc4h9+o=nc3h7cho+h                         4.82E+13    0.0        0.0
1047. sc4h9=c3h6+ch3                             4.79E+10    1.0    30360.0
1048. sc4h9=c4h8-1+h                             2.99E+11    0.6    36820.0
1049. sc4h9=t2c4h8+h                             2.85E+11    0.3    35520.0
1050. sc4h9=c2c4h8+h                             2.85E+11    0.3    35520.0
1051. sc4h9+o2=c4h8-1+ho2                        4.35E+07    1.2     2523.0
      Declared duplicate reaction...
1052. sc4h9+o2=c4h8-1+ho2                        2.23E+43   -9.6    18181.0
      Declared duplicate reaction...
1053. sc4h9+o2=c4h8-1+ho2                        8.01E-06    4.6     4928.0
      Declared duplicate reaction...
1054. sc4h9+o2=c4h8-1+ho2                        2.65E+01    3.2    10591.0
      Declared duplicate reaction...
1055. sc4h9+o2=t2c4h8+ho2                        3.55E+01    2.8     2086.0
      Declared duplicate reaction...
1056. sc4h9+o2=t2c4h8+ho2                        9.47E+36   -7.3    20864.0
      Declared duplicate reaction...
1057. sc4h9+o2=t2c4h8+ho2                        8.73E-10    5.7     6060.0
      Declared duplicate reaction...
1058. sc4h9+o2=t2c4h8+ho2                        5.37E+00    3.3    12856.0
      Declared duplicate reaction...
1059. sc4h9+o2=c2c4h8+ho2                        1.77E+01    2.8     2086.0
      Declared duplicate reaction...
1060. sc4h9+o2=c2c4h8+ho2                        4.73E+36   -7.3    20864.0
      Declared duplicate reaction...
1061. sc4h9+o2=c2c4h8+ho2                        4.37E-10    5.7     6060.0
      Declared duplicate reaction...
1062. sc4h9+o2=c2c4h8+ho2                        2.69E+00    3.3    12856.0
      Declared duplicate reaction...
1063. sc4h9+ho2=c4h8-1+h2o2                      2.40E+13    0.0        0.0
1064. sc4h9+ho2=t2c4h8+h2o2                      2.40E+13    0.0        0.0
1065. sc4h9+ho2=c2c4h8+h2o2                      2.40E+13    0.0        0.0
1066. sc4h9+oh=c4h8-1+h2o                        2.40E+13    0.0        0.0
1067. sc4h9+oh=t2c4h8+h2o                        2.40E+13    0.0        0.0
1068. sc4h9+oh=c2c4h8+h2o                        2.40E+13    0.0        0.0
1069. sc4h9+h=c4h8-1+h2                          5.00E+13    0.0        0.0
1070. sc4h9+h=t2c4h8+h2                          5.00E+13    0.0        0.0
1071. sc4h9+h=c2c4h8+h2                          5.00E+13    0.0        0.0
1072. sc4h9+ch3=c4h8-1+ch4                       1.00E+12    0.0        0.0
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1073. sc4h9+ch3=t2c4h8+ch4                          1.00E+12    0.0        0.0
1074. sc4h9+ch3=c2c4h8+ch4                          1.00E+12    0.0        0.0
1075. c2c4h8=t2c4h8                                 3.62E+13    0.0    61330.0
1076. c2c4h8=c4h6+h2                                1.00E+13    0.0    65500.0
1077. c2c4h8=c4h713+h                               1.06E+85  -20.0   132787.0
1078. c2c4h8=c3h5-a+ch3                             2.00E+66  -15.6    97300.0
1079. c3h5-s+ch3(+m)=c2c4h8(+m)                     2.50E+13    0.0        0.0
      Low pressure limit:  0.42700E+59 -0.11940E+02  0.97698E+04
      TROE centering:      0.17500E+00  0.13406E+04  0.60000E+05  0.10140E+05
         h2o              Enhanced by    6.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         ch4              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
         h2               Enhanced by    2.000E+00
         c2h2             Enhanced by    3.000E+00
         c2h4             Enhanced by    3.000E+00
         ar               Enhanced by    7.000E-01
1080. c2c4h8+o2=c4h713+ho2                          4.20E+12    0.0    34400.0
1081. c2c4h8+h=c4h713+h2                            1.00E+13    0.0     3500.0
1082. c2c4h8+o=c4h713+oh                            3.48E+11    0.7     5900.0
1083. c2c4h8+oh=c4h713+h2o                          9.00E+06    2.0      -60.0
1084. c2c4h8+ho2=c4h713+h2o2                        1.92E+04    2.6    13900.0
1085. c2c4h8+ch3=c4h713+ch4                         1.00E+11    0.0     8200.0
1086. c2c4h8+o=ch3co+c2h5                           2.17E+05    2.3    -1050.0
1087. c2c4h8+o=ch3chcho+ch3                         1.81E+05    2.3    -1050.0
1088. c2c4h8+o=ch3cho+c2h4                          3.25E+05    2.3    -1050.0
1089. c2c4h8+h=c3h6+ch3                             3.46E+17   -1.1     6461.0
1090. c2c4h8+h=c4h722+h2                            8.20E+05    2.5     9790.0
1091. c2c4h8+o=c4h722+oh                            1.20E+11    0.7     7630.0
1092. c2c4h8+oh=c4h722+h2o                          2.20E+06    2.0     1450.0
1093. c2c4h8+ch3=c4h722+ch4                         1.96E+00    3.5    11700.0
1094. c2c4h8+ho2=c4h8cy2o3+oh                       4.07E+11    0.0    11940.0
1095. t2c4h8=c4h713+h                               1.06E+85  -20.0   132787.0
1096. t2c4h8=c3h5-a+ch3                             2.00E+66  -15.6    97300.0
1097. c3h5-s+ch3(+m)=t2c4h8(+m)                     2.50E+13    0.0        0.0
      Low pressure limit:  0.42700E+59 -0.11940E+02  0.97698E+04
      TROE centering:      0.17500E+00  0.13406E+04  0.60000E+05  0.10140E+05
         h2o              Enhanced by    6.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         ch4              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
         h2               Enhanced by    2.000E+00
         c2h2             Enhanced by    3.000E+00
         c2h4             Enhanced by    3.000E+00
         ar               Enhanced by    7.000E-01
1098. t2c4h8+o2=c4h713+ho2                          4.20E+12    0.0    34400.0
1099. sc4h9+c4h713=t2c4h8+t2c4h8                    4.33E+14   -0.8     -130.0
1100. sc4h9+c4h713=c2c4h8+t2c4h8                    4.33E+14   -0.8     -130.0
1101. sc4h9+c4h713=c2c4h8+c2c4h8                    4.33E+14   -0.8     -130.0
1102. t2c4h8+h=c4h713+h2                            5.00E+12    0.0     3500.0
1103. t2c4h8+o=c4h713+oh                            3.48E+11    0.7     5900.0
1104. t2c4h8+oh=c4h713+h2o                          9.00E+06    2.0      -60.0
1105. t2c4h8+ho2=c4h713+h2o2                        1.92E+04    2.6    13900.0
1106. t2c4h8+ch3=c4h713+ch4                         1.00E+11    0.0     8200.0
1107. t2c4h8+o=ch3co+c2h5                           2.17E+05    2.3    -1050.0
1108. t2c4h8+o=ch3chcho+ch3                         1.81E+05    2.3    -1050.0
1109. t2c4h8+o=ch3cho+c2h4                          3.25E+05    2.3    -1050.0
1110. t2c4h8+h=c3h6+ch3                             3.46E+17   -1.1     6461.0
1111. t2c4h8+h=c4h722+h2                            8.20E+05    2.5     9790.0
1112. t2c4h8+o=c4h722+oh                            1.20E+11    0.7     7630.0
1113. t2c4h8+oh=c4h722+h2o                          2.20E+06    2.0     1450.0
1114. t2c4h8+ch3=c4h722+ch4                         1.96E+00    3.5    11700.0
1115. t2c4h8+ho2=c4h8cy2o3+oh                       4.07E+11    0.0    11940.0
1116. c4h8-1=c4h713+h                               4.08E+18   -1.0    97350.0
1117. c4h8-1=c3h5-a+ch3                             1.00E+16    0.0    72930.0
1118. c4h8-1=c2h3+c2h5                              1.00E+19   -1.0    96770.0
1119. c4h8-1+o2=c4h713+ho2                          1.40E+12    0.0    35000.0
1120. c4h8-1+o2=c4h714+ho2                          2.10E+13    0.0    52300.0
1121. c4h8-1+ho2=c4h713+h2o2                        6.40E+03    2.6    12400.0
1122. c4h8-1+ho2=c4h714+h2o2                        6.00E+11    0.0    17000.0
1123. c4h8-1+ho2=c4h8cy1o2+oh                       4.07E+11    0.0    11940.0
1124. c4h8-1+oh=c4h713+h2o                          3.00E+06    2.0    -1520.0
1125. c4h8-1+oh=c4h714+h2o                          2.67E+06    2.0      450.0
1126. c4h8-1+oh=c4h712+h2o                          1.10E+06    2.0     1450.0
1127. c4h8-1+oh=c4h711+h2o                          2.20E+06    2.0     2780.0
1128. c4h8-1+o=c3h6+ch2o                            2.50E+12    0.0        0.0
1129. c4h8-1+o=ch3cho+c2h4                          1.25E+13    0.0      850.0
1130. c4h8-1+o=c2h5+ch3+co                          1.62E+13    0.0      850.0
1131. c4h8-1+o=c4h713+oh                            8.80E+10    0.7     3250.0
1132. c4h8-1+o=c4h714+oh                            5.10E+13    0.0     7850.0
1133. c4h8-1+o=c4h712+oh                            6.00E+10    0.7     7630.0
1134. c4h8-1+o=c4h711+oh                            1.20E+11    0.7     8960.0
1135. c4h8-1+h=c4h713+h2                            5.40E+04    2.5    -1900.0
1136. c4h8-1+h=c4h714+h2                            2.85E+07    2.0     7700.0
1137. c4h8-1+h=c4h712+h2                            4.10E+05    2.5     9790.0
1138. c4h8-1+h=c4h711+h2                            8.20E+05    2.5    12280.0
1139. c4h8-1+ch3=c4h714+ch4                         1.00E+11    0.0     7300.0
1140. c4h8-1+ch3=c4h713+ch4                         1.00E+11    0.0     7300.0
1141. c4h8-1+ch3=c4h712+ch4                         9.80E-01    3.5    11700.0
1142. c4h8-1+ch3=c4h711+ch4                         1.38E+00    3.5    12900.0
1143. c4h8-1+hco=c4h713+ch2o                        1.08E+07    1.9    17010.0
1144. c4h8-1+c2h3=c4h713+c2h4                       7.20E+11    0.0     5008.0
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1145. c4h8-1+c2h5=c4h713+c2h6                    1.00E+11    0.0     8300.0
1146. c4h8-1+c3h5-a=c4h713+c3h6                  8.00E+10    0.0    12400.0
1147. c4h8-1+c3h5-s=c4h713+c3h6                  8.00E+10    0.0    12400.0
1148. c4h8-1+c3h5-t=c4h713+c3h6                  8.00E+10    0.0    12400.0
1149. c4h8-1+h=c3h6+ch3                          3.20E+22   -2.4    11180.0
1150. c4h8-1+h=c2h4+c2h5                         8.80E+16   -1.1     6461.0
1151. c4h714+o2=c4h6+ho2                         1.02E+12    0.0    22654.0
1152. c4h714+ho2=c4h6+h2o2                       1.80E+12    0.0        0.0
1153. c4h714+ho2=>c3h5-a+ch2o+oh                 1.00E+12    0.0        0.0
1154. c4h714+oh=c4h6+h2o                         4.00E+13    0.0        0.0
1155. c4h714+o=c4h6+oh                           4.00E+13    0.0        0.0
1156. c4h714+c2h3=c4h6+c2h4                      4.00E+12    0.0        0.0
1157. c4h714+c2h5=c4h6+c2h6                      4.00E+12    0.0        0.0
1158. c4h714+c2h5=c4h8-1+c2h4                    5.00E+11    0.0        0.0
1159. c4h714+c3h3=c4h6+c3h4-p                    4.00E+12    0.0        0.0
1160. c4h714+c3h3=c4h6+c3h4-a                    4.00E+12    0.0        0.0
1161. c4h714+c3h5-a=c4h6+c3h6                    6.30E+12    0.0        0.0
1162. c4h714+c4h714=c4h6+c4h8-1                  3.16E+12    0.0        0.0
1163. c4h714+c2h6=c4h8-1+c2h5                    3.00E+13    0.0    12300.0
1164. c4h714+c2h4=c4h8-1+c2h3                    1.00E+11    0.0    15000.0
1165. c4h714+c3h6=c4h8-1+c3h5-a                  1.00E+11    0.0     9800.0
1166. c4h714+c4h8-1=c4h8-1+c4h713                1.00E+11    0.0     8300.0
1167. c4h714=c4h713                              3.31E-03    4.4    23806.0
1168. c4h714+h(+M)=c4h8-1(+M)                    3.60E+13    0.0        0.0
      Low pressure limit:  0.30100E+49 -0.93200E+01  0.58336E+04
      TROE centering:      0.49800E+00  0.13140E+04  0.13140E+04  0.50000E+05
         h2               Enhanced by    2.000E+00
         h2o              Enhanced by    6.000E+00
         ch4              Enhanced by    2.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
         ar               Enhanced by    7.000E-01
1169. c4h714+h=ch3+c3h5-a                        2.00E+21   -2.0    11000.0
1170. c4h714+h=c4h6+h2                           1.80E+12    0.0        0.0
1171. c4h714+hco=c4h8-1+co                       6.00E+13    0.0        0.0
1172. c4h714+ch3=c4h6+ch4                        1.10E+13    0.0        0.0
1173. c4h6+c4h714=nc4h5+c4h8-1                   6.32E+02    3.1    20010.0
1174. c4h6+c4h714=ic4h5+c4h8-1                   6.32E+02    3.1    18010.0
1175. c4h713=c4h6+h                              3.00E+13    0.0    51500.0
1176. c4h713=c4h612+h                            1.40E+13    0.0    60000.0
1177. c4h713+o2=c4h6+ho2                         6.90E+11    0.0    15200.0
1178. c4h713+o2=c4h612+ho2                       1.00E+12    0.0    22730.0
1179. c4h713+ho2=c4h6+h2o2                       1.00E+12    0.0        0.0
1180. c4h713+ho2=>c2h3cho+ch3+oh                 4.50E+12    0.0        0.0
1181. c4h713+oh=c4h6+h2o                         6.00E+12    0.0        0.0
1182. c4h713+oh=c4h612+h2o                       6.00E+12    0.0        0.0
1183. c4h713+o=c4h6+oh                           4.00E+13    0.0        0.0
1184. c4h713+o=c2h3cho+ch3                       6.03E+13    0.0        0.0
1185. c4h713+h=c4h6+h2                           1.80E+13    0.0        0.0
1186. c4h713+h=c4h612+h2                         1.80E+13    0.0        0.0
1187. c4h714+h=c4h713+h                          1.00E+13    0.0        0.0
1188. c4h713+ch3=c4h6+ch4                        1.00E+13    0.0        0.0
1189. c4h713+c2h3=c4h6+c2h4                      1.00E+13    0.0        0.0
1190. c4h713+c2h3=c4h612+c2h4                    1.00E+13    0.0        0.0
1191. c4h713+c2h5=c4h6+c2h6                      4.00E+12    0.0        0.0
1192. c4h713+c2h5=c4h8-1+c2h4                    5.00E+11    0.0        0.0
1193. c4h713+c3h3=c4h6+c3h4-p                    4.00E+12    0.0        0.0
1194. c4h713+c3h3=c4h6+c3h4-a                    4.00E+12    0.0        0.0
1195. c4h713+c3h5-a=c4h6+c3h6                    6.30E+12    0.0        0.0
1196. c4h713+c3h5-a=c4h8-1+c3h4-a                1.00E+12    0.0        0.0
1197. c4h713+c4h713=c4h6+c4h8-1                  3.00E+12    0.0        0.0
1198. c4h712=c3h4-a+ch3                          2.00E+13    0.0    32500.0
1199. c4h712=butyne+h                            4.00E+12    0.0    38000.0
1200. c4h712=c4h612+h                            3.00E+13    0.0    38000.0
1201. c4h712+o2=>c2h5co+ch2o                     4.60E+16   -1.4     1010.0
1202. c4h722=c3h4-p+ch3                          2.00E+13    0.0    31500.0
1203. c4h722=c4h612+h                            3.00E+13    0.0    40000.0
1204. c4h722=butyn2+h                            4.00E+12    0.0    36500.0
1205. c4h722+o2=>ch3cho+ch3co                    4.60E+16   -1.4     1010.0
1206. c4h711=c2h2+c2h5                           2.00E+13    0.0    33000.0
1207. c4h711+o2=>hco+c2h5cho                     4.60E+16   -1.4     1010.0
1208. c4h711+ch2o=c4h8-1+hco                     5.42E+03    2.8     5862.0
1209. butyne=c3h3+ch3                            3.00E+15    0.0    75800.0
1210. butyne+ho2=nc4h5+h2o2                      5.00E+11    0.0    17000.0
1211. butyne+ho2=ic4h5+h2o2                      5.00E+11    0.0    17000.0
1212. butyne+oh=nc4h5+h2o                        2.60E+02    3.0      200.0
1213. butyne+oh=ic4h5+h2o                        2.60E+02    3.0      200.0
1214. butyne+oh=ch2co+c2h5                       4.00E-04    4.5    -1000.0
1215. butyne+o=c3h6+co                           2.00E+13    0.0     1660.0
1216. butyne+h=c3h4-a+ch3                        1.30E+05    2.5     1000.0
1217. butyne+h=c2h5+c2h2                         6.50E+04    2.5     1000.0
1218. butyne+h=ic4h5+h2                          6.50E+13    0.0     9400.0
1219. butyne+h=nc4h5+h2                          6.50E+13    0.0     9400.0
1220. butyne+ch3=ic4h5+ch4                       1.00E+14    0.0    19500.0
1221. butyne+ch3=nc4h5+ch4                       1.00E+14    0.0    19500.0
1222. butyne=c4h612                              2.50E+13    0.0    65000.0
1223. butyn2=c4h6                                3.00E+13    0.0    65000.0
1224. butyn2=c4h612                              6.90E+13    0.0    64600.0
1225. butyn2+h=c4h612+h                          2.00E+13    0.0     4000.0
1226. butyn2+h=c4h5-2+h2                         3.40E+05    2.5     2490.0
1227. butyn2+h=c3h4-p+ch3                        2.60E+05    2.5     1000.0
1228. butyn2=c4h5-2+h                            3.80E+15    0.0    89200.0
1229. butyn2+ch3=c4h5-2+ch4                      1.40E+14    0.0    18500.0
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1230. c4h5-2=ic4h5	5.00E+12	0.0	50500.0
1231. ic4h5+h=c4h5-2+h	3.10E+26	-3.4	17423.0
1232. c4h5-2+ho2=oh+c2h2+ch3co	8.00E+11	0.0	0.0
1233. c3h3+ch3=c4h612	5.00E+12	0.0	0.0
1234. c4h612=c4h6	2.50E+13	0.0	63000.0
1235. c4h612+h=c3h4-a+ch3	2.00E+13	0.0	2000.0
1236. c4h612+h=c3h4-p+ch3	2.00E+13	0.0	2000.0
1237. c4h612=ic4h5+h	4.20E+15	0.0	92600.0
1238. c4h612+h=c4h6+h	2.00E+13	0.0	4000.0
1239. c4h612+h=ic4h5+h2	1.70E+05	2.5	2490.0
1240. c4h612+ch3=ic4h5+ch4	7.00E+13	0.0	18500.0
1241. c4h612+o=ch2co+c2h4	1.20E+08	1.6	327.0
1242. c4h612+o=ic4h5+oh	1.80E+11	0.7	5880.0
1243. c4h612+oh=ic4h5+h2o	3.10E+06	2.0	-298.0
1244. c2h3+c2h3=c4h6	1.50E+42	-8.8	12483.0
1245. c2h3+c2h4=c4h6+h	5.00E+11	0.0	7310.0
1246. c4h6+h=nc4h5+h2	1.33E+06	2.5	12240.0
1247. c4h6+h=ic4h5+h2	6.65E+05	2.5	9240.0
1248. c4h6+o=nc4h5+oh	7.50E+06	1.9	3740.0
1249. c4h6+o=ic4h5+oh	7.50E+06	1.9	3740.0
1250. c4h6+o=c3h5-a+hco	4.69E+07	1.6	-628.0
1251. c4h6+o=c3h4-p+ch2o	7.02E+07	1.6	-628.0
1252. c4h6+o=c2h3+ch2cho	3.90E+07	1.6	-628.0
1253. c4h6+oh=nc4h5+h2o	1.53E+06	2.1	1905.5
Declared duplicate reaction...			
1254. c4h6+oh=nc4h5+h2o	3.49E+06	2.0	4292.0
Declared duplicate reaction...			
1255. c4h6+oh=ic4h5+h2o	1.54E+06	2.1	1440.6
Declared duplicate reaction...			
1256. c4h6+oh=ic4h5+h2o	1.62E+06	2.0	2150.0
Declared duplicate reaction...			
1257. c4h6+ch3=nc4h5+ch4	2.00E+14	0.0	22800.0
1258. c4h6+ch3=ic4h5+ch4	1.00E+14	0.0	19800.0
1259. c4h6+c2h3=nc4h5+c2h4	5.00E+13	0.0	22800.0
1260. c4h6+c2h3=ic4h5+c2h4	2.50E+13	0.0	19800.0
1261. ic3h7+c2h2=c4h6+ch3	2.77E+10	0.0	6504.0
1262. c4h6=c2h4+c2h2	7.00E+12	0.0	67100.0
1263. c4h6=c4h4+h2	2.50E+15	0.0	94700.0
1264. c4h6+oh=c3h5-a+ch2o	2.80E+12	0.0	-900.0
1265. c4h6+oh=c2h3cho+ch3	2.80E+12	0.0	-900.0
1266. c4h6+oh=ch3cho+c2h3	2.80E+12	0.0	-900.0
1267. c4h6+h=c3h4-a+ch3	6.00E+12	0.0	7100.0
1268. c4h6+h=c3h4-p+ch3	6.00E+12	0.0	7100.0
1269. c2h3cho+c2h3=c4h6+hco	2.80E+21	-2.4	14720.0
1270. c4h6+ho2=c4h6o25+oh	1.20E+12	0.0	14000.0
1271. c4h6+ho2=c2h3choch2+oh	4.80E+12	0.0	14000.0
1272. c4h6o23=sc3h5cho	1.95E+13	0.0	49400.0
1273. c4h6o23=c2h4+ch2co	5.75E+15	0.0	69300.0
1274. c4h6o23=c2h2+c2h4o1,2	1.00E+16	0.0	75800.0
1275. c4h6o25=c4h4o+h2	5.30E+12	0.0	48500.0
1276. c4h4o=co+c3h4-p	1.78E+15	0.0	77500.0
1277. c4h4o=c2h2+ch2co	5.01E+14	0.0	77500.0
1278. c4h6+oh=hoc4h6	1.84E+12	0.0	-1170.0
Declared duplicate reaction...			
1279. c4h6+oh=hoc4h6	5.70E+12	0.0	-570.0
Declared duplicate reaction...			
1280. hoc4h6=>c2h3choch2+h	5.00E+14	0.0	28000.0
1281. hoc4h6=>c2h3coch3+h	1.50E+14	0.0	28000.0
1282. hoc4h6=>ac3h5cho+h	1.50E+14	0.0	28000.0
1283. c4h6+o=>c2h3choch2	1.70E+13	0.0	80.0
1284. c4h6+o=>c2h3coch3	5.00E+12	0.0	80.0
1285. c4h6+o=>ac3h5cho	5.00E+12	0.0	80.0
1286. c2h3choch2=>c2h4+ch2co	5.00E+16	0.0	73000.0
1287. c4h6+ho2=>c4h6o2h	2.00E+11	0.0	8000.0
1288. c4h6o2h=>c2h3cho+oh+ch2	1.00E+10	0.0	19500.0
1289. c4h6o2h=>c2h3choch2+oh	2.00E+11	0.0	19500.0
1290. c4h6o2h=>c2h3coch3+oh	7.00E+10	0.0	19500.0
1291. c4h6o2h=>ac3h5cho+oh	7.00E+10	0.0	19500.0
1292. c4h5o+o2=>c2h3cho+co+oh	1.00E+12	0.0	25000.0
1293. c4h5o=>ch2co+c2h3	1.00E+15	0.0	65000.0
1294. c4h5o=>co+c3h5-a	5.00E+14	0.0	60000.0
1295. ic4h5+h=c4h4+h2	3.00E+13	0.0	0.0
1296. ic4h5+h=c3h3+ch3	2.00E+13	0.0	2000.0
1297. ic4h5+oh=c4h4+h2o	4.00E+12	0.0	0.0
1298. ic4h5+hco=c4h6+co	5.00E+12	0.0	0.0
1299. ic4h5+ho2=c4h6+o2	6.00E+11	0.0	0.0
1300. ic4h5+h2o2=c4h6+ho2	1.21E+10	0.0	-596.0
1301. ic4h5+o=>ch2co+c2h3	1.00E+13	0.0	2000.0
1302. ic4h5+ch2o=c4h6+hco	4.00E+12	0.0	8840.0
1303. nc4h5+o=>c3h5-a+co	1.00E+13	0.0	2000.0
1304. nc4h5+ch2o=c4h6+hco	4.00E+12	0.0	8840.0
1305. nc4h5+h=c4h4+h2	1.50E+13	0.0	0.0
1306. nc4h5+oh=c4h4+h2o	2.00E+12	0.0	0.0
1307. nc4h5+hco=c4h6+co	5.00E+12	0.0	0.0
1308. nc4h5+h2o2=c4h6+ho2	1.21E+10	0.0	-596.0
1309. nc4h5+ho2=c4h6+o2	6.00E+11	0.0	0.0
1310. nc4h5+o2=c4h4+ho2	3.25E+19	-2.3	7932.0
1311. c2h6+nc4h5=c2h5+c4h6	6.00E+12	0.0	0.0
1312. c2h+c2h3=c4h4	1.00E+14	0.0	0.0
1313. c4h4=c2h2+c2h2	3.40E+13	0.0	77102.0
1314. c4h4=c4h2+h2	1.30E+15	0.0	94680.0
1315. c4h4+o2=nc4h3+ho2	1.00E+13	0.0	63200.0
1316. c4h4+o2=ic4h3+ho2	1.00E+13	0.0	44640.0
1317. c4h4+ho2=nc4h3+h2o2	2.00E+11	0.0	12600.0

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1318. c4h4+ho2=ic4h3+h2o2                          1.00E+11    0.0     9920.0
1319. c4h4+h=nc4h3+h2                              6.65E+05    2.5    12240.0
1320. c4h4+h=ic4h3+h2                              3.33E+05    2.5     9240.0
1321. c4h4+oh=nc4h3+h2o                            3.10E+07    2.0     3430.0
1322. c4h4+oh=ic4h3+h2o                            1.55E+07    2.0      430.0
1323. c4h4+o=c3h3+hco                              6.00E+08    1.4     -860.0
1324. c2h4+c2h=c4h4+h                              1.20E+13    0.0        0.0
1325. c2h2+c2h2=ic4h3+h                            1.13E+14    0.0    56000.0
1326. ic4h3+o2=ch2co+hcco                          1.00E+12    0.0        0.0
1327. ic4h3+oh=c4h2+h2o                            3.00E+13    0.0        0.0
1328. ic4h3+o=h2c4o+h                              2.00E+13    0.0        0.0
1329. ic4h3+h=c4h2+h2                              1.02E+13    0.0        0.0
1330. ic4h3(+M)=c4h2+h(+M)                         1.00E+14    0.0    55000.0
      Low pressure limit:  0.25000E+16  0.00000E+00  0.48000E+05
1331. nc4h3(+M)=c4h2+h(+M)                         1.00E+14    0.0    36000.0
      Low pressure limit:  0.10000E+15  0.00000E+00  0.30000E+05
1332. nc4h3+oh=c4h2+h2o                            3.00E+13    0.0        0.0
1333. nc4h3+h=c4h2+h2                              5.00E+13    0.0        0.0
1334. c2h2+c2h(+M)=nc4h3(+M)                       8.30E+10    0.9     -363.0
      Low pressure limit:  0.12400E+32 -0.47180E+01  0.18710E+04
      TROE centering:      0.10000E+01  0.10000E+03  0.56130E+04  0.13387E+05
         h2               Enhanced by    2.000E+00
         h2o              Enhanced by    6.000E+00
         ch4              Enhanced by    2.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
         c2h2             Enhanced by    2.500E+00
         c2h4             Enhanced by    2.500E+00
1335. c2h2+c2h(+M)=ic4h3(+M)                       8.30E+10    0.9     -363.0
      Low pressure limit:  0.12400E+32 -0.47180E+01  0.18710E+04
      TROE centering:      0.10000E+01  0.10000E+03  0.56130E+04  0.13387E+05
         h2               Enhanced by    2.000E+00
         h2o              Enhanced by    6.000E+00
         ch4              Enhanced by    2.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
         c2h2             Enhanced by    2.500E+00
         c2h4             Enhanced by    2.500E+00
1336. h2c4o+oh=ch2co+hcco                          1.00E+07    2.0     2000.0
1337. h2c4o+h=c2h2+hcco                            5.00E+13    0.0     3000.0
1338. c2h2+c2h=c4h2+h                              1.94E+13    0.2      -70.0
1339. c4h2+M=c4h+h+M                               3.50E+17    0.0    80065.0
1340. c4h2+oh=h2c4o+h                              6.66E+12    0.0     -410.0
1341. c4h2+o=c3h2+co                               1.20E+12    0.0        0.0
1342. pc4h9oh(+M)=h2o+c4h8-1(+M)                   3.52E+13    0.0    67230.0
      Low pressure limit:  0.16900E+76 -0.17040E+02  0.64750E+05
      TROE centering:      0.80000E-01  0.10000E+01  0.99240E+10  0.99240E+10
1343. h+pc4h8oh-1=pc4h9oh                          4.00E+13    0.0        0.0
1344. h+pc4h8oh-2=pc4h9oh                          4.00E+13    0.0        0.0
1345. h+pc4h8oh-3=pc4h9oh                          4.00E+13    0.0        0.0
1346. h+pc4h8oh-4=pc4h9oh                          4.00E+13    0.0        0.0
1347. pc4h9oh(+M)=pc4h9o+h(+M)                     6.04E+14    0.1   103800.0
      Low pressure limit:  0.24080E+40 -0.70300E+01  0.95960E+05
      TROE centering:      0.38650E+00  0.56491E+03  0.44380E+10  0.67100E+10
1348. pc4h9oh(+m)<=>ch3+nc3h6oh-3(+m)              3.79E+24   -2.2    88070.0
      Low pressure limit:  0.17820E+61 -0.12280E+02  0.83980E+05
      TROE centering:      0.23520E+00  0.72400E+03  0.50000E+10  0.50000E+10
1349. pc4h9oh(+m)<=>c2h5+pc2h4oh(+m)               5.53E+24   -2.2    89010.0
      Low pressure limit:  0.66320E+60 -0.12130E+02  0.84720E+05
      TROE centering:      0.24380E+00  0.74406E+03  0.50000E+10  0.50000E+10
1350. pc4h9oh(+M)=ch2oh+nc3h7(+M)                  3.02E+23   -1.9    85710.0
      Low pressure limit:  0.14160E+60 -0.11930E+02  0.83980E+05
      TROE centering:      0.76460E+00  0.83440E+10  0.72480E+03  0.82140E+10
1351. pc4h9oh(+M)=pc4h9+oh(+M)                     6.33E+20   -1.4    94930.0
      Low pressure limit:  0.69020E+52 -0.10210E+02  0.89200E+05
      TROE centering:      0.70300E+00  0.98820E+10  0.63468E+03  0.17860E+10
1352. pc4h9oh+o2=ho2+pc4h8oh-4                     3.00E+13    0.0    52340.0
1353. pc4h9oh+o2=ho2+pc4h8oh-3                     2.00E+13    0.0    49800.0
1354. pc4h9oh+o2=ho2+pc4h8oh-2                     2.00E+13    0.0    49800.0
1355. pc4h9oh+o2=ho2+pc4h8oh-1                     2.00E+13    0.0    46800.0
1356. pc4h9oh+o2=ho2+pc4h9o                        1.00E+13    0.0    56340.0
1357. pc4h9oh+h<=>pc4h9o+h2                        5.55E-23   10.6    -4459.0
1358. pc4h9oh+oh<=>pc4h9o+h2o                      2.81E+02    3.0     -580.0
1359. pc4h9oh+o<=>pc4h9o+oh                        1.46E-03    4.7     1727.0
1360. pc4h9oh+ho2<=>pc4h9o+h2o2                    2.50E+12    0.0    24000.0
1361. pc4h9oh+ch3<=>pc4h9o+ch4                     2.04E+00    3.6     7722.0
1362. pc4h9oh+ch3o<=>pc4h9o+ch3oh                  2.30E+10    0.0     2900.0
1363. pc4h9oh+ch3o2<=>pc4h9o+ch3o2h                1.50E+12    0.0    15000.0
1364. pc4h9oh+c2h5<=>pc4h9o+c2h6                   1.00E+11    0.0     9200.0
1365. pc4h9oh+o=pc4h8oh-1+oh                       1.45E+05    2.4      876.0
1366. pc4h9oh+o=pc4h8oh-2+oh                       4.77E+04    2.7     2106.0
1367. pc4h9oh+o=pc4h8oh-3+oh                       4.77E+04    2.7     2106.0
1368. pc4h9oh+o=pc4h8oh-4+oh                       1.93E+05    2.7     3716.0
1369. pc4h9oh+h=pc4h8oh-1+h2                       1.79E+05    2.5     3420.0
1370. pc4h9oh+h=pc4h8oh-2+h2                       1.30E+06    2.4     4471.0
1371. pc4h9oh+h=pc4h8oh-3+h2                       1.30E+06    2.4     4471.0
1372. pc4h9oh+h=pc4h8oh-4+h2                       1.88E+05    2.8     6280.0
1373. pc4h9oh+oh=pc4h8oh-1+h2o                     1.31E+05    2.4    -1457.0
1374. pc4h9oh+oh=pc4h8oh-2+h2o                     4.68E+07    1.6      -35.0
1375. pc4h9oh+oh=pc4h8oh-3+h2o                     4.68E+07    1.6      -35.0
1376. pc4h9oh+oh=pc4h8oh-4+h2o                     1.05E+10    1.0     1590.0
1377. pc4h9oh+ho2=pc4h8oh-1+h2o2                   8.20E+03    2.5    10750.0
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1378.	pc4h9oh+ho2=pc4h8oh-2+h2o2	5.60E+12	0.0	17690.0
1379.	pc4h9oh+ho2=pc4h8oh-3+h2o2	5.60E+12	0.0	17690.0
1380.	pc4h9oh+ho2=pc4h8oh-4+h2o2	1.68E+13	0.0	20440.0
1381.	pc4h9oh+ch3=pc4h8oh-1+ch4	1.99E+01	3.4	7635.0
1382.	pc4h9oh+ch3=pc4h8oh-2+ch4	2.70E+04	2.3	7287.0
1383.	pc4h9oh+ch3=pc4h8oh-3+ch4	2.70E+04	2.3	7287.0
1384.	pc4h9oh+ch3=pc4h8oh-4+ch4	9.04E-01	3.6	7154.0
1385.	pc4h8oh-1=ch3cho+c2h5	1.52E+12	0.6	29120.0
1386.	pc4h8oh-2=c2h5cho+ch3	2.00E+13	0.0	31000.0
1387.	pc4h8oh-3=c3h6+ch2oh	4.23E+10	1.0	28170.0
1388.	pc4h8oh-4=pc2h4oh+c2h4	2.00E+13	0.0	28700.0
1389.	nc3h7cho+h<=>pc4h8oh-1	8.00E+12	0.0	9500.0
1390.	pc4h9o<=>pc4h8oh-4	1.32E-01	3.6	2689.0
1391.	pc4h9o<=>pc4h8oh-3	5.32E-10	6.2	6710.0
1392.	pc4h8oh-4<=>pc4h8oh-1	3.30E-19	8.6	5268.0
1393.	c2h3oh<=>c2h3+oh	6.90E+21	-1.6	110700.0
	Reverse Arrhenius coefficients:	2.41E+13	0.0	0.0
1394.	c2h3oh<=>ch2cho+h	3.64E+15	-0.4	95390.0
	Reverse Arrhenius coefficients:	2.40E+13	0.0	12510.0
1395.	c2h3oh+o2<=>ch2cho+ho2	5.31E+11	0.2	39830.0
	Reverse Arrhenius coefficients:	7.33E+09	0.5	5816.0
1396.	c2h3oh+h<=>ch2cho+h2	9.81E+02	3.4	3537.0
	Reverse Arrhenius coefficients:	2.58E+00	4.0	24210.0
1397.	c2h3oh+o<=>ch2cho+oh	1.88E+06	1.9	-860.0
	Reverse Arrhenius coefficients:	2.56E+03	2.6	18410.0
1398.	c2h3oh+oh<=>ch2cho+h2o	3.33E+09	1.1	540.5
	Reverse Arrhenius coefficients:	9.29E+07	1.7	36110.0
1399.	c2h3oh+ch3<=>ch2cho+ch4	2.03E-08	5.9	1052.0
	Reverse Arrhenius coefficients:	4.87E-08	6.1	23270.0
1400.	c2h3oh+ho2<=>ch2cho+h2o2	3.40E+03	2.5	8922.0
	Reverse Arrhenius coefficients:	5.18E+03	2.5	13600.0
1401.	c2h3oh+ch3o2<=>ch2cho+ch3o2h	3.40E+03	2.5	8922.0
	Reverse Arrhenius coefficients:	1.01E+05	2.0	12000.0
1402.	sc4h9oh+h<=>sc4h9o+h2	5.55E-23	10.6	-4459.0
1403.	sc4h9oh+oh<=>sc4h9o+h2o	2.81E+02	3.0	-580.0
1404.	sc4h9oh+o<=>sc4h9o+oh	1.46E-03	4.7	1727.0
1405.	sc4h9oh+ho2<=>sc4h9o+h2o2	2.50E+12	0.0	24000.0
1406.	sc4h9oh+ch3<=>sc4h9o+ch4	2.04E+00	3.6	7722.0
1407.	sc4h9oh+hco<=>sc4h9o+ch2o	3.40E+04	2.5	13500.0
1408.	sc4h9oh+ch3o<=>sc4h9o+ch3oh	2.30E+10	0.0	2900.0
1409.	sc4h9oh+ch3o2<=>sc4h9o+ch3o2h	1.50E+12	0.0	15000.0
1410.	sc4h9oh+c2h5<=>sc4h9o+c2h6	1.00E+11	0.0	9200.0
1411.	sc4h9oh+o=sc4h8oh-1+oh	1.93E+05	2.7	3716.0
1412.	sc4h9oh+o=sc4h8oh-3+oh	4.77E+04	2.7	2106.0
1413.	sc4h9oh+h=sc4h8oh-1+h2	1.88E+05	2.8	6280.0
1414.	sc4h9oh+h=sc4h8oh-3+h2	1.30E+06	2.4	4471.0
1415.	sc4h9oh+oh=sc4h8oh-1+h2o	1.05E+10	1.0	1590.0
1416.	sc4h9oh+oh=sc4h8oh-3+h2o	4.68E+07	1.6	-35.0
1417.	sc4h9oh+ho2=sc4h8oh-1+h2o2	1.68E+13	0.0	20440.0
1418.	sc4h9oh+ho2=sc4h8oh-3+h2o2	5.60E+12	0.0	17690.0
1419.	sc4h9oh+ch3=sc4h8oh-1+ch4	9.04E-01	3.6	7154.0
1420.	sc4h9oh+ch3=sc4h8oh-3+ch4	2.70E+04	2.3	7287.0
1421.	nc3h7cho=nc3h7co+h	5.00E+15	0.0	85000.0
1422.	nc3h7cho=c3h6cho-2+h	5.00E+15	0.0	94990.0
1423.	nc3h7cho=c3h6cho-3+h	5.00E+15	0.0	94990.0
1424.	nc3h7cho=c3h6cho-4+h	8.00E+15	0.0	98000.0
1425.	nc3h7cho=>nc3h7+hco	6.00E+14	0.0	79100.0
1426.	nc3h7cho=pc2h4cho+ch3	1.00E+17	0.0	84650.0
1427.	nc3h7cho=c2h5+ch2cho	1.58E+17	0.0	80280.0
1428.	nc3h7cho+o2=nc3h7co+ho2	3.00E+13	0.0	39150.0
1429.	nc3h7cho+o2=c3h6cho-2+ho2	4.00E+13	0.0	47690.0
1430.	nc3h7cho+o2=c3h6cho-3+ho2	4.00E+13	0.0	47690.0
1431.	nc3h7cho+o2=c3h6cho-4+ho2	4.00E+13	0.0	50870.0
1432.	nc3h7cho+h=nc3h7co+h2	4.10E+09	1.2	2405.0
1433.	nc3h7cho+h=c3h6cho-2+h2	1.30E+06	2.4	4471.0
1434.	nc3h7cho+h=c3h6cho-3+h2	1.30E+06	2.4	4471.0
1435.	nc3h7cho+h=c3h6cho-4+h2	9.50E+04	2.8	6280.0
1436.	nc3h7cho+o=nc3h7co+oh	5.85E+12	0.0	1808.0
1437.	nc3h7cho+o=c3h6cho-2+oh	4.77E+04	2.7	2106.0
1438.	nc3h7cho+o=c3h6cho-3+oh	4.77E+04	2.7	2106.0
1439.	nc3h7cho+o=c3h6cho-4+oh	9.50E+04	2.7	3716.0
1440.	nc3h7cho+oh=nc3h7co+h2o	2.35E+10	0.7	-1113.0
1441.	nc3h7cho+oh=c3h6cho-2+h2o	4.68E+07	1.6	-35.0
1442.	nc3h7cho+oh=c3h6cho-3+h2o	4.68E+07	1.6	-35.0
1443.	nc3h7cho+oh=c3h6cho-4+h2o	5.25E+09	1.0	1590.0
1444.	nc3h7cho+ho2=nc3h7co+h2o2	3.10E+12	0.0	11920.0
1445.	nc3h7cho+ho2=c3h6cho-2+h2o2	5.60E+12	0.0	17690.0
1446.	nc3h7cho+ho2=c3h6cho-3+h2o2	5.60E+12	0.0	17690.0
1447.	nc3h7cho+ho2=c3h6cho-4+h2o2	8.50E+12	0.0	20440.0
1448.	nc3h7cho+ch3=nc3h7co+ch4	1.70E+12	0.0	8440.0
1449.	nc3h7cho+ch3=c3h6cho-2+ch4	2.70E+04	2.3	7287.0
1450.	nc3h7cho+ch3=c3h6cho-3+ch4	2.70E+04	2.3	7287.0
1451.	nc3h7cho+ch3=c3h6cho-4+ch4	4.50E-03	3.6	7154.0
1452.	nc3h7cho+hco=nc3h7co+ch2o	1.70E+12	0.0	8440.0
1453.	nc3h7cho+ch3o=nc3h7co+ch3oh	1.15E+11	0.0	1280.0
1454.	nc3h7cho+ch3o=c3h6cho-2+ch3oh	1.10E+11	0.0	5000.0
1455.	nc3h7cho+ch3o=c3h6cho-3+ch3oh	1.10E+11	0.0	5000.0
1456.	nc3h7cho+ch3o=c3h6cho-4+ch3oh	1.58E+11	0.0	7000.0
1457.	nc3h7cho+ch3o2=nc3h7co+ch3o2h	1.00E+12	0.0	9500.0
1458.	nc3h7cho+c2h5=nc3h7co+c2h6	1.70E+12	0.0	8440.0
1459.	nc3h7cho+c2h3=nc3h7co+c2h4	1.70E+12	0.0	8440.0
1460.	nc3h7co=c2h5chco+h	4.66E+10	0.8	42550.0
1461.	nc3h7co=ch2co+c2h5	2.74E+09	1.4	35830.0
1462.	nc3h7co+m=nc3h7+co+m	8.64E+15	0.0	14400.0

1463.	c3h6cho-4+o2=c3h6cho-4o2	9.00E+18	-2.5	0.0
1464.	c3h6cho-4o2+ho2=but4ooh1*o+o2	2.29E+11	0.0	-1790.0
1465.	c3h6cho-4o2+h2o2=but4ooh1*o+ho2	2.41E+12	0.0	9936.0
1466.	c3h6cho-4o2+ho2=>c3h6cho-4o+oh+o2	1.40E+16	-1.6	1860.0
1467.	c3h6cho-4o2+ch3o2=>c3h6cho-4o+ch3o+o2	1.40E+16	-1.6	1860.0
1468.	c3h6cho-4o=ch2o+pc2h4cho	2.00E+13	0.0	20000.0
1469.	c3h6cho-4o+o2=choc2h4cho+ho2	8.43E+09	0.0	220.0
1470.	c3h6cho-3+o2=c3h6cho-3o2	9.00E+18	-2.5	0.0
1471.	c3h6cho-3o2+ho2=but3ooh1*o+o2	2.29E+11	0.0	-1790.0
1472.	c3h6cho-3o2+h2o2=but3ooh1*o+ho2	2.41E+12	0.0	9936.0
1473.	c3h6cho-3o2+ho2=>c3h6cho-3o+oh+o2	1.40E+16	-1.6	1860.0
1474.	c3h6cho-3o2+ch3o2=>c3h6cho-3o+ch3o+o2	1.40E+16	-1.6	1860.0
1475.	c3h6cho-3o=ch3cho+ch2cho	2.00E+13	0.0	20000.0
1476.	c3h6cho-3o+o2=c4ald2oxo+ho2	8.43E+09	0.0	220.0
1477.	c3h6cho-2+o2=c3h6cho-2o2	9.00E+18	-2.5	0.0
1478.	c3h6cho-2o2+ho2=but2ooh1*o+o2	2.29E+11	0.0	-1790.0
1479.	c3h6cho-2o2+h2o2=but2ooh1*o+ho2	2.41E+12	0.0	9936.0
1480.	c3h6cho-2o2+ho2=>c3h6cho-2o+oh+o2	1.40E+16	-1.6	1860.0
1481.	c3h6cho-2o2+ch3o2=>c3h6cho-2o+ch3o+o2	1.40E+16	-1.6	1860.0
1482.	c3h6cho-2o=chocho+c2h5	2.00E+13	0.0	20000.0
1483.	c3h6cho-2o+o2=c4ald3oxo+ho2	8.43E+09	0.0	220.0
1484.	c4h8-1+oh=pc4h8oh-2	5.00E+53	-12.2	22976.0
	Declared duplicate reaction...			
1485.	c4h8-1+oh=pc4h8oh-2	4.28E+41	-9.3	8921.0
	Declared duplicate reaction...			
1486.	c4h8-1+oh=sc4h8oh-1	5.00E+53	-12.2	22976.0
	Declared duplicate reaction...			
1487.	c4h8-1+oh=sc4h8oh-1	4.28E+41	-9.3	8921.0
	Declared duplicate reaction...			
1488.	c2c4h8+oh=sc4h8oh-3	5.00E+53	-12.2	22976.0
	Declared duplicate reaction...			
1489.	c2c4h8+oh=sc4h8oh-3	4.28E+41	-9.3	8921.0
	Declared duplicate reaction...			
1490.	t2c4h8+oh=sc4h8oh-3	5.00E+53	-12.2	22976.0
	Declared duplicate reaction...			
1491.	t2c4h8+oh=sc4h8oh-3	4.28E+41	-9.3	8921.0
	Declared duplicate reaction...			
1492.	pc4h8oh-2+o2=pc4h8oh-2oo	1.80E+19	-2.5	0.0
1493.	sc4h8oh-1+o2=sc4h8oh-1oo	1.50E+18	-2.5	0.0
1494.	sc4h8oh-3+o2=sc4h8oh-3oo	9.50E+18	-2.5	0.0
1495.	pc4h8oh-2oo=c2h5cho+ch2o+oh	1.00E+09	0.0	30.0
1496.	sc4h8oh-1oo=c2h5cho+ch2o+oh	1.00E+09	0.0	30.0
1497.	sc4h8oh-3oo=ch3cho+ch3cho+oh	1.00E+09	0.0	30.0
1498.	pc4h8oh-1+o2=nc3h7cho+ho2	1.00E+13	0.0	5564.0
1499.	pc4h8oh-2+o2=nc3h7cho+ho2	1.00E+13	0.0	2500.0
1500.	sc4h8oh-1=ch3cho+c2h5	1.52E+12	0.6	31120.0
1501.	sc4h8oh-1+o2=c2h5coch3+ho2	2.25E+11	0.0	2500.0
1502.	sc4h8oh-3=ch3+c2h5cho	1.52E+12	0.6	31120.0
1503.	sc4h8oh-3+o2=c2h5coch3+ho2	2.25E+11	0.0	2500.0
1504.	nc4h10+c4h91o2=pc4h9+c4h91o2h	1.68E+13	0.0	20440.0
1505.	nc4h10+c4h91o2=sc4h9+c4h91o2h	1.12E+13	0.0	17690.0
1506.	nc4h10+c4h92o2=pc4h9+c4h92o2h	1.68E+13	0.0	20440.0
1507.	nc4h10+c4h92o2=sc4h9+c4h92o2h	1.12E+13	0.0	17690.0
1508.	pc4h9+o2=c4h91o2	1.15E+20	-2.4	2451.3
1509.	sc4h9+o2=c4h92o2	6.74E+27	-4.8	3779.8
1510.	c2h5o2+ch3o2=>c2h5oh+ch2o+o2	1.34E+11	0.0	0.0
1511.	c2h5o2+ch3o2=>ch3cho+ch3oh+o2	1.34E+11	0.0	0.0
1512.	c4h91o2+ch3o2=>pc4h9oh+ch2o+o2	1.34E+11	0.0	0.0
1513.	c4h91o2+ch3o2=>nc3h7cho+ch3oh+o2	1.34E+11	0.0	0.0
1514.	c4h92o2+ch3o2=>sc4h9oh+ch2o+o2	1.34E+11	0.0	0.0
1515.	c4h92o2+ch3o2=>c2h5coch3+ch3oh+o2	1.34E+11	0.0	0.0
1516.	c4h91o2+c4h91o2=>pc4h9oh+nc3h7cho+o2	5.00E+10	0.0	0.0
1517.	c4h91o2+c4h92o2=>pc4h9oh+c2h5coch3+o2	5.00E+10	0.0	0.0
1518.	c4h91o2+c4h92o2=>nc3h7cho+sc4h9oh+o2	5.00E+10	0.0	0.0
1519.	c4h92o2+c4h92o2=>sc4h9oh+c2h5coch3+o2	5.00E+10	0.0	0.0
1520.	but1ooh2o2+ch3o2=>but2ooh1*o+ch3oh+o2	1.34E+11	0.0	0.0
1521.	but1ooh3o2+ch3o2=>but3ooh1*o+ch3oh+o2	1.34E+11	0.0	0.0
1522.	but1ooh4o2+ch3o2=>but4ooh1*o+ch3oh+o2	1.34E+11	0.0	0.0
1523.	but2ooh1o2+ch3o2=>but1ooh2*o+ch3oh+o2	1.34E+11	0.0	0.0
1524.	but2ooh3o2+ch3o2=>but3ooh2*o+ch3oh+o2	1.34E+11	0.0	0.0
1525.	but2ooh4o2+ch3o2=>but4ooh2*o+ch3oh+o2	1.34E+11	0.0	0.0
1526.	c4h91o2=c4h81ooh2j	2.54E-01	3.7	24800.0
1527.	c4h91o2=c4h81ooh3j	6.36E+04	1.8	17200.0
1528.	c4h91o2=c4h81ooh4j	2.62E+03	2.2	19100.0
1529.	c4h92o2=c4h82ooh1j	9.13E-04	4.6	26900.0
1530.	c4h92o2=c4h82ooh3j	2.54E-01	3.7	24800.0
1531.	c4h92o2=c4h82ooh4j	1.41E+04	2.2	19800.0
1532.	c4h81ooh2j+o2=but1ooh2o2	9.00E+18	-2.5	0.0
1533.	c4h81ooh3j+o2=but1ooh3o2	8.50E+18	-2.5	0.0
1534.	c4h81ooh4j+o2=but1ooh4o2	4.50E+18	-2.5	0.0
1535.	c4h82ooh1j+o2=but2ooh1o2	7.50E+17	-2.5	0.0
1536.	c4h82ooh3j+o2=but2ooh3o2	4.75E+18	-2.5	0.0
1537.	c4h82ooh4j+o2=but2ooh4o2	4.50E+18	-2.5	0.0
1538.	but1ooh2o2=>but2ooh1*o+oh	2.54E-01	3.7	22800.0
1539.	but1ooh3o2=>but3ooh1*o+oh	6.36E+04	1.8	17200.0
1540.	but1ooh4o2=>but4ooh1*o+oh	2.00E+04	1.7	16100.0
1541.	but2ooh1o2=>but1ooh2*o+oh	1.20E+01	3.1	22500.0
1542.	but2ooh3o2=>but3ooh2*o+oh	1.20E+01	3.1	22500.0
1543.	but2ooh4o2=>but4ooh2*o+oh	1.29E+05	1.7	14600.0
1544.	but2ooh1*o=>c2h5cho+hco+oh	2.50E+15	0.0	43000.0
1545.	but3ooh1*o=>ch3cho+ch2cho+oh	2.50E+15	0.0	43000.0
1546.	but4ooh1*o=>ch2o+pc2h4cho+oh	2.50E+15	0.0	43000.0
1547.	but1ooh2*o=>c2h5co+ch2o+oh	2.50E+15	0.0	43000.0
1548.	but3ooh2*o=>ch3co+ch3cho+oh	2.50E+15	0.0	43000.0

1549. but4ooh2*o=>ch2o+ch3coch2+oh	2.50E+15	0.0	43000.0
1550. but4ooh2*o=>ch3cooh+ch3cho	2.10E+08	0.0	24500.0
1551. but3ooh1*o=>ch3coch3+hcooh	2.10E+08	0.0	24500.0
1552. but3ooh1*o=>ch3cooh+ch3cho	2.10E+08	0.0	24500.0
1553. c4h81ooh2j=c4h8cy1o2+oh	3.30E+10	0.5	12600.0
1554. c4h81ooh3j=c4h8cy1o3+oh	1.20E+10	0.3	17700.0
1555. c4h81ooh4j=c4h8cy1o4+oh	2.26E+09	0.3	12800.0
1556. c4h82ooh1j=c4h8cy1o2+oh	1.24E+11	0.5	14500.0
1557. c4h82ooh3j=c4h8cy2o3+oh	3.30E+10	0.5	12600.0
1558. c4h82ooh4j=c4h8cy1o3+oh	3.05E+10	0.3	20200.0
1559. c4h8cy1o2+h=>h2+c3h6cho-2	9.60E+08	1.5	2785.0
1560. c4h8cy1o2+h=>h2+c2h5+ch2co	9.60E+08	1.5	2785.0
1561. c4h8cy1o2+h=>h2+c2h5coch2	4.80E+08	1.5	2005.0
1562. c4h8cy1o3+h=>h2+c3h6cho-3	9.60E+08	1.5	2785.0
1563. c4h8cy1o3+h=>h2+acetoch2	4.80E+08	1.5	2005.0
1564. c4h8cy1o4+h=>h2+c3h6cho-4	1.92E+09	1.5	2005.0
1565. c4h8cy2o3+h=>h2+ch3chcoch3	4.80E+08	1.5	2005.0
1566. c4h8cy1o2+oh=>h2o+c3h6cho-2	4.80E+06	2.0	-1192.0
1567. c4h8cy1o2+oh=>h2o+c2h5+ch2co	4.80E+06	2.0	-1192.0
1568. c4h8cy1o2+oh=>h2o+c2h5coch2	2.40E+06	2.0	-1192.0
1569. c4h8cy1o3+oh=>h2o+c3h6cho-3	4.80E+06	2.0	-1192.0
1570. c4h8cy1o3+oh=>h2o+acetoch2	2.40E+06	2.0	-1192.0
1571. c4h8cy1o4+oh=>h2o+c3h6cho-4	9.60E+06	2.0	-1192.0
1572. c4h8cy2o3+oh=>h2o+ch3chcoch3	2.40E+06	2.0	-1192.0
1573. c4h8cy1o2+ho2=>h2o2+c3h6cho-2	8.00E+12	0.0	14400.0
1574. c4h8cy1o2+ho2=>h2o2+c2h5+ch2co	8.00E+12	0.0	14400.0
1575. c4h8cy1o2+ho2=>h2o2+c2h5coch2	4.00E+12	0.0	13260.0
1576. c4h8cy1o3+ho2=>h2o2+c3h6cho-3	8.00E+12	0.0	14400.0
1577. c4h8cy1o3+ho2=>h2o2+acetoch2	4.00E+12	0.0	13260.0
1578. c4h8cy1o4+ho2=>h2o2+c3h6cho-4	1.60E+13	0.0	14400.0
1579. c4h8cy2o3+ho2=>h2o2+ch3chcoch3	4.00E+12	0.0	13260.0
1580. c4h8cy1o2=nc3h7cho	1.59E+12	-0.8	46420.0
1581. c4h8cy1o2=c2h5coch3	1.59E+12	-0.8	46420.0
1582. c4h8cy2o3=c2h5coch3	3.18E+12	-0.8	46420.0
1583. c4h91o2=c4h8-1+ho2	1.26E+08	1.4	28900.0
1584. c4h92o2=c4h8-1+ho2	1.03E+10	1.0	30400.0
1585. c4h92o2=c2c4h8+ho2	3.40E+10	0.7	30700.0
1586. c4h92o2=t2c4h8+ho2	1.45E+10	0.8	29900.0
1587. but3ooh2*o=>ch3cococh3+h2o	1.28E+07	2.2	44950.0
1588. but2ooh1*o=>c4ald2oxo+h+oh	2.50E+14	0.0	43000.0
1589. but3ooh1*o=>c4ald3oxo+h+oh	2.50E+14	0.0	43000.0
1590. but4ooh1*o=>choc2h4cho+h+oh	2.50E+14	0.0	43000.0
1591. but1ooh2*o=>c4ald2oxo+h+oh	2.50E+14	0.0	43000.0
1592. but3ooh2*o=>ch3cococh3+h+oh	2.50E+14	0.0	43000.0
1593. but4ooh2*o=>c4ald3oxo+h+oh	2.50E+14	0.0	43000.0
1594. but2ooh1*o+oh=>c4ald2oxo+oh+h2o	3.62E+12	0.0	-380.0
1595. but3ooh1*o+oh=>c4ald3oxo+oh+h2o	3.62E+12	0.0	-380.0
1596. but4ooh1*o+oh=>choc2h4cho+oh+h2o	3.62E+12	0.0	-380.0
1597. but1ooh2*o+oh=>c4ald2oxo+oh+h2o	3.62E+12	0.0	-380.0
1598. but3ooh2*o+oh=>ch3cococh3+oh+h2o	3.62E+12	0.0	-380.0
1599. but4ooh2*o+oh=>c4ald3oxo+oh+h2o	3.62E+12	0.0	-380.0
1600. c4h91o2+ho2=c4h91o2h+o2	2.29E+11	0.0	-1790.0
1601. c4h91o2+h2o2=c4h91o2h+ho2	2.41E+12	0.0	9936.0
1602. c4h91o2+ch2o=c4h91o2h+hco	1.99E+12	0.0	11660.0
1603. c4h91o2+ch3cho=c4h91o2h+ch3co	1.00E+12	0.0	11660.0
1604. c4h91o2+ho2=>pc4h9o+oh+o2	1.40E+16	-1.6	1860.0
1605. c4h91o2+ch3o2=>pc4h9o+ch3o+o2	1.40E+16	-1.6	1860.0
1606. c4h91o2+c4h91o2=>pc4h9o+pc4h9o+o2	2.41E+10	0.0	0.0
1607. c4h91o2h=pc4h9o+oh	2.50E+15	0.0	43000.0
1608. pc4h9o=nc3h7cho+h	1.70E+13	0.0	20510.0
1609. pc4h9o=ch2o+nc3h7	9.12E+13	0.0	14360.0
1610. pc4h9o+o2=nc3h7cho+ho2	3.61E+10	0.0	1090.0
1611. c4h92o2+ho2=c4h92o2h+o2	2.29E+11	0.0	-1790.0
1612. c4h92o2+h2o2=c4h92o2h+ho2	2.41E+12	0.0	9936.0
1613. c4h92o2+ch2o=c4h92o2h+hco	1.99E+12	0.0	11660.0
1614. c4h92o2+ch3cho=c4h92o2h+ch3co	1.00E+12	0.0	11660.0
1615. c4h92o2+ho2=>sc4h9o+oh+o2	1.40E+16	-1.6	1860.0
1616. c4h92o2+ch3o2=>sc4h9o+ch3o+o2	1.40E+16	-1.6	1860.0
1617. c4h92o2+c4h91o2=>sc4h9o+pc4h9o+o2	2.41E+10	0.0	0.0
1618. c4h92o2+c4h92o2=>sc4h9o+sc4h9o+o2	2.41E+10	0.0	0.0
1619. c4h92o2h=sc4h9o+oh	2.50E+15	0.0	43000.0
1620. sc4h9o=c2h5coch3+h	1.51E+13	0.0	18070.0
1621. sc4h9o=ch3cho+c2h5	5.25E+13	0.0	11690.0
1622. sc4h9o=ch3+c2h5cho	1.78E+13	0.0	14890.0
1623. sc4h9o+o2=c2h5coch3+ho2	8.43E+09	0.0	420.0
1624. c4h8-1+ho2=c4h81ooh2j	2.47E+04	2.1	12160.0
1625. c4h8-1+ho2=c4h82ooh1j	7.74E+03	2.3	11080.0
1626. c2c4h8+ho2=c4h82ooh3j	1.55E+04	2.3	11080.0
1627. t2c4h8+ho2=c4h82ooh3j	1.55E+04	2.3	11080.0
1628. c4h81ooh3j=>c3h6+ch2o+oh	1.23E+09	1.3	24900.0
1629. c4h81ooh4j=>c2h4+c2h4o2h	2.33E+12	0.6	29000.0
1630. c4h82ooh4j=>c2h4+ch3cho+oh	3.08E+08	1.5	23500.0
1631. c4h82ooh4j=>c3h6+ch2o+oh	3.08E+08	1.5	23500.0
1632. c4h82ooh1j=>ch2cho+c2h5+oh	4.87E+12	0.3	29600.0
1633. c4h81ooh2j=>c3h5o+ch3+oh	1.09E+09	1.4	29500.0
1634. c4h82ooh3j=>ch3chcho+ch3+oh	2.78E+11	0.7	32500.0
1635. c4h91o2+pc4h9=pc4h9o+pc4h9o	7.00E+12	0.0	-1000.0
1636. c4h91o2+sc4h9=pc4h9o+sc4h9o	7.00E+12	0.0	-1000.0
1637. c4h92o2+pc4h9=sc4h9o+pc4h9o	7.00E+12	0.0	-1000.0
1638. c4h92o2+sc4h9=sc4h9o+sc4h9o	7.00E+12	0.0	-1000.0
1639. pc4h9+ho2=pc4h9o+oh	7.00E+12	0.0	-1000.0
1640. sc4h9+ho2=sc4h9o+oh	7.00E+12	0.0	-1000.0
1641. c4h91o2+ch3=pc4h9o+ch3o	7.00E+12	0.0	-1000.0
1642. c4h92o2+ch3=sc4h9o+ch3o	7.00E+12	0.0	-1000.0

1643. pc4h9+ch3o2=pc4h9o+ch3o	7.00E+12	0.0	-1000.0
1644. sc4h9+ch3o2=sc4h9o+ch3o	7.00E+12	0.0	-1000.0
1645. c4h713+o2=c4h73o2	6.00E+09	0.0	-2300.0
1646. c4h713+o2=c4h71o2	6.00E+09	0.0	-2300.0
1647. c4h73o2=c4h6+ho2	5.13E+09	1.0	28400.0
1648. c4h73o2=c4h63ooh4j	8.62E+08	1.0	35500.0
1649. c4h71o2=c4h61ooh4j	1.48E+08	1.0	21000.0
1650. c4h63ooh4j+o2=c4h63ooh4o2	1.50E+18	-2.5	0.0
1651. c4h61ooh4j+o2=c4h61ooh4o2	1.20E+10	0.0	-2300.0
1652. c4h63ooh4o2=>c4h54o2h3*o+oh	2.87E+08	1.0	25500.0
1653. c4h61ooh4o2=>c4h54o2h1*o+oh	9.87E+07	1.0	26500.0
1654. c4h54o2h3*o=>ch2o+c2h3co+oh	2.50E+15	0.0	43000.0
1655. c4h54o2h1*o=>ch2o+c2h2+hco+oh	2.50E+15	0.0	43000.0
1656. c4h73o2=ch3cho+ch2cho	1.70E+09	1.0	26400.0
1657. c4h71o2=ch3chcho+ch2o	1.70E+09	1.0	26400.0
1658. ch3coch3+ch3o=ch3coch2+ch3oh	1.00E+11	0.0	7000.0
Reverse Arrhenius coefficients:	1.00E+10	0.0	9000.0
1659. c3h6o1-2=c2h4+ch2o	6.00E+14	0.0	60000.0
Reverse Arrhenius coefficients:	2.97E+11	0.0	50000.0
1660. c3h6o1-3=c2h4+ch2o	6.00E+14	0.0	60000.0
Reverse Arrhenius coefficients:	2.97E+11	0.0	31080.0
1661. tc3h6cho=ic3h5cho+h	2.88E+16	-0.6	41280.0
Reverse Arrhenius coefficients:	1.30E+13	0.0	1200.0
1662. tc3h6cho=ic3h6co+h	8.88E+16	-0.7	44350.0
Reverse Arrhenius coefficients:	1.30E+13	0.0	4800.0
1663. tc3h6cho+h2=ic3h7cho+h	2.16E+05	2.4	18990.0
Reverse Arrhenius coefficients:	1.32E+05	2.5	3550.0
1664. ic3h7cho=tc3h6cho+h	2.30E+18	-0.9	92000.0
Reverse Arrhenius coefficients:	2.00E+14	0.0	0.0
1665. tc3h6cho+ch2o=ic3h7cho+hco	2.52E+08	1.9	18190.0
Reverse Arrhenius coefficients:	1.23E+07	2.0	17420.0
1666. ic3h6co+oh=ic3h7+co2	1.73E+12	0.0	-1010.0
Reverse Arrhenius coefficients:	2.58E+14	-0.4	55480.0
1667. ic3h7cho+ho2=ic3h7co+h2o2	3.00E+12	0.0	11920.0
Reverse Arrhenius coefficients:	7.71E+12	-0.3	11990.0
1668. ic3h7cho+ho2=tc3h6cho+h2o2	8.00E+10	0.0	11920.0
Reverse Arrhenius coefficients:	3.37E+12	-0.4	11050.0
1669. ic3h7cho+ch3=ic3h7co+ch4	3.98E+12	0.0	8700.0
Reverse Arrhenius coefficients:	2.32E+13	-0.1	25630.0
1670. ic3h7cho+o=ic3h7co+oh	7.18E+12	0.0	1389.0
Reverse Arrhenius coefficients:	7.05E+11	-0.1	15740.0
1671. ic3h7cho+o2=ic3h7co+ho2	4.00E+13	0.0	37600.0
Reverse Arrhenius coefficients:	1.62E+11	0.3	-3432.0
1672. ic3h7cho+oh=ic3h7co+h2o	2.41E+12	0.0	-781.0
Reverse Arrhenius coefficients:	2.33E+12	-0.1	30820.0
1673. ic3h7cho+oh=tc3h6cho+h2o	1.68E+12	0.0	-781.0
Reverse Arrhenius coefficients:	1.19E+13	-0.1	29810.0
1674. ic3h7cho+h=ic3h7co+h2	2.60E+12	0.0	2600.0
Reverse Arrhenius coefficients:	1.00E+00	0.0	0.0
1675. ic3h7cho=ic3h7+hco	1.13E+17	0.0	79760.0
Reverse Arrhenius coefficients:	1.81E+13	0.0	0.0
1676. ic3h7co=ic3h7+co	1.43E+13	0.0	10950.0
Reverse Arrhenius coefficients:	1.50E+11	0.0	4810.0
1677. ic3h7cho+oh=ic3h6cho+h2o	3.12E+06	2.0	-298.0
Reverse Arrhenius coefficients:	6.39E+05	2.0	19130.0
1678. ic3h7cho+ho2=ic3h6cho+h2o2	2.74E+04	2.5	15500.0
Reverse Arrhenius coefficients:	3.33E+04	2.2	3468.0
1679. tc3h6cho+o2=ic3h5cho+ho2	2.72E-19	0.0	7240.0
Reverse Arrhenius coefficients:	1.39E+11	-0.2	17310.0
1680. tc3h6cho+o2=ch3coch3+co+oh	3.62E-20	0.0	0.0
Reverse Arrhenius coefficients:	0.00E+00	0.0	0.0
1681. tc3h6cho+ho2=ic3h7cho+o2	3.68E+12	0.0	1310.0
Reverse Arrhenius coefficients:	1.24E+14	-0.2	43350.0
1682. tc3h6cho+ch3=ic3h5cho+ch4	3.01E+12	-0.3	-131.0
Reverse Arrhenius coefficients:	2.21E+15	-0.8	67900.0
1683. ic3h5cho+oh=ic3h5co+h2o	1.07E+13	0.0	-348.0
Reverse Arrhenius coefficients:	0.00E+00	0.0	0.0
1684. ic3h5cho+ho2=ic3h5co+h2o2	1.00E+12	0.0	11920.0
Reverse Arrhenius coefficients:	3.76E+12	-0.3	12000.0
1685. ic3h5cho+ch3=ic3h5co+ch4	3.98E+12	0.0	8700.0
Reverse Arrhenius coefficients:	1.52E+13	0.0	25570.0
1686. ic3h5cho+o=ic3h5co+oh	7.18E+12	0.0	1389.0
Reverse Arrhenius coefficients:	4.61E+11	0.0	15680.0
1687. ic3h5cho+o2=ic3h5co+ho2	2.00E+13	0.0	40700.0
Reverse Arrhenius coefficients:	5.31E+10	0.3	-394.0
1688. ic3h5cho+h=ic3h5co+h2	2.60E+12	0.0	2600.0
Reverse Arrhenius coefficients:	3.80E+11	0.0	18990.0
1689. ic3h5co=c3h5-t+co	4.78E+12	0.0	27470.0
Reverse Arrhenius coefficients:	1.51E+11	0.0	4809.0
1690. ic3h7+oh=c3h6+h2o	2.41E+13	0.0	0.0
Reverse Arrhenius coefficients:	2.98E+12	0.6	83820.0
1691. ic3h6co+h=ic3h7+co	4.40E+12	0.0	1459.0
Reverse Arrhenius coefficients:	0.00E+00	0.0	0.0
1692. ic3h6co+o=ch3coch3+co	3.20E+12	0.0	-437.0
Reverse Arrhenius coefficients:	0.00E+00	0.0	0.0
1693. c2h5chco+oh=nc3h7+co2	3.73E+12	0.0	-1010.0
Reverse Arrhenius coefficients:	0.00E+00	0.0	0.0
1694. c2h5chco+h=nc3h7+co	4.40E+12	0.0	1459.0
Reverse Arrhenius coefficients:	0.00E+00	0.0	0.0
1695. c2h5chco+o=c3h6+co2	3.20E+12	0.0	-437.0
Reverse Arrhenius coefficients:	0.00E+00	0.0	0.0
1696. ch3chcho+ho2=ch3chocho+oh	9.64E+12	0.0	0.0
Reverse Arrhenius coefficients:	1.31E+19	-1.5	28580.0
1697. ch3chocho=ch3cho+hco	3.98E+13	0.0	9700.0

Reverse Arrhenius coefficients:	4.34E+05	1.7	8282.0
1698. ch3chcho=ch3chco+h	1.34E+13	-0.2	33460.0
Reverse Arrhenius coefficients:	5.00E+12	0.0	1200.0
1699. ch3chcho+o2=ch3chco+ho2	1.81E+11	0.0	1840.0
Reverse Arrhenius coefficients:	2.31E+13	-0.5	19540.0
1700. ch3chcho+o2=c2h3cho+ho2	2.72E+11	0.0	7240.0
Reverse Arrhenius coefficients:	1.46E+14	-0.7	25880.0
1701. ch3chcho+o2=ch3cho+co+oh	3.62E+10	0.0	0.0
Reverse Arrhenius coefficients:	0.00E+00	0.0	0.0
1702. sc3h5cho+o=sc3h5co+oh	7.18E+12	0.0	1389.0
Reverse Arrhenius coefficients:	1.31E+12	0.0	21570.0
1703. sc3h5cho+o2=sc3h5co+ho2	4.00E+13	0.0	37600.0
Reverse Arrhenius coefficients:	3.01E+11	0.3	2394.0
1704. sc3h5co=c3h5-s+co	8.60E+15	0.0	23000.0
Reverse Arrhenius coefficients:	1.00E+11	0.0	6000.0
1705. sc3h5cho=c3h6+co	3.90E+14	0.0	69000.0
1706. sc3h5cho+h=sc3h5co+h2	1.00E+05	2.5	2490.0
1707. sc3h5cho+ch3=sc3h5co+ch4	1.10E+00	3.5	5675.0
1708. sc3h5cho+c2h3=sc3h5co+c2h4	1.11E+00	3.5	4682.0
1709. c3h6cho-2=c2h5chco+h	8.43E+15	-0.6	40400.0
Reverse Arrhenius coefficients:	5.00E+12	0.0	1200.0
1710. c3h6cho-2=c2h3cho+ch3	1.30E+12	0.0	39200.0
1711. c3h6cho-3=sc3h5cho+h	4.95E+12	-0.1	31300.0
Reverse Arrhenius coefficients:	5.00E+12	0.0	2900.0
1712. c3h6cho-3=c3h6+hco	8.25E+12	-0.2	21900.0
1713. c3h6cho-4=c2h4+ch2cho	2.00E+13	0.0	28700.0
1714. etcoet+oh=etcoetp+h2o	1.05E+10	1.0	1586.0
Reverse Arrhenius coefficients:	1.19E+09	0.9	21030.0
1715. etcoet+oh=etcoets+h2o	1.69E+12	0.0	-228.0
Reverse Arrhenius coefficients:	3.30E+13	-0.3	28740.0
1716. etcoet+ho2=etcoetp+h2o2	4.76E+04	2.5	16490.0
Reverse Arrhenius coefficients:	3.20E+04	2.2	4472.0
1717. etcoet+ho2=etcoets+h2o2	4.00E+11	0.0	8698.0
Reverse Arrhenius coefficients:	4.63E+13	-0.7	6200.0
1718. etcoet+o2=etcoetp+ho2	4.10E+13	0.0	51310.0
Reverse Arrhenius coefficients:	1.95E+10	0.3	-1882.0
1719. etcoet+o2=etcoets+ho2	3.10E+13	0.0	41970.0
Reverse Arrhenius coefficients:	2.54E+12	0.0	-1702.0
1720. etcoet+h=etcoetp+h2	1.83E+07	2.0	7700.0
Reverse Arrhenius coefficients:	4.79E+05	2.0	11990.0
1721. etcoet+h=etcoets+h2	8.96E+06	2.0	3200.0
Reverse Arrhenius coefficients:	4.04E+07	1.7	17010.0
1722. etcoet+c2h3=etcoetp+c2h4	1.00E+12	0.0	10400.0
Reverse Arrhenius coefficients:	3.85E+08	0.8	14040.0
1723. etcoet+c2h3=etcoets+c2h4	6.00E+11	0.0	5600.0
Reverse Arrhenius coefficients:	3.98E+10	0.5	18760.0
1724. etcoet+c2h5=etcoetp+c2h6	1.00E+11	0.0	13400.0
Reverse Arrhenius coefficients:	1.07E+13	-0.6	14000.0
1725. etcoet+c2h5=etcoets+c2h6	6.00E+10	0.0	8600.0
Reverse Arrhenius coefficients:	1.10E+15	-0.9	18720.0
1726. etcoet+ch3o=etcoetp+ch3oh	4.34E+11	0.0	6460.0
Reverse Arrhenius coefficients:	5.48E+09	0.0	9020.0
1727. etcoet+ch3o=etcoets+ch3oh	2.90E+11	0.0	2771.0
Reverse Arrhenius coefficients:	6.30E+11	-0.3	14850.0
1728. etcoet+ch3o2=etcoetp+ch3o2h	6.02E+12	0.0	19380.0
Reverse Arrhenius coefficients:	1.66E+13	-0.5	6642.0
1729. etcoet+ch3o2=etcoets+ch3o2h	4.00E+12	0.0	15250.0
Reverse Arrhenius coefficients:	1.90E+15	-0.8	12030.0
1730. etcoets=etcoc2h3+h	8.70E+16	-0.8	42130.0
Reverse Arrhenius coefficients:	1.30E+13	0.0	1560.0
1731. etcoetp=c2h5co+c2h4	1.55E+17	-1.5	27840.0
Reverse Arrhenius coefficients:	7.00E+10	0.0	9600.0
1732. etcoc2h3+oh=c2h5coch2+ch2o	1.00E+10	0.0	0.0
Reverse Arrhenius coefficients:	1.67E+11	-0.4	18220.0
1733. etcoc2h3+oh=petcoc2h3+h2o	7.55E+09	1.0	1586.0
Reverse Arrhenius coefficients:	1.28E+08	2.5	20210.0
1734. etcoc2h3+oh=setcoc2h3+h2o	8.45E+11	0.0	-228.0
Reverse Arrhenius coefficients:	1.35E+13	-0.2	28600.0
1735. etcoc2h3+ho2=c2h5co+ch2cho+oh	6.03E+09	0.0	7949.0
Reverse Arrhenius coefficients:	1.00E+00	0.0	0.0
1736. etcoc2h3+ho2=petcoc2h3+h2o2	2.38E+04	2.5	16490.0
Reverse Arrhenius coefficients:	2.40E+03	3.8	3652.0
1737. etcoc2h3+ho2=setcoc2h3+h2o2	2.00E+11	0.0	8698.0
Reverse Arrhenius coefficients:	1.90E+13	-0.5	6065.0
1738. etcoc2h3+ch3o2=c2h5co+ch2cho+ch3o	3.97E+11	0.0	17050.0
Reverse Arrhenius coefficients:	1.00E+00	0.0	0.0
1739. etcoc2h3+ch3o2=petcoc2h3+ch3o2h	3.01E+12	0.0	19380.0
Reverse Arrhenius coefficients:	1.25E+12	1.1	5822.0
1740. etcoc2h3+ch3o2=setcoc2h3+ch3o2h	2.00E+12	0.0	15250.0
Reverse Arrhenius coefficients:	7.79E+14	-0.7	11900.0
1741. petcoc2h3=c2h3co+c2h4	2.02E+15	0.3	26400.0
Reverse Arrhenius coefficients:	8.00E+10	0.0	11300.0
1742. setcoc2h3=ch3chco+c2h3	1.64E+16	-0.7	54590.0
Reverse Arrhenius coefficients:	8.00E+10	0.0	12600.0
1743. nc3h7coch3+oh=prcoch3-1+h2o	2.06E+07	1.7	753.0
Reverse Arrhenius coefficients:	3.60E+06	1.8	20170.0
1744. nc3h7coch3+oh=prcoch3-2+h2o	3.62E+07	1.6	-247.0
Reverse Arrhenius coefficients:	3.67E+05	2.0	21660.0
1745. nc3h7coch3+oh=prcoch3-3+h2o	8.45E+11	0.0	-228.0
Reverse Arrhenius coefficients:	2.37E+13	-0.3	28700.0
1746. nc3h7coch3+oh=nc3h7coch2+h2o	5.10E+11	0.0	1192.0
Reverse Arrhenius coefficients:	9.29E+13	-0.7	27730.0
1747. nc3h7coch3+ho2=prcoch3-1+h2o2	2.38E+04	2.5	16490.0
Reverse Arrhenius coefficients:	2.46E+04	2.2	4442.0

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1748. nc3h7coch3+ho2=prcoch3-2+h2o2                5.60E+12    0.0    17700.0
        Reverse Arrhenius coefficients:            3.37E+11    0.1     8142.0
1749. nc3h7coch3+ho2=prcoch3-3+h2o2                2.00E+11    0.0     8698.0
        Reverse Arrhenius coefficients:            3.33E+13   -0.6     6160.0
1750. nc3h7coch3+ho2=nc3h7coch2+h2o2               2.38E+04    2.5    14690.0
        Reverse Arrhenius coefficients:            2.57E+07    1.5     9762.0
1751. nc3h7coch3+ch3o2=prcoch3-1+ch3o2h            3.01E+12    0.0    19380.0
        Reverse Arrhenius coefficients:            1.28E+13   -0.5     6607.0
1752. nc3h7coch3+ch3o2=prcoch3-2+ch3o2h            1.99E+12    0.0    17050.0
        Reverse Arrhenius coefficients:            4.93E+11   -0.1     6774.0
1753. nc3h7coch3+ch3o2=prcoch3-3+ch3o2h            2.00E+12    0.0    15250.0
        Reverse Arrhenius coefficients:            1.37E+15   -0.8    11990.0
1754. nc3h7coch3+ch3o2=nc3h7coch2+ch3o2h           3.01E+12    0.0    17580.0
        Reverse Arrhenius coefficients:            1.34E+16   -1.2    11930.0
1755. prcoch3-2=c3h6+ch3co                         2.72E+16   -1.1    25590.0
        Reverse Arrhenius coefficients:            1.00E+11    0.0     7800.0
1756. prcoch3-3=c2h3coch3+ch3                      9.62E+15   -0.8    32390.0
        Reverse Arrhenius coefficients:            1.00E+11    0.0     7800.0
1757. nc3h7coch2=nc3h7+ch2co                       1.23E+18   -1.4    43450.0
        Reverse Arrhenius coefficients:            1.00E+11    0.0    11600.0
1758. nprcoet+oh=prcoet-1+h2o                      2.06E+07    1.7      753.0
        Reverse Arrhenius coefficients:            5.17E+06    1.7    20220.0
1759. nprcoet+oh=prcoet-2+h2o                      3.62E+07    1.6     -247.0
        Reverse Arrhenius coefficients:            7.23E+05    1.9    21760.0
1760. nprcoet+oh=prcoet-3+h2o                      8.45E+11    0.0     -228.0
        Reverse Arrhenius coefficients:            3.31E+13   -0.3    28740.0
1761. nprcoet+oh=nprcoetp+h2o                      5.10E+11    0.0     1192.0
        Reverse Arrhenius coefficients:            1.28E+11    0.0    20660.0
1762. nprcoet+oh=nprcoets+h2o                      8.45E+11    0.0     -228.0
        Reverse Arrhenius coefficients:            3.31E+13   -0.3    28740.0
1763. nprcoet+ho2=prcoet-1+h2o2                    2.38E+04    2.5    16490.0
        Reverse Arrhenius coefficients:            3.54E+04    2.2     4492.0
1764. nprcoet+ho2=prcoet-2+h2o2                    5.60E+12    0.0    17700.0
        Reverse Arrhenius coefficients:            6.65E+11   -0.1     8242.0
1765. nprcoet+ho2=prcoet-3+h2o2                    2.00E+11    0.0     8698.0
        Reverse Arrhenius coefficients:            4.65E+13   -0.7     6200.0
1766. nprcoet+ho2=nprcoetp+h2o2                    2.38E+04    2.5    14690.0
        Reverse Arrhenius coefficients:            3.54E+04    2.2     2692.0
1767. nprcoet+ho2=nprcoets+h2o2                    2.00E+11    0.0     8698.0
        Reverse Arrhenius coefficients:            4.65E+13   -0.7     6200.0
1768. nprcoet+ch3o2=prcoet-1+ch3o2h                3.01E+12    0.0    19380.0
        Reverse Arrhenius coefficients:            1.84E+13   -0.5     6657.0
1769. nprcoet+ch3o2=prcoet-2+ch3o2h                1.99E+12    0.0    17050.0
        Reverse Arrhenius coefficients:            9.71E+11   -0.2     6874.0
1770. nprcoet+ch3o2=prcoet-3+ch3o2h                2.00E+12    0.0    15250.0
        Reverse Arrhenius coefficients:            1.91E+15   -0.8    12030.0
1771. nprcoet+ch3o2=nprcoetp+ch3o2h                3.01E+12    0.0    17580.0
        Reverse Arrhenius coefficients:            1.84E+13   -0.5     4862.0
1772. nprcoet+ch3o2=nprcoets+ch3o2h                2.00E+12    0.0    15250.0
        Reverse Arrhenius coefficients:            1.91E+15   -0.8    12030.0
1773. prcoet-1=c2h4+c2h5coch2                      2.22E+15   -0.8    23590.0
        Reverse Arrhenius coefficients:            2.50E+11    0.0     7800.0
1774. prcoet-2=c3h6+c2h5co                         4.05E+16   -1.1    26150.0
        Reverse Arrhenius coefficients:            1.00E+11    0.0     8300.0
1775. prcoet-3=etcoc2h3+ch3                        2.92E+15   -0.7    32300.0
        Reverse Arrhenius coefficients:            1.00E+11    0.0     7800.0
1776. nprcoetp=nc3h7co+c2h4                        5.40E+17   -1.4    26040.0
        Reverse Arrhenius coefficients:            2.50E+11    0.0     7800.0
1777. ac3h5cho=c3h5-a+hco                          1.81E+19   -1.1    68480.0
        Reverse Arrhenius coefficients:            1.00E+13    0.0        0.0
1778. ac3h5cho+oh=ac3h5co+h2o                      3.37E+12    0.0      616.0
        Reverse Arrhenius coefficients:            2.18E+12    0.0    32150.0
1779. ac3h5cho+oh=c2h3chcho+h2o                    3.12E+06    2.0     -298.0
        Reverse Arrhenius coefficients:            1.25E+08    1.8    34930.0
1780. ac3h5cho+ho2=ac3h5co+h2o2                    3.00E+12    0.0    11920.0
        Reverse Arrhenius coefficients:            1.15E+13   -0.3    11990.0
1781. ac3h5cho+ho2=c2h3chcho+h2o2                  9.63E+03    2.6    13910.0
        Reverse Arrhenius coefficients:            2.28E+06    2.1    17670.0
1782. ac3h5cho+ch3o2=ac3h5co+ch3o2h                1.00E+12    0.0    11920.0
        Reverse Arrhenius coefficients:            1.58E+13   -0.5    11270.0
1783. ac3h5cho+ch3o2=c2h3chcho+ch3o2h              1.99E+12    0.0    17050.0
        Reverse Arrhenius coefficients:            1.94E+15   -0.7    20090.0
1784. ac3h5co=c3h5-a+co                            6.20E+15   -1.1     -330.0
        Reverse Arrhenius coefficients:            1.50E+11    0.0     4810.0
1785. c2h3chcho+ho2=c2h3cho+hco+oh                 8.91E+12    0.0        0.0
        Reverse Arrhenius coefficients:            0.00E+00    0.0        0.0
1786. c2h3chcho=c3h5-a+co                          1.00E+14    0.0    25000.0
1787. c2h3chcho+h=ac3h5cho                         1.00E+14    0.0        0.0
1788. butyne+oh=ch3chcch+h2o                       1.00E+07    2.0     2000.0
1789. c4h612+oh=ch3ccch2+h2o                       1.00E+07    2.0     2000.0
1790. c4h612+oh=ch3chcch+h2o                       2.00E+07    2.0     2500.0
1791. c4h612+h=ch3ccch2+h2                         1.50E+07    2.0     6000.0
1792. c4h612+h=ch3chcch+h2                         3.00E+07    2.0     6500.0
1793. ch3chcch+h=ch3+c3h3                          1.00E+14    0.0        0.0
1794. ch3chcch+oh=c4h4+h2o                         3.00E+13    0.0        0.0
1795. ic4h5+h=ch3ccch2+h                           3.00E+13    0.0        0.0
1796. ch3ccch2+h=ch3+c3h3                          1.00E+14    0.0        0.0
1797. ch3ccch2+o2=ch3co+ch2co                      4.16E+10    0.0     2510.0
1798. ch3ccch2+h=h2cccch2+h2                       1.00E+14    0.0     8000.0
1799. ch3ccch2+oh=h2cccch2+h2o                     1.00E+13    0.0        0.0
1800. ch3chcch(+M)=c4h4+h(+M)                      1.00E+13    0.0    49000.0
      Low pressure limit:  0.20000E+15  0.00000E+00  0.41000E+05
1801. ch3ccch2(+M)=h2cccch2+h(+M)                  1.00E+13    0.0    56000.0
      Low pressure limit:  0.20000E+15  0.00000E+00  0.48000E+05
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1802. h2cccch2+oh=ic4h3+h2o                    2.00E+07   2.0    2000.0
1803. h2cccch2+h=ic4h3+h2                      3.00E+07   2.0    6000.0
1804. ic4h9+h=ic4h10                           1.00E+14   0.0       0.0
1805. tc4h9+h=ic4h10                           1.00E+14   0.0       0.0
1806. ic4h7+h=ic4h8                            1.00E+14   0.0       0.0
1807. ic4h9+h=ic4h8+h2                         9.04E+11   0.0       0.0
1808. ic4h9=tc4h9                              3.56E+10   0.9   34600.0
1809. ic4h9=c3h6+ch3                           9.59E+11   0.8   30710.0
1810. ic4h9o2+c3h6=ic4h9o2h+c3h5-a             3.24E+11   0.0   14900.0
        Reverse Arrhenius coefficients:        2.00E+10   0.0   15000.0
1811. ic4h9o2+ic4h8=ic4h9o2h+ic4h7             1.40E+12   0.0   14900.0
        Reverse Arrhenius coefficients:        3.16E+11   0.0   13000.0
1812. ic4h9o2+c4h8-1=ic4h9o2h+c4h713           1.40E+12   0.0   14900.0
        Reverse Arrhenius coefficients:        3.16E+11   0.0   13000.0
1813. ic4h9o=ch2o+ic3h7                        2.00E+14   0.0   17500.0
        Reverse Arrhenius coefficients:        2.16E+11   0.1   11510.0
1814. ic4h9o+o2=ic3h7cho+ho2                   1.93E+11   0.0    1660.0
        Reverse Arrhenius coefficients:        1.88E+09   0.4   32620.0
1815. ic4h9o2h=ic4h9o+oh                       1.50E+16   0.0   42500.0
        Reverse Arrhenius coefficients:        1.66E+08   1.7   -3245.0
1816. ic4h9o2+ho2=ic4h9o2h+o2                  1.75E+10   0.0   -3275.0
        Reverse Arrhenius coefficients:        5.11E+13  -0.8   34480.0
1817. ic4h9o2+h2o2=ic4h9o2h+ho2                2.40E+12   0.0   10000.0
        Reverse Arrhenius coefficients:        2.40E+12   0.0   10000.0
1818. ic4h9o2+ch2o=ic4h9o2h+hco                1.30E+11   0.0    9000.0
        Reverse Arrhenius coefficients:        2.50E+10   0.0   10100.0
1819. ic4h9o2+ch3o2=>ic4h9o+ch3o+o2            1.40E+16  -1.6    1860.0
1820. ic4h9o2+ic4h9o2=>o2+ic4h9o+ic4h9o        1.40E+16  -1.6    1860.0
1821. ic4h9o2+ho2=>ic4h9o+oh+o2                1.40E-14  -1.6    1860.0
1822. ic4h9o2+ch3=ic4h9o+ch3o                  7.00E+12   0.0   -1000.0
        Reverse Arrhenius coefficients:        1.77E+12   0.2   26240.0
1823. ic4h9o2+c2h5=ic4h9o+ch3ch2o              7.00E+12   0.0   -1000.0
        Reverse Arrhenius coefficients:        3.90E+12   0.2   29180.0
1824. ic4h9o2+ic4h9=ic4h9o+ic4h9o              7.00E+12   0.0   -1000.0
        Reverse Arrhenius coefficients:        7.33E+13  -0.2   29370.0
1825. ic4h9o2+c3h5-a=ic4h9o+c3h5o              7.00E+12   0.0   -1000.0
        Reverse Arrhenius coefficients:        1.18E+11   0.4   14950.0
1826. ic4h9o2+ic4h7=ic4h9o+ic4h7o              7.00E+12   0.0   -1000.0
        Reverse Arrhenius coefficients:        1.27E+11   0.4   14740.0
1827. ic4h9+ho2=ic4h9o+oh                      7.00E+12   0.0   -1000.0
        Reverse Arrhenius coefficients:        1.26E+16  -0.7   26680.0
1828. ch3o2+ic4h9=ch3o+ic4h9o                  7.00E+12   0.0   -1000.0
        Reverse Arrhenius coefficients:        1.23E+18  -1.3   31440.0
1829. ic4h9o=ic3h7cho+h                        4.00E+14   0.0   21500.0
        Reverse Arrhenius coefficients:        1.14E+10   1.1    2500.0
1830. ic4h9o+ho2=ic3h7cho+h2o2                 1.00E+12   0.0       0.0
        Reverse Arrhenius coefficients:        1.38E+13  -0.2   72130.0
1831. ic4h9o+oh=ic3h7cho+h2o                   1.81E+13   0.0       0.0
        Reverse Arrhenius coefficients:        4.21E+13   0.1  103600.0
1832. ic4h9o+ch3=ic3h7cho+ch4                  2.40E+13   0.0       0.0
        Reverse Arrhenius coefficients:        3.37E+14   0.1   88920.0
1833. ic4h9o+o=ic3h7cho+oh                     6.00E+12   0.0       0.0
        Reverse Arrhenius coefficients:        1.42E+12   0.1   86350.0
1834. ic4h9o+h=ic3h7cho+h2                     1.99E+13   0.0       0.0
        Reverse Arrhenius coefficients:        1.07E+13   0.1   88440.0
1835. ic4h8+h=ic4h9                            6.25E+11   0.5    2620.0
1836. ic4h8+h=tc4h9                            1.06E+12   0.5    1230.0
1837. ic4h8+o=oh+ic4h7                         2.64E+11   0.7    3250.0
1838. ic4h8+h=h2+ic4h7                         1.72E+14   0.0    7990.0
1839. ic4h8+oh=h2o+ic4h7                       6.00E+06   2.0    -298.0
1840. ic4h8+ho2=h2o2+ic4h7                     1.92E+04   2.6   13900.0
1841. ic4h8+ch3=ch4+ic4h7                      3.00E+11   0.0    7300.0
1842. ic4h8+o2=ic4h7+ho2                       6.00E+12   0.0   39900.0
        Reverse Arrhenius coefficients:        2.21E+12  -0.3      30.0
1843. c3h5-t+ch3(+m)=ic4h8(+m)                 2.50E+13   0.0       0.0
      Low pressure limit:  0.42700E+59 -0.11940E+02  0.97698E+04
      TROE centering:      0.17500E+00  0.13406E+04  0.60000E+05  0.10140E+05
        h2o              Enhanced by    6.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        ch4              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        h2               Enhanced by    2.000E+00
        c2h2             Enhanced by    3.000E+00
        c2h4             Enhanced by    3.000E+00
        ar               Enhanced by    7.000E-01
1844. ic4h8+o=ch2co+ch3+ch3                    3.33E+07   1.8      76.0
        Reverse Arrhenius coefficients:        0.00E+00   0.0       0.0
1845. ic4h8+o=ic3h7+hco                        1.58E+07   1.8   -1216.0
        Reverse Arrhenius coefficients:        1.75E+09   0.5   27580.0
1846. ic4h8+ch3o2=ic4h7+ch3o2h                 1.93E+04   2.6   13910.0
        Reverse Arrhenius coefficients:        2.09E+07   1.5   12190.0
1847. ic4h8+c3h5-t=ic4h7+c3h6                  7.94E+11   0.0   20500.0
        Reverse Arrhenius coefficients:        5.59E+20  -1.3   80170.0
1848. ic4h8+c3h5-s=ic4h7+c3h6                  7.94E+11   0.0   20500.0
        Reverse Arrhenius coefficients:        5.59E+20  -1.3   82170.0
1849. ic4h8+c3h5-a=ic4h7+c3h6                  7.94E+11   0.0   20500.0
        Reverse Arrhenius coefficients:        4.40E+20  -1.3   60610.0
1850. tc4h9+o2=ic4h8+ho2                       2.07E+12   0.0    5000.0
1851. ic4h9+o2=ic4h8+ho2                       4.50E+11   0.0    5000.0
1852. ic4h8+h=ch3+c3h6                         1.72E+13   0.0    3600.0
1853. ic4h8o+oh=>ic3h6cho+h2o                  1.25E+12   0.0       0.0
1854. ic4h8o+h=>ic3h6cho+h2                    1.25E+12   0.0       0.0
1855. ic4h8o+ho2=>ic3h6cho+h2o2                2.50E+12   0.0   15000.0
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1856. ic4h8o+ch3o2=>ic3h6cho+ch3o2h                2.50E+12    0.0    19000.0
1857. ic4h8o+ch3=>ic3h6cho+ch4                     5.00E+10    0.0    10000.0
1858. ic4h8o+o=>ic3h6cho+oh                        1.25E+12    0.0        0.0
1859. ic4h7=c3h4-a+ch3                             7.10E+10    1.4    56360.0
         Reverse Arrhenius coefficients:           3.02E+41   -8.7    26620.0
1860. ic4h7+o=ic3h5cho+h                           6.03E+13    0.0        0.0
         Reverse Arrhenius coefficients:           5.01E+15   -0.3    66490.0
1861. ic4h8+ho2=ic4h8o+oh                          1.29E+12    0.0    13340.0
         Reverse Arrhenius coefficients:           1.00E+12    0.0     7500.0
1862. ic4h8oh=ic4h8+oh                             9.65E+13   -0.4    28500.0
         Reverse Arrhenius coefficients:           9.93E+11    0.0     -960.0
1863. ic4h9+o2=ic4h9o2                             1.50E+18   -2.5        0.0
1864. ic4h9o2=tc4h8io2h                            1.67E+09    1.0    29500.0
1865. ic4h9o2=ic4h8io2h                            1.53E+08    1.0    28000.0
1866. tc4h8io2h+o2=o2tc4h8io2h                     2.50E+19   -2.5        0.0
1867. ic4h8io2h+o2=o2ic4h8io2h                     1.50E+18   -2.5        0.0
1868. o2tc4h8io2h=ho2tc4h7io+oh                    3.34E+09    1.0    30500.0
1869. o2ic4h8io2h=ho2ic4h7io+oh                    5.75E+08    1.0    20000.0
1870. ho2tc4h7io=>hco+ch3coch3+oh                  1.00E+16    0.0    42000.0
1871. ho2ic4h7io=>ch2o+ch3chcho+oh                 1.00E+16    0.0    42000.0
1872. ic4h8to2h=ic4h8+ho2                          7.16E+19   -2.1    20660.0
         Reverse Arrhenius coefficients:           3.97E+11    0.0    12620.0
1873. tc4h8io2h=ic4h8+ho2                          1.02E+16   -1.1    18820.0
         Reverse Arrhenius coefficients:           3.97E+11    0.0    12620.0
1874. tc4h8io2h=>ic4h8o+oh                         4.00E+11    0.0    22000.0
1875. ic4h8io2h=>oh+ch2o+c3h6                      8.45E+15   -0.7    29170.0
1876. ic4h7oh=ic4h7o+h                             5.97E+16   -0.6   105900.0
         Reverse Arrhenius coefficients:           4.00E+13    0.0        0.0
1877. ic4h8oh=ic4h7oh+h                            3.71E+14   -0.4    40790.0
         Reverse Arrhenius coefficients:           1.00E+13    0.0     1200.0
1878. ic4h7o+h2=ic4h7oh+h                          9.05E+06    2.0    17830.0
         Reverse Arrhenius coefficients:           7.16E+05    2.4    16310.0
1879. ic4h7oh=ic4h7+oh                             7.31E+16   -0.4    79700.0
         Reverse Arrhenius coefficients:           3.00E+13    0.0        0.0
1880. ic4h8+o=>ic3h6co+h+h                         1.66E+07    1.8       76.0
1881. ic4h8o=ic3h7cho                              4.18E+13    0.0    52720.0
         Reverse Arrhenius coefficients:           1.39E+10    0.6    72050.0
1882. ic4h7o=ic3h5cho+h                            5.00E+13    0.0    29100.0
         Reverse Arrhenius coefficients:           3.07E+11    0.5    16470.0
1883. ic3h6cho=c3h6+hco                            1.03E+15   -0.6    23170.0
         Reverse Arrhenius coefficients:           1.00E+11    0.0     7800.0
1884. ic3h6cho=c2h3cho+ch3                         2.42E+13   -0.3    22470.0
         Reverse Arrhenius coefficients:           1.00E+11    0.0     7800.0
1885. ic4h7+o2=ic3h5cho+oh                         2.47E+13   -0.5    23020.0
         Reverse Arrhenius coefficients:           1.62E+14   -0.8    73390.0
1886. ic4h7+o2=ch3coch2+ch2o                       7.14E+15   -1.2    21050.0
         Reverse Arrhenius coefficients:           1.23E+15   -1.2    90190.0
1887. ic4h7+o2=>c3h4-a+ch2o+oh                     7.29E+29   -5.7    21450.0
1888. ic4h7o+o2=ic3h5cho+ho2                       3.00E+10    0.0     1649.0
         Reverse Arrhenius coefficients:           6.31E+10   -0.1    38980.0
1889. ic4h7o+ho2=ic3h5cho+h2o2                     3.00E+11    0.0        0.0
         Reverse Arrhenius coefficients:           8.93E+14   -0.8    78500.0
1890. ic4h7o+ch3=ic3h5cho+ch4                      2.40E+13    0.0        0.0
         Reverse Arrhenius coefficients:           7.26E+16   -0.5    95290.0
1891. ic4h7o+o=ic3h5cho+oh                         6.00E+12    0.0        0.0
         Reverse Arrhenius coefficients:           3.05E+14   -0.5    92720.0
1892. ic4h7o+oh=ic3h5cho+h2o                       1.81E+13    0.0        0.0
         Reverse Arrhenius coefficients:           9.08E+15   -0.5   110000.0
1893. ic4h7o+h=ic3h5cho+h2                         1.99E+13    0.0        0.0
         Reverse Arrhenius coefficients:           2.30E+15   -0.5    94810.0
1894. ic4h7o=ic4h6oh                               1.39E+11    0.0    15600.0
         Reverse Arrhenius coefficients:           4.23E+11   -0.2    31670.0
1895. ic4h6oh+h2=ic4h7oh+h                         2.16E+04    2.4    18990.0
         Reverse Arrhenius coefficients:           5.61E+02    3.0     1399.0
1896. ic4h6oh+ho2=ic4h7oh+o2                       4.19E+13   -0.3        9.0
         Reverse Arrhenius coefficients:           6.00E+13    0.0    39900.0
1897. ic4h6oh+ch2o=ic4h7oh+hco                     6.30E+08    1.9    18190.0
         Reverse Arrhenius coefficients:           1.31E+06    2.5    15270.0
1898. ic4h6oh+ic4h8=ic4h7oh+ic4h7                  4.70E+02    3.3    19840.0
         Reverse Arrhenius coefficients:           2.81E-01    3.9     6521.0
1899. ic4h6oh+h2o=ic4h7oh+oh                       5.20E+08    1.4    32450.0
         Reverse Arrhenius coefficients:           3.12E+06    2.0     -298.0
1900. ic4h6oh+ch4=ic4h7oh+ch3                      2.22E+03    2.9    23750.0
         Reverse Arrhenius coefficients:           2.21E+00    3.5     5675.0
1901. ic4h6oh+c3h6=ic4h7oh+c3h5-a                  4.82E+04    2.5    19230.0
         Reverse Arrhenius coefficients:           5.75E+02    3.1    18670.0
1902. ic4h6oh+ch3cho=ic4h7oh+ch3co                 1.30E+09    1.4    17440.0
         Reverse Arrhenius coefficients:           5.30E+06    2.0    16240.0
1903. ic4h7oh=ic4h6oh+h                            4.90E+16   -0.4    89850.0
         Reverse Arrhenius coefficients:           1.00E+14    0.0        0.0
1904. ic4h7oh+ho2=ic4h6oh+h2o2                     7.92E+02    3.0    12300.0
         Reverse Arrhenius coefficients:           7.83E+05    2.0    13580.0
1905. ic4h6oh=c3h4-a+ch2oh                         1.72E+22   -2.7    54980.0
         Reverse Arrhenius coefficients:           1.00E+11    0.0     9200.0
1906. ic4h6oh+ho2=>c3h4oh+ch2o+oh                  1.45E+13    0.0        0.0
1907. c2h5coch3+h<=>c2h5+ch3cho                    3.55E+12   -0.1     7920.7
1908. c2h5coch3+h<=>c2h5cho+ch3                    9.98E+10    0.3     9474.7
1909. c2h5coch3(+m)<=>c2h5+ch3co(+m)               3.56E+27   -3.2    85748.1
      Low pressure limit:  0.25780E+80 -0.17020E+02  0.96875E+05
      TROE centering:      0.20000E-03  0.91070E+03  0.22707E+05  0.56355E+04
         h2               Enhanced by    2.000E+00
         h2o              Enhanced by    6.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
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   ch4              Enhanced by    2.000E+00
   c2h6             Enhanced by    3.000E+00
1910. c2h5coch3(+m)<=>c2h5co+ch3(+m)                3.36E+27   -3.4    88546.3
      Low pressure limit:  0.11750E+73 -0.15361E+02  0.90947E+05
      TROE centering:      0.76000E-01  0.70200E+03  0.74415E+05  0.50698E+04
   h2               Enhanced by    2.000E+00
   h2o              Enhanced by    6.000E+00
   co               Enhanced by    1.500E+00
   co2              Enhanced by    2.000E+00
   ch4              Enhanced by    2.000E+00
   c2h6             Enhanced by    3.000E+00
1911. c2h5coch3(+m)<=>ch3coch2+ch3(+m)              2.24E+24   -2.5    87646.2
      Low pressure limit:  0.44170E+70 -0.14656E+02  0.94756E+05
      TROE centering:      0.12440E+00  0.10579E+04  0.10430E+07  0.61129E+04
   h2               Enhanced by    2.000E+00
   h2o              Enhanced by    6.000E+00
   co               Enhanced by    1.500E+00
   co2              Enhanced by    2.000E+00
   ch4              Enhanced by    2.000E+00
   c2h6             Enhanced by    3.000E+00
1912. c2h5coch3(+m)<=>h+c2h5coch2(+m)               3.05E+16   -0.3    97579.1
      Low pressure limit:  0.46750E+32 -0.45850E+01  0.83405E+05
      TROE centering:      0.66330E+00  0.15028E+06  0.32000E+01  0.10054E+04
   h2               Enhanced by    2.000E+00
   h2o              Enhanced by    6.000E+00
   co               Enhanced by    1.500E+00
   co2              Enhanced by    2.000E+00
   ch4              Enhanced by    2.000E+00
   c2h6             Enhanced by    3.000E+00
1913. c2h5coch3(+m)<=>h+ch3chcoch3(+m)              1.23E+14    0.4    91068.9
      Low pressure limit:  0.74800E+33 -0.51040E+01  0.70813E+05
      TROE centering:      0.50000E+00  0.12000E+01  0.12000E+01  0.14285E+04
   h2               Enhanced by    2.000E+00
   h2o              Enhanced by    6.000E+00
   co               Enhanced by    1.500E+00
   co2              Enhanced by    2.000E+00
   ch4              Enhanced by    2.000E+00
   c2h6             Enhanced by    3.000E+00
1914. c2h5coch3(+m)<=>h+acetoch2(+m)                3.23E+13    0.7    99725.1
      Low pressure limit:  0.40220E+27 -0.30930E+01  0.85410E+05
      TROE centering:      0.20400E-01  0.22467E+04  0.17054E+04  0.10730E+04
   h2               Enhanced by    2.000E+00
   h2o              Enhanced by    6.000E+00
   co               Enhanced by    1.500E+00
   co2              Enhanced by    2.000E+00
   ch4              Enhanced by    2.000E+00
   c2h6             Enhanced by    3.000E+00
1915. c2h5coch3+oh<=>acetoch2+h2o                   1.35E+00    3.8    -2900.0
1916. c2h5coch3+oh<=>ch3chcoch3+h2o                 2.36E+02    3.1    -3050.0
1917. c2h5coch3+oh<=>c2h5coch2+h2o                  3.99E+02    3.1     -944.0
1918. c2h5coch3+ho2<=>acetoch2+h2o2                 6.18E-05    4.9    11100.0
1919. c2h5coch3+ho2<=>ch3chcoch3+h2o2               8.42E-02    3.9    10400.0
1920. c2h5coch3+ho2<=>c2h5coch2+h2o2                5.58E-03    4.3    13400.0
1921. c2h5coch3+ch3<=>acetoch2+ch4                  3.60E+00    3.5    11228.3
1922. c2h5coch3+ch3<=>ch3chcoch3+ch4                2.00E+00    3.4     6858.1
1923. c2h5coch3+ch3<=>c2h5coch2+ch4                 2.04E+01    3.4     9356.1
1924. c2h5coch3+h<=>acetoch2+h2                     7.35E+06    2.3     8780.9
1925. c2h5coch3+h<=>ch3chcoch3+h2                   1.99E+06    2.3     4083.8
1926. c2h5coch3+h<=>c2h5coch2+h2                    1.20E+07    2.2     6937.8
1927. c2h5coch3+o<=>acetoch2+oh                     9.81E+05    2.4     4750.0
1928. c2h5coch3+o<=>ch3chcoch3+oh                   1.44E+11    0.2     2970.0
1929. c2h5coch3+o<=>c2h5coch2+oh                    5.00E+12    0.0     5962.0
1930. c2h5coch3+o2<=>acetoch2+ho2                   3.00E+13    0.0    52290.0
1931. c2h5coch3+o2<=>ch3chcoch3+ho2                 2.02E+13    0.0    45850.0
1932. c2h5coch3+o2<=>c2h5coch2+ho2                  2.05E+13    0.0    49150.0
1933. c2h5coch3+ch3o<=>acetoch2+ch3oh               2.17E+11    0.0     6460.0
1934. c2h5coch3+ch3o<=>ch3chcoch3+ch3oh             5.76E+11    0.0     4573.0
1935. c2h5coch3+ch3o<=>c2h5coch2+ch3oh              2.17E+11    0.0     4660.0
1936. c2h5coch3+ch3o2<=>acetoch2+ch3o2h             6.90E-01    4.0    18280.0
1937. c2h5coch3+ch3o2<=>ch3chcoch3+ch3o2h           3.44E+12    0.1    17880.0
1938. c2h5coch3+ch3o2<=>c2h5coch2+ch3o2h            3.01E+12    0.0    17580.0
1939. c2h5coch3+c2h3<=>acetoch2+c2h4                5.00E+11    0.0    10400.0
1940. c2h5coch3+c2h3<=>ch3chcoch3+c2h4              3.00E+11    0.0     5600.0
1941. c2h5coch3+c2h3<=>c2h5coch2+c2h4               6.15E+10    0.0     4278.0
1942. c2h5coch3+c2h5<=>acetoch2+c2h6                5.00E+10    0.0    13400.0
1943. c2h5coch3+c2h5<=>ch3chcoch3+c2h6              3.00E+11    0.0     8600.0
1944. c2h5coch3+c2h5<=>c2h5coch2+c2h6               5.00E+10    0.0    11600.0
1945. acetoch2+o2<=>ho2+c2h3coch3                   2.63E+00    3.5     1481.2
1946. acetoch2<=>c2h4+ch3co                         3.83E+32   -6.0    32835.5
1947. acetoch2<=>h+c2h3coch3                        1.40E+35   -7.3    44868.4
1948. acetoch2<=>ch3chcoch3                         1.01E+40   -8.8    42042.9
1949. acetoch2<=>c2h5coch2                          3.35E+33   -7.1    34478.6
1950. acetoch2<=>ch3+ch3chco                        6.44E+11   -0.1    43433.5
1951. acetoch2<=>c2h5+ch2co                         1.21E+29   -5.4    46577.5
1952. h+acetoch2<=>c2h5+ch3co                       1.47E+35   -5.8    20746.4
1953. h+acetoch2<=>c2h5co+ch3                       9.35E+33   -5.5    20860.3
1954. h+acetoch2<=>ch3coch2+ch3                     8.13E+32   -5.2    20915.9
1955. ch3chcoch3+o2<=>c2h3coch3+ho2                 3.86E-07    4.2     4221.5
      Declared duplicate reaction...
1956. ch3chcoch3+o2<=>c2h3coch3+ho2                 1.50E-02    4.0    13140.8
      Declared duplicate reaction...
1957. ch3chcoch3+o2<=>c2h3coch3+ho2                 2.27E+11   -0.2     7653.1
      Declared duplicate reaction...
1958. ch3chcoch3+o2<=>ch3choococh3                  2.60E+39   -9.2     4825.7
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      Declared duplicate reaction...
 1959. ch3chcoch3+o2<=>ch3choococh3                  2.37E+79  -19.5    50634.6
      Declared duplicate reaction...
 1960. ch3choococh3<=>c2h3coch3+ho2                  1.78E+25   -5.1    25130.0
 1961. ch3chcoch3<=>ch3+ch3chco                      1.52E+31   -5.2    53980.4
 1962. ch3chcoch3<=>h+c2h3coch3                      1.67E+29   -4.8    53356.2
 1963. ch3chcoch3<=>c2h5coch2                        1.22E+48  -10.9    67143.5
 1964. ch3chcoch3<=>c2h4+ch3co                       8.42E+39   -7.9    59709.2
 1965. ch3chcoch3<=>c2h5+ch2co                       7.13E+50  -11.1    79262.1
 1966. h+ch3chcoch3<=>c2h5+ch3co                     3.32E+36   -6.1    24776.3
 1967. h+ch3chcoch3<=>ch3coch2+ch3                   3.08E+38   -6.7    28683.2
 1968. h+ch3chcoch3<=>c2h5co+ch3                     4.41E+39   -7.0    28667.2
 1969. c2h5coch2<=>c2h5+ch2co                        1.70E+29   -4.8    42920.1
 1970. c2h5coch2<=>ch3+ch3chco                       6.92E+48  -10.6    74370.0
 1971. c2h5coch2<=>c2h4+ch3co                        6.32E+42   -9.0    52442.6
 1972. c2h5coch2<=>h+c2h3coch3                       1.35E+35   -7.1    57179.5
 1973. h+c2h5coch2<=>c2h5+ch3co                      2.24E+39   -6.9    25024.3
 1974. h+c2h5coch2<=>c2h5co+ch3                      3.24E+44   -8.3    30920.4
 1975. h+c2h5coch2<=>ch3coch2+ch3                    1.76E+35   -5.7    23742.0
 1976. ch3chco+h<=>c2h3co+h2                         1.43E+06    2.3     4022.7
 1977. ch3chco+oh<=>c2h3co+h2o                       2.27E+03    3.0     -793.5
 1978. ch3chco+ch3<=>c2h3co+ch4                      1.17E-01    4.0     7457.4
 1979. ch3chco+ho2<=>c2h3co+h2o2                     6.72E-04    4.5     8803.1
 1980. ch3chco+o<=>c2h3co+oh                         1.75E+11    0.7     5884.0
 1981. ch3chco+o2<=>c2h3co+ho2                       5.96E+19   -1.7    46192.1
 1982. ch3chco+oh=>c2h5+co2                          2.62E+08    0.9    11817.9
 1983. ch3chco+oh=>ch3choh+co                        6.25E+04    2.1    -3207.4
 1984. ch3chco+o=>ch3cho+co                          3.20E+12    0.0     -437.0
 1985. ch3chco(+m)<=>c2h4+co(+m)                     1.81E+10    0.9    78030.6
      Low pressure limit:  0.10020E+55 -0.99890E+01  0.87553E+05
      TROE centering:      0.50000E+00  0.13586E+04  0.13586E+04  0.77374E+04
 1986. ch3chco+h<=>c2h3cho+h                         5.45E+17   -0.9    20684.2
 1987. ch3chco+h<=>c2h5+co                           3.09E+08    1.3     1834.7
 1988. c2h3coch3(+m)<=>ch3co+c2h3(+m)                2.58E+22   -1.7    92775.2
      Low pressure limit:  0.43080E+64 -0.12945E+02  0.10164E+06
      TROE centering:      0.24820E+00  0.57015E+04  0.36000E+02  0.10539E+05
         h2               Enhanced by    2.000E+00
         h2o              Enhanced by    6.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         ch4              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
 1989. c2h3coch3(+m)<=>c2h3co+ch3(+m)                9.77E+20   -1.2    84070.1
      Low pressure limit:  0.23380E+74 -0.15321E+02  0.93700E+05
      TROE centering:      0.31730E+00  0.92670E+03  0.39500E+02  0.66310E+04
         h2               Enhanced by    2.000E+00
         h2o              Enhanced by    6.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         ch4              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
 1990. c2h3coch3(+m)<=>c2h3coch2+h(+m)               3.52E+18   -0.9    99383.8
      Low pressure limit:  0.31600E+40 -0.66860E+01  0.93378E+05
      TROE centering:      0.34720E+00  0.70000E+00  0.20800E+02  0.13920E+03
         h2               Enhanced by    2.000E+00
         h2o              Enhanced by    6.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         ch4              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
 1991. c2h3coch3+oh<=>c2h3coch2+h2o                  4.17E+13    0.0     4700.0
 1992. c2h3coch3+ho2<=>c2h3coch2+h2o2                1.67E-02    4.3    16400.0
 1993. c2h3coch3+o<=>c2h3coch2+oh                    5.00E+12    0.0     5962.0
 1994. c2h3coch3+h<=>c2h3coch2+h2                    5.62E+04    2.6     5287.1
 1995. c2h3coch3+ch3<=>c2h3coch2+ch4                 2.69E-01    3.8     7971.5
 1996. c2h3coch3+c2h3=c2h3coch2+c2h4                 6.15E+10    0.0     4278.0
 1997. c2h3coch3+oh<=>ch3cho+ch3co                   6.68E+17   -1.4     6375.0
 1998. h+c2h3coch3<=>c2h4+ch3co                      1.26E+21   -2.0    12593.5
 1999. h+c2h3coch3<=>ch3+ch3chco                     4.94E+22   -2.0    23813.6
 2000. c2h3coch3+ch3<=>c3h6+ch3co                    4.69E+20   -2.5    19711.0
 2001. h+c2h3coch2<=>c2h3co+ch3                      2.69E+28   -3.8    15586.8
 2002. h+c2h3coch2<=>c2h3+ch3co                      3.14E+26   -3.4    18155.7
 2003. c2h3coch2(+m)<=>ch2co+c2h3(+m)                4.87E+14   -0.1    48621.5
      Low pressure limit:  0.59560E+33 -0.46130E+01  0.37873E+05
      TROE centering:      0.50500E-01  0.80870E+03  0.40299E+04  0.61983E+04
         h2               Enhanced by    2.000E+00
         h2o              Enhanced by    6.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         ch4              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
 2004. c2h3coch2+o<=>c2h3co+ch2o                     6.02E+13    0.0        0.0
 2005. c2h3coch2+ho2<=>c2h3coch2o2h                  2.13E+50  -12.0    11723.1
 2006. c2h3coch2+ho2<=>c2h3coch2o+oh                 1.58E+22   -2.7     5972.3
 2007. c2h3coch2o2h<=>c2h3coch2o+oh                  2.39E+36   -6.5    49429.0
 2008. c2h3coch2o(+m)<=>c2h3co+ch2o(+m)              2.06E+01    3.6     -487.4
      Low pressure limit:  0.37950E+20 -0.13040E+01  0.52154E+04
      TROE centering:      0.31000E-02  0.15370E+03  0.16000E+01  0.96880E+03
         h2               Enhanced by    2.000E+00
         h2o              Enhanced by    6.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         ch4              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
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2009. c4h9oc4h8-a+h<=>c4h9oc4h9                    1.00E+14    0.0        0.0
2010. c4h9oc4h8-b+h<=>c4h9oc4h9                    1.00E+14    0.0        0.0
2011. c4h9oc4h8-c+h<=>c4h9oc4h9                    1.00E+14    0.0        0.0
2012. c4h9oc4h8-d+h<=>c4h9oc4h9                    1.00E+14    0.0        0.0
2013. c4h9oc4h9(+m)<=>ch3+c4h9oc3h6(+m)            3.79E+24   -2.2    88070.0
      Low pressure limit:  0.17820E+61 -0.12280E+02  0.83980E+05
      TROE centering:      0.23520E+00  0.72400E+03  0.50000E+10  0.50000E+10
2014. c4h9oc4h9(+m)<=>c2h5+c4h9oc2h4(+m)           5.53E+24   -2.2    89010.0
      Low pressure limit:  0.66320E+60 -0.12130E+02  0.84720E+05
      TROE centering:      0.24380E+00  0.74406E+03  0.50000E+10  0.50000E+10
2015. c4h9oc4h9(+m)=c4h9och2+nc3h7(+m)             3.02E+23   -1.9    85710.0
      Low pressure limit:  0.14160E+60 -0.11930E+02  0.83980E+05
      TROE centering:      0.76460E+00  0.83440E+10  0.72480E+03  0.82140E+10
2016. c4h9oc4h9(+m)=pc4h9+pc4h9o(+m)               6.33E+20   -1.4    89930.0
      Low pressure limit:  0.69020E+52 -0.10210E+02  0.84200E+05
      TROE centering:      0.70300E+00  0.98820E+10  0.63468E+03  0.17860E+10
2017. c4h9oc4h9<=>pc4h9oh+c4h8-1                   2.30E+41   -8.6    77125.0
2018. c4h9oc4h9+h<=>c4h9oc4h8-a+h2                 6.00E+07    1.8     3107.0
      Declared duplicate reaction...
2019. c4h9oc4h9+h<=>c4h9oc4h8-a+h2                 7.80E+07    1.8     3203.0
      Declared duplicate reaction...
2020. c4h9oc4h9+h<=>c4h9oc4h8-b+h2                 3.20E+08    1.6     6596.0
      Declared duplicate reaction...
2021. c4h9oc4h9+h<=>c4h9oc4h8-b+h2                 6.10E+07    1.8     6095.0
      Declared duplicate reaction...
2022. c4h9oc4h9+h<=>c4h9oc4h8-c+h2                 8.30E+07    1.8     4995.0
      Declared duplicate reaction...
2023. c4h9oc4h9+h<=>c4h9oc4h8-c+h2                 7.00E+07    1.8     5091.0
      Declared duplicate reaction...
2024. c4h9oc4h9+h<=>c4h9oc4h8-d+h2                 3.30E+07    1.9     7600.0
      Declared duplicate reaction...
2025. c4h9oc4h9+h<=>c4h9oc4h8-d+h2                 9.20E+07    1.8     7791.0
      Declared duplicate reaction...
2026. c4h9oc4h9+h<=>c4h9oc4h8-d+h2                 9.40E+07    1.9     8102.0
      Declared duplicate reaction...
2027. c4h9oc4h9+oh<=>c4h9oc4h8-a+h2o               2.61E+05    2.4    -1457.0
2028. c4h9oc4h9+oh<=>c4h9oc4h8-b+h2o               9.36E+07    1.6      -35.0
2029. c4h9oc4h9+oh<=>c4h9oc4h8-c+h2o               9.36E+07    1.6      -35.0
2030. c4h9oc4h9+oh<=>c4h9oc4h8-d+h2o               2.10E+10    1.0     1590.0
2031. c4h9oc4h9+o<=>c4h9oc4h8-a+oh                 2.90E+05    2.4      876.0
2032. c4h9oc4h9+o<=>c4h9oc4h8-b+oh                 9.54E+04    2.7     2106.0
2033. c4h9oc4h9+o<=>c4h9oc4h8-c+oh                 9.54E+04    2.7     2106.0
2034. c4h9oc4h9+o<=>c4h9oc4h8-d+oh                 3.86E+05    2.7     3716.0
2035. c4h9oc4h9+ho2<=>c4h9oc4h8-a+h2o2             7.85E-01    3.7     9168.0
2036. c4h9oc4h9+ho2<=>c4h9oc4h8-b+h2o2             8.05E-03    4.2    12942.0
2037. c4h9oc4h9+ho2<=>c4h9oc4h8-c+h2o2             3.05E-01    3.7    13627.0
2038. c4h9oc4h9+ho2<=>c4h9oc4h8-d+h2o2             5.88E+01    3.2    17198.0
2039. c4h9oc4h9+ch3<=>c4h9oc4h8-a+ch4              3.99E+01    3.4     7634.0
2040. c4h9oc4h9+ch3<=>c4h9oc4h8-b+ch4              1.60E+00    3.2     6461.0
2041. c4h9oc4h9+ch3<=>c4h9oc4h8-c+ch4              3.02E+00    3.5     5481.0
2042. c4h9oc4h9+ch3<=>c4h9oc4h8-d+ch4              9.06E-01    3.6     7154.0
2043. c4h9oc4h9+o2<=>c4h9oc4h8-a+ho2               4.00E+13    0.0    46800.0
2044. c4h9oc4h9+o2<=>c4h9oc4h8-b+ho2               4.00E+13    0.0    49800.0
2045. c4h9oc4h9+o2<=>c4h9oc4h8-c+ho2               4.00E+13    0.0    49800.0
2046. c4h9oc4h9+o2<=>c4h9oc4h8-d+ho2               6.00E+13    0.0    52340.0
2047. c4h9oc4h9+c2h5<=>c4h9oc4h8-a+c2h6            4.02E+11    0.0     7900.0
2048. c4h9oc4h9+c2h5<=>c4h9oc4h8-b+c2h6            1.00E+11    0.0    10400.0
2049. c4h9oc4h9+c2h5<=>c4h9oc4h8-c+c2h6            1.00E+11    0.0    10400.0
2050. c4h9oc4h9+c2h5<=>c4h9oc4h8-d+c2h6            1.00E+11    0.0    13400.0
2051. c4h9oc4h9+ch3o<=>c4h9oc4h8-a+ch3oh           3.00E+11    0.0     4500.0
2052. c4h9oc4h9+ch3o<=>c4h9oc4h8-b+ch3oh           6.04E+10    0.2     4703.0
2053. c4h9oc4h9+ch3o<=>c4h9oc4h8-c+ch3oh           2.90E+11    0.0     4571.0
2054. c4h9oc4h9+ch3o<=>c4h9oc4h8-d+ch3oh           4.34E+11    0.0     6458.0
2055. c4h9oc4h9+ch3o2<=>c4h9oc4h8-a+ch3o2h         6.00E+12    0.0    17500.0
2056. c4h9oc4h9+ch3o2<=>c4h9oc4h8-b+ch3o2h         3.16E+03    2.8    14050.0
2057. c4h9oc4h9+ch3o2<=>c4h9oc4h8-c+ch3o2h         1.93E+04    2.6    13910.0
2058. c4h9oc4h9+ch3o2<=>c4h9oc4h8-d+ch3o2h         4.76E+04    2.5    16490.0
2059. c4h9oc2h3+h<=>c2h3oc4h8-1+h2                 1.79E+05    2.5     3420.0
2060. c4h9oc2h3+h<=>c2h3oc4h8-2+h2                 1.30E+06    2.4     4471.0
2061. c4h9oc2h3+h<=>c2h3oc4h8-3+h2                 1.30E+06    2.4     4471.0
2062. c4h9oc2h3+h<=>c2h3oc4h8-4+h2                 1.88E+05    2.8     6280.0
2063. c4h9oc2h3+oh<=>c2h3oc4h8-1+h2o               1.31E+05    2.4    -1457.0
2064. c4h9oc2h3+oh<=>c2h3oc4h8-2+h2o               4.68E+07    1.6      -35.0
2065. c4h9oc2h3+oh<=>c2h3oc4h8-3+h2o               4.68E+07    1.6      -35.0
2066. c4h9oc2h3+oh<=>c2h3oc4h8-4+h2o               1.05E+10    1.0     1590.0
2067. c4h9oc2h3+o<=>c2h3oc4h8-1+oh                 1.45E+05    2.4      876.0
2068. c4h9oc2h3+o<=>c2h3oc4h8-2+oh                 4.77E+04    2.7     2106.0
2069. c4h9oc2h3+o<=>c2h3oc4h8-3+oh                 4.77E+04    2.7     2106.0
2070. c4h9oc2h3+o<=>c2h3oc4h8-4+oh                 1.93E+05    2.7     3716.0
2071. c4h9oc2h3+ho2<=>c2h3oc4h8-1+h2o2             8.20E+03    2.5    10750.0
2072. c4h9oc2h3+ho2<=>c2h3oc4h8-2+h2o2             5.60E+12    0.0    17690.0
2073. c4h9oc2h3+ho2<=>c2h3oc4h8-3+h2o2             5.60E+12    0.0    17690.0
2074. c4h9oc2h3+ho2<=>c2h3oc4h8-4+h2o2             1.68E+13    0.0    20440.0
2075. c4h9oc2h3+ch3<=>c2h3oc4h8-1+ch4              1.99E+01    3.4     7634.0
2076. c4h9oc2h3+ch3<=>c2h3oc4h8-2+ch4              8.02E-01    3.2     6461.0
2077. c4h9oc2h3+ch3<=>c2h3oc4h8-3+ch4              1.51E+00    3.5     5481.0
2078. c4h9oc2h3+ch3<=>c2h3oc4h8-4+ch4              4.53E-01    3.6     7154.0
2079. c4h9oc2h3+o2<=>c2h3oc4h8-1+ho2               2.00E+13    0.0    46800.0
2080. c4h9oc2h3+o2<=>c2h3oc4h8-2+ho2               2.00E+13    0.0    49800.0
2081. c4h9oc2h3+o2<=>c2h3oc4h8-3+ho2               2.00E+13    0.0    49800.0
2082. c4h9oc2h3+o2<=>c2h3oc4h8-4+ho2               3.00E+13    0.0    52340.0
2083. c4h9oc2h3+c2h5<=>c2h3oc4h8-1+c2h6            2.01E+11    0.0     7900.0
2084. c4h9oc2h3+c2h5<=>c2h3oc4h8-2+c2h6            5.00E+10    0.0    10400.0
2085. c4h9oc2h3+c2h5<=>c2h3oc4h8-3+c2h6            5.00E+10    0.0    10400.0
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2086.	c4h9oc2h3+c2h5<=>c2h3oc4h8-4+c2h6	5.00E+10	0.0	13400.0
2087.	c4h9oc2h3+ch3o<=>c2h3oc4h8-1+ch3oh	1.50E+11	0.0	4500.0
2088.	c4h9oc2h3+ch3o<=>c2h3oc4h8-2+ch3oh	3.02E+10	0.2	4703.0
2089.	c4h9oc2h3+ch3o<=>c2h3oc4h8-3+ch3oh	1.45E+11	0.0	4571.0
2090.	c4h9oc2h3+ch3o<=>c2h3oc4h8-4+ch3oh	2.17E+11	0.0	6458.0
2091.	c4h9oc2h3+ch3o2<=>c2h3oc4h8-1+ch3o2h	3.00E+12	0.0	17500.0
2092.	c4h9oc2h3+ch3o2<=>c2h3oc4h8-2+ch3o2h	1.58E+03	2.8	14050.0
2093.	c4h9oc2h3+ch3o2<=>c2h3oc4h8-3+ch3o2h	9.64E+03	2.6	13910.0
2094.	c4h9oc2h3+ch3o2<=>c2h3oc4h8-4+ch3o2h	2.38E+04	2.5	16490.0
2095.	c4h9oc2h3+c2h3<=>c2h3oc4h8-1+c2h4	4.00E+11	0.0	16800.0
2096.	c4h9oc2h3+c2h3<=>c2h3oc4h8-2+c2h4	4.00E+11	0.0	16800.0
2097.	c4h9oc2h3+c2h3<=>c2h3oc4h8-3+c2h4	4.00E+11	0.0	16800.0
2098.	c4h9oc2h3+c2h3<=>c2h3oc4h8-4+c2h4	5.00E+11	0.0	18000.0
2099.	c4h9oc2h3+hco<=>c2h3oc4h8-1+ch2o	5.60E+12	0.0	17690.0
2100.	c4h9oc2h3+hco<=>c2h3oc4h8-2+ch2o	5.60E+12	0.0	17690.0
2101.	c4h9oc2h3+hco<=>c2h3oc4h8-3+ch2o	5.60E+12	0.0	17690.0
2102.	c4h9oc2h3+hco<=>c2h3oc4h8-4+ch2o	8.40E+12	0.0	20440.0
2103.	c4h9oc3h5-3+h<=>c4oc3h4-3-1+h2	8.80E+04	2.7	2915.0
2104.	c4h9oc3h5-3+h<=>c4h8-1oc3h5+h2	8.80E+04	2.7	2915.0
2105.	c4h9oc3h5-3+h<=>c4h8-2oc3h5+h2	1.08E+05	2.7	4440.0
2106.	c4h9oc3h5-3+h<=>c4h8-3oc3h5+h2	1.30E+06	2.4	4471.0
2107.	c4h9oc3h5-3+h<=>c4h8-4oc3h5+h2	6.65E+05	2.5	6756.0
2108.	c4h9oc3h5-3+oh<=>c4oc3h4-3-1+h2o	6.32E+03	2.9	-2291.0
2109.	c4h9oc3h5-3+oh<=>c4h8-1oc3h5+h2o	6.32E+03	2.9	-2291.0
2110.	c4h9oc3h5-3+oh<=>c4h8-2oc3h5+h2o	3.08E+00	3.7	-3736.0
2111.	c4h9oc3h5-3+oh<=>c4h8-3oc3h5+h2o	2.28E+03	2.9	-2926.0
2112.	c4h9oc3h5-3+oh<=>c4h8-4oc3h5+h2o	1.06E+10	1.0	1586.0
2113.	c4h9oc3h5-3+o<=>c4oc3h4-3-1+oh	1.45E+05	2.5	876.0
2114.	c4h9oc3h5-3+o<=>c4h8-1oc3h5+oh	1.45E+05	2.5	876.0
2115.	c4h9oc3h5-3+o<=>c4h8-2oc3h5+oh	1.44E+05	2.6	3029.0
2116.	c4h9oc3h5-3+o<=>c4h8-3oc3h5+oh	5.50E+05	2.5	2830.0
2117.	c4h9oc3h5-3+o<=>c4h8-4oc3h5+oh	9.80E+05	2.4	4750.0
2118.	c4h9oc3h5-3+ho2<=>c4oc3h4-3-1+h2o2	3.50E-05	5.3	8268.0
2119.	c4h9oc3h5-3+ho2<=>c4h8-1oc3h5+h2o2	3.50E-05	5.3	8268.0
2120.	c4h9oc3h5-3+ho2<=>c4h8-2oc3h5+h2o2	7.51E-03	4.5	14710.0
2121.	c4h9oc3h5-3+ho2<=>c4h8-3oc3h5+h2o2	2.76E-04	4.8	11850.0
2122.	c4h9oc3h5-3+ho2<=>c4h8-4oc3h5+h2o2	8.80E-03	4.3	17270.0
2123.	c4h9oc3h5-3+ch3<=>c4oc3h4-3-1+ch4	1.99E+01	3.4	7634.0
2124.	c4h9oc3h5-3+ch3<=>c4h8-1oc3h5+ch4	1.99E+01	3.4	7634.0
2125.	c4h9oc3h5-3+ch3<=>c4h8-2oc3h5+ch4	8.02E-01	3.2	6461.0
2126.	c4h9oc3h5-3+ch3<=>c4h8-3oc3h5+ch4	1.51E+00	3.5	5481.0
2127.	c4h9oc3h5-3+ch3<=>c4h8-4oc3h5+ch4	4.53E-01	3.6	7154.0
2128.	c4h9oc3h5-3+o2<=>c4oc3h4-3-1+ho2	2.00E+13	0.0	46800.0
2129.	c4h9oc3h5-3+o2<=>c4h8-1oc3h5+ho2	2.00E+13	0.0	46800.0
2130.	c4h9oc3h5-3+o2<=>c4h8-2oc3h5+ho2	2.00E+13	0.0	49800.0
2131.	c4h9oc3h5-3+o2<=>c4h8-3oc3h5+ho2	2.00E+13	0.0	49800.0
2132.	c4h9oc3h5-3+o2<=>c4h8-4oc3h5+ho2	3.00E+13	0.0	52340.0
2133.	c4h9oc3h5-3+c2h5<=>c4oc3h4-3-1+c2h6	2.01E+11	0.0	7900.0
2134.	c4h9oc3h5-3+c2h5<=>c4h8-1oc3h5+c2h6	2.01E+11	0.0	7900.0
2135.	c4h9oc3h5-3+c2h5<=>c4h8-2oc3h5+c2h6	5.00E+10	0.0	10400.0
2136.	c4h9oc3h5-3+c2h5<=>c4h8-3oc3h5+c2h6	5.00E+10	0.0	10400.0
2137.	c4h9oc3h5-3+c2h5<=>c4h8-4oc3h5+c2h6	5.00E+10	0.0	13400.0
2138.	c4h9oc3h5-3+ch3o<=>c4oc3h4-3-1+ch3oh	1.50E+11	0.0	4500.0
2139.	c4h9oc3h5-3+ch3o<=>c4h8-1oc3h5+ch3oh	1.50E+11	0.0	4500.0
2140.	c4h9oc3h5-3+ch3o<=>c4h8-2oc3h5+ch3oh	3.02E+10	0.2	4703.0
2141.	c4h9oc3h5-3+ch3o<=>c4h8-3oc3h5+ch3oh	1.45E+11	0.0	4571.0
2142.	c4h9oc3h5-3+ch3o<=>c4h8-4oc3h5+ch3oh	2.17E+11	0.0	6458.0
2143.	c4h9oc3h5-3+ch3o2<=>c4oc3h4-3-1+ch3o2h	3.00E+12	0.0	17500.0
2144.	c4h9oc3h5-3+ch3o2<=>c4h8-1oc3h5+ch3o2h	3.00E+12	0.0	17500.0
2145.	c4h9oc3h5-3+ch3o2<=>c4h8-2oc3h5+ch3o2h	1.58E+03	2.8	14050.0
2146.	c4h9oc3h5-3+ch3o2<=>c4h8-3oc3h5+ch3o2h	9.64E+03	2.6	13910.0
2147.	c4h9oc3h5-3+ch3o2<=>c4h8-4oc3h5+ch3o2h	2.38E+04	2.5	16490.0
2148.	c4h9oc3h5-3+c2h3<=>c4oc3h4-3-1+c2h4	4.00E+11	0.0	16800.0
2149.	c4h9oc3h5-3+c2h3<=>c4h8-1oc3h5+c2h4	4.00E+11	0.0	16800.0
2150.	c4h9oc3h5-3+c2h3<=>c4h8-2oc3h5+c2h4	4.00E+11	0.0	16800.0
2151.	c4h9oc3h5-3+c2h3<=>c4h8-3oc3h5+c2h4	4.00E+11	0.0	16800.0
2152.	c4h9oc3h5-3+c2h3<=>c4h8-4oc3h5+c2h4	5.00E+11	0.0	18000.0
2153.	c4h9oc3h6<=>c4h9och2+c2h4	5.27E+21	-2.8	30991.2
2154.	c4h9och2<=>pc4h9+ch2o	1.14E+32	-5.8	29120.3
2155.	c4h9oc2h4<=>pc4h9o+c2h4	1.27E+20	-2.4	25468.7
2156.	c4h9oc4h8-a<=>pc4h9+nc3h7cho	1.14E+32	-5.8	29120.3
2157.	c4h9oc4h8-a<=>c2h5+c4h9oc2h3	1.15E+32	-5.6	35793.1
2158.	c4h9oc4h8-b<=>ch3+c4h9oc3h5-3	1.30E+20	-2.2	30468.3
2159.	c4h9oc4h8-b<=>pc4h9o+c4h8-1	1.27E+20	-2.4	25468.7
2160.	c4h9oc4h8-c<=>c3h6+c4h9och2	5.26E+21	-2.8	28991.6
2161.	c4h9oc4h8-d<=>c2h4+c4h9oc2h4	5.27E+21	-2.8	30991.2
2162.	c4h9oc4h8-a<=>h+c4h9oc4h7-2	2.85E+11	0.3	32520.0
2163.	c4h9oc4h8-b<=>h+c4h9oc4h7-2	2.85E+11	0.3	35520.0
2164.	c4h9oc4h8-b<=>h+c4h9oc4h7-3	2.85E+11	0.3	35520.0
2165.	c4h9oc4h8-c<=>h+c4h9oc4h7-3	2.85E+11	0.3	35520.0
2166.	c4h9oc4h8-c<=>h+c4h9oc4h7-4	2.85E+11	0.3	35520.0
2167.	c4h9oc4h8-d<=>h+c4h9oc4h7-4	2.85E+11	0.3	35520.0
2168.	c4h9oc3h6<=>h+c4h9oc3h5-3	2.85E+11	0.3	35520.0
2169.	c4h9oc2h4<=>h+c4h9oc2h3	2.85E+11	0.3	35520.0
2170.	ch3oc4h8-2<=>ch3o+c4h8-1	1.27E+20	-2.4	25468.7
2171.	ch3oc4h8-2<=>ch3oc3h5+ch3	1.30E+20	-2.2	30468.3
2172.	ch3oc4h8-3<=>c3h6+ch3och2	5.26E+21	-2.8	28991.6
2173.	c2h5oc4h8-1<=>c2h5+nc3h7cho	1.14E+32	-5.8	29120.3
2174.	c2h5oc4h8-1<=>c2h5oc2h3+c2h5	1.15E+32	-5.6	35793.1
2175.	c2h5oc4h8-2<=>c2h5oc3h5+ch3	1.30E+20	-2.2	30468.3
2176.	c2h5oc4h8-2<=>c4h8-1+ch3ch2o	1.27E+20	-2.4	25468.7
2177.	c2h5oc4h8-4<=>c2h5oc2h4p+c2h4	5.27E+21	-2.8	30991.2
2178.	c2h5och2<=>c2h5+ch2o	1.14E+32	-5.8	29120.3
2179.	c2h4och3<=>c2h4+ch3o	1.14E+32	-5.8	29120.3

2180. c2h3oc4h8-1<=>c2h3+nc3h7cho	1.14E+32	-5.8	29120.3
2181. c2h3oc4h8-1<=>c2h3oc2h3+c2h5	1.15E+32	-5.6	35793.1
2182. c2h3oc4h8-4<=>c2h3oc2h4-2+c2h4	5.27E+21	-2.8	30991.2
2183. c2h3oc4h8-3<=>c2h3och2+c3h6	5.26E+21	-2.8	28991.6
2184. c2h3oc4h8-2<=>ch2cho+c4h8-1	1.27E+20	-2.4	25468.7
2185. c2h3oc4h8-2<=>ch3+c2h3oc3h5-3	1.30E+20	-2.2	30468.3
2186. c2h3och2<=>ch2o+c2h3	1.14E+32	-5.8	29120.3
2187. c2h3oc2h4-2<=>ch2cho+c2h4	1.27E+20	-2.4	25468.7
2188. c4oc3h4-3-1<=>c2h3cho+pc4h9	1.14E+32	-5.8	29120.3
2189. c4h8-3oc3h5<=>ch2oc3h5-3+c3h6	5.26E+21	-2.8	28991.6
2190. ch2oc3h5-3<=>c3h5-a+ch2o	1.14E+32	-5.8	29120.3
2191. c4h8-2oc3h5<=>c3h5o+c4h8-1	1.14E+32	-5.8	29120.3
2192. c4h8-2oc3h5<=>c3h5oc3h5+ch3	1.30E+20	-2.2	30468.3
2193. c4h8-4oc3h5<=>c2h4-2oc3h5+c2h4	5.27E+21	-2.8	30991.2
2194. c2h4-2oc3h5<=>c2h4+c3h5o	1.14E+32	-5.8	29120.3
2195. c4h8-1oc3h5<=>c3h5-a+nc3h7cho	1.14E+32	-5.8	29120.3
2196. c4h8-1oc3h5<=>c2h3oc3h5-3+c2h5	1.15E+32	-5.6	35793.1
2197. c4h9oc4h8-a<=>c4h9oc4h8-b	9.73E+17	-2.1	25068.8
2198. c4h9oc4h8-a<=>c4h9oc4h8-c	1.25E+15	-1.3	18882.2
2199. c4h9oc4h8-a<=>c4h9oc4h8-d	9.33E+16	-1.8	26657.4
2200. c4h9och2<=>ch3oc4h8-2	9.73E+17	-2.1	25068.8
2201. c4h9och2<=>ch3oc4h8-3	1.25E+15	-1.3	18882.2
2202. c2h5oc4h8-1<=>c4h9oc2h4	9.73E+17	-2.1	25068.8
2203. c4h9oc2h4<=>c2h5oc4h8-2	1.25E+15	-1.3	18882.2
2204. c2h5oc4h8-1<=>c2h5oc4h8-2	9.73E+17	-2.1	25068.8
2205. c2h5oc4h8-1<=>c2h5oc4h8-4	9.73E+17	-2.1	25068.8
2206. c2h5och2<=>c2h4och3	9.73E+17	-2.1	25068.8
2207. c2h3oc4h8-1<=>c2h3oc4h8-4	9.33E+16	-1.8	26657.4
2208. c4oc3h4-3-1<=>c4h8-2oc3h5	9.33E+16	-1.8	26657.4
2209. c4oc3h4-3-1<=>c4h8-3oc3h5	9.33E+16	-1.8	26657.4
2210. c4h8-1oc3h5<=>c4h8-4oc3h5	9.33E+16	-1.8	26657.4
2211. c4h9oc4h7-2+ho2<=>c4h9oc4h6+h2o2	5.06E+02	3.4	13719.9
2212. c4h9oc4h7-3+ho2<=>c4h9oc4h6+h2o2	5.06E+02	3.4	13719.9
2213. c4h9oc4h7-4+ho2<=>c4h9oc4h6+h2o2	5.06E+02	3.4	13719.9
2214. c4h9oc4h7-2+oh<=>c4h9oc4h6+h2o	3.74E+08	1.6	-34.9
2215. c4h9oc4h7-3+oh<=>c4h9oc4h6+h2o	3.74E+08	1.6	-34.9
2216. c4h9oc4h7-4+oh<=>c4h9oc4h6+h2o	3.74E+08	1.6	-34.9
2217. c4h9oc4h7-2+h<=>c4h9oc4h6+h2	1.04E+07	2.4	4471.1
2218. c4h9oc4h7-3+h<=>c4h9oc4h6+h2	1.04E+07	2.4	4471.1
2219. c4h9oc4h7-4+h<=>c4h9oc4h6+h2	1.04E+07	2.4	4471.1
2220. c4h9oc4h7-2+ch3<=>c4h9oc4h6+ch4	1.21E+01	3.5	5481.1
2221. c4h9oc4h7-3+ch3<=>c4h9oc4h6+ch4	1.21E+01	3.5	5481.1
2222. c4h9oc4h7-4+ch3<=>c4h9oc4h6+ch4	1.21E+01	3.5	5481.1
2223. c4h9oc4h7-2+o<=>c4h9oc4h6+oh	4.42E+06	2.5	2830.1
2224. c4h9oc4h7-3+o<=>c4h9oc4h6+oh	4.42E+06	2.5	2830.1
2225. c4h9oc4h7-4+o<=>c4h9oc4h6+oh	4.42E+06	2.5	2830.1
2226. c4h9oc4h7-2+oh<=>nc3h7cho+pc4h9o	1.00E+11	0.0	-4000.0
2227. c4h9oc4h7-2+oh<=>c2h5cho+c4h9och2	1.00E+11	0.0	-4000.0
2228. c4h9oc4h7-3+oh<=>ch3cho+c4h9oc2h4	1.00E+11	0.0	-4000.0
2229. c4h9oc4h7-4+oh<=>ch2o+c4h9oc3h6	1.00E+11	0.0	-4000.0
2230. c4h9oc4h7-4+oh<=>ch3cho+c4h9oc2h4	1.00E+11	0.0	-4000.0
2231. c4h9oc4h7-2+o<=>nc3h7cho+c4h8cy1o4	1.00E+11	0.0	-4000.0
2232. c4h9oc4h7-2+o<=>c2h5cho+c4h7och3	1.00E+11	0.0	-4000.0
2233. c4h9oc4h7-3+o<=>ch3cho+c4h9oc2h3	1.00E+11	0.0	-4000.0
2234. c4h9oc4h7-4+o<=>ch2o+c4h9oc3h5-3	1.00E+11	0.0	-4000.0
2235. c4h9oc4h7-4+o<=>ch3cho+c4h9oc2h3	1.00E+11	0.0	-4000.0
2236. c4h9oc4h6+ho2<=>sc3h5cho+pc4h9o+oh	9.64E+12	0.0	0.0
2237. c4h9oc4h6+ch3o2<=>sc3h5cho+pc4h9o+ch3o	9.64E+12	0.0	0.0
2238. c4h9oc4h6+c2h5o2<=>sc3h5cho+pc4h9o+ch3ch2o	9.64E+12	0.0	0.0
2239. c4h9oc4h6<=>c4h712+c4h8cy1o4	2.50E+13	0.0	30000.0
Reverse Arrhenius coefficients:	1.00E+11	0.0	9600.0
2240. c4h9oc4h6<=>c3h5-s+c4h7och3	2.50E+13	0.0	30000.0
Reverse Arrhenius coefficients:	1.00E+11	0.0	9600.0
2241. c4h9oc4h6<=>c3h5-a+c4h7och3	2.50E+13	0.0	30000.0
Reverse Arrhenius coefficients:	1.00E+11	0.0	9600.0
2242. c4h9oc4h7-2<=>c4h712+pc4h9o	2.50E+16	0.0	71000.0
Reverse Arrhenius coefficients:	1.00E+13	0.0	0.0
2243. c4h9oc4h7-3<=>c3h5-s+c4h9och2	2.50E+16	0.0	71000.0
Reverse Arrhenius coefficients:	1.00E+13	0.0	0.0
2244. c4h9oc4h7-4<=>c3h5-a+c4h9och2	2.50E+16	0.0	71000.0
Reverse Arrhenius coefficients:	1.00E+13	0.0	0.0
2245. c4h9oc3h5-3<=>c3h5-a+pc4h9o	2.50E+16	0.0	71000.0
Reverse Arrhenius coefficients:	1.00E+13	0.0	0.0
2246. c4h7och3<=>ch3+ch2o+c3h5-a	2.50E+16	0.0	71000.0
Reverse Arrhenius coefficients:	1.00E+13	0.0	0.0
2247. c4h9oc4h7-2<=>c4h9oc2h3+c2h4	3.98E+12	0.0	57629.1
2248. c4h9oc4h7-4<=>c4h7och3+c3h6	3.98E+12	0.0	57629.1
2249. c4h9oc3h5-3<=>c4h8cy1o4+c3h6	3.98E+12	0.0	57629.1
2250. ch3oc3h5<=>c2h3+ch3och2	3.98E+12	0.0	57629.1
2251. c2h5oc3h5<=>c2h3+c2h5och2	3.98E+12	0.0	57629.1
2252. c2h5oc2h3<=>c2h3+ch3ch2o	3.98E+12	0.0	57629.1
2253. c2h3oc2h3<=>c2h3+ch2cho	3.98E+12	0.0	57629.1
2254. c2h3oc2h3+oh=>ch2o+ch2o+c2h3	1.37E+12	0.0	-1040.0
2255. c2h3oc3h5-3<=>c2h3+c3h5o	3.98E+12	0.0	57629.1
2256. c2h3oc3h5-3<=>ch2cho+c3h5-a	3.98E+12	0.0	57629.1
2257. c3h5oc3h5<=>c3h5-a+c3h5o	3.98E+12	0.0	57629.1
2258. c4h9oc4h8-a+o2<=>c4oc4h8oo-a	6.74E+27	-4.8	4779.8
2259. c4h9oc4h8-b+o2<=>c4oc4h8oo-b	6.74E+27	-4.8	3779.8
2260. c4h9oc4h8-c+o2<=>c4oc4h8oo-c	6.74E+27	-4.8	3779.8
2261. c4h9oc4h8-d+o2<=>c4oc4h8oo-d	1.15E+20	-2.4	2451.3
2262. c4h9oc4h8-a+o2<=>ho2+c4h9oc4h7-2	3.70E+16	-1.6	3418.0
2263. c4h9oc4h8-b+o2<=>ho2+c4h9oc4h7-2	3.70E+16	-1.6	3418.0
2264. c4h9oc4h8-b+o2<=>ho2+c4h9oc4h7-3	3.70E+16	-1.6	3418.0
2265. c4h9oc4h8-c+o2<=>ho2+c4h9oc4h7-3	3.70E+16	-1.6	3418.0

2266.	c4h9oc4h8-c+o2<=>ho2+c4h9oc4h7-4	3.35E+20	-3.0	2504.0
2267.	c4h9oc4h8-d+o2<=>ho2+c4h9oc4h7-4	3.70E+16	-1.6	3418.0
2268.	c4h9oc4h8-a+c4oc4h8oo-a<=>2c4h9oc4h8o-a	4.50E+12	0.0	-500.0
2269.	c4h9oc4h8-a+c4oc4h8oo-b<=>c4h9oc4h8o-a+c4h9oc4h8o-b	4.50E+12	0.0	0.0
2270.	c4h9oc4h8-a+c4oc4h8oo-c<=>c4h9oc4h8o-a+c4h9oc4h8o-c	4.50E+12	0.0	0.0
2271.	c4h9oc4h8-a+c4oc4h8oo-d<=>c4h9oc4h8o-a+c4h9oc4h8o-d	4.50E+12	0.0	0.0
2272.	c4h9oc4h8-b+c4oc4h8oo-a<=>c4h9oc4h8o-b+c4h9oc4h8o-a	4.50E+12	0.0	-500.0
2273.	c4h9oc4h8-b+c4oc4h8oo-b<=>2c4h9oc4h8o-b	4.50E+12	0.0	0.0
2274.	c4h9oc4h8-b+c4oc4h8oo-c<=>c4h9oc4h8o-b+c4h9oc4h8o-c	4.50E+12	0.0	0.0
2275.	c4h9oc4h8-b+c4oc4h8oo-d<=>c4h9oc4h8o-b+c4h9oc4h8o-d	4.50E+12	0.0	0.0
2276.	c4h9oc4h8-c+c4oc4h8oo-a<=>c4h9oc4h8o-c+c4h9oc4h8o-a	4.50E+12	0.0	-500.0
2277.	c4h9oc4h8-c+c4oc4h8oo-b<=>c4h9oc4h8o-c+c4h9oc4h8o-b	4.50E+12	0.0	0.0
2278.	c4h9oc4h8-c+c4oc4h8oo-c<=>2c4h9oc4h8o-c	4.50E+12	0.0	0.0
2279.	c4h9oc4h8-c+c4oc4h8oo-d<=>c4h9oc4h8o-c+c4h9oc4h8o-d	4.50E+12	0.0	0.0
2280.	c4h9oc4h8-d+c4oc4h8oo-a<=>c4h9oc4h8o-c+c4h9oc4h8o-a	4.50E+12	0.0	-500.0
2281.	c4h9oc4h8-d+c4oc4h8oo-b<=>c4h9oc4h8o-c+c4h9oc4h8o-b	4.50E+12	0.0	0.0
2282.	c4h9oc4h8-d+c4oc4h8oo-c<=>2c4h9oc4h8o-c	4.50E+12	0.0	0.0
2283.	c4h9oc4h8-d+c4oc4h8oo-d<=>c4h9oc4h8o-c+c4h9oc4h8o-d	4.50E+12	0.0	0.0
2284.	pc4h9+c4oc4h8oo-a<=>pc4h9o+c4h9oc4h8o-a	4.50E+12	0.0	-500.0
2285.	pc4h9+c4oc4h8oo-b<=>pc4h9o+c4h9oc4h8o-b	4.50E+12	0.0	0.0
2286.	pc4h9+c4oc4h8oo-c<=>pc4h9o+c4h9oc4h8o-c	4.50E+12	0.0	0.0
2287.	pc4h9+c4oc4h8oo-d<=>pc4h9o+c4h9oc4h8o-d	4.50E+12	0.0	0.0
2288.	nc3h7+c4oc4h8oo-a<=>nc3h7o+c4h9oc4h8o-a	4.50E+12	0.0	-500.0
2289.	nc3h7+c4oc4h8oo-b<=>nc3h7o+c4h9oc4h8o-b	4.50E+12	0.0	0.0
2290.	nc3h7+c4oc4h8oo-c<=>nc3h7o+c4h9oc4h8o-c	4.50E+12	0.0	0.0
2291.	nc3h7+c4oc4h8oo-d<=>nc3h7o+c4h9oc4h8o-d	4.50E+12	0.0	0.0
2292.	hco+c4oc4h8oo-a<=>hco2+c4h9oc4h8o-a	4.50E+12	0.0	-500.0
2293.	hco+c4oc4h8oo-b<=>hco2+c4h9oc4h8o-b	4.50E+12	0.0	0.0
2294.	hco+c4oc4h8oo-c<=>hco2+c4h9oc4h8o-c	4.50E+12	0.0	0.0
2295.	hco+c4oc4h8oo-d<=>hco2+c4h9oc4h8o-d	4.50E+12	0.0	0.0
2296.	c4h9oc4h8-a+ho2<=>c4h9oc4h8o-a+oh	7.00E+12	0.0	-1000.0
2297.	c4h9oc4h8-b+ho2<=>c4h9oc4h8o-b+oh	7.00E+12	0.0	-1000.0
2298.	c4h9oc4h8-c+ho2<=>c4h9oc4h8o-c+oh	7.00E+12	0.0	-1000.0
2299.	c4h9oc4h8-d+ho2<=>c4h9oc4h8o-d+oh	7.00E+12	0.0	-1000.0
2300.	c4h9oc4h8-a+ch3o2<=>c4h9oc4h8o-a+ch3o	4.50E+12	0.0	0.0
2301.	c4h9oc4h8-b+ch3o2<=>c4h9oc4h8o-b+ch3o	4.50E+12	0.0	0.0
2302.	c4h9oc4h8-c+ch3o2<=>c4h9oc4h8o-c+ch3o	4.50E+12	0.0	0.0
2303.	c4h9oc4h8-d+ch3o2<=>c4h9oc4h8o-d+ch3o	4.50E+12	0.0	0.0
2304.	c4oc4h8oo-a<=>c4oc4-ao2h-b	4.32E+08	1.3	28600.0
2305.	c4oc4h8oo-a<=>c4oc4-ao2h-c	6.18E+08	0.9	18400.0
2306.	c4oc4h8oo-a<=>c4oc4-ao2h-d	7.83E+06	1.3	20800.0
2307.	c4oc4h8oo-a<=>c4oc4-ao2h-1	6.18E+08	0.9	17400.0
2308.	c4oc4h8oo-a<=>c4oc4-ao2h-2	2.86E+06	1.3	21000.0
2309.	c4oc4h8oo-a<=>c4oc4-ao2h-3	5.34E+05	1.1	15700.0
2310.	c4oc4h8oo-b<=>c4oc4-bo2h-a	6.15E+08	1.1	27600.0
2311.	c4oc4h8oo-b<=>c4oc4-bo2h-c	6.15E+08	1.1	28600.0
2312.	c4oc4h8oo-b<=>c4oc4-bo2h-d	1.49E+08	1.1	21500.0
2313.	c4oc4h8oo-b<=>c4oc4-bo2h-1	2.86E+06	1.3	20000.0
2314.	c4oc4h8oo-b<=>c4oc4-bo2h-2	5.34E+05	1.1	15700.0
2315.	c4oc4h8oo-c<=>c4oc4-co2h-a	6.18E+08	0.9	17400.0
2316.	c4oc4h8oo-c<=>c4oc4-co2h-b	4.32E+08	1.3	28600.0
2317.	c4oc4h8oo-c<=>c4oc4-co2h-d	1.24E+07	1.6	32200.0
2318.	c4oc4h8oo-c<=>c4oc4-co2h-1	5.34E+05	1.1	14700.0
2319.	c4oc4h8oo-d<=>c4oc4-do2h-a	2.86E+06	1.3	20000.0
2320.	c4oc4h8oo-d<=>c4oc4-do2h-b	8.52E+06	1.4	17900.0
2321.	c4oc4h8oo-d<=>c4oc4-do2h-c	4.32E+08	1.3	28600.0
2322.	c4oc4h8oo-a<=>c4h9oc4h7-2+ho2	4.48E+09	0.9	29200.0
2323.	c4oc4h8oo-b<=>c4h9oc4h7-2+ho2	4.48E+09	0.9	29200.0
2324.	c4oc4h8oo-b<=>c4h9oc4h7-3+ho2	4.48E+09	0.9	29200.0
2325.	c4oc4h8oo-c<=>c4h9oc4h7-3+ho2	4.48E+09	0.9	29200.0
2326.	c4oc4h8oo-c<=>c4h9oc4h7-4+ho2	2.40E+09	1.1	30100.0
2327.	c4oc4h8oo-d<=>c4h9oc4h7-4+ho2	2.58E+07	1.6	28500.0
2328.	c4oc4h8oo-a+ho2<=>c4oc4h8ooh-a+o2	2.00E+11	0.0	650.0
2329.	c4oc4h8oo-b+ho2<=>c4oc4h8ooh-b+o2	2.00E+11	0.0	650.0
2330.	c4oc4h8oo-c+ho2<=>c4oc4h8ooh-c+o2	2.00E+11	0.0	650.0
2331.	c4oc4h8oo-d+ho2<=>c4oc4h8ooh-d+o2	2.00E+11	0.0	650.0
2332.	c4oc4h8oo-a+h2o2<=>c4oc4h8ooh-a+ho2	2.40E+12	0.0	5000.0
2333.	c4oc4h8oo-b+h2o2<=>c4oc4h8ooh-b+ho2	2.40E+12	0.0	5000.0
2334.	c4oc4h8oo-c+h2o2<=>c4oc4h8ooh-c+ho2	2.40E+12	0.0	5000.0
2335.	c4oc4h8oo-d+h2o2<=>c4oc4h8ooh-d+ho2	2.40E+12	0.0	5000.0
2336.	c4oc4h8oo-a+ch3o2=>c4h9oc4h8o-a+ch3o+o2	3.40E+16	-1.6	1500.0
2337.	c4oc4h8oo-b+ch3o2=>c4h9oc4h8o-b+ch3o+o2	3.40E+16	-1.6	2000.0
2338.	c4oc4h8oo-c+ch3o2=>c4h9oc4h8o-c+ch3o+o2	3.40E+16	-1.6	2000.0
2339.	c4oc4h8oo-d+ch3o2=>c4h9oc4h8o-d+ch3o+o2	3.40E+16	-1.6	2000.0
2340.	2c4oc4h8oo-a=>2c4h9oc4h8o-a+o2	6.80E+16	-1.6	2000.0
2341.	c4oc4h8oo-a+c4oc4h8oo-b=>c4h9oc4h8o-a+c4h9oc4h8o-b+o2	6.80E+16	-1.6	2500.0
2342.	c4oc4h8oo-a+c4oc4h8oo-c=>c4h9oc4h8o-a+c4h9oc4h8o-c+o2	6.80E+16	-1.6	2500.0
2343.	c4oc4h8oo-a+c4oc4h8oo-d=>c4h9oc4h8o-a+c4h9oc4h8o-d+o2	6.80E+16	-1.6	2500.0
2344.	2c4oc4h8oo-b=>2c4h9oc4h8o-b+o2	6.80E+16	-1.6	3000.0

2345.	c4oc4h8oo-b+c4oc4h8oo-c =>c4h9oc4h8o-b+c4h9oc4h8o-c+o2	6.80E+16	-1.6	3000.0
2346.	c4oc4h8oo-b+c4oc4h8oo-d =>c4h9oc4h8o-b+c4h9oc4h8o-d+o2	6.80E+16	-1.6	3000.0
2347.	2c4oc4h8oo-c=>2c4h9oc4h8o-c+o2	6.80E+16	-1.6	3000.0
2348.	c4oc4h8oo-c+c4oc4h8oo-d =>c4h9oc4h8o-c+c4h9oc4h8o-d+o2	6.80E+16	-1.6	3000.0
2349.	2c4oc4h8oo-d=>2c4h9oc4h8o-d+o2	6.80E+16	-1.6	3000.0
2350.	c4oc4h8oo-a+c4h91o2=>c4h9oc4h8o-a+o2+pc4h9o	6.80E+16	-1.6	2500.0
2351.	c4oc4h8oo-b+c4h91o2=>c4h9oc4h8o-b+o2+pc4h9o	6.80E+16	-1.6	3000.0
2352.	c4oc4h8oo-c+c4h91o2=>c4h9oc4h8o-c+o2+pc4h9o	6.80E+16	-1.6	3000.0
2353.	c4oc4h8oo-d+c4h91o2=>c4h9oc4h8o-d+o2+pc4h9o	6.80E+16	-1.6	3000.0
2354.	c4oc4h8oo-a+nc3h7o2=>nc3h7o+c4h9oc4h8o-a+o2	6.80E+16	-1.6	2500.0
2355.	c4oc4h8oo-b+nc3h7o2=>nc3h7o+c4h9oc4h8o-b+o2	6.80E+16	-1.6	3000.0
2356.	c4oc4h8oo-c+nc3h7o2=>nc3h7o+c4h9oc4h8o-c+o2	6.80E+16	-1.6	3000.0
2357.	c4oc4h8oo-d+nc3h7o2=>nc3h7o+c4h9oc4h8o-d+o2	6.80E+16	-1.6	3000.0
2358.	c4oc4h8oo-a+hco3=>c4h9oc4h8o-a+o2+hco2	6.80E+16	-1.6	2500.0
2359.	c4oc4h8oo-b+hco3=>c4h9oc4h8o-b+o2+hco2	6.80E+16	-1.6	3000.0
2360.	c4oc4h8oo-c+hco3=>c4h9oc4h8o-c+o2+hco2	6.80E+16	-1.6	3000.0
2361.	c4oc4h8oo-d+hco3=>c4h9oc4h8o-d+o2+hco2	6.80E+16	-1.6	3000.0
2362.	c4oc4h8ooh-a<=>c4h9oc4h8o-a+oh	1.00E+16	0.0	37000.0
2363.	c4oc4h8ooh-b<=>c4h9oc4h8o-b+oh	4.00E+15	0.0	43000.0
2364.	c4oc4h8ooh-c<=>c4h9oc4h8o-c+oh	4.00E+15	0.0	43000.0
2365.	c4oc4h8ooh-d<=>c4h9oc4h8o-d+oh	4.00E+15	0.0	43000.0
2366.	c4h9oc4h8o-a=>pc4h9o+nc3h7cho	3.15E+43	-9.4	30900.0
2367.	c4h9oc4h8o-b=>c4h9och2+c2h5cho	3.53E+36	-7.2	35800.0
2368.	c4h9oc4h8o-c=>c4h9oc2h4+ch3cho	4.38E+40	-8.4	39900.0
2369.	c4h9oc4h8o-d=>c4h9oc3h6+ch2o	4.27E+39	-8.1	38700.0
2370.	c4oc4-ao2h-b<=>c4oc4oa-b+oh	4.78E+09	0.8	9600.0
2371.	c4oc4-bo2h-a<=>c4oc4oa-b+oh	4.78E+09	0.8	9600.0
2372.	c4oc4-bo2h-c<=>c4oc4ob-c+oh	4.78E+09	0.8	9600.0
2373.	c4oc4-co2h-b<=>c4oc4ob-c+oh	4.78E+09	0.8	9600.0
2374.	c4oc4-co2h-d<=>c4oc4oc-d+oh	1.16E+11	0.4	10700.0
2375.	c4oc4-do2h-c<=>c4oc4oc-d+oh	1.71E+09	1.1	10900.0
2376.	c4oc4-ao2h-c<=>c4oc4oa-c+oh	2.68E+09	0.6	15900.0
2377.	c4oc4-ao2h-1<=>c4oc4oa-1+oh	2.68E+09	0.6	15900.0
2378.	c4oc4-bo2h-d<=>c4oc4ob-d+oh	2.03E+10	0.5	17700.0
2379.	c4oc4-co2h-a<=>c4oc4oa-c+oh	2.68E+09	0.6	15900.0
2380.	c4oc4-do2h-b<=>c4oc4ob-d+oh	8.45E+08	0.9	15300.0
2381.	c4oc4-ao2h-d<=>c4oc4oa-d+oh	2.48E+09	0.3	11200.0
2382.	c4oc4-ao2h-2<=>c4oc4oa-2+oh	2.42E+07	1.0	10300.0
2383.	c4oc4-bo2h-1<=>c4oc4oa-2+oh	2.42E+07	1.0	10300.0
2384.	c4oc4-do2h-a<=>c4oc4oa-d+oh	2.42E+07	1.0	8300.0
2385.	c4oc4-ao2h-3<=>c4oc4oa-3+oh	3.05E+07	0.8	8800.0
2386.	c4oc4-bo2h-2<=>c4oc4ob-2+oh	3.05E+07	0.8	8800.0
2387.	c4oc4-co2h-1<=>c4oc4oa-3+oh	3.05E+07	0.8	8800.0
2388.	c4oc4-ao2h-b<=>c4h9oc4h7-2+ho2	3.01E+11	0.3	15200.0
2389.	c4oc4-bo2h-a<=>c4h9oc4h7-2+ho2	7.82E+09	0.9	14900.0
2390.	c4oc4-bo2h-c<=>c4h9oc4h7-3+ho2	3.50E+11	0.4	14900.0
2391.	c4oc4-co2h-b<=>c4h9oc4h7-3+ho2	3.50E+11	0.4	14900.0
2392.	c4oc4-co2h-d<=>c4h9oc4h7-4+ho2	2.21E+12	0.2	15600.0
2393.	c4oc4-do2h-c<=>c4h9oc4h7-4+ho2	1.04E+10	0.9	15100.0
2394.	c4oc4-ao2h-1=>nc3h7cho+nc3h7cho+oh	3.15E+43	-9.4	39900.0
2395.	c4oc4-co2h-a=>c4h9oc2h3+ch3cho+oh	5.32E+44	-9.5	47397.0
2396.	c4oc4-do2h-b=>c4h9oc3h5-3+ch2o+oh	4.27E+39	-8.1	31180.0
2397.	c4oc4-do2h-b=>oh+ch2o+c3h5-a+pc4h9o	4.27E+39	-8.1	31180.0
2398.	c4oc4-ao2h-c=>c3h6+oh+c4h9ocho	3.53E+36	-7.2	42824.0
2399.	c4oc4-ao2h-b+o2<=>c8o-ao2h-bo2	6.74E+27	-4.8	3779.8
2400.	c4oc4-ao2h-c+o2<=>c8o-ao2h-co2	6.74E+27	-4.8	3779.8
2401.	c4oc4-ao2h-d+o2<=>c8o-ao2h-do2	1.15E+20	-2.4	2451.3
2402.	c4oc4-ao2h-1+o2<=>c8o-ao2h-1o2	6.74E+27	-4.8	3779.8
2403.	c4oc4-ao2h-2+o2<=>c8o-ao2h-2o2	6.74E+27	-4.8	3779.8
2404.	c4oc4-ao2h-3+o2<=>c8o-ao2h-3o2	6.74E+27	-4.8	3779.8
2405.	c4oc4-bo2h-a+o2<=>c8o-bo2h-ao2	6.74E+27	-4.8	3779.8
2406.	c4oc4-bo2h-c+o2<=>c8o-bo2h-co2	6.74E+27	-4.8	3779.8
2407.	c4oc4-bo2h-d+o2<=>c8o-bo2h-do2	1.15E+20	-2.4	2451.3
2408.	c4oc4-bo2h-1+o2<=>c8o-bo2h-1o2	6.74E+27	-4.8	3779.8
2409.	c4oc4-bo2h-2+o2<=>c8o-bo2h-2o2	6.74E+27	-4.8	3779.8
2410.	c4oc4-co2h-a+o2<=>c8o-co2h-ao2	6.74E+27	-4.8	3779.8
2411.	c4oc4-co2h-b+o2<=>c8o-co2h-bo2	6.74E+27	-4.8	3779.8
2412.	c4oc4-co2h-d+o2<=>c8o-co2h-do2	1.15E+20	-2.4	2451.3
2413.	c4oc4-co2h-1+o2<=>c8o-co2h-1o2	6.74E+27	-4.8	3779.8
2414.	c4oc4-do2h-a+o2<=>c8o-do2h-ao2	6.74E+27	-4.8	3779.8
2415.	c4oc4-do2h-b+o2<=>c8o-do2h-bo2	6.74E+27	-4.8	3779.8
2416.	c4oc4-do2h-c+o2<=>c8o-do2h-co2	6.74E+27	-4.8	3779.8
2417.	c8o-ao2h-bo2<=>c4oc4keta-b+oh	2.86E+07	1.4	19600.0
2418.	c8o-ao2h-co2<=>c4oc4keta-c+oh	2.79E+07	1.1	9400.0
2419.	c8o-ao2h-do2<=>c4oc4keta-d+oh	1.63E+07	0.9	8700.0
2420.	c8o-ao2h-1o2<=>c4oc4keta-1+oh	2.79E+07	1.1	9400.0
2421.	c8o-ao2h-2o2<=>c4oc4keta-2+oh	1.49E+08	0.7	9000.0
2422.	c8o-ao2h-3o2<=>c4oc4keta-3+oh	1.13E+06	0.8	7800.0
2423.	c8o-bo2h-ao2<=>c4oc4ketb-a+oh	2.86E+07	1.4	25600.0
2424.	c8o-bo2h-co2<=>c4oc4ketb-c+oh	2.86E+07	1.4	25600.0
2425.	c8o-bo2h-do2<=>c4oc4ketb-d+oh	2.79E+07	1.1	15400.0
2426.	c8o-bo2h-1o2<=>c4oc4ketb-1+oh	1.49E+08	0.7	15000.0
2427.	c8o-bo2h-2o2<=>c4oc4ketb-2+oh	1.13E+06	0.8	13800.0
2428.	c8o-co2h-ao2<=>c4oc4ketc-a+oh	2.79E+07	1.1	15400.0
2429.	c8o-co2h-bo2<=>c4oc4ketc-b+oh	2.86E+07	1.4	25600.0
2430.	c8o-co2h-do2<=>c4oc4ketc-d+oh	2.86E+07	1.4	25600.0
2431.	c8o-co2h-1o2<=>c4oc4ketc-1+oh	1.13E+06	0.8	13800.0
2432.	c8o-do2h-ao2<=>c4oc4ketd-a+oh	1.63E+07	0.9	14700.0
2433.	c8o-do2h-bo2<=>c4oc4ketd-b+oh	2.79E+07	1.1	15400.0
2434.	c8o-do2h-co2<=>c4oc4ketd-c+oh	2.86E+07	1.4	25600.0
2435.	c4oc4keta-b=>c4h9oco+c2h5cho+oh	4.00E+15	0.0	43000.0

2436.	c4oc4keta-c=>ch3cho+c4ococh2+oh	4.00E+15	0.0	43000.0
2437.	c4oc4keta-d=>c4h9oco+c2h4+ch2o+oh	4.00E+15	0.0	43000.0
2438.	c4oc4keta-1=>nc3h7+co2+nc3h7cho+oh	1.00E+16	0.0	37000.0
2439.	c4oc4keta-2=>nc3h7co+ch2o+c2h5cho+oh	4.00E+15	0.0	41000.0
2440.	c4oc4keta-3=>nc3h7+co2+c2h4+ch3cho+oh	4.00E+15	0.0	43000.0
2441.	c4oc4ketb-a=>c4h9ocho+c2h5co+oh	1.00E+16	0.0	37000.0
2442.	c4oc4ketb-c=>pc4h9o+ch2co+ch3cho+oh	4.00E+15	0.0	43000.0
2443.	c4oc4ketb-1=>nc3h7cho+c2h5co+ch2o+oh	1.00E+16	0.0	37000.0
2444.	c4oc4ketb-2=>c2h5cho+c2h5+ch2co+ch2o+oh	4.00E+15	0.0	41000.0
2445.	c4oc4ketc-a=>ch3coch2+c4h9ocho+oh	1.00E+16	0.0	37000.0
2446.	c4oc4ketc-a=>pc4h9o+ch3coch2coh+oh	1.00E+16	0.0	37000.0
2447.	c4oc4ketc-b=>ch3co+c4h9och2cho+oh	4.00E+15	0.0	43000.0
2448.	c4oc4ketc-d=>2ch2o+pc4h9+ch2co+oh	4.00E+15	0.0	43000.0
2449.	c4oc4ketc-1=>nc3h7cho+ch3coch2+ch2o+oh	1.00E+16	0.0	37000.0
2450.	c4oc4ketd-a=>pc2h4cho+c4h9ocho+oh	1.00E+16	0.0	37000.0
2451.	c4oc4ketd-b=>ch2cho+c4h9och2cho+oh	4.00E+15	0.0	43000.0
2452.	c4oc4ketd-c=>hco+c4h9oc2h4cho+oh	4.00E+15	0.0	43000.0
2453.	c4oc4ketb-d=>ch2o+ch2co+c4h9och2+oh	4.00E+15	0.0	43000.0
2454.	c4oc4keta-c=>co2+ch3coch3+pc4h9oh	2.10E+08	0.0	20000.0
2455.	c4oc4keta-1=>c3h7cooh+c3h8+co2	2.10E+08	0.0	20000.0
2456.	c4oc4oa-d+oh=>pc4h9o+ch2co+c2h4+h2o	2.40E+06	2.0	-3000.0
2457.	c4oc4oa-d+oh=>c4h9oc2h3+ch2cho+h2o	4.80E+06	2.0	-3000.0
2458.	c4oc4oa-d+oh=>pc4h9o+c4h6o23+h2o	4.80E+06	2.0	-3000.0
2459.	c4oc4oa-3+oh=>nc3h7cho+acetoch2+h2o	9.60E+06	2.0	-3000.0
2460.	c4oc4oa-3+oh=>c3h6+nc3h7co+ch2o+h2o	2.40E+06	2.0	-3000.0
2461.	c4oc4ob-2+oh=>c4h8-1+c2h5co+ch2o+h2o	2.40E+06	2.0	-3000.0
2462.	c4oc4ob-2+oh=>c2h5cho+ch2o+c4h711+h2o	1.92E+07	2.0	-3000.0
2463.	c4oc4oa-b+oh=>pc4h9o+c2h5chco+h2o	2.40E+06	2.0	-3000.0
2464.	c4oc4oa-b+oh=>c4h9ochco+c2h5+h2o	2.40E+06	2.0	-3000.0
2465.	c4oc4oa-c+oh=>c4h9oco+c3h6+h2o	2.40E+06	2.0	-3000.0
2466.	c4oc4oa-c+oh=>c4h9oc2h3+ch3co+h2o	2.40E+06	2.0	-3000.0
2467.	c4oc4oa-1+oh=>nc3h7cho+nc3h7co+h2o	4.80E+06	2.0	-3000.0
2468.	c4oc4oa-2+oh=>c4h8-1+nc3h7+co2+h2o	4.80E+06	2.0	-3000.0
2469.	c4oc4oa-2+oh=>nc3h7cho+c2h5coch2+h2o	2.40E+06	2.0	-3000.0
2470.	c4oc4oa-2+oh=>nc3h7cho+ch2co+c2h5+h2o	2.40E+06	2.0	-3000.0
2471.	c4oc4ob-c+oh=>c4h9och2+ch3chco+h2o	2.40E+06	2.0	-3000.0
2472.	c4oc4ob-c+oh=>pc4h9o+c2h3coch3+h2o	2.40E+06	2.0	-3000.0
2473.	c4oc4ob-d+oh=>c2h4+pc4h9o+ch2co+h2o	2.40E+06	2.0	-3000.0
2474.	c4oc4ob-d+oh=>hco+c4h9oc3h5-3+h2o	4.80E+06	2.0	-3000.0
2475.	c4oc4oc-d+oh=>ch2co+c4h9oc2h4+h2o	2.40E+06	2.0	-3000.0
2476.	c4oc4oc-d+oh=>c2h3cho+c4h9och2+h2o	4.80E+06	2.0	-3000.0
2477.	c4oc4oa-d+ho2=>pc4h9o+ch2co+c2h4+h2o2	4.00E+12	0.0	11260.0
2478.	c4oc4oa-d+ho2=>c4h9oc2h3+ch2cho+h2o2	8.00E+12	0.0	11260.0
2479.	c4oc4oa-d+ho2=>pc4h9o+c4h6o23+h2o2	8.00E+12	0.0	11260.0
2480.	c4oc4oa-3+ho2=>nc3h7cho+acetoch2+h2o2	1.60E+13	0.0	11260.0
2481.	c4oc4oa-3+ho2=>c3h6+nc3h7co+ch2o+h2o2	4.00E+12	0.0	11260.0
2482.	c4oc4ob-2+ho2=>c4h8-1+c2h5co+ch2o+h2o2	4.00E+12	0.0	11260.0
2483.	c4oc4ob-2+ho2=>c2h5cho+ch2o+c4h711+h2o2	3.20E+13	0.0	11260.0
2484.	c4oc4oa-b+ho2=>pc4h9o+c2h5chco+h2o2	4.00E+12	0.0	11260.0
2485.	c4oc4oa-b+ho2=>c4h9ochco+c2h5+h2o2	4.00E+12	0.0	11260.0
2486.	c4oc4oa-c+ho2=>c4h9oco+c3h6+h2o2	4.00E+12	0.0	11260.0
2487.	c4oc4oa-c+ho2=>c4h9oc2h3+ch3co+h2o2	4.00E+12	0.0	11260.0
2488.	c4oc4oa-1+ho2=>nc3h7cho+nc3h7co+h2o2	8.00E+12	0.0	11260.0
2489.	c4oc4oa-2+ho2=>c4h8-1+nc3h7+co2+h2o2	8.00E+12	0.0	11260.0
2490.	c4oc4oa-2+ho2=>nc3h7cho+c2h5coch2+h2o2	4.00E+12	0.0	11260.0
2491.	c4oc4oa-2+ho2=>nc3h7cho+ch2co+c2h5+h2o2	4.00E+12	0.0	11260.0
2492.	c4oc4ob-c+ho2=>c4h9och2+ch3chco+h2o2	4.00E+12	0.0	11260.0
2493.	c4oc4ob-c+ho2=>pc4h9o+c2h3coch3+h2o2	4.00E+12	0.0	11260.0
2494.	c4oc4ob-d+ho2=>c2h4+pc4h9o+ch2co+h2o2	4.00E+12	0.0	11260.0
2495.	c4oc4ob-d+ho2=>hco+c4h9oc3h5-3+h2o2	8.00E+12	0.0	11260.0
2496.	c4oc4oc-d+ho2=>ch2co+c4h9oc2h4+h2o2	4.00E+12	0.0	11260.0
2497.	c4oc4oc-d+ho2=>c2h3cho+c4h9och2+h2o2	8.00E+12	0.0	11260.0
2498.	c4oc4oa-d+h=>pc4h9o+ch2co+c2h4+h2	4.80E+08	1.5	2005.0
2499.	c4oc4oa-d+h=>c4h9oc2h3+ch2cho+h2	9.60E+08	1.5	2005.0
2500.	c4oc4oa-d+h=>pc4h9o+c4h6o23+h2	9.60E+08	1.5	2005.0
2501.	c4oc4oa-3+h=>nc3h7cho+acetoch2+h2	1.92E+09	1.5	2005.0
2502.	c4oc4oa-3+h=>c3h6+nc3h7co+ch2o+h2	4.80E+08	1.5	2005.0
2503.	c4oc4ob-2+h=>c4h8-1+c2h5co+ch2o+h2	4.80E+08	1.5	2005.0
2504.	c4oc4ob-2+h=>c2h5cho+ch2o+c4h711+h2	3.84E+19	1.5	2005.0
2505.	c4oc4oa-b+h=>pc4h9o+c2h5chco+h2	4.80E+08	1.5	2005.0
2506.	c4oc4oa-b+h=>c4h9ochco+c2h5+h2	4.80E+08	1.5	2005.0
2507.	c4oc4oa-c+h=>c4h9oco+c3h6+h2	4.80E+08	1.5	2005.0
2508.	c4oc4oa-c+h=>c4h9oc2h3+ch3co+h2	4.80E+08	1.5	2005.0
2509.	c4oc4oa-1+h=>nc3h7cho+nc3h7co+h2	9.60E+08	1.5	2005.0
2510.	c4oc4oa-2+h=>c4h8-1+nc3h7+co2+h2	9.60E+08	1.5	2005.0
2511.	c4oc4oa-2+h=>nc3h7cho+c2h5coch2+h2	4.80E+08	1.5	2005.0
2512.	c4oc4oa-2+h=>nc3h7cho+ch2co+c2h5+h2	4.80E+08	1.5	2005.0
2513.	c4oc4ob-c+h=>c4h9och2+ch3chco+h2	4.80E+08	1.5	2005.0
2514.	c4oc4ob-c+h=>pc4h9o+c2h3coch3+h2	4.80E+08	1.5	2005.0
2515.	c4oc4ob-d+h=>c2h4+pc4h9o+ch2co+h2	4.80E+08	1.5	2005.0
2516.	c4oc4ob-d+h=>hco+c4h9oc3h5-3+h2	9.60E+08	1.5	2005.0
2517.	c4oc4oc-d+h=>ch2co+c4h9oc2h4+h2	4.80E+08	1.5	2005.0
2518.	c4oc4oc-d+h=>c2h3cho+c4h9och2+h2	9.60E+08	1.5	2005.0
2519.	c4ococh2=ch2co+pc4h9o	9.24E+20	-2.3	24916.9
2520.	c4h9ocho+oh=c4h9oco+h2o	1.40E+03	3.0	98.0
	Declared duplicate reaction...			
2521.	c4h9ocho+oh=c4h9oco+h2o	1.94E+03	3.1	289.0
	Declared duplicate reaction...			
2522.	c4h9ocho+oh=a-c4h8ocho+h2o	1.60E+02	3.0	-2844.0
	Declared duplicate reaction...			
2523.	c4h9ocho+oh=a-c4h8ocho+h2o	1.84E+02	3.0	-2574.0
	Declared duplicate reaction...			
2524.	c4h9ocho+oh=b-c4h8ocho+h2o	3.55E+02	3.0	-1381.0
	Declared duplicate reaction...			

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2525. c4h9ocho+oh=b-c4h8ocho+h2o                    1.81E+03    3.0     -167.0
      Declared duplicate reaction...
2526. c4h9ocho+oh=c-c4h8ocho+h2o                    2.98E+02    3.0    -2144.0
      Declared duplicate reaction...
2527. c4h9ocho+oh=c-c4h8ocho+h2o                    2.12E+03    3.0    -1355.0
      Declared duplicate reaction...
2528. c4h9ocho+oh=d-c4h8ocho+h2o                    2.20E+03    3.0      535.0
      Declared duplicate reaction...
2529. c4h9ocho+oh=d-c4h8ocho+h2o                    5.96E+03    3.0     1408.0
      Declared duplicate reaction...
2530. c4h9ocho+ho2=c4h9oco+h2o2                     1.39E-01    4.2    12973.3
2531. c4h9ocho+ho2=a-c4h8ocho+h2o2                  1.74E-03    4.5    11886.9
2532. c4h9ocho+ho2=b-c4h8ocho+h2o2                  4.68E-02    4.4    13478.0
2533. c4h9ocho+ho2=c-c4h8ocho+h2o2                  2.65E-04    4.5    10257.3
2534. c4h9ocho+ho2=d-c4h8ocho+h2o2                  7.05E-02    4.3    15029.8
2535. c4h9ocho+h=c4h9oco+h2                         7.53E+05    2.4     6748.8
2536. c4h9ocho+h=a-c4h8ocho+h2                      1.06E+06    2.4     6250.7
2537. c4h9ocho+h=b-c4h8ocho+h2                      9.04E+06    2.1     7288.8
2538. c4h9ocho+h=c-c4h8ocho+h2                      6.14E+05    2.5     5738.8
2539. c4h9ocho+h=d-c4h8ocho+h2                      1.15E+06    2.4     8089.7
2540. c4h9ocho+ch3=c4h9oco+ch4                      1.51E+00    3.5     5480.0
2541. c4h9ocho+ch3=a-c4h8ocho+ch4                   3.98E+11    0.0     9500.0
2542. c4h9ocho+ch3=b-c4h8ocho+ch4                   8.60E+11    0.0    11600.0
2543. c4h9ocho+ch3=c-c4h8ocho+ch4                   1.51E+00    3.5     5480.0
2544. c4h9ocho+ch3=d-c4h8ocho+ch4                   4.53E-01    3.6     7150.0
2545. c4h9ocho+ch3o2=c4h9oco+ch3o2h                 1.57E+05    2.2    16544.0
2546. c4h9ocho+ch3o2=a-c4h8ocho+ch3o2h              8.49E+03    2.4    16594.0
2547. c4h9ocho+ch3o2=b-c4h8ocho+ch3o2h              2.26E+04    2.4    16594.0
2548. c4h9ocho+ch3o2=c-c4h8ocho+ch3o2h              8.49E+03    2.4    16594.0
2549. c4h9ocho+ch3o2=d-c4h8ocho+ch3o2h              1.70E+04    2.4    16594.0
2550. c4h9ocho+ch3o=c4h9oco+ch3oh                   5.27E+09    0.8     2912.0
2551. c4h9ocho+ch3o=a-c4h8ocho+ch3oh                1.50E+11    0.0     4500.0
2552. c4h9ocho+ch3o=b-c4h8ocho+ch3oh                3.02E+10    0.2     4703.0
2553. c4h9ocho+ch3o=c-c4h8ocho+ch3oh                1.45E+11    0.0     4571.0
2554. c4h9ocho+ch3o=d-c4h8ocho+ch3oh                2.17E+11    0.0     6458.0
2555. c4h9ocho+o=c4h9oco+oh                         5.51E+05    2.5     2830.0
2556. c4h9ocho+o=a-c4h8ocho+oh                      2.81E+13    0.0     5200.0
2557. c4h9ocho+o=b-c4h8ocho+oh                      6.87E+13    0.0     7850.0
2558. c4h9ocho+o=c-c4h8ocho+oh                      5.52E+05    2.5     2830.0
2559. c4h9ocho+o=d-c4h8ocho+oh                      9.81E+05    2.4     4750.0
2560. c4h9ocho+o2=c4h9oco+ho2                       2.00E+13    0.0    49700.0
2561. c4h9ocho+o2=a-c4h8ocho+ho2                    4.00E+13    0.0    46800.0
2562. c4h9ocho+o2=b-c4h8ocho+ho2                    4.00E+13    0.0    49800.0
2563. c4h9ocho+o2=c-c4h8ocho+ho2                    4.00E+13    0.0    49800.0
2564. c4h9ocho+o2=d-c4h8ocho+ho2                    6.00E+13    0.0    52300.0
2565. c4h9ocho+hco=c4h9oco+ch2o                     5.40E+06    1.9    17010.0
2566. c4h9ocho+hco=a-c4h8ocho+ch2o                  1.53E+04    2.5    18430.0
2567. c4h9ocho+hco=b-c4h8ocho+ch2o                  4.08E+04    2.5    18430.0
2568. c4h9ocho+hco=c-c4h8ocho+ch2o                  1.53E+04    2.5    18430.0
2569. c4h9ocho+hco=d-c4h8ocho+ch2o                  3.06E+04    2.5    18430.0
2570. c4h9ocho+c2h5=c4h9oco+c2h6                    1.00E+11    0.0    10400.0
2571. c4h9ocho+c2h5=a-c4h8ocho+c2h6                 1.50E+10    0.0    10400.0
2572. c4h9ocho+c2h5=b-c4h8ocho+c2h6                 4.00E+10    0.0    10400.0
2573. c4h9ocho+c2h5=c-c4h8ocho+c2h6                 1.50E+10    0.0    10400.0
2574. c4h9ocho+c2h5=d-c4h8ocho+c2h6                 3.00E+10    0.0    10400.0
2575. c4h9ocho+c2h3=c4h9oco+c2h4                    1.00E+11    0.0    10400.0
2576. c4h9ocho+c2h3=a-c4h8ocho+c2h4                 1.50E+10    0.0    10400.0
2577. c4h9ocho+c2h3=b-c4h8ocho+c2h4                 4.00E+10    0.0    10400.0
2578. c4h9ocho+c2h3=c-c4h8ocho+c2h4                 1.50E+10    0.0    10400.0
2579. c4h9ocho+c2h3=d-c4h8ocho+c2h4                 3.00E+10    0.0    10400.0
2580. c4h9ocho(+m)=nc4h10+co2(+m)                   1.50E+12    0.0    59700.0
      Low pressure limit:  0.56300E+62 -0.12790E+02  0.71100E+05
      TROE centering:      0.17940E+00  0.35754E+03  0.99187E+10  0.32899E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2581. c4h9ocho(+m)=nc3h7cho+ch2o(+m)                1.00E+12    0.0    60500.0
      Low pressure limit:  0.15500E+58 -0.11570E+02  0.71700E+05
      TROE centering:      0.78075E+00  0.64901E+10  0.61880E+03  0.67101E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2582. c4h9ocho(+m)=pc4h9+hco2(+m)                   2.17E+24   -2.4    92600.0
      Low pressure limit:  0.57100E+48 -0.84300E+01  0.98490E+05
      TROE centering:      0.68932E-14  0.47341E+04  0.93302E+10  0.17860E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2583. c4h9ocho(+m)=pc4h9o+hco(+m)                   4.18E+16    0.0    97000.0
      Low pressure limit:  0.52700E+64 -0.12320E+02  0.10918E+06
      TROE centering:      0.89375E+00  0.74991E+10  0.64704E+03  0.66980E+09
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
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        co2              Enhanced by    5.400E+00
        he               Enhanced by    1.200E+00
2584. c4h9ocho=>c4h8-1+hcooh                        2.43E+10    0.9    50061.0
2585. c4h9ocho=pc4h9oh+co                           4.92E+11    0.8    63906.0
2586. c4h9ocho=nc3h7+ch2ocho                        1.00E+17    0.0    84650.0
2587. c4h9ocho=c2h5+ch2ch2ocho                      7.94E+16    0.0    80280.0
2588. c4h9ocho=ch3+c3h6ocho                         1.00E+17    0.0    84650.0
2589. c4h9ocho=hco2+pc4h9                           1.00E+17    0.0    90000.0
2590. c4h9oco+h=c4h9ocho                            1.00E+14    0.0        0.0
2591. a-c4h8ocho+h=c4h9ocho                         1.00E+14    0.0        0.0
2592. b-c4h8ocho+h=c4h9ocho                         1.00E+14    0.0        0.0
2593. c-c4h8ocho+h=c4h9ocho                         1.00E+14    0.0        0.0
2594. d-c4h8ocho+h=c4h9ocho                         1.00E+14    0.0        0.0
2595. c3h6ocho=c2h4+ch2ocho                         3.75E+12    0.4    30104.0
2596. a-c4h8ocho=nc3h7cho+hco                       6.46E+12    0.1    28197.0
2597. a-c4h8ocho=c2h3ocho+c2h5                      2.28E+12    0.5    30862.0
2598. b-c4h8ocho=c4h8-1+hco2                        2.57E+11    0.2    18558.0
2599. b-c4h8ocho=c3h5ocho+ch3                       7.75E+11    0.6    32021.0
2600. c-c4h8ocho=c3h6+ch2ocho                       6.89E+11    0.4    29693.0
2601. d-c4h8ocho=c2h4+ch2ch2ocho                    3.75E+12    0.4    30104.0
2602. c4h9oco=co+pc4h9o                             2.08E+13    0.3    24053.0
2603. c4h9oco=co2+pc4h9                             2.39E+12    0.5    14044.0
2604. b-c4h8ocho=c4h7ocho1-2+h                      2.84E+11    0.3    35500.0
2605. b-c4h8ocho=c4h7ocho1-1+h                      3.03E+11    0.6    36800.0
2606. b-c4h8ocho=hcooh+c4h713                       3.54E+09    0.9    28100.0
2607. a-c4h8ocho=c4h7ocho1-1+h                      2.62E+12    0.3    35700.0
2608. c-c4h8ocho=c4h7ocho1-2+h                      2.84E+11    0.3    35500.0
2609. c-c4h8ocho=c4h7ocho1-3+h                      2.84E+11    0.3    35500.0
2610. d-c4h8ocho=c4h7ocho1-3+h                      2.84E+11    0.3    35500.0
2611. ch2ch2ocho=c2h4+hco2                          6.46E+12    0.1    28197.0
2612. ch2ch2ocho=c2h5oco                            3.18E+10    0.7    21998.0
2613. c2h5oco=co+ch3ch2o                            2.08E+13    0.3    24053.0
2614. c2h5oco=co2+c2h5                              2.39E+12    0.5    14044.0
2615. c4h9oco<=>b-c4h8ocho                          3.18E+10    0.7    21998.0
2616. a-c4h8ocho<=>d-c4h8ocho                       1.96E+10    0.6    25917.0
2617. c4h9oco<=>c-c4h8ocho                          8.93E+09    0.7    18666.0
2618. c4h7ocho1-1+h<=>c4h6ocho1-21+h2               3.38E+05    2.4      207.0
2619. c4h7ocho1-1+o<=>c4h6ocho1-21+oh               9.59E+12    0.0     1967.0
2620. c4h7ocho1-1+oh<=>c4h6ocho1-21+h2o             2.76E+04    2.6    -1919.0
2621. c4h7ocho1-1+ch3<=>c4h6ocho1-21+ch4            3.69E+00    3.3     4002.0
2622. c4h7ocho1-1+ho2<=>c4h6ocho1-21+h2o2           4.82E+03    2.5    10530.0
2623. c4h7ocho1-1+ch3o2<=>c4h6ocho1-21+ch3o2h       4.82E+03    2.5    10530.0
2624. c4h7ocho1-1+ch3o<=>c4h6ocho1-21+ch3oh         4.00E+01    2.9     8609.0
2625. c4h7ocho1-2+h<=>c4h6ocho1-21+h2               3.38E+05    2.4      207.0
2626. c4h7ocho1-2+o<=>c4h6ocho1-21+oh               9.59E+12    0.0     1967.0
2627. c4h7ocho1-2+oh<=>c4h6ocho1-21+h2o             2.76E+04    2.6    -1919.0
2628. c4h7ocho1-2+ch3<=>c4h6ocho1-21+ch4            3.69E+00    3.3     4002.0
2629. c4h7ocho1-2+ho2<=>c4h6ocho1-21+h2o2           4.82E+03    2.5    10530.0
2630. c4h7ocho1-2+ch3o2<=>c4h6ocho1-21+ch3o2h       4.82E+03    2.5    10530.0
2631. c4h7ocho1-2+ch3o<=>c4h6ocho1-21+ch3oh         4.00E+01    2.9     8609.0
2632. c4h7ocho1-2+h<=>c4h6ocho1-32+h2               3.38E+05    2.4      207.0
2633. c4h7ocho1-2+o<=>c4h6ocho1-32+oh               9.59E+12    0.0     1967.0
2634. c4h7ocho1-2+oh<=>c4h6ocho1-32+h2o             2.76E+04    2.6    -1919.0
2635. c4h7ocho1-2+ch3<=>c4h6ocho1-32+ch4            3.69E+00    3.3     4002.0
2636. c4h7ocho1-2+ho2<=>c4h6ocho1-32+h2o2           4.82E+03    2.5    10530.0
2637. c4h7ocho1-2+ch3o2<=>c4h6ocho1-32+ch3o2h       4.82E+03    2.5    10530.0
2638. c4h7ocho1-2+ch3o<=>c4h6ocho1-32+ch3oh         4.00E+01    2.9     8609.0
2639. c4h7ocho1-3+h<=>c4h6ocho1-32+h2               3.38E+05    2.4      207.0
2640. c4h7ocho1-3+o<=>c4h6ocho1-32+oh               9.59E+12    0.0     1967.0
2641. c4h7ocho1-3+oh<=>c4h6ocho1-32+h2o             2.76E+04    2.6    -1919.0
2642. c4h7ocho1-3+ch3<=>c4h6ocho1-32+ch4            3.69E+00    3.3     4002.0
2643. c4h7ocho1-3+ho2<=>c4h6ocho1-32+h2o2           4.82E+03    2.5    10530.0
2644. c4h7ocho1-3+ch3o2<=>c4h6ocho1-32+ch3o2h       4.82E+03    2.5    10530.0
2645. c4h7ocho1-3+ch3o<=>c4h6ocho1-32+ch3oh         4.00E+01    2.9     8609.0
2646. c4h6ocho1-21=sc3h5cho+hco                     4.17E+15   -0.9    14040.0
2647. c4h6ocho1-32=c4h6+hco2                        1.34E+13   -0.4    24610.0
2648. c4h7ocho1-1(+m)=c4h8-1+co2(+m)                1.50E+12    0.0    59700.0
      Low pressure limit:  0.56300E+62 -0.12790E+02  0.71100E+05
      TROE centering:      0.17940E+00  0.35754E+03  0.99187E+10  0.32899E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2649. c4h7ocho1-1(+m)=sc3h5cho+ch2o(+m)             1.00E+12    0.0    60500.0
      Low pressure limit:  0.15500E+58 -0.11570E+02  0.71700E+05
      TROE centering:      0.78075E+00  0.64901E+10  0.61880E+03  0.67101E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2650. c4h7ocho1-1(+m)=c4h711+hco2(+m)               2.17E+24   -2.4    92600.0
      Low pressure limit:  0.57100E+48 -0.84300E+01  0.98490E+05
      TROE centering:      0.68932E-14  0.47341E+04  0.93302E+10  0.17860E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2651. c4h7ocho1-1(+m)=c3h6cho-3+hco(+m)             4.18E+16    0.0    97000.0
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      Low pressure limit:  0.52700E+64 -0.12320E+02  0.10918E+06
      TROE centering:      0.89375E+00  0.74991E+10  0.64704E+03  0.66980E+09
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2652. c4h7ocho1-2(+m)=t2c4h8+co2(+m)                1.50E+12    0.0    59700.0
      Low pressure limit:  0.56300E+62 -0.12790E+02  0.71100E+05
      TROE centering:      0.17940E+00  0.35754E+03  0.99187E+10  0.32899E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2653. c4h7ocho1-2(+m)=sc3h5cho+ch2o(+m)             1.00E+12    0.0    60500.0
      Low pressure limit:  0.15500E+58 -0.11570E+02  0.71700E+05
      TROE centering:      0.78075E+00  0.64901E+10  0.61880E+03  0.67101E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2654. c4h7ocho1-2(+m)=c4h713+hco2(+m)               2.17E+24   -2.4    92600.0
      Low pressure limit:  0.57100E+48 -0.84300E+01  0.98490E+05
      TROE centering:      0.68932E-14  0.47341E+04  0.93302E+10  0.17860E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2655. c4h7ocho1-2(+m)=c3h5-a+ch2o+hco(+m)           4.18E+16    0.0    97000.0
      Low pressure limit:  0.52700E+64 -0.12320E+02  0.10918E+06
      TROE centering:      0.89375E+00  0.74991E+10  0.64704E+03  0.66980E+09
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2656. c4h7ocho1-3(+m)=c4h8-1+co2(+m)                1.50E+12    0.0    59700.0
      Low pressure limit:  0.56300E+62 -0.12790E+02  0.71100E+05
      TROE centering:      0.17940E+00  0.35754E+03  0.99187E+10  0.32899E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2657. c4h7ocho1-3(+m)=sc3h5cho+ch2o(+m)             1.00E+12    0.0    60500.0
      Low pressure limit:  0.15500E+58 -0.11570E+02  0.71700E+05
      TROE centering:      0.78075E+00  0.64901E+10  0.61880E+03  0.67101E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2658. c4h7ocho1-3(+m)=c4h714+hco2(+m)               2.17E+24   -2.4    92600.0
      Low pressure limit:  0.57100E+48 -0.84300E+01  0.98490E+05
      TROE centering:      0.68932E-14  0.47341E+04  0.93302E+10  0.17860E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2659. c4h7ocho1-3(+m)=c3h5-a+ch2o+hco(+m)           4.18E+16    0.0    97000.0
      Low pressure limit:  0.52700E+64 -0.12320E+02  0.10918E+06
      TROE centering:      0.89375E+00  0.74991E+10  0.64704E+03  0.66980E+09
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2660. c4h7ocho1-1=>c2h5+c2h3+co2                    2.21E+22   -1.6    97520.0
2661. c4h7ocho1-2=>c3h5-s+ch2o+hco                  2.21E+22   -1.6    97520.0
2662. c4h7ocho1-3=>c2h3+c2h4+hco2                   6.64E+19   -1.1    74590.0
2663. c4h7ocho1-1+h<=>nc3h7cho+hco                  6.26E+13    0.0     4500.0
2664. c4h7ocho1-1+h<=>c4h8-1+hco2                   6.26E+13    0.0     4500.0
2665. c4h7ocho1-2+h<=>c4h8-1+hco2                   6.26E+13    0.0     4500.0
2666. c4h7ocho1-2+h<=>c3h6+ch2ocho                  6.26E+13    0.0     4500.0
2667. c4h7ocho1-3+h<=>c2h4+ch2ch2ocho               6.26E+13    0.0     4500.0
2668. c4h7ocho1-3+h<=>c3h6+ch2ocho                  6.26E+13    0.0     4500.0
2669. c4h7ocho1-1+o2=c4h6ocho1-21+ho2               4.00E+12    0.0    39900.0
2670. c4h7ocho1-2+o2=c4h6ocho1-21+ho2               4.00E+12    0.0    39900.0
2671. c4h7ocho1-3+o2=c4h6ocho1-32+ho2               4.00E+12    0.0    39900.0
2672. c2h3ocho(+m)=c2h4+co2(+m)                     1.50E+12    0.0    59700.0
      Low pressure limit:  0.56300E+62 -0.12790E+02  0.71100E+05
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      TROE centering:      0.17940E+00  0.35754E+03  0.99187E+10  0.32899E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2673. c2h3ocho(+m)=ch2co+ch2o(+m)                    1.00E+12    0.0    60500.0
      Low pressure limit:  0.15500E+58 -0.11570E+02  0.71700E+05
      TROE centering:      0.78075E+00  0.64901E+10  0.61880E+03  0.67101E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2674. c2h3ocho(+m)=c2h3+hco2(+m)                     2.17E+24   -2.4    92600.0
      Low pressure limit:  0.57100E+48 -0.84300E+01  0.98490E+05
      TROE centering:      0.68932E-14  0.47341E+04  0.93302E+10  0.17860E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2675. c2h3ocho(+m)=ch2cho+hco(+m)                    4.18E+16    0.0    97000.0
      Low pressure limit:  0.52700E+64 -0.12320E+02  0.10918E+06
      TROE centering:      0.89375E+00  0.74991E+10  0.64704E+03  0.66980E+09
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2676. c2h3ocho=c2h2+hcooh                            1.00E+13    0.0    58000.0
2677. c2h3ocho+h=c2h3oco+h2                          6.50E+05    2.4     4471.0
2678. c2h3ocho+o=c2h3oco+oh                          5.51E+05    2.5     2830.0
2679. c2h3ocho+oh=c2h3oco+h2o                        2.33E+07    1.6      -35.0
2680. c2h3ocho+ch3=c2h3oco+ch4                       1.51E+00    3.5     5481.0
2681. c2h3ocho+ho2=c2h3oco+h2o2                      9.64E+03    2.6    13910.0
2682. c2h3ocho+o2=c2h3oco+ho2                        2.00E+13    0.0    49700.0
2683. c2h3ocho+ch3o=c2h3oco+ch3oh                    5.48E+11    0.0     5000.0
2684. c2h3ocho+ch3o2=c2h3oco+ch3o2h                  4.82E+03    2.6    13910.0
2685. ch2cho+co=c2h3oco                              1.55E+06    2.0     5734.0
2686. c2h3+co2=c2h3oco                               4.76E+07    1.5    37410.0
2687. c3h5ocho(+m)=c3h6+co2(+m)                      1.50E+12    0.0    59700.0
      Low pressure limit:  0.56300E+62 -0.12790E+02  0.71100E+05
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      TROE centering:      0.17940E+00  0.35754E+03  0.99187E+10  0.32899E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2688. c3h5ocho(+m)=c2h3cho+ch2o(+m)                  1.00E+12    0.0    60500.0
      Low pressure limit:  0.15500E+58 -0.11570E+02  0.71700E+05
      TROE centering:      0.78075E+00  0.64901E+10  0.61880E+03  0.67101E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2689. c3h5ocho(+m)=c3h5-a+hco2(+m)                   2.17E+24   -2.4    92600.0
      Low pressure limit:  0.57100E+48 -0.84300E+01  0.98490E+05
      TROE centering:      0.68932E-14  0.47341E+04  0.93302E+10  0.17860E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2690. c3h5ocho(+m)=c3h5o+hco(+m)                     4.18E+16    0.0    97000.0
      Low pressure limit:  0.52700E+64 -0.12320E+02  0.10918E+06
      TROE centering:      0.89375E+00  0.74991E+10  0.64704E+03  0.66980E+09
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2691. c3h5ocho=c3h4-p+hcooh                          1.00E+13    0.0    70000.0
2692. c3h5ocho+h=c3h5oco+h2                          6.50E+05    2.4     4471.0
2693. c3h5ocho+o=c3h5oco+oh                          5.51E+05    2.5     2830.0
2694. c3h5ocho+oh=c3h5oco+h2o                        2.33E+07    1.6      -35.0
2695. c3h5ocho+ch3=c3h5oco+ch4                       1.51E+00    3.5     5481.0
2696. c3h5ocho+ho2=c3h5oco+h2o2                      9.64E+03    2.6    13910.0
2697. c3h5ocho+o2=c3h5oco+ho2                        2.00E+13    0.0    49700.0
2698. c3h5ocho+ch3o=c3h5oco+ch3oh                    5.48E+11    0.0     5000.0
2699. c3h5ocho+ch3o2=c3h5oco+ch3o2h                  4.82E+03    2.6    13910.0
2700. c3h5o+co=c3h5oco                               1.55E+06    2.0     5734.0
2701. c3h5-a+co2=c3h5oco                             4.76E+07    1.5    37410.0
2702. ch3ocho=>ch2ocho+h                             8.24E+19   -1.1   103000.0
2703. ch2ocho+h=>ch3ocho                             1.00E+14    0.0        0.0
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2704. ch3ocho=>ch3oco+h                          1.33E+19   -1.0   100000.0
2705. ch3oco+h=>ch3ocho                          1.00E+14    0.0        0.0
2706. ch3ocho+oh=ch2ocho+h2o                     8.86E+12    0.1     3340.5
2707. ch3ocho+h=ch2ocho+h2                       6.65E+05    2.5     6760.0
2708. ch3ocho+ch3=ch2ocho+ch4                    2.91E-01    3.7     6823.8
2709. ch3ocho+ho2=ch2ocho+h2o2                   5.66E+04    2.4    16594.3
2710. ch3ocho+ch3o2=ch2ocho+ch3o2h               5.66E+04    2.4    16594.3
2711. ch3ocho+ch3o=ch2ocho+ch3oh                 4.59E+09    0.5     4823.6
2712. ch3ocho+o=ch2ocho+oh                       8.84E+05    2.4     4593.2
2713. ch3ocho+o2=ch2ocho+ho2                     1.53E+13    0.1    51749.8
2714. ch3ocho+hco=ch2ocho+ch2o                   1.03E+05    2.5    18400.0
2715. ch3ocho+c2h5=ch2ocho+c2h6                  1.00E+11    0.0    10400.0
2716. ch3ocho+c2h3=ch2ocho+c2h4                  1.00E+11    0.0    10400.0
2717. ch3ocho+hco2=ch2ocho+hcooh                 5.66E+04    2.4    16594.3
2718. ch3ocho+h=ch3oco+h2                        2.58E+05    2.5     5736.8
2719. ch3ocho+oh=ch3oco+h2o                      1.22E+16   -1.0     4946.1
2720. ch3ocho+ch3=ch3oco+ch4                     9.21E-02    3.7     6052.6
2721. ch3ocho+ch3o2=ch3oco+ch3o2h                1.57E+05    2.2    16544.4
2722. ch3ocho+ho2=ch3oco+h2o2                    1.57E+05    2.2    16544.4
2723. ch3ocho+ch3o=ch3oco+ch3oh                  5.27E+09    0.8     2912.4
2724. ch3ocho+o=ch3oco+oh                        2.45E+05    2.5     4047.8
2725. ch3ocho+o2=ch3oco+ho2                      3.85E+12    0.1    50759.6
2726. ch3ocho+hco=ch3oco+ch2o                    5.40E+06    1.9    17000.0
2727. ch3ocho+c2h5=ch3oco+c2h6                   1.00E+11    0.0    10400.0
2728. ch3ocho+c2h3=ch3oco+c2h4                   1.00E+11    0.0    10400.0
2729. ch3ocho+hco2=ch3oco+hcooh                  1.57E+05    2.2    16544.4
2730. ch2ocho=>ch3oco                            2.62E+11    0.0    38200.0
2731. ch3oco=>ch2ocho                            1.63E+12   -0.2    40700.0
2732. ch3oco=>ch3+co2                            3.59E+14   -0.2    16000.0
2733. ch3+co2=>ch3oco                            4.76E+07    1.5    34700.0
2734. ch3oco=>ch3o+co                            1.43E+15    0.0    23800.0
2735. ch3o+co=>ch3oco                            1.55E+06    2.0     5730.0
2736. ch2o+hco=ch2ocho                           3.89E+10    0.0    22000.0
2737. ch3och2<=>ch2o+ch3                         1.60E+13    0.0    25500.0
2738. c2h5oc2h5(+m)<=>c2h5+ch3ch2o(+m)           2.60E+23   -2.0    88386.0
      Low pressure limit:  0.10737E+77 -0.16418E+02  0.98829E+05
      TROE centering:      0.87622E-04  0.58993E+03  0.68923E+04  0.19679E+04
2739. c2h5oc2h5(+m)<=>c2h5och2+ch3(+m)           1.80E+23   -1.9    88635.0
      Low pressure limit:  0.94699E+76 -0.16410E+02  0.99222E+05
      TROE centering:      0.42576E+00  0.10123E+04  0.10346E+03  0.22761E+04
2740. c2h5oc2h5(+m)<=>c2h5oh+c2h4(+m)            1.00E+14    0.0    65200.0
      Low pressure limit:  0.61359E+96 -0.22570E+02  0.80762E+05
      TROE centering:      0.22531E-01  0.19124E+02  0.14140E+11  0.39354E+04
2741. c2h5oc2h5+o2<=>c2h5oc2h4p+ho2              4.00E+13    0.0    52800.0
2742. c2h5oc2h5+o2<=>c2h5oc2h4s+ho2              5.20E+13    0.0    46800.0
2743. c2h5oc2h5+oh<=>c2h5oc2h4p+h2o              1.14E+01    3.4    -2390.0
2744. c2h5oc2h5+oh<=>c2h5oc2h4s+h2o              2.26E+03    2.9    -4039.0
2745. c2h5oc2h5+h<=>c2h5oc2h4p+h2                1.06E+05    2.8     7496.0
2746. c2h5oc2h5+h<=>c2h5oc2h4s+h2                1.15E+06    2.5     2300.0
2747. c2h5oc2h5+ho2<=>c2h5oc2h4p+h2o2            1.60E-05    5.1    14871.0
2748. c2h5oc2h5+ho2<=>c2h5oc2h4s+h2o2            3.82E-02    4.2     9023.0
2749. c2h5oc2h5+ch3<=>c2h5oc2h4p+ch4             6.60E+02    3.3    12291.0
2750. c2h5oc2h5+ch3<=>c2h5oc2h4s+ch4             3.98E+01    3.4     7635.0
2751. c2h5oc2h5+o<=>c2h5oc2h4p+oh                1.94E+03    3.2     4658.0
2752. c2h5oc2h5+o<=>c2h5oc2h4s+oh                2.90E+05    2.4      876.0
2753. c2h5oc2h5+c2h3<=>c2h5oc2h4p+c2h4           5.00E+11    0.0    10400.0
2754. c2h5oc2h5+c2h3<=>c2h5oc2h4s+c2h4           6.00E+11    0.0     5200.0
2755. c2h5oc2h5+c2h5<=>c2h5oc2h4p+c2h6           5.00E+10    0.0    13400.0
2756. c2h5oc2h5+c2h5<=>c2h5oc2h4s+c2h6           1.00E+11    0.0    10400.0
2757. c2h5oc2h5+ch3o<=>c2h5oc2h4p+ch3oh          4.34E+11    0.0     6458.0
2758. c2h5oc2h5+ch3o<=>c2h5oc2h4s+ch3oh          3.00E+11    0.0     4500.0
2759. c2h5oc2h5+ch3o2<=>c2h5oc2h4p+ch3o2h        1.60E-05    5.1    14871.0
2760. c2h5oc2h5+ch3o2<=>c2h5oc2h4s+ch3o2h        3.82E-02    4.2     9023.0
2761. c2h5oc2h5+ch3co2=c2h5oc2h4p+ch3cooh        1.60E-05    5.1    14871.0
2762. c2h5oc2h5+ch3co2=c2h5oc2h4s+ch3cooh        3.82E-02    4.2     9023.0
2763. c2h5oc2h5+c2h5o2<=>c2h5oc2h4p+c2h5o2h      1.60E-05    5.1    14871.0
2764. c2h5oc2h5+c2h5o2<=>c2h5oc2h4s+c2h5o2h      3.82E-02    4.2     9023.0
2765. c2h5oc2h4p=ch3ch2o+c2h4                    4.41E+12    0.2    24200.0
2766. c2h5oc2h4s=ch3cho+c2h5                     4.92E+15   -0.5    24346.1
2767. c2h5oc2h4p=c2h5oc2h4s                      1.09E+01    2.9    12135.7
2768. c2h5oc2h4p+o2=c2oc2-po2                    1.15E+20   -2.4     2451.0
2769. c2h5oc2h4s+o2=c2oc2-so2                    9.00E+18   -2.5        0.0
2770. c2oc2-so2=c2oc2sooh4                       1.03E+06    1.5    20200.0
2771. c2oc2-so2=c2oc2sooh3                       9.30E+07    1.1    18200.0
2772. c2oc2-so2=c2oc2sooh1                       6.51E+06    1.7    32000.0
2773. c2oc2-po2=c2oc2pooh4                       1.03E+05    1.5    19700.0
2774. c2oc2-po2=c2oc2pooh3                       1.03E+06    1.4    16400.0
2775. c2oc2-po2=c2oc2pooh2                       9.56E+07    1.4    28600.0
2776. c2oc2-so2=c2h5oc2h3+ho2                    4.92E+08    1.2    29800.0
2777. c2oc2-po2=c2h5oc2h3+ho2                    7.59E+06    1.7    28400.0
2778. c2h5oc2h4s+c2oc2-so2=c2oc2-so+c2oc2-so     4.50E+12    0.0     -500.0
2779. c2h5oc2h4p+c2oc2-po2=c2oc2-po+c2oc2-po     4.50E+12    0.0        0.0
2780. c2oc2-so2+ho2=c2oc2-so2h+o2                2.00E+11    0.0      650.0
2781. c2oc2-po2+ho2=c2oc2-po2h+o2                2.00E+11    0.0      650.0
2782. c2oc2-so2h=c2oc2-so+oh                     1.00E+16    0.0    37000.0
2783. c2oc2-po2h=c2oc2-po+oh                     4.00E+15    0.0    43000.0
2784. c2h5oc2h4s+ho2=c2oc2-so+oh                 7.00E+12    0.0    -1000.0
2785. c2h5oc2h4p+ho2=c2oc2-po+oh                 7.00E+12    0.0    -1000.0
2786. c2oc2-so2+c2oc2-so2=c2oc2-so+c2oc2-so+o2   6.80E+16   -1.6     3000.0
2787. c2oc2-po2+c2oc2-po2=c2oc2-po+c2oc2-po+o2   6.80E+16   -1.6     3000.0
2788. c2oc2-so=ch3cho+ch3ch2o                    1.27E+20   -2.4    25468.7
2789. c2oc2-po=ch2o+ch2o+c2h5                    2.00E+13    0.0    28700.0
2790. c2oc2pooh2=c2h5+choch2ooh                  1.14E+32   -5.8    29120.3
2791. choch2ooh=>hco+ch2o+oh                     1.00E+16    0.0    43000.0
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2792. c2oc2pooh3=ch3cho+c2h4+ho2	2.21E+12	0.2	15600.0
2793. c2oc2pooh4=c2h4+ch2o+ch2o+oh	1.27E+20	-2.4	25468.7
2794. c2oc2sooh4=c2h4+ch3cho+ho2	1.27E+20	-2.4	25468.7
2795. c2oc2sooh3=ch3cho+ch3cho+oh	6.30E+08	1.3	16100.0
2796. c2oc2sooh1=c2h5oc2h3+ho2	2.67E+11	0.5	15800.0
2797. c2oc2sooh1=ch3ch2o+ch3cooh	1.27E+20	-2.4	25468.7
2798. ch2chooh=ch2cho+oh	1.00E+16	0.0	37000.0
2799. c2oc2sooh4=c2oc2o-cy5+oh	2.48E+09	0.3	9200.0
2800. c2oc2sooh3=c2oc2o-cy4+oh	1.38E+09	0.7	15200.0
2801. c2oc2sooh1=c2ococ-cy3+oh	4.45E+09	0.9	10800.0
2802. c2oc2pooh4=c2oc2o-cy6+oh	2.89E+07	0.8	11300.0
2803. c2oc2pooh3=c2oc2o-cy5+oh	4.82E+07	0.9	9000.0
2804. c2oc2pooh2=c2ococ-cy3+oh	1.71E+09	1.1	10900.0
2805. c2oc2sooh4+o2=c2oc2sooh4o2	3.37E+27	-4.8	3779.8
2806. c2oc2sooh3+o2=c2oc2sooh3o2	3.37E+27	-4.8	3779.8
2807. c2oc2sooh1+o2=c2oc2sooh1o2	5.75E+19	-2.4	2451.0
2808. c2oc2pooh4+o2=c2oc2pooh4o2	5.75E+19	-2.4	2451.0
2809. c2oc2pooh3+o2=c2oc2pooh3o2	3.37E+27	-4.8	3779.8
2810. c2oc2pooh2+o2=c2oc2pooh2o2	3.37E+27	-4.8	3779.8
2811. c2oc2sooh4o2=c2oc24oohket2+oh	1.63E+07	0.9	14700.0
2812. c2oc2sooh3o2=c2oc23oohket2+oh	2.69E+07	1.1	16100.0
2813. c2oc2sooh1o2=c2oc21oohket2+oh	3.07E+07	1.4	25900.0
2814. c2oc2pooh4o2=c2oc24oohald+oh	1.03E+05	1.4	16200.0
2815. c2oc2pooh3o2=c2oc23oohald+oh	1.03E+06	1.4	16400.0
2816. c2oc2pooh2o2=c2oc22oohald+oh	9.56E+07	1.4	28600.0
2817. c2oc23oohket2=>oh+ch3cho+ch3co2	1.00E+16	0.0	37000.0
2818. c2oc21oohket2=>oh+ch2o+co+ch3ch2o	1.00E+16	0.0	43000.0
2819. c2oc24oohket2=>oh+2ch2o+ch3co	1.00E+16	0.0	43000.0
2820. c2oc24oohald=>oh+2ch2o+ch2cho	1.00E+16	0.0	43000.0
2821. c2oc23oohald=>oh+ch3cho+ch2o+hco	1.00E+16	0.0	37000.0
2822. c2oc22oohald=>oh+ch3ch2o+chocho	1.00E+16	0.0	37000.0
2823. c2oc24oohald=>2ch2o+ch3cooh	2.10E+08	0.0	24500.0
2824. c2oc23oohket2=>ch3cooh+ch3cooh	2.10E+08	0.0	24500.0
2825. c2oc2o-cy5+oh=>ch3co2+c2h4+h2o	2.93E+04	2.5	-1659.0
2826. c2oc2o-cy5+h=>ch3co2+c2h4+h2	6.02E+05	2.4	2583.0
2827. c2oc2o-cy5+ho2=>ch3co2+c2h4+h2o2	4.34E+02	3.0	12094.0
2828. c2oc2o-cy5+oh=>ch3cho+ch2cho+h2o	9.36E+07	1.6	-35.0
2829. c2oc2o-cy5+h=>ch3cho+ch2cho+h2	2.60E+06	2.4	4471.0
2830. c2oc2o-cy5+ho2=>ch3cho+ch2cho+h2o2	1.26E+02	3.4	13719.0
2831. c2oc2o-cy5+oh=>ch2o+c2h3och2+h2o	5.28E+09	1.0	1586.0
2832. c2oc2o-cy5+h=>ch2o+c2h3och2+h2	6.66E+06	2.5	6756.0
2833. c2oc2o-cy5+ho2=>ch2o+c2h3och2+h2o2	2.04E+01	3.6	17161.0
2834. c2oc2o-cy6+oh=>c2h4+ch2o+hco+h2o	1.87E+08	1.6	-35.0
2835. c2oc2o-cy6+h=>c2h4+ch2o+hco+h2	5.20E+06	2.4	4471.0
2836. c2oc2o-cy6+ho2=>c2h4+ch2o+hco+h2o2	2.52E+02	3.4	13719.0
2837. c2ococ-cy3+oh=>ch3cho+c2h3o1,2+h2o	4.68E+07	1.6	-35.0
2838. c2ococ-cy3+h=>ch3cho+c2h3o1,2+h2	1.30E+06	2.4	4471.0
2839. c2ococ-cy3+ho2=>ch3cho+c2h3o1,2+h2o2	6.32E+01	3.4	13719.0
2840. c2ococ-cy3+oh=>ch3ch2o+ch2co+h2o	2.93E+04	2.5	-1659.0
2841. c2ococ-cy3+h=>ch3ch2o+ch2co+h2	6.02E+05	2.4	2583.0
2842. c2ococ-cy3+ho2=>ch3ch2o+ch2co+h2o2	4.34E+02	3.0	12094.0
2843. c2ococ-cy3+oh=>c2h4+hco+ch2o+h2o	1.76E+09	1.0	1586.0
2844. c2ococ-cy3+h=>c2h4+hco+ch2o+h2	2.22E+06	2.5	6756.0
2845. c2ococ-cy3+ho2=>c2h4+hco+ch2o+h2o2	6.80E+00	3.6	17161.0
2846. c2ococ-cy3+oh=>chocho+c2h5+h2o	4.68E+07	1.6	-35.0
2847. c2ococ-cy3+h=>chocho+c2h5+h2	1.30E+06	2.4	4471.0
2848. c2ococ-cy3+ho2=>chocho+c2h5+h2o2	6.32E+01	3.4	13719.0
2849. c2oc2o-cy4+oh=>ch3cho+ch3co+h2o	5.86E+04	2.5	-1659.0
2850. c2oc2o-cy4+h=>ch3cho+ch3co+h2	1.20E+06	2.4	2583.0
2851. c2oc2o-cy4+ho2=>ch3cho+ch3co+h2o2	8.68E+02	3.0	12094.0
2852. c2oc2o-cy4+oh=>ch3cho+ch2cho+h2o	1.06E+10	1.0	1586.0
2853. c2oc2o-cy4+h=>ch3cho+ch2cho+h2	1.33E+07	2.5	6756.0
2854. c2oc2o-cy4+ho2=>ch3cho+ch2cho+h2o2	4.08E+01	3.6	17161.0
2855. c2h5oc2h3+oh=c2h4oc2h3+h2o	5.70E+00	3.4	-2390.0
2856. c2h5oc2h3+h=c2h4oc2h3+h2	5.31E+04	2.8	7496.0
2857. c2h5oc2h3+ho2=c2h4oc2h3+h2o2	5.32E-06	5.1	14871.0
2858. c2h5oc2h3+ch3=c2h4oc2h3+ch4	3.30E+02	3.3	12291.0
2859. c2h4oc2h3=c2h4+ch2cho	4.41E+12	0.2	24200.0

NOTE: A units mole-cm-sec-K, E units cal/mole

Annexe 3 : Mécanisme d'oxydation du DPE

	REACTIONS	A	b	E
		(k = A T**b exp(-E/RT))		
1.	ch3+oh=ch2oh+h	1.99E+19	-1.7	11157.0
2.	ch3+oh=ch3o+h	9.95E+14	-0.8	16872.0
3.	ch3+oh=ch2(s)+h2o	6.37E+18	-1.7	11141.0
4.	ch3+oh=ch2o+h2	7.39E+14	-1.1	14551.0
5.	c2h3+o2=ch2cho+o	3.81E+17	-1.4	5580.0
6.	c2h3+o2=ch2o+hco	3.71E+25	-4.0	7043.0
7.	c2h3+o2=chocho+h	7.78E+20	-2.9	5541.0
8.	c2h3+o2=c2h2+ho2	3.25E+19	-2.3	7932.0
9.	ch2cho+o2<=>ch2co+ho2	7.05E+07	1.6	25290.0
10.	ch2cho+o2=>ch2o+co+oh	8.95E+13	-0.6	10120.0
11.	c3h4-p+h=c2h2+ch3	1.72E+14	0.0	7134.0
12.	c3h4-a+h=c2h2+ch3	1.68E+16	-0.6	14754.0
	Declared duplicate reaction...			
13.	c3h4-a+h=c2h2+ch3	3.31E+08	1.1	8886.0
	Declared duplicate reaction...			
14.	c2h2+ch3=c3h5-s	6.02E+43	-9.7	20561.0
	Declared duplicate reaction...			
15.	c2h2+ch3=c3h5-s	3.03E+32	-7.0	12357.0
	Declared duplicate reaction...			
16.	c3h4-a=c3h4-p	4.79E+48	-10.0	88685.0
17.	c3h4-a+h=c3h5-t	7.95E+51	-11.8	18286.0
	Declared duplicate reaction...			
18.	c3h4-a+h=c3h5-t	2.59E+35	-7.6	7147.0
	Declared duplicate reaction...			
19.	c3h4-a+h=c3h5-a	3.75E+48	-10.3	22511.0
	Declared duplicate reaction...			
20.	c3h4-a+h=c3h5-a	2.29E+26	-4.3	6163.0
	Declared duplicate reaction...			
21.	c3h4-a+h=c3h4-p+h	2.35E+25	-3.2	13165.0
	Declared duplicate reaction...			
22.	c3h4-a+h=c3h4-p+h	1.74E+07	2.0	4521.0
	Declared duplicate reaction...			
23.	c3h4-p+h=c3h5-t	9.51E+51	-11.7	18331.0
	Declared duplicate reaction...			
24.	c3h4-p+h=c3h5-t	6.81E+34	-7.3	6722.0
	Declared duplicate reaction...			
25.	c3h4-p+h=c3h5-s	3.88E+50	-11.9	16915.0
	Declared duplicate reaction...			
26.	c3h4-p+h=c3h5-s	4.33E+40	-9.6	9401.0
	Declared duplicate reaction...			
27.	c3h5-a+c3h5-a=c3h4-a+c3h6	4.07E+28	-5.5	7410.0
28.	c3h5-a+o2=c3h5-aoo	2.43E+39	-9.0	8620.0
29.	c3h5-a+o2=c2h3cho+oh	3.36E+05	1.8	19190.0
30.	c3h5-a+o2=c3h4-a+ho2	2.06E+04	2.2	17590.0
31.	c3h5-a+o2=ch2cho+ch2o	3.08E+09	0.4	16910.0
32.	c3h5-a+o2=>c2h2+ch2o+oh	9.71E+20	-2.7	24980.0
33.	c3h6+h=c2h4+ch3	3.30E+24	-3.0	15610.0
34.	c3h6+oh=c3h61oh	5.03E+53	-12.2	22976.0
	Declared duplicate reaction...			
35.	c3h6+oh=c3h61oh	4.28E+41	-9.3	8921.0
	Declared duplicate reaction...			
36.	c3h6+oh=c3h62oh	5.03E+53	-12.2	22976.0
	Declared duplicate reaction...			
37.	c3h6+oh=c3h62oh	4.28E+41	-9.3	8921.0
	Declared duplicate reaction...			
38.	c3h6+oh=c3h5oh+h	1.25E+23	-2.7	20993.0
	Declared duplicate reaction...			
39.	c3h6+oh=c3h5oh+h	3.66E+05	2.1	10410.0
	Declared duplicate reaction...			
40.	c3h6+oh=c2h3oh+ch3	2.27E-02	4.0	1952.0
	Declared duplicate reaction...			
41.	c3h6+oh=c2h3oh+ch3	2.42E+19	-1.7	13107.0
	Declared duplicate reaction...			
42.	c3h6+oh=c2h5cho+h	4.51E+19	-1.9	15763.0
	Declared duplicate reaction...			
43.	c3h6+oh=c2h5cho+h	3.40E-02	3.9	4390.0
	Declared duplicate reaction...			
44.	c3h6+oh=ch3coch3+h	1.47E-05	4.8	2168.0
	Declared duplicate reaction...			
45.	c3h6+oh=ch3coch3+h	2.64E+15	-0.8	12728.0
	Declared duplicate reaction...			
46.	c3h6+oh=ch3cho+ch3	5.13E+18	-2.1	12359.0
	Declared duplicate reaction...			
47.	c3h6+oh=ch3cho+ch3	7.59E-06	4.5	-680.0
	Declared duplicate reaction...			
48.	c2h3+c2h2=c4h4+h	4.90E+16	-1.1	11800.0
49.	nc4h5=c2h3+c2h2	1.00E+14	0.0	43920.0
50.	c2h3+c2h2=ic4h5	5.10E+53	-12.6	28800.0
51.	c2h3+c2h3=ic4h5+h	1.20E+22	-2.4	13654.0
52.	c2h3+c2h3=nc4h5+h	2.40E+20	-2.0	15361.0
53.	c4h6=ic4h5+h	5.70E+36	-6.3	112353.0
54.	c4h6=nc4h5+h	5.30E+44	-8.6	123608.0
55.	c4h4+h=nc4h5	6.20E+45	-10.1	15800.0
56.	c4h4+h=ic4h5	1.50E+48	-10.6	18800.0
57.	nc4h3+h=c2h2+h2cc	6.30E+25	-3.3	10014.0
58.	ic4h3+h=c2h2+h2cc	2.80E+23	-2.5	10780.0
59.	ic4h3+h=c4h4	3.40E+43	-9.0	12120.0

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60. nc4h3+h=c4h4                                2.00E+47  -10.3    13070.0
61. nc4h3=ic4h3                                 4.10E+43   -9.5    53000.0
62. nc4h3+h=ic4h3+h                             2.50E+20   -1.7    10800.0
63. c2h4+c2h3<=>c4h714                          2.99E+36   -7.4    15480.0
64. c4h714<=>c4h6+h                             1.85E+48  -10.5    51770.0
65. h+o2<=>o+oh                                 1.04E+14    0.0    15286.0
66. o+h2<=>h+oh                                 5.08E+04    2.7     6292.0
67. oh+h2<=>h+h2o                               4.38E+13    0.0     6990.0
68. o+h2o<=>oh+oh                               2.97E+06    2.0    13400.0
69. h2+M<=>h+h+M                                4.58E+19   -1.4   104400.0
      h2              Enhanced by    2.500E+00
      h2o             Enhanced by    1.200E+01
      co              Enhanced by    1.900E+00
      co2             Enhanced by    3.800E+00
      he              Enhanced by    8.300E-01
70. o+o+M<=>o2+M                                6.16E+15   -0.5        0.0
      h2              Enhanced by    2.500E+00
      h2o             Enhanced by    1.200E+01
      ar              Enhanced by    8.300E-01
      co              Enhanced by    1.900E+00
      co2             Enhanced by    3.800E+00
      he              Enhanced by    8.300E-01
71. o+h+M<=>oh+M                                4.71E+18   -1.0        0.0
      h2              Enhanced by    2.500E+00
      h2o             Enhanced by    1.200E+01
      ar              Enhanced by    7.500E-01
      co              Enhanced by    1.500E+00
      co2             Enhanced by    2.000E+00
      he              Enhanced by    7.500E-01
72. h+oh+M<=>h2o+M                              3.50E+22   -2.0        0.0
      h2              Enhanced by    7.300E-01
      h2o             Enhanced by    3.650E+00
      ar              Enhanced by    3.800E-01
73. h+o2(+M)<=>ho2(+M)                          4.65E+12    0.4        0.0
    Low pressure limit:  0.17370E+20 -0.12300E+01  0.00000E+00
    TROE centering:      0.67000E+00  0.10000E-29  0.10000E+31  0.10000E+31
      h2              Enhanced by    1.300E+00
      co              Enhanced by    1.900E+00
      co2             Enhanced by    3.800E+00
      h2o             Enhanced by    1.000E+01
      ar              Enhanced by    0.000E+00
      he              Enhanced by    0.000E+00
74. h+o2(+ar)<=>ho2(+ar)                        4.65E+12    0.4        0.0
    Low pressure limit:  0.68100E+19 -0.12000E+01  0.00000E+00
    TROE centering:      0.70000E+00  0.10000E-29  0.10000E+31  0.10000E+31
75. h+o2(+he)<=>ho2(+he)                        4.65E+12    0.4        0.0
    Low pressure limit:  0.91920E+19 -0.12000E+01  0.00000E+00
    TROE centering:      0.59000E+00  0.10000E-29  0.10000E+31  0.10000E+31
76. ho2+h<=>oh+oh                               7.08E+13    0.0      295.0
77. h2+o2<=>h+ho2                               5.18E+05    2.4    53502.0
78. ho2+o<=>oh+o2                               3.25E+13    0.0        0.0
79. ho2+oh<=>h2o+o2                             1.93E+20   -2.5      584.0
    Declared duplicate reaction...
80. ho2+oh<=>h2o+o2                             1.21E+09    1.2    -1307.0
    Declared duplicate reaction...
81. ho2+ho2<=>h2o2+o2                           1.30E+11    0.0    -1630.0
    Declared duplicate reaction...
82. ho2+ho2<=>h2o2+o2                           3.66E+14    0.0    12000.0
    Declared duplicate reaction...
83. h2o2(+h2o)<=>oh+oh(+h2o)                    2.00E+12    0.9    48749.0
    Low pressure limit:  0.18660E+26 -0.23000E+01  0.48749E+05
    TROE centering:      0.51000E+00  0.10000E-29  0.10000E+31
84. h2o2(+he)<=>oh+oh(+he)                      2.00E+12    0.9    48749.0
    Low pressure limit:  0.16090E+25 -0.23000E+01  0.48749E+05
    TROE centering:      0.37000E+00  0.10000E-29  0.10000E+31
85. h2o2(+M)<=>oh+oh(+M)                        2.00E+12    0.9    48749.0
    Low pressure limit:  0.36580E+25 -0.23000E+01  0.48749E+05
    TROE centering:      0.43000E+00  0.10000E-29  0.10000E+31
      h2o             Enhanced by    0.000E+00
      co2             Enhanced by    1.060E+00
      n2              Enhanced by    1.000E+00
      o2              Enhanced by    7.900E-01
      h2o2            Enhanced by    7.700E+00
      he              Enhanced by    0.000E+00
      ar              Enhanced by    6.800E-01
      h2              Enhanced by    3.700E+00
      co              Enhanced by    2.800E+00
86. h2o2+h<=>h2o+oh                             2.41E+13    0.0     3970.0
87. h2o2+h<=>h2+ho2                             2.15E+10    1.0     6000.0
88. h2o2+o<=>oh+ho2                             9.55E+06    2.0     3970.0
89. h2o2+oh<=>h2o+ho2                           1.74E+12    0.0      318.0
    Declared duplicate reaction...
90. h2o2+oh<=>h2o+ho2                           7.59E+13    0.0     7269.0
    Declared duplicate reaction...
91. co+ho2=co2+oh                               1.15E+05    2.3    17550.0
92. co+o+m=co2+m                                2.83E+13    0.0    -4540.0
      h2o             Enhanced by    1.625E+01
      h2              Enhanced by    2.500E+00
      co              Enhanced by    1.875E+00
      co2             Enhanced by    3.750E+00
      ch4             Enhanced by    1.625E+01
      c2h6            Enhanced by    1.625E+01
      ar              Enhanced by    7.500E-01
93. co+o2=co2+o                                 2.53E+12    0.0    47700.0
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 94. co+oh=co2+h                                  7.05E+04    2.1     -276.2
     Declared duplicate reaction...
 95. co+oh=co2+h                                  5.76E+12   -0.7      331.8
     Declared duplicate reaction...
 96. hco+m=h+co+m                                 1.85E+17   -1.0    17090.0
        h2o              Enhanced by    1.625E+01
        h2               Enhanced by    1.900E+00
        co               Enhanced by    1.875E+00
        co2              Enhanced by    3.750E+00
        ch4              Enhanced by    1.625E+01
        c2h6             Enhanced by    1.625E+01
        ar               Enhanced by    1.000E+00
        he               Enhanced by    1.250E+00
 97. hco+oh=co+h2o                                1.00E+14    0.0        0.0
 98. hco+o=co+oh                                  3.00E+13    0.0        0.0
 99. hco+o=co2+h                                  3.00E+13    0.0        0.0
100. hco+h=co+h2                                  7.22E+13    0.0        0.0
101. hco+o2=co+ho2                                7.58E+12    0.0      410.0
102. hco+ho2=co2+oh+h                             3.00E+13    0.0        0.0
103. hco+hco=ch2o+co                              1.81E+13    0.0        0.0
104. hco+hco=h2+co+co                             3.00E+12    0.0        0.0
105. ch2o+M=hco+h+M                               3.30E+39   -6.3   100000.0
        co               Enhanced by    1.500E+00
        ch2o             Enhanced by    3.000E+00
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    1.200E+01
106. ch2o+M=co+h2+M                               3.10E+45   -8.0    97600.0
        co               Enhanced by    1.500E+00
        ch2o             Enhanced by    3.000E+00
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    1.200E+01
107. ch2o+oh=hco+h2o                              7.82E+07    1.6    -1055.0
108. ch2o+ho2=hco+h2o2                            4.11E+04    2.5    10205.0
109. ch2o+o=hco+oh                                1.81E+13    0.0     3088.0
110. ch2o+h=hco+h2                                5.86E+03    3.1     1514.1
111. ch2o+o2=hco+ho2                              8.07E+15    0.0    53420.0
112. hoch2o=hcooh+h                               1.00E+13    0.0    15900.0
113. hoch2o=ch2o+oh                               8.54E+13   -0.1    17530.0
114. hcooh=hco+oh                                 4.59E+18   -0.5   108300.0
115. hcooh=hoco+h                                 1.00E+17    0.0    97000.0
116. hcooh=co+h2o                                 1.51E+31   -5.1    76324.0
117. hcooh=co2+h2                                 1.88E+28   -4.3    79410.0
118. hcooh+o2=ho2+hoco                            2.00E+13    0.0    49700.0
119. hcooh+o2=ho2+hco2                            2.00E+13    0.0    56000.0
120. hcooh+ho2=hco2+h2o2                          3.90E+01    3.1    25206.0
121. hcooh+ho2=h2o2+hoco                          4.70E-01    4.0    16787.0
122. hcooh+oh=h2o+hoco                            2.20E+00    4.0    -1617.0
123. hcooh+oh=h2o+hco2                            2.59E-05    4.9    -2046.0
124. hcooh+h=h2+hco2                              4.24E+05    2.3    14091.0
125. hcooh+h=h2+hoco                              2.30E+02    3.3     4858.0
126. hcooh+ch3=ch4+hoco                           5.81E+01    3.4    11379.0
127. hcooh+ch3=ch4+hco2                           2.11E+01    3.2    12084.0
128. hoco(+M)<=>oh+co(+M)                         1.19E+14    0.1    36463.0
     Low pressure limit:  0.13710E+26 -0.23960E+01  0.37483E+05
     TROE centering:      0.50000E+00  0.11204E+04  0.11204E+04  0.17203E+04
        ar               Enhanced by    7.000E-01
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    2.000E+00
        co2              Enhanced by    3.000E+00
        c2h6             Enhanced by    3.000E+00
        ch3oh            Enhanced by    3.000E+00
129. hoco(+M)<=>h+co2(+M)                         8.22E+11    0.4    35338.0
     Low pressure limit:  0.59570E+27 -0.31480E+01  0.37020E+05
     TROE centering:      0.44500E+00  0.81980E+03  0.82280E+03  0.52904E+04
        ar               Enhanced by    7.000E-01
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    2.000E+00
        co2              Enhanced by    3.000E+00
        c2h6             Enhanced by    3.000E+00
        ch3oh            Enhanced by    3.000E+00
130. hoco+o2=co2+ho2                              1.10E+10    0.9      127.8
131. hco2+m=>h+co2+m                              2.44E+15   -0.5    27500.0
132. ch3oh(+m)=ch2oh+h(+m)                        7.90E-03    5.0    84467.4
     Low pressure limit:  0.33900E+43 -0.72440E+01  0.10523E+06
     TROE centering:     -0.73910E+02  0.37050E+05  0.41500E+05  0.52200E+04
133. ch3oh(+m)=ch3+oh(+m)                         2.08E+18   -0.6    92540.6
     Low pressure limit:  0.15000E+44 -0.69950E+01  0.97992E+05
     TROE centering:     -0.47480E+00  0.35580E+05  0.11160E+04  0.90230E+04
134. ch3oh(+m)=ch2(s)+h2o(+m)                     3.12E+18   -1.0    91712.0
     Low pressure limit:  0.14300E+48 -0.82270E+01  0.99417E+05
     TROE centering:      0.25450E+01  0.32900E+04  0.47320E+05  0.47110E+05
135. ch3oh+o2=ch2oh+ho2                           2.05E+13    0.0    44910.0
136. ch3oh+o2=ch3o+ho2                            2.50E+12    0.0    55000.0
137. ch3oh+ho2=ch2oh+h2o2                         1.13E+13    0.0    19360.0
138. ch3oh+oh=ch2oh+h2o                           7.10E+06    1.8     -596.0
139. ch3oh+oh=ch3o+h2o                            1.00E+06    2.1      496.7
140. ch3oh+o=ch2oh+oh                             1.63E+13    0.0     5030.0
141. ch3oh+h=ch2oh+h2                             1.44E+13    0.0     6095.0
142. ch3oh+h=ch3o+h2                              3.60E+12    0.0     6095.0
143. ch3oh+h=ch3+h2o                              1.70E+13    0.0     5311.0
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144. ch3oh+ch2o=ch3o+ch3o                          1.55E+12    0.0    79570.0
145. ch3oh+ch3=ch2oh+ch4                           3.57E+11    0.0     8663.0
146. ch3oh+ch3=ch3o+ch4                            4.68E+05    2.3    12764.0
147. ch2oh+m=ch2o+h+m                              1.00E+14    0.0    25100.0
        h2o              Enhanced by    1.000E+00
        co               Enhanced by    1.875E+00
        co2              Enhanced by    3.750E+00
        h2               Enhanced by    2.500E+00
        ch4              Enhanced by    1.625E+01
        c2h6             Enhanced by    1.625E+01
        ar               Enhanced by    7.500E-01
148. ch2oh+h=ch2o+h2                               3.00E+13    0.0        0.0
149. ch2oh+o2=ch2o+ho2                             2.41E+14    0.0     5017.0
     Declared duplicate reaction...
150. ch2oh+o2=ch2o+ho2                             1.51E+15   -1.0        0.0
     Declared duplicate reaction...
151. ch2oh+o=ch2o+oh                               4.22E+13    0.0        0.0
152. ch2oh+oh=ch2o+h2o                             2.41E+13    0.0        0.0
153. ch2oh+ho2=ch2o+h2o2                           1.20E+13    0.0        0.0
154. ch2oh+hco=ch3oh+co                            1.50E+13    0.0        0.0
155. ch2oh+ch2o=ch3oh+hco                          1.29E-01    4.6     6596.0
        Reverse Arrhenius coefficients:            9.63E+03    2.9    13110.0
156. ch2oh+ch3o=ch3oh+ch2o                         4.00E+12    0.0        0.0
157. ch2oh+ch2oh=ch2o+ch3oh                        4.00E+12    0.0        0.0
158. ch3o+m=ch2o+h+m                               4.88E+15    0.0    22773.0
159. ch3o+ho2=ch2o+h2o2                            3.00E+11    0.0        0.0
160. ch3o+oh=ch2o+h2o                              1.00E+13    0.0        0.0
161. ch3o+o=ch2o+oh                                1.30E+13    0.0        0.0
162. ch3o+h=ch2o+h2                                2.00E+13    0.0        0.0
163. ch3o+o2=ch2o+ho2                              2.35E+10    0.0     1788.0
164. ch3o+ch2o=ch3oh+hco                           3.42E+05    2.0       31.2
165. ch3o+h2o2=ch3oh+ho2                           3.42E+04    2.0    -2593.8
166. ch3o+co=ch3+co2                               1.57E+13    0.0    11804.0
167. ch3o+hco=ch3oh+co                             9.00E+13    0.0        0.0
168. ch3o+c2h5=ch2o+c2h6                           2.41E+13    0.0        0.0
169. ch3o+c2h4=ch2o+c2h5                           1.20E+11    0.0     7000.0
170. ch3oh+ch3o=ch3oh+ch2oh                        3.01E+11    0.0     4070.0
171. ch3+ho2=ch4+o2                                1.19E+05    2.2    -3022.0
172. ch4(+m)=ch3+h(+m)                             2.40E+16    0.0   104913.0
     Low pressure limit:  0.45000E+18  0.00000E+00  0.90800E+05
     TROE centering:      0.64000E+00  0.10000E-14  0.31950E+04  0.12126E+05
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
173. ch4+h=ch3+h2                                  4.08E+03    3.2     8760.0
174. ch4+o=ch3+oh                                  1.62E+06    2.3     7094.0
175. ch4+oh=ch3+h2o                                1.00E+06    2.2     2450.0
176. ch4+ch2=ch3+ch3                               4.30E+12    0.0    10038.0
177. ch4+ch2(s)=ch3+ch3                            4.00E+12    0.0        0.0
178. ch4+ho2=ch3+h2o2                              9.04E+12    0.0    24640.0
179. h+ch2(+M)<=>ch3(+M)                           6.00E+14    0.0        0.0
     Low pressure limit:  0.10400E+27 -0.27600E+01  0.16000E+04
     TROE centering:      0.56200E+00  0.91000E+02  0.58360E+04  0.85520E+04
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        ar               Enhanced by    7.000E-01
180. ch+h2(+M)<=>ch3(+M)                           1.97E+12    0.4     -370.0
     Low pressure limit:  0.48200E+26 -0.28000E+01  0.59000E+03
     TROE centering:      0.57800E+00  0.12200E+03  0.25350E+04  0.93650E+04
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        ar               Enhanced by    7.000E-01
181. ch3+ho2=ch3o+oh                               1.00E+12    0.3     -687.5
182. ch3+o=ch2o+h                                  4.54E+13    0.1     -136.0
183. ch3+o=hco+h2                                  1.00E+13    0.1     -136.0
184. ch3+o2=ch2o+oh                                6.38E+11    0.0    13514.0
185. ch3+o2=ch3o+o                                 7.55E+12    0.0    28297.0
186. ch3+ch3=c2h5+h                                6.84E+12    0.1    10600.0
187. ch3+ch3(+m)=c2h6(+m)                          8.88E+16   -1.2      774.5
     Low pressure limit:  0.53120E+51 -0.99300E+01  0.73890E+04
     TROE centering:      0.75480E+00  0.15800E+03  0.32828E+05  0.46564E+05
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    3.000E+00
        c2h6             Enhanced by    3.000E+00
        ar               Enhanced by    7.000E-01
188. ch3+ch3o=ch4+ch2o                             2.41E+13    0.0        0.0
189. ch3+ch2oh=ch4+ch2o                            2.41E+12    0.0        0.0
190. ch3+o2(+m)=ch3o2(+m)                          7.83E+08    1.2        0.0
     Low pressure limit:  0.58000E+26 -0.33000E+01  0.00000E+00
     TROE centering:      0.66400E+00  0.10000E+06  0.10000E+02
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191. ch3+h=ch2+h2                                6.03E+13    0.0    15100.0
192. ch3+hco=co+ch4                              8.48E+12    0.0        0.0
193. ch3+ch2o=hco+ch4                            3.19E+01    3.4     4312.0
194. ch2+oh=ch+h2o                               1.13E+07    2.0     3000.0
195. ch2+oh=ch2o+h                               2.50E+13    0.0        0.0
196. ch2+o=co+h+h                                5.00E+13    0.0        0.0
197. ch2+o=co+h2                                 4.00E+13    0.0        0.0
198. ch2+h=ch+h2                                 1.00E+18   -1.6        0.0
199. ch2+o2=co2+h2                               2.63E+21   -3.3     2860.0
200. ch2+o2=co2+h+h                              3.29E+21   -3.3     2860.0
201. ch2+o2=co+h2o                               2.24E+22   -3.3     2860.0
202. ch2+o2=ch2o+o                               3.29E+21   -3.3     2860.0
203. ch2+co2=ch2o+co                             1.10E+11    0.0     1000.0
204. ch2+ch2=c2h2+h2                             3.20E+13    0.0        0.0
205. ch2+ch2=c2h2+h+h                            4.00E+13    0.0        0.0
206. ch2+ch3=c2h4+h                              4.00E+13    0.0        0.0
207. ch2+ch=c2h2+h                               4.00E+13    0.0        0.0
208. ch2+c2h2=h+c3h3                             1.20E+13    0.0     6620.0
209. ch2+c2h4=c3h6                               4.30E+12    0.0    10038.0
210. ch2+c2h6=ch3+c2h5                           6.50E+12    0.0     7911.0
211. ch2(s)+m=ch2+m                              1.00E+13    0.0        0.0
        h               Enhanced by    0.000E+00
        h2o             Enhanced by    0.000E+00
        co              Enhanced by    1.875E+00
        co2             Enhanced by    3.750E+00
        ch4             Enhanced by    1.625E+01
        c2h6            Enhanced by    1.625E+01
        h2              Enhanced by    2.500E+00
        ar              Enhanced by    7.500E-01
212. ch2(s)+h=ch2+h                              2.00E+14    0.0        0.0
213. ch2(s)+h2o=ch2+h2o                          3.00E+13    0.0        0.0
214. ch2(s)+o2=co+oh+h                           3.00E+13    0.0        0.0
215. ch2(s)+h2=ch3+h                             7.00E+13    0.0        0.0
216. ch2(s)+h=ch+h2                              3.00E+13    0.0        0.0
217. ch2(s)+o=co+h+h                             1.50E+13    0.0        0.0
218. ch2(s)+o=co+h2                              1.50E+13    0.0        0.0
219. ch2(s)+oh=ch2o+h                            3.00E+13    0.0        0.0
220. ch2(s)+ho2=ch2o+oh                          3.00E+13    0.0        0.0
221. ch2(s)+h2o2=ch3o+oh                         3.00E+13    0.0        0.0
222. ch2(s)+ch2o=ch3+hco                         1.20E+12    0.0        0.0
223. ch2(s)+hco=ch3+co                           1.80E+13    0.0        0.0
224. ch2(s)+ch3=c2h4+h                           1.80E+13    0.0        0.0
225. ch2(s)+c2h6=ch3+c2h5                        1.20E+14    0.0        0.0
226. ch2(s)+c2h4=c3h5-a+h                        1.30E+14    0.0        0.0
227. ch2(s)+c2h2=c3h3+h                          1.80E+14    0.0        0.0
228. ch2(s)+co2=ch2o+co                          3.00E+12    0.0        0.0
229. ch2(s)+ch2co=c2h4+co                        1.60E+14    0.0        0.0
230. ch+oh=hco+h                                 3.00E+13    0.0        0.0
231. ch+o=co+h                                   5.70E+13    0.0        0.0
232. ch+h=c+h2                                   1.10E+14    0.0        0.0
233. ch+o2=hco+o                                 1.00E+13    0.0        0.0
234. ch+o2=co+oh                                 1.00E+13    0.0        0.0
235. ch+co2=hco+co                               3.40E+12    0.0      690.0
236. ch+h2o=ch2o+h                               1.71E+13    0.0     -755.0
237. ch+ch4=c2h4+h                               6.00E+13    0.0        0.0
238. ch+ch3=c2h3+h                               3.00E+13    0.0        0.0
239. ch+ch2o=ch2co+h                             9.46E+13    0.0     -515.0
240. c+oh=co+h                                   5.00E+13    0.0        0.0
241. c+o2=co+o                                   1.20E+14    0.0     3990.0
242. ch3o2+ho2=ch3o2h+o2                         2.90E+11    0.0     1552.0
243. ch3o2+ch2o=hco+ch3o2h                       1.99E+12    0.0    11660.0
244. ch3o2+ch4=ch3+ch3o2h                        1.81E+11    0.0    18480.0
245. ch3o2+ho2=ch2o+h2o+o2                       1.80E+10    0.0    -1431.0
246. ch3o2+ch3o2=>ch3oh+ch2o+o2                  1.34E+11    0.0        0.0
247. ch3o2+ch3o2=>ch3o+ch3o+o2                   4.46E+11    0.0     1030.0
248. ch3o2+ch3=ch3o+ch3o                         5.06E+12    0.0    -1411.0
249. ch3o2+oh=ch3oh+o2                           6.03E+13    0.0        0.0
250. ch3o2+h=ch3o+oh                             9.60E+13    0.0        0.0
251. ch3o2+h=ch4+o2                              2.11E+10    1.0    16600.0
252. ch3o2+h2o2=ch3o2h+ho2                       2.41E+12    0.0     9936.0
253. ch3o2+o=ch3o+o2                             3.61E+13    0.0        0.0
254. ch3o2+ch3o=ch3o2h+ch2o                      3.01E+11    0.0        0.0
255. ch3o2+ch2oh=ch2o+ch3o2h                     1.21E+13    0.0        0.0
256. ch3o2+h2=ch3o2h+h                           3.01E+13    0.0    26030.0
257. ch3o2h(+m)=ch3o+oh(+m)                      4.05E+19   -1.2    44250.0
     Low pressure limit:  0.38910E+43 -0.75020E+01  0.46756E+05
     TROE centering:      0.83750E+00  0.36562E+05  0.49880E+03  0.99900E+04
258. ch3o2h+oh=ch3o2+h2o                         1.14E+12    0.0     -380.0
259. ch3o2h+o=oh+ch3o2                           2.00E+13    0.0     4750.0
260. ch3o2h+h=ch3o+h2o                           7.30E+10    0.0     1860.0
261. c2h6+ho2=c2h5+h2o2                          2.61E+02    3.4    15900.0
262. c2h6+ch3o2=c2h5+ch3o2h                      1.94E+01    3.6    17100.0
263. c2h6+c2h5o2=c2h5+c2h5o2h                    8.60E+00    3.8    17200.0
264. c2h6+oh=c2h5+h2o                            5.11E+06    2.1      854.0
265. c2h6+o=c2h5+oh                              9.99E+08    1.5     5803.0
266. c2h6+h=c2h5+h2                              1.44E+09    1.5     7410.0
267. c2h6+o2=c2h5+ho2                            6.03E+13    0.0    51870.0
268. c2h6+ch3o=c2h5+ch3oh                        3.02E+11    0.0     7000.0
269. c2h6+ch3=c2h5+ch4                           7.54E+00    3.7     9883.0
270. c2h6+hco=ch2o+c2h5                          4.70E+04    2.7    18235.0
271. c2h6+ch=c2h5+ch2                            1.10E+14    0.0     -260.0
        Reverse Arrhenius coefficients:          3.83E+10    0.6      440.0
272. c2h5+o2=ch3ch2o+o                           1.10E+13   -0.2    27937.0
273. c2h5+ho2=ch3ch2o+oh                         1.90E+12    0.0    -1200.0
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274. c2h5+ho2=c2h4+h2o2                          1.79E+12    0.0        0.0
275. c2h5+oh=c2h4+h2o                            2.41E+13    0.0        0.0
276. c2h5+oh=>ch3+ch2o+h                         2.41E+13    0.0        0.0
277. c2h5+o=ch2o+ch3                             1.61E+13    0.0        0.0
278. c2h5+o=ch3cho+h                             8.02E+13    0.0        0.0
279. c2h5+o=c2h4+oh                              3.17E+12    0.0     -390.0
280. c2h5+h=c2h4+h2                              1.82E+12    0.0        0.0
281. c2h5+ch3=c2h4+ch4                           1.14E+12    0.0        0.0
282. c2h5+c2h5=c2h4+c2h6                         1.40E+12    0.0        0.0
283. h+c2h5(+m)=c2h6(+m)                         5.21E+17   -1.0     1580.0
     Low pressure limit:  0.19900E+42 -0.70800E+01  0.66850E+04
     TROE centering:      0.84220E+00  0.12500E+03  0.22190E+04  0.68820E+04
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        ch4              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
284. c2h5+hco=c2h6+co                            1.21E+14    0.0        0.0
285. c2h5+o2=c2h5o2                              9.42E+36   -8.0     6098.0
286. c2h5+o2=ch3cho+oh                           1.94E+12   -0.5     7765.0
287. c2h5+o2=c2h4+ho2                            2.43E+17   -1.9     4430.0
     Declared duplicate reaction...
288. c2h5+o2=c2h4o2h                             8.84E+37   -9.3    10159.0
289. c2h5+o2=c2h4+ho2                            1.02E+20   -3.0     8639.0
     Declared duplicate reaction...
290. c2h5+o2=c2h4o1,2+oh                         1.93E+20   -3.1     8636.0
291. c2h5o2=ch3cho+oh                            2.13E+41   -9.8    45919.0
292. c2h5o2=c2h4+ho2                             6.46E+30   -6.1    35147.0
     Declared duplicate reaction...
293. c2h5o2=c2h4o2h                              4.55E+51  -13.3    44125.0
294. c2h5o2=c2h4+ho2                             4.47E+42  -10.1    44734.0
     Declared duplicate reaction...
295. c2h5o2=c2h4o1,2+oh                          3.01E+42  -10.0    44609.0
296. c2h4o2h=ch3cho+oh                           3.10E+37  -10.1    28588.0
297. c2h4o2h=c2h4+ho2                            5.65E+41  -10.9    26490.0
     Declared duplicate reaction...
298. c2h4o2h=c2h4+ho2                            6.58E+41   -9.7    23023.0
     Declared duplicate reaction...
299. c2h4o2h=c2h4o1,2+oh                         1.49E+41   -9.5    22589.0
300. c2h4+h(+m)<=>c2h5(+m)                       5.27E+09    1.2     1272.7
     Low pressure limit:  0.20270E+41 -0.66420E+01  0.57690E+04
     TROE centering:      0.97600E+00  0.99900E+10  0.38400E+03  0.32900E+10
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        ar               Enhanced by    7.000E-01
301. c2h4+ho2=c2h4o1,2+oh                        2.23E+12    0.0    17190.0
        Reverse Arrhenius coefficients:          3.52E+17   -1.2    39670.0
302. h+c2h3(+M)<=>c2h4(+M)                       6.08E+12    0.3      280.0
     Low pressure limit:  0.14000E+31 -0.38600E+01  0.33200E+04
     TROE centering:      0.78200E+00  0.20750E+03  0.26630E+04  0.60950E+04
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        ar               Enhanced by    7.000E-01
303. c2h4(+M)<=>h2+c2h2(+M)                      8.00E+12    0.4    88700.0
     Low pressure limit:  0.15800E+52 -0.93000E+01  0.97800E+05
     TROE centering:      0.73500E+00  0.18000E+03  0.10350E+04  0.54170E+04
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        ar               Enhanced by    7.000E-01
304. c2h4+oh=c2h3+h2o                            1.31E-01    4.2     -860.0
305. c2h4+oh=c2h3oh+h                            1.94E+08    1.4     7829.0
306. c2h4+oh=ch3cho+h                            8.25E+08    1.0    10507.0
307. c2h4+h=c2h3+h2                              1.27E+05    2.8    11650.0
308. c2h4+o=ch3+hco                              5.88E+17   -1.7     2893.1
309. c2h4+o=ch3co+h                              8.66E+12   -0.5     1957.8
310. c2h4+o=ch2cho+h                             9.15E+09    0.9     1724.3
311. c2h4+o=ch2+ch2o                             6.28E+06    2.0     2859.3
312. c2h4+o=ch2co+h2                             1.12E+17   -1.8     3179.2
313. c2h4+o=c2h3+oh                              1.51E+07    1.9     3740.0
314. c2h4+o2=c2h3+ho2                            4.00E+13    0.0    61500.0
315. c2h4+c2h4=c2h5+c2h3                         5.00E+14    0.0    64700.0
316. c2h4+ch3=c2h3+ch4                           4.15E+12    0.0    11128.0
317. c2h4+ch3o=c2h3+ch3oh                        1.20E+11    0.0     6750.0
        Reverse Arrhenius coefficients:          1.00E+10    0.0     9000.0
318. c2h4+ho2=c2h3+h2o2                          4.80E+04    2.5    27622.0
319. c2h4+oh=pc2h4oh                             6.02E+37   -8.1     8043.0
     Declared duplicate reaction...
320. c2h4+oh=pc2h4oh                             7.29E+31   -6.9     2855.0
     Declared duplicate reaction...
321. pc2h4oh=ch3cho+h                            1.00E+13    0.0    30000.0
322. pc2h4oh+o2=ch3cho+ho2                       1.00E+12    0.0     2500.0
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323. pc2h4oh+o2=o2c2h4oh                          1.00E+12    0.0    -1100.0
324. o2c2h4oh=ch2o+ch2o+oh                        5.00E+16   -2.3    17552.0
325. c2h3+ho2=>ch3+co+oh                          3.00E+13    0.0        0.0
326. c2h3+oh=c2h2+h2o                             3.00E+13    0.0        0.0
327. c2h3+h=c2h2+h2                               1.21E+13    0.0        0.0
328. c2h3+o=ch3+co                                1.50E+13    0.0        0.0
329. c2h3+o=ch2co+h                               1.50E+13    0.0        0.0
330. c2h3+ch=ch2+c2h2                             5.00E+13    0.0        0.0
331. c2h3+ch3=c2h2+ch4                            3.91E+11    0.0        0.0
332. c2h3+c2h6=c2h4+c2h5                          1.50E+13    0.0    10000.0
333. c2h3+c2h=c2h2+c2h2                           9.64E+11    0.0        0.0
334. c2h3+hco=c2h4+co                             9.03E+13    0.0        0.0
335. c2h3+ch2o=c2h4+hco                           1.42E+10    0.2     3934.2
336. c2h3+c2h3=c2h2+c2h4                          1.08E+13    0.0        0.0
337. c2h3+ch2=c3h4-a+h                            3.00E+13    0.0        0.0
338. c2h3+ch2oh=c2h4+ch2o                         3.01E+13    0.0        0.0
339. c2h3+ch3o=c2h4+ch2o                          2.41E+13    0.0        0.0
340. c2h2+oh(+m)=c2h2oh(+m)                       2.29E+13    0.0     1808.0
     Low pressure limit:  0.74400E+27 -0.31000E+01  0.18080E+04
     TROE centering:      0.17000E+00  0.18000E+03  0.50000E+05  0.12772E+05
341. c2h2+o2=hcco+oh                              7.00E+07    1.5    30100.0
342. c2h2+o2=c2h+ho2                              1.21E+13    0.0    74520.0
343. c2h2+ho2=ch2co+oh                            6.09E+09    0.0     7948.0
344. c2h2+oh=c2h+h2o                              3.40E+07    2.0    14000.0
345. c2h2+oh=ch3+co                               4.84E-04    4.0    -2000.0
346. c2h2+oh=ch2co+h                              2.19E-04    4.5    -1000.0
347. c2h2+oh=hccoh+h                              5.06E+05    2.3    13500.0
348. c2h2+o=ch2+co                                4.08E+06    2.0     1900.0
349. c2h2+o=hcco+h                                1.63E+07    2.0     1900.0
350. c2h2+o=c2h+oh                                4.60E+19   -1.4    28950.0
351. c2h2+ch3=c2h+ch4                             1.80E+11    0.0    17290.0
352. c2h3(+m)=c2h2+h(+m)                          3.86E+08    1.6    37048.2
     Low pressure limit:  0.25650E+28 -0.34000E+01  0.35799E+05
     TROE centering:      0.19816E+01  0.53837E+04  0.42932E+01 -0.79500E-01
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        ar               Enhanced by    7.000E-01
        c2h2             Enhanced by    3.000E+00
353. c2h2(+M)=h2cc(+m)                            8.00E+14   -0.5    50750.0
     Low pressure limit:  0.24500E+16 -0.64000E+00  0.49700E+05
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        c2h2             Enhanced by    2.500E+00
        c2h4             Enhanced by    2.500E+00
354. h2cc+h=c2h2+h                                1.00E+14    0.0        0.0
355. h2cc+oh=ch2co+h                              2.00E+13    0.0        0.0
356. h2cc+o2=hco+hco                              1.00E+13    0.0        0.0
357. h2cc+o2=ch2+co2                              3.30E+12    0.0        0.0
358. h2cc+c2h2(+M)=c4h4(+M)                       3.50E+05    2.1    -2400.0
     Low pressure limit:  0.14000E+61 -0.12599E+02  0.74170E+04
     TROE centering:      0.98000E+00  0.56000E+02  0.58000E+03  0.41640E+04
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        c2h2             Enhanced by    3.000E+00
        c2h4             Enhanced by    3.000E+00
359. c2h4+ch2(s)=h2cc+ch4                         5.00E+13    0.0        0.0
360. c2h+h2=c2h2+h                                4.45E+06    2.2      920.0
361. c2h+oh=hcco+h                                2.00E+13    0.0        0.0
362. c2h+o=co+ch                                  1.00E+13    0.0        0.0
363. c2h+o2=co+co+h                               1.80E+13    0.0        0.0
364. h+c2h(+m)=c2h2(+m)                           1.00E+17   -1.0        0.0
     Low pressure limit:  0.37500E+34 -0.48000E+01  0.19000E+04
     TROE centering:      0.64640E+00  0.13200E+03  0.13150E+04  0.55660E+04
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        ar               Enhanced by    7.000E-01
365. c2h4o1,2=ch4+co                              1.21E+13    0.0    57200.0
366. c2h4o1,2+o2=c2h3o1,2+ho2                     4.00E+13    0.0    61500.0
367. c2h4o1,2+h=c2h3+h2o                          5.00E+09    0.0     5000.0
368. c2h4o1,2+h=c2h4+oh                           9.51E+10    0.0     5000.0
369. c2h4o1,2+o=c2h3o1,2+oh                       1.91E+12    0.0     5250.0
370. c2h4o1,2+ch3=ch4+c2h3o1,2                    1.07E+12    0.0    11830.0
371. c2h4o1,2<=>ch3+hco                           3.63E+13    0.0    57200.0
        Reverse Arrhenius coefficients:           1.01E+04    1.5    -2750.0
372. c2h4o1,2<=>ch3cho                            7.41E+12    0.0    53800.0
        Reverse Arrhenius coefficients:           9.01E+10    0.2    80800.0
373. c2h4o1,2+oh<=>c2h3o1,2+h2o                   1.78E+13    0.0     3610.0
        Reverse Arrhenius coefficients:           1.35E+10    0.7    24740.0
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374. c2h4o1,2+h<=>c2h3o1,2+h2	8.00E+13	0.0	9680.0
Reverse Arrhenius coefficients:	5.71E+09	0.8	15920.0
375. c2h4o1,2+ho2<=>c2h3o1,2+h2o2	1.13E+13	0.0	30430.0
Reverse Arrhenius coefficients:	4.67E+11	0.1	20670.0
376. c2h4o1,2+ch3o=c2h3o1,2+ch3oh	1.20E+11	0.0	6750.0
Reverse Arrhenius coefficients:	3.61E+09	-0.9	25480.0
377. c2h4o1,2+ch3o2<=>c2h3o1,2+ch3o2h	1.13E+13	0.0	30430.0
Reverse Arrhenius coefficients:	9.08E+12	-0.3	19070.0
378. c2h4o1,2+c2h5o2<=>c2h3o1,2+c2h5o2h	1.13E+13	0.0	30430.0
Reverse Arrhenius coefficients:	9.09E+12	-0.3	19080.0
379. c2h5o2+h2o2=c2h5o2h+ho2	2.41E+12	0.0	9936.0
380. c2h5o2+ch3=ch3ch2o+ch3o	8.17E+12	0.0	-906.0
381. c2h5o2+ho2=c2h5o2h+o2	1.75E+10	0.0	-3275.0
382. c2h5o2+ch2o=c2h5o2h+hco	1.99E+12	0.0	11660.0
383. c2h4+c2h5o2=c2h3+c2h5o2h	2.23E+12	0.0	17190.0
384. ch4+c2h5o2=ch3+c2h5o2h	1.81E+11	0.0	18480.0
385. ch3o2+c2h5o2=o2+ch3o+ch3ch2o	7.74E+10	0.0	-61.0
386. c2h5o2+c2h5o2=ch3ch2o+ch3ch2o+o2	7.74E+10	0.0	-61.0
387. c2h5o2+c2h5o2=c2h5oh+ch3cho+o2	1.34E+11	0.0	0.0
388. c3h6+c2h5o2=c3h5-a+c2h5o2h	3.24E+11	0.0	14900.0
389. c2h5o2+c3h8=c2h5o2h+nc3h7	1.70E+13	0.0	20460.0
390. c2h5o2+c3h8=c2h5o2h+ic3h7	2.00E+12	0.0	17000.0
391. c4h8-1+c2h5o2=c4h713+c2h5o2h	1.40E+12	0.0	14900.0
392. c2h5o2h+o=oh+c2h5o2	2.00E+13	0.0	4750.0
393. c2h5o2h+oh=c2h5o2+h2o	2.00E+12	0.0	-370.0
394. c2h5o2h+h=ch3cho+oh+h2	3.20E+13	0.0	7700.0
395. c2h5o2h+ch3=ch3cho+oh+ch4	5.70E+11	0.0	8700.0
396. c2h5o2h+c2h5=ch3cho+oh+c2h6	3.40E+11	0.0	11400.0
397. c2h5o2h+oh=ch3cho+oh+h2o	5.90E+12	0.0	900.0
398. c2h5o2h+hco=ch3cho+oh+ch2o	1.80E+12	0.0	16700.0
399. c2h5o2h+ch3o=ch3cho+oh+ch3oh	6.30E+11	0.0	5500.0
400. c2h5o2h+ho2=ch3cho+oh+h2o2	8.00E+11	0.0	16200.0
401. c2h5o2h=ch3ch2o+oh	6.31E+14	0.0	42300.0
402. ch3cho=ch3+hco	6.00E+14	0.0	79100.0
403. ch3cho=ch3co+h	5.00E+14	0.0	87900.0
404. ch3cho=ch4+co	1.00E+15	0.0	85000.0
405. ch3cho=ch2co+h2	3.00E+14	0.0	84000.0
406. ch3cho+h=ch3co+h2	1.20E+14	0.0	7000.0
407. ch3cho+h=ch2cho+h2	4.40E+14	0.0	10000.0
408. ch3cho+ch3=ch3co+ch4	1.70E+12	0.0	8440.0
409. ch3cho+ch3=ch2cho+ch4	6.00E+12	0.0	11000.0
410. ch3cho+o2=ch3co+ho2	3.00E+13	0.0	39150.0
411. ch3cho+o=ch3co+oh	5.85E+12	0.0	1808.0
412. ch3cho+o=ch2cho+oh	1.50E+13	0.0	5000.0
413. ch3cho+oh=ch3co+h2o	2.35E+10	0.7	-1113.0
414. ch3cho+oh=ch2cho+h2o	1.55E+06	2.2	1000.0
415. ch3cho+ho2=ch3co+h2o2	3.10E+12	0.0	11920.0
416. ch3cho+ho2=ch2cho+h2o2	1.00E+12	0.0	14000.0
417. ch3cho+c2h5=ch3co+c2h6	1.70E+12	0.0	8440.0
418. ch3co+o=ch3+co2	1.00E+13	0.0	0.0
419. ch3co+oh=ch3+co+oh	3.16E+13	0.0	0.0
420. ch3co+ho2=ch3+co2+oh	3.16E+13	0.0	0.0
421. ch3cho+oh=ch3cooh+h	1.00E+08	1.2	-447.0
422. ch2co+h=ch3co	2.30E+08	1.6	2627.0
423. ch3co<=>ch3+co	8.18E+19	-2.5	17263.0
424. ch3co+o2=ch3co3	3.01E+12	0.0	0.0
425. ch3co3+ho2=ch3co3h+o2	1.75E+10	0.0	-3275.0
426. ch3co3h=ch3co2+oh	5.00E+14	0.0	40142.0
427. ch3co3h+h=ch3co3+h2	5.40E+10	0.0	1860.0
428. ch3co3h+oh=ch3co3+h2o	1.10E+12	0.0	-437.0
429. ch3co3h+ho2=ch3co3+h2o2	4.10E+04	2.5	10206.0
430. ch3co3+h=ch3co2+oh	1.00E+14	0.0	0.0
431. ch3co3+oh=ch3co2+ho2	4.00E+11	0.6	0.0
432. ch3co3+ho2=>ch3cooh+o+o2	1.69E+12	0.0	0.0
433. ch3co3+ch3o2=>ch3cooh+ch2o+o2	3.31E+12	0.0	0.0
434. ch3co2+ho2=ch3cooh+o2	1.75E+10	0.0	-3275.0
435. ch3co3=>ch2co+ho2	3.34E+09	1.0	32500.0
436. ch3co3h=>ch3+co2+oh	1.00E+15	0.0	37400.0
437. ch3co3+ho2=>ch3+co2+o2+oh	1.00E+12	0.0	0.0
438. ch3co+h=ch2co+h2	2.00E+13	0.0	0.0
Reverse Arrhenius coefficients:	7.27E+09	0.0	83040.0
439. ch3co+o=ch2co+oh	2.00E+13	0.0	0.0
Reverse Arrhenius coefficients:	7.27E+09	0.0	83040.0
440. ch3co+ch3=ch2co+ch4	5.00E+13	0.0	0.0
Reverse Arrhenius coefficients:	7.27E+09	0.0	83040.0
441. ch3cooh=ch3co2+h	2.30E+14	0.0	106345.3
442. ch3+hoco+m=ch3cooh+m	1.00E+22	-2.0	0.0
443. ch3co+oh+m=ch3cooh+m	1.00E+22	-2.0	0.0
444. ch3cooh=ch4+co2	3.20E+10	0.9	71963.0
445. ch3cooh=ch2co+h2o	3.58E+10	1.0	74793.0
446. ch3cooh+h=ch2cooh+h2	1.68E+04	2.9	7376.0
447. ch3cooh+h=ch3co2+h2	1.79E+06	2.3	15215.0
448. ch3cooh+o=ch2cooh+oh	2.30E+04	2.9	7040.0
449. ch3cooh+o=ch3co2+oh	8.50E+05	2.1	9880.0
450. ch3cooh+oh=ch2cooh+h2o	2.20E+00	3.8	-725.0
451. ch3cooh+oh=ch3co2+h2o	1.06E-04	4.8	-3949.0
452. ch3cooh+ch3=ch2cooh+ch4	2.14E-01	4.0	8222.0
453. ch3cooh+ch3=ch3co2+ch4	9.30E+01	3.0	10773.0
454. ch3cooh+ho2=ch2cooh+h2o2	4.02E-06	5.3	15153.0
455. ch3cooh+ho2=ch3co2+h2o2	1.41E-02	4.2	20862.0
456. ch3cooh+ch3o2=ch2cooh+ch3o2h	8.40E+12	0.0	20440.0
457. ch3cooh+ch3o=ch2cooh+ch3oh	1.58E+11	0.0	7000.0
458. ch2cooh+h=ch2co+h2o	1.00E+14	0.0	0.0
459. ch2co+oh=ch2cooh	6.35E+30	-6.0	4435.0

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460. ch2cooh=>co2+ch3                          1.70E+09    1.0    38640.0
461. ch3co2=ch3+co2                            7.54E+11    0.9    17058.0
462. ch3co2+h=ch2co+h2o                        1.00E+04    0.0        0.0
463. ch2cho+o=ch2o+hco                         2.00E+13    0.0     4000.0
464. ch2cho+ho2=ch2o+hco+oh                    1.00E+13    0.0        0.0
465. ch2cho+oh=ch2co+h2o                       1.00E+13    0.0     2000.0
466. ch2cho+h=ch2co+h2                         2.00E+13    0.0     4000.0
467. ch2cho+h=ch3co+h                          5.00E+12    0.0        0.0
468. ch2cho+h=ch3+hco                          9.00E+13    0.0        0.0
469. ch2cho+ch3=>c2h5+co+h                     4.90E+14   -0.5        0.0
470. ch2cho=ch3co                              1.00E+13    0.0    47100.0
471. ch2cho<=>h+ch2co                          3.46E+36   -6.9    52986.0
472. ch2cho<=>ch3+co                           2.15E+35   -6.8    49554.0
473. ch2+co(+M)<=>ch2co(+M)                    8.10E+11    0.5     4510.0
     Low pressure limit:  0.26900E+34 -0.51100E+01  0.70950E+04
     TROE centering:      0.59070E+00  0.27500E+03  0.12260E+04  0.51850E+04
        h2              Enhanced by    2.000E+00
        h2o             Enhanced by    6.000E+00
        ch4             Enhanced by    2.000E+00
        co              Enhanced by    1.500E+00
        co2             Enhanced by    2.000E+00
        c2h6            Enhanced by    3.000E+00
        ar              Enhanced by    7.000E-01
474. ch2co+o2=ch2o+co2                         2.00E+13    0.0    61500.0
475. ch2co+ho2=>ch2o+co+oh                     6.00E+11    0.0    12738.0
476. ch2co+o=ch2+co2                           1.76E+12    0.0     1349.0
477. ch2co+o=hcco+oh                           1.00E+13    0.0     8000.0
478. ch2co+oh<=>ch2oh+co                       2.00E+12    0.0    -1010.0
479. ch2co+oh<=>hcco+h2o                       1.00E+13    0.0     2000.0
480. ch2co+h<=>hcco+h2                         1.40E+15   -0.2     8783.2
481. ch2co+h<=>ch3+co                          7.70E+13   -0.2     4183.2
482. ch2co+ch3=c2h5+co                         9.00E+10    0.0        0.0
483. ch2co+ch3=hcco+ch4                        7.50E+12    0.0    13000.0
484. ch2co+ch2=c2h4+co                         1.00E+12    0.0        0.0
485. ch2co+ch2=hcco+ch3                        3.60E+13    0.0    11000.0
486. chocho(+m)=ch2o+co(+m)                    4.27E+12    0.0    50600.0
     Low pressure limit:  0.89100E+17  0.00000E+00  0.49200E+05
487. chocho(+m)=co+co+h2(+m)                   1.07E+14    0.0    55100.0
     Low pressure limit:  0.25700E+17  0.00000E+00  0.38400E+05
488. chocho+oh=choco+h2o                       1.00E+13    0.0        0.0
489. chocho+o=choco+oh                         7.24E+12    0.0     1970.0
490. chocho+h=ch2o+hco                         1.00E+12    0.0        0.0
491. chocho+ho2=choco+h2o2                     1.70E+12    0.0    10700.0
492. chocho+ch3=choco+ch4                      1.74E+12    0.0     8440.0
493. chocho+o2=hco+co+ho2                      6.30E+13    0.0    30000.0
494. hco+hco=chocho                            1.00E+13    0.0        0.0
495. choco=hco+co                              2.00E+07    0.0        0.0
496. choco+o2=co+co+ho2                        3.98E+12    0.0    30000.0
497. c2h3o1,2=ch2co+h                          4.96E+13    0.0    14860.0
498. c2h3o1,2=ch3+co                           7.31E+12    0.0    14280.0
499. c2h3o1,2=ch3co                            8.51E+14    0.0    14000.0
500. c2h3o1,2=ch2cho                           8.74E+31   -6.9    14990.0
501. c2h2oh=ch2co+h                            5.00E+15    0.0    28000.0
502. c2h2oh+h=ch2co+h2                         2.00E+13    0.0     4000.0
503. c2h2oh+o=ch2co+oh                         2.00E+13    0.0     4000.0
504. c2h2oh+oh=ch2co+h2o                       1.00E+13    0.0     2000.0
505. c2h2oh+o2=>hco+co2+h2                     4.00E+12    0.0     -250.0
506. hccoh+h=ch2co+h                           1.00E+13    0.0        0.0
507. ch+co(+M)<=>hcco(+M)                      5.00E+13    0.0        0.0
     Low pressure limit:  0.26900E+29 -0.37400E+01  0.19360E+04
     TROE centering:      0.57570E+00  0.23700E+03  0.16520E+04  0.50690E+04
        h2              Enhanced by    2.000E+00
        h2o             Enhanced by    6.000E+00
        ch4             Enhanced by    2.000E+00
        co              Enhanced by    1.500E+00
        co2             Enhanced by    2.000E+00
        c2h6            Enhanced by    3.000E+00
        ar              Enhanced by    7.000E-01
508. hcco+oh=c2o+h2o                           3.00E+13    0.0        0.0
509. hcco+oh=hco+co+h                          1.00E+13    0.0        0.0
510. hcco+o=co+co+h                            1.93E+14    0.0      590.0
511. hcco+h=ch2(s)+co                          1.50E+14    0.0        0.0
512. hcco+o2=co+co+oh                          1.60E+12    0.0      854.0
513. hcco+ch2=c2h+ch2o                         1.00E+13    0.0     2000.0
514. hcco+ch2=c2h3+co                          3.00E+13    0.0        0.0
515. hcco+ch=c2h2+co                           5.00E+13    0.0        0.0
516. hcco+hcco=c2h2+co+co                      1.00E+13    0.0        0.0
517. hcco+o=ch+co2                             2.95E+13    0.0     1113.0
518. hcco+c2h2=c3h3+co                         1.00E+11    0.0     3000.0
519. hcco+ch3=c2h4+co                          5.00E+13    0.0        0.0
520. c2o+o2=co+co+o                            2.00E+13    0.0        0.0
521. c2o+oh=co+co+h                            2.00E+13    0.0        0.0
522. c2o+o=co+co                               5.00E+13    0.0        0.0
523. c2o+h=ch+co                               5.00E+13    0.0        0.0
524. c2+o2=co+co                               5.00E+13    0.0        0.0
525. c2+oh=c2o+h                               5.00E+13    0.0        0.0
526. c2+h2=c2h+h                               4.00E+05    2.4     1000.0
527. c2h5oh(+M)=ch3+ch2oh(+M)                  5.94E+23   -1.7    91163.0
     Low pressure limit:  0.28800E+86 -0.18900E+02  0.10991E+06
     TROE centering:      0.50000E+00  0.20000E+03  0.89000E+03  0.46000E+04
        h2o             Enhanced by    5.000E+00
        h2              Enhanced by    2.000E+00
        co2             Enhanced by    3.000E+00
        co              Enhanced by    2.000E+00
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528. c2h5oh(+M)=c2h5+oh(+M)                        5.74E+09   -2.2    96578.0
     Low pressure limit:  0.83560E+52 -0.19700E+02  0.11447E+06
     TROE centering:      0.20940E+01  0.16539E+05  0.16136E+03  0.11140E+01
529. c2h5oh(+M)=c2h4+h2o(+M)                       2.79E+13    0.1    66136.0
     Low pressure limit:  0.25700E+84 -0.18850E+02  0.86452E+05
     TROE centering:      0.70000E+00  0.35000E+03  0.80000E+03  0.38000E+04
        h2o              Enhanced by    5.000E+00
530. c2h5oh(+M)=ch3cho+h2(+M)                      7.24E+11    0.1    91007.0
     Low pressure limit:  0.44600E+88 -0.19420E+02  0.11559E+06
     TROE centering:      0.90000E+00  0.90000E+03  0.11000E+04  0.35000E+04
        h2o              Enhanced by    5.000E+00
531. c2h5oh+o2=pc2h4oh+ho2                         2.00E+13    0.0    52800.0
532. c2h5oh+o2=ch3choh+ho2                         1.50E+13    0.0    50150.0
533. c2h5oh+c2h5=pc2h4oh+c2h6                      5.00E+10    0.0    13400.0
534. c2h5oh+c2h5=ch3choh+c2h6                      5.00E+10    0.0    10400.0
535. c2h5oh+oh=pc2h4oh+h2o                         6.20E+03    2.7     -576.0
536. c2h5oh+oh=ch3choh+h2o                         1.31E+05    2.4    -1457.0
537. c2h5oh+oh=ch3ch2o+h2o                         2.81E+02    3.0     -580.0
538. c2h5oh+h=pc2h4oh+h2                           1.88E+03    3.2     7150.0
539. c2h5oh+h=ch3choh+h2                           1.79E+05    2.5     3420.0
540. c2h5oh+h=ch3ch2o+h2                           5.55E-23   10.6    -4459.0
541. c2h5oh+o=pc2h4oh+oh                           9.69E+02    3.2     4658.0
542. c2h5oh+o=ch3choh+oh                           1.45E+05    2.4      876.0
543. c2h5oh+o=ch3ch2o+oh                           1.46E-03    4.7     1727.0
544. c2h5oh+ch3=pc2h4oh+ch4                        3.30E+02    3.3    12291.0
545. c2h5oh+ch3=ch3choh+ch4                        1.99E+01    3.4     7635.0
546. c2h5oh+ch3=ch3ch2o+ch4                        2.04E+00    3.6     7722.0
547. c2h5oh+ho2=ch3choh+h2o2                       8.20E+03    2.5    10750.0
548. c2h5oh+ho2=pc2h4oh+h2o2                       1.23E+04    2.5    15750.0
549. c2h5oh+ho2=ch3ch2o+h2o2                       2.50E+12    0.0    24000.0
550. ch3ch2o+M=ch3cho+h+M                          2.32E+35   -5.9    25274.0
551. ch3ch2o+M=ch3+ch2o+M                          1.35E+38   -7.0    23800.0
552. ch3ch2o+o2=ch3cho+ho2                         4.00E+10    0.0     1100.0
553. ch3ch2o+h=ch3cho+h2                           1.00E+13    0.0        0.0
554. ch3ch2o+oh=ch3cho+h2o                         1.00E+13    0.0        0.0
555. ch3ch2o+ho2=ch3cho+h2o2                       3.00E+11    0.0        0.0
556. ch3ch2o+co=c2h5+co2                           4.68E+02    3.2     5380.0
557. ch3choh+o2=ch3cho+ho2                         1.00E+13    0.0     5564.0
558. ch3choh+ch3=c3h6+h2o                          1.00E+13    0.0        0.0
559. ch3choh+o=ch3cho+oh                           1.00E+14    0.0        0.0
560. ch3choh+h=c2h4+h2o                            3.00E+13    0.0        0.0
561. ch3choh+h=ch3+ch2oh                           3.00E+13    0.0        0.0
562. ch3choh+ho2=ch3cho+oh+oh                      4.00E+13    0.0        0.0
563. ch3choh+oh=ch3cho+h2o                         5.00E+12    0.0        0.0
564. ch3choh+M=ch3cho+h+M                          1.00E+14    0.0    25000.0
565. ch2+c3h8=ch3+ic3h7                            2.19E+12    0.0     6405.0
566. ch2+c3h8=ch3+nc3h7                            1.79E+12    0.0     6405.0
567. c3h8(+m)<=>c2h5+ch3(+m)                       1.29E+37   -5.8    97380.0
     Low pressure limit:  0.56400E+75 -0.15740E+02  0.98714E+05
     TROE centering:      0.31000E+00  0.50000E+02  0.30000E+04  0.90000E+04
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ar               Enhanced by    7.000E-01
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        ch4              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        he               Enhanced by    7.000E-01
568. c3h8=nc3h7+h                                  1.58E+16    0.0    97970.0
569. c3h8=ic3h7+h                                  5.00E+15    0.0    94990.0
570. c3h8+o2=nc3h7+ho2                             4.00E+13    0.0    50872.0
571. c3h8+o2=ic3h7+ho2                             4.00E+13    0.0    47500.0
572. c3h8+ho2=nc3h7+h2o2                           4.76E+04    2.5    16494.0
573. c3h8+ho2=ic3h7+h2o2                           9.64E+03    2.6    13910.0
574. c3h8+oh=nc3h7+h2o                             3.16E+07    1.8      934.0
575. c3h8+oh=ic3h7+h2o                             7.08E+06    1.9     -159.0
576. c3h8+o=nc3h7+oh                               3.72E+06    2.4     5505.0
577. c3h8+o=ic3h7+oh                               5.50E+05    2.5     3140.0
578. c3h8+h=nc3h7+h2                               1.34E+06    2.5     6756.0
579. c3h8+h=ic3h7+h2                               1.01E+04    2.9     2931.0
580. c3h8+ch3=nc3h7+ch4                            3.00E+12    0.0    11710.0
581. c3h8+ch3=ic3h7+ch4                            8.07E+11    0.0    10110.0
582. c3h8+c2h5=nc3h7+c2h6                          3.16E+11    0.0    12300.0
583. c3h8+c2h5=ic3h7+c2h6                          5.01E+10    0.0    10400.0
584. c3h8+c2h3=nc3h7+c2h4                          6.00E+02    3.3    10502.0
585. c3h8+c2h3=ic3h7+c2h4                          1.00E+03    3.1     8829.0
586. c3h8+ic3h7=nc3h7+c3h8                         1.00E+11    0.0    12900.0
587. c3h8+c3h5-a=nc3h7+c3h6                        7.94E+11    0.0    20500.0
588. c3h8+c3h5-a=ic3h7+c3h6                        7.94E+11    0.0    16200.0
589. c3h8+ch3o=nc3h7+ch3oh                         3.18E+11    0.0     7050.0
590. c3h8+ch3o=ic3h7+ch3oh                         7.20E+10    0.0     4470.0
591. nc3h7(+M)=c2h4+ch3(+M)                        1.23E+13   -0.1    30202.0
     Low pressure limit:  0.55450E+50 -0.10000E+02  0.35766E+05
     TROE centering:      0.21700E+01  0.10000E-14  0.25100E+03  0.11850E+04
        h2o              Enhanced by    5.000E+00
        h2               Enhanced by    2.000E+00
        co2              Enhanced by    3.000E+00
        co               Enhanced by    2.000E+00
592. c3h6+h(+m)=nc3h7(+m)                          1.33E+13    0.0     3260.7
     Low pressure limit:  0.62600E+39 -0.66600E+01  0.70000E+04
     TROE centering:      0.10000E+01  0.10000E+04  0.13100E+04  0.48097E+05
        h2o              Enhanced by    6.000E+00
        co               Enhanced by    1.875E+00
        co2              Enhanced by    3.750E+00
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      ch4              Enhanced by    1.625E+01
      c2h6             Enhanced by    1.625E+01
593. c3h6+h(+m)=ic3h7(+m)                          5.70E+09    1.2      874.0
     Low pressure limit:  0.16400E+55 -0.11100E+02  0.93640E+04
     TROE centering:      0.10000E+01  0.10000E-14  0.26000E+03  0.30000E+04
      h2o              Enhanced by    1.625E+01
      co               Enhanced by    1.875E+00
      co2              Enhanced by    3.850E+00
594. nc3h7=ic3h7                                   3.56E+10    0.9    37300.0
595. nc3h7+o2=c3h6+ho2                             2.63E+00    3.5     2481.2
596. ic3h7+o2=c3h6+ho2                             4.91E+17   -1.7     6964.0
597. ho2+ic3h7=ic3h7o2h                            4.80E+12    0.0        0.0
598. ho2+nc3h7=nc3h7o2h                            4.80E+12    0.0        0.0
599. nc3h7+o2=nc3h7o2                              1.15E+20   -2.4     2451.3
600. ic3h7+o2=ic3h7o2                              6.74E+27   -4.8     3779.8
601. nc3h7+o2=c3h6o1-2+oh                          3.35E+02    2.6     4697.4
602. ic3h7+o2=c3h6o1-2+oh                          2.81E+18   -2.3    10119.3
603. nc3h7+h=c2h5+ch3                              1.00E+14    0.0        0.0
604. ic3h7+h=c2h5+ch3                              5.00E+13    0.0        0.0
605. ic3h7+h=c3h6+h2                               3.61E+12    0.0        0.0
606. ic3h7+o=ch3coch3+h                            4.82E+13    0.0        0.0
607. ic3h7+o=ch3cho+ch3                            4.82E+13    0.0        0.0
608. nc3h7+o=ch2o+c2h5                             4.82E+13    0.0        0.0
609. nc3h7+o=c2h5cho+h                             4.82E+13    0.0        0.0
610. ch3o2+nc3h7=ch3o+nc3h7o                       1.90E+12    0.0    -1200.0
611. ic3h7o2+nc3h7=ic3h7o+nc3h7o                   1.90E+12    0.0    -1200.0
612. nc3h7o2+nc3h7=nc3h7o+nc3h7o                   1.90E+12    0.0    -1200.0
613. nc3h7+ho2=nc3h7o+oh                           1.90E+12    0.0    -1200.0
614. ch3o2+ic3h7=ch3o+ic3h7o                       1.90E+12    0.0    -1200.0
615. ic3h7o2+ic3h7=ic3h7o+ic3h7o                   1.90E+12    0.0    -1200.0
616. nc3h7o2+ic3h7=nc3h7o+ic3h7o                   1.90E+12    0.0    -1200.0
617. ic3h7+ho2=ic3h7o+oh                           1.90E+12    0.0    -1200.0
618. nc3h7o=c2h5cho+h                              1.70E+13    0.0    20510.0
619. nc3h7o=c2h5+ch2o                              5.89E+13    0.0    13890.0
620. nc3h7o+o2=c2h5cho+ho2                         8.43E+09    0.0      220.0
621. ic3h7o=ch3coch3+h                             1.58E+13    0.0    18310.0
622. ic3h7o=ch3+ch3cho                             9.12E+13    0.0    14360.0
623. ic3h7o+o2=ch3coch3+ho2                        8.43E+09    0.0      420.0
624. ic3h7o2+c2h3cho=c2h3co+ic3h7o2h               2.80E+12    0.0    13600.0
625. ic3h7o2+c2h4=c2h3+ic3h7o2h                    1.13E+13    0.0    30430.0
626. ic3h7o2+c2h5cho=ic3h7o2h+c2h5co               2.00E+11    0.0     9500.0
627. ic3h7o2+c2h6=ic3h7o2h+c2h5                    1.70E+13    0.0    20460.0
628. ic3h7o2+ch2o=ic3h7o2h+hco                     5.60E+12    0.0    13600.0
629. ic3h7o2+ch3cho=ic3h7o2h+ch3co                 2.80E+12    0.0    13600.0
630. ic3h7o2+ch4=ch3+ic3h7o2h                      1.12E+13    0.0    24640.0
631. ic3h7o2+h2=h+ic3h7o2h                         3.01E+13    0.0    26030.0
632. ic3h7o2+ch3oh=ch2oh+ic3h7o2h                  6.30E+12    0.0    19360.0
633. ic3h7o2+ho2=ic3h7o2h+o2                       2.29E+11    0.0    -1790.0
634. ic3h7o2+c2h5o2=ic3h7o+ch3ch2o+o2              5.00E+10    0.0        0.0
635. ic3h7o2+ic3h7o2=o2+ic3h7o+ic3h7o              5.00E+10    0.0        0.0
636. ic3h7o2+nc3h7o2=ic3h7o+nc3h7o+o2              5.00E+10    0.0        0.0
637. ic3h7o2+ch3co3=ic3h7o+ch3co2+o2               5.00E+10    0.0        0.0
638. ic3h7o2+ch3o2=ic3h7o+ch3o+o2                  1.00E+11    0.0        0.0
639. ic3h7o2+ho2=ic3h7o+oh+o2                      1.00E+11    0.0        0.0
640. ic3h7o2+c2h5=ic3h7o+ch3ch2o                   1.90E+12    0.0    -1200.0
641. ic3h7o2+c3h5-a=ic3h7o+c3h5o                   1.90E+12    0.0    -1200.0
642. ic3h7o2+ch3=ic3h7o+ch3o                       1.90E+12    0.0    -1200.0
643. ic3h7o2+h2o2=ic3h7o2h+ho2                     2.41E+12    0.0     9936.0
644. nc3h7o2+h2o2=nc3h7o2h+ho2                     2.41E+12    0.0     9936.0
645. nc3h7o2+c2h3cho=c2h3co+nc3h7o2h               2.80E+12    0.0    13600.0
646. nc3h7o2+c2h4=c2h3+nc3h7o2h                    1.13E+13    0.0    30430.0
647. nc3h7o2+c2h5cho=nc3h7o2h+c2h5co               2.00E+11    0.0     9500.0
648. nc3h7o2+c2h6=nc3h7o2h+c2h5                    1.70E+13    0.0    20460.0
649. nc3h7o2+ch3cho=nc3h7o2h+ch3co                 2.80E+12    0.0    13600.0
650. nc3h7o2+ch4=ch3+nc3h7o2h                      1.12E+13    0.0    24640.0
651. nc3h7o2+h2=h+nc3h7o2h                         3.01E+13    0.0    26030.0
652. nc3h7o2+ch3oh=ch2oh+nc3h7o2h                  6.30E+12    0.0    19360.0
653. nc3h7o2+ho2=nc3h7o2h+o2                       2.29E+11    0.0    -1790.0
654. nc3h7o2+c2h5o2=nc3h7o+ch3ch2o+o2              5.00E+10    0.0        0.0
655. nc3h7o2+nc3h7o2=o2+nc3h7o+nc3h7o              5.00E+10    0.0        0.0
656. nc3h7o2+ch3o2=nc3h7o+ch3o+o2                  1.00E+11    0.0        0.0
657. nc3h7o2+ho2=nc3h7o+oh+o2                      1.00E+11    0.0        0.0
658. nc3h7o2+c2h5=nc3h7o+ch3ch2o                   1.90E+12    0.0    -1200.0
659. nc3h7o2+c3h5-a=nc3h7o+c3h5o                   1.90E+12    0.0    -1200.0
660. nc3h7o2+ch3=nc3h7o+ch3o                       1.90E+12    0.0    -1200.0
661. nc3h7o2=c3h6+ho2                              4.16E+08    1.2    29600.0
662. ic3h7o2=c3h6+ho2                              8.16E+08    1.3    30000.0
663. nc3h7o2=c2h5cho+oh                            3.36E+05    2.3    36900.0
664. ic3h7o2=ch3coch3+oh                           5.22E+04    2.5    35700.0
665. nc3h7o2=prooh1-2                              2.86E+07    1.5    29100.0
666. nc3h7o2=prooh1-3                              2.05E+07    1.3    21700.0
667. ic3h7o2=prooh2-1                              1.10E+07    1.8    32300.0
668. nc3h7o2=c3h6o1-2+oh                           3.28E+21   -2.9    37342.8
669. ic3h7o2=c3h6o1-2+oh                           1.94E+53  -13.0    49382.4
670. prooh1-2=prooh1-3                             5.36E-85   31.0      535.8
671. nc3h7o2h=nc3h7o+oh                            4.00E+15    0.0    42000.0
672. ic3h7o2h=ic3h7o+oh                            2.50E+15    0.0    43000.0
673. prooh1-2=c3h6o1-2+oh                          1.21E+09    1.1    11300.0
674. prooh2-1=c3h6o1-2+oh                          4.45E+09    0.9    10800.0
675. prooh1-3=c3h6o1-3+oh                          2.64E+09    0.7    18500.0
676. c3h6+ho2=c3h6o1-2+oh                          1.92E+12    0.1    17384.8
677. prooh1-2=c3h6+ho2                             1.16E-09    7.5    14745.7
678. prooh1-3=c3h6+ho2                             1.60E+10   -0.4    17531.8
679. prooh2-1=c3h6+ho2                             5.04E-23   10.5     2465.0
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680. prooh1-3=>oh+ch2o+c2h4                        2.89E+09    1.3    26700.0
681. prooh1-2+o2=prooh1-2o2                        8.50E+18   -2.5        0.0
682. prooh1-3+o2=prooh1-3o2                        4.50E+18   -2.5        0.0
683. prooh2-1+o2=prooh2-1o2                        7.50E+17   -2.5        0.0
684. prooh1-2o2=c3ket12+oh                         2.54E-01    3.7    22800.0
685. prooh1-3o2=c3ket13+oh                         6.36E+04    1.8    17200.0
686. prooh2-1o2=c3ket21+oh                         1.20E+01    3.1    22500.0
687. c3ket12=ch3cho+hco+oh                         2.50E+15    0.0    43000.0
688. c3ket13=ch2o+ch2cho+oh                        2.50E+15    0.0    43000.0
689. c3ket21=ch2o+ch3co+oh                         2.50E+15    0.0    43000.0
690. c3h6o1-2+h=>h2+ch3chcho                       9.60E+08    1.5     2785.0
691. c3h6o1-2+h=>h2+ch3coch2                       4.80E+08    1.5     2005.0
692. c3h6o1-2+oh=>h2o+ch3chcho                     4.80E+06    2.0    -1192.0
693. c3h6o1-2+oh=>h2o+ch3coch2                     2.40E+06    2.0    -1192.0
694. c3h6o1-2+ho2=>h2o2+ch3chcho                   8.00E+12    0.0    14400.0
695. c3h6o1-2+ho2=>h2o2+ch3coch2                   4.00E+12    0.0    13260.0
696. c3h6o1-3+h=>h2+pc2h4cho                       1.92E+09    1.5     2785.0
697. c3h6o1-3+oh=>h2o+pc2h4cho                     9.60E+06    2.0    -1192.0
698. c3h6o1-3+ho2=>h2o2+pc2h4cho                   1.60E+13    0.0    14400.0
699. c3h6o1-2=c2h5+hco                             2.45E+13    0.0    58500.0
700. c3h6o1-2=c2h5cho                              1.11E+14    0.0    55150.0
701. c3h6o1-2=ch3+ch3co                            4.54E+13    0.0    59900.0
702. c3h6o1-2=ch3+ch2cho                           2.45E+13    0.0    58820.0
703. c3h6o1-2=ch3+c2h3o1,2                         8.00E+15    0.0    92010.0
704. c3h5-a+h(+m)=c3h6(+m)                         2.00E+14    0.0        0.0
     Low pressure limit:  0.13300E+61 -0.12000E+02  0.59678E+04
     TROE centering:      0.20000E-01  0.10966E+04  0.10966E+04  0.68595E+04
        h2o              Enhanced by    6.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        ch4              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        h2               Enhanced by    2.000E+00
        ar               Enhanced by    7.000E-01
705. c2h3+ch3(+m)=c3h6(+m)                         2.50E+13    0.0        0.0
     Low pressure limit:  0.42700E+59 -0.11940E+02  0.97698E+04
     TROE centering:      0.17500E+00  0.13406E+04  0.60000E+05  0.10140E+05
        h2o              Enhanced by    6.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        ch4              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        h2               Enhanced by    2.000E+00
        c2h2             Enhanced by    3.000E+00
        c2h4             Enhanced by    3.000E+00
        ar               Enhanced by    7.000E-01
706. c3h5-a+ho2=c3h6+o2                            1.00E+12    0.0        0.0
707. c3h6+o2=c3h5-s+ho2                            1.40E+13    0.0    60200.0
708. c3h6+o2=c3h5-t+ho2                            7.00E+12    0.0    60200.0
709. c3h6+ho2=c3h5-a+h2o2                          2.70E+04    2.5    12340.0
710. c3h6+ho2=c3h5-s+h2o2                          1.80E+04    2.5    27620.0
711. c3h6+ho2=c3h5-t+h2o2                          9.00E+03    2.5    23590.0
712. c3h6+oh=c3h5-a+h2o                            5.27E+04    2.7      312.8
713. c3h6+oh=c3h5-s+h2o                            7.59E+03    2.8     2193.0
     Declared duplicate reaction...
714. c3h6+oh=c3h5-s+h2o                            1.01E+00    3.5     -101.0
     Declared duplicate reaction...
715. c3h6+oh=c3h5-t+h2o                            4.67E+04    2.5     1748.0
     Declared duplicate reaction...
716. c3h6+oh=c3h5-t+h2o                            5.72E-07    2.6    -3086.0
     Declared duplicate reaction...
717. c3h6+o=c2h5+hco                               4.69E+07    1.6     -628.0
718. c3h6+o=ch3+ch2cho                             3.90E+07    1.6     -628.0
719. c3h6+o=c2h4+ch2o                              7.02E+07    1.6     -628.0
720. c3h6+o=c3h5-a+oh                              1.75E+11    0.7     5884.0
721. c3h6+o=c3h5-s+oh                              1.20E+11    0.7     8960.0
722. c3h6+o=c3h5-t+oh                              6.02E+10    0.7     7633.0
723. c3h6+h=c3h5-a+h2                              1.73E+05    2.5     2492.0
724. c3h6+h=c3h5-s+h2                              8.04E+05    2.5    12280.0
725. c3h6+h=c3h5-t+h2                              4.05E+05    2.5     9794.0
726. c3h6+ch3=c3h5-a+ch4                           2.21E+00    3.5     5675.0
727. c3h6+ch3=c3h5-s+ch4                           1.35E+00    3.5    12850.0
728. c3h6+ch3=c3h5-t+ch4                           8.40E-01    3.5    11660.0
729. c3h6+c3h6=c3h5-a+nc3h7                        1.32E+13    0.0    48400.0
730. c3h6+c2h5=c3h5-a+c2h6                         1.00E+11    0.0     9800.0
731. c3h6+c2h3=c4h6+ch3                            7.20E+11    0.0     5008.0
732. c3h6+hco=c3h5-a+ch2o                          1.08E+07    1.9    17010.0
733. c3h5-s+ch2o=c3h6+hco                          5.42E+03    2.8     5862.0
734. c3h6+c2h3=c3h5-a+c2h4                         1.00E+12    0.0     8000.0
735. c3h6+c2h3=c3h5-t+c2h4                         2.21E+00    3.5     4682.0
736. c3h6+c2h3=c3h5-s+c2h4                         2.21E+00    3.5     4682.0
737. c3h61oh2oo=ch3cho+ch2o+oh                     1.00E+12    0.0       30.0
738. c3h62oh1oo=ch3cho+ch2o+oh                     1.00E+12    0.0       30.0
739. c3h61oh+o2=c2h5cho+ho2                        1.50E+12    0.0     5000.0
740. c3h62oh+o2=ch3coch3+ho2                       1.50E+12    0.0     5000.0
741. c3h5-a+ho2=c3h5-aooh                          2.79E+37   -7.9     6497.9
742. c3h5-a+ho2=c2h3cho+h2o                        3.10E+05    1.6     2677.6
743. c3h5-a+ho2=c3h5o+oh                           7.77E+17   -1.5     2379.2
744. c3h5-aooh=c2h3cho+h2o                         1.50E+40   -8.8    53179.2
745. c3h5-aooh=c3h5o+oh                            3.36E+46   -9.8    52468.5
746. c3h5o=c2h4+hco                                1.07E+24   -4.2    18985.0
747. c3h5-a+h<=>c3h4-a+h2                          1.23E+03    3.0     2582.0
748. c3h5-a+oh=c3h4-a+h2o                          6.00E+12    0.0        0.0
749. c2h3+ch3=c3h5-a+h                             1.50E+24   -2.8    18618.0
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750. c3h5-a+ch3=c3h4-a+ch4                        1.00E+11    0.0        0.0
751. c3h5-a+ch2=c4h6+h                            3.00E+13    0.0        0.0
752. c3h5-a+c2h5=c3h4-a+c2h6                      4.00E+11    0.0        0.0
753. c3h5-a+c2h3=c3h4-a+c2h4                      1.00E+12    0.0        0.0
754. c3h5-a+o=c2h3cho+h                           6.03E+13    0.0        0.0
755. c3h5-a+hco=c3h6+co                           6.03E+13    0.0        0.0
756. c3h5-a+c2h3=c3h6+c2h2                        4.82E+12    0.0        0.0
757. c3h5-a+c2h5=c2h4+c3h6                        4.00E+11    0.0        0.0
        Reverse Arrhenius coefficients:           6.94E+16   -1.3    52800.0
758. c3h5-aoo+ho2=c3h5-aooh+o2                    3.37E+12    0.0        0.0
759. c3h5-s+o2=>ch3cho+hco                        4.34E+12    0.0        0.0
760. c3h5-s+ho2=>ch2co+ch3+oh                     4.50E+12    0.0        0.0
761. c3h5-s+h=c3h4-p+h2                           3.33E+12    0.0        0.0
762. c3h5-s+o=>ch2co+ch3                          1.81E+14    0.0        0.0
763. c3h5-s+ch3=c3h4-p+ch4                        1.00E+11    0.0        0.0
764. c3h5-s+c2h5=c3h4-p+c2h6                      1.00E+11    0.0        0.0
765. c3h5-s+c2h3=c3h4-p+c2h4                      1.00E+11    0.0        0.0
766. c3h5-t+o2=>ch3co+ch2o                        1.00E+11    0.0        0.0
767. c3h5-t+ho2=>ch2co+ch3+oh                     2.00E+13    0.0        0.0
768. c3h5-t+o=>ch2co+ch3                          1.81E+14    0.0        0.0
769. c3h5-t+hco=>co+c3h6                          9.00E+13    0.0        0.0
770. c3h5-t+oh=>ch2co+ch3+h                       5.00E+12    0.0        0.0
771. c3h5-t+h=c3h4-p+h2                           1.00E+13    0.0        0.0
772. c3h5-t+ch3=c3h4-a+ch4                        1.00E+11    0.0        0.0
773. c3h5-t+ch3=c3h4-p+ch4                        1.00E+11    0.0        0.0
774. c3h5-t+c2h5=c3h4-a+c2h6                      1.00E+11    0.0        0.0
775. c3h5-t+c2h3=c3h4-a+c2h4                      1.00E+11    0.0        0.0
776. c3h5-t+o2=c3h4-a+ho2                         1.89E+30   -5.6    15540.0
777. c3h3+h(+m)=>c3h4-a(+m)                       2.00E+13    0.0        0.0
     Low pressure limit:  0.22900E+57 -0.12550E+02  0.79340E+04
     TROE centering:      0.23400E+00  0.33000E+03  0.48080E+04  0.72620E+04
778. c3h4-a+o2=c3h3+ho2                           4.00E+13    0.0    39160.0
        Reverse Arrhenius coefficients:           3.17E+11   -0.1      311.0
779. c3h4-a+o2=>ch2co+ch2o                        1.00E+07    1.5    25000.0
780. c3h4-a+ho2=>c3h4o2h                          3.00E+11    0.0     8000.0
781. c3h4-a+ho2=c3h3+h2o2                         1.80E+13    0.0    19000.0
782. c3h4-a+ho2=>ch2co+ch2+oh                     4.00E+12    0.0    19000.0
783. c3h4-a+ho2=>c2h3cho+oh                       5.00E+11    0.0    19000.0
784. c3h4-a+ho2=>c2h2+ch2o+oh                     5.00E+11    0.0    19000.0
785. c3h4-a+oh=ch2co+ch3                          4.07E+25   -3.4    18370.0
     Declared duplicate reaction...
786. c3h4-a+oh=ch2co+ch3                          1.51E+04    2.2     1759.0
     Declared duplicate reaction...
787. c3h4-a+oh=c3h3+h2o                           5.05E+05    2.4     2879.0
     Declared duplicate reaction...
788. c3h4-a+oh=c3h3+h2o                           5.95E+04    2.5      661.1
     Declared duplicate reaction...
789. c3h4-a+o=c2h2+ch2o                           2.50E-03    4.6    -4243.0
790. c3h4-a+o=c2h4+co                             7.80E+12    0.0     1600.0
791. c3h4-a+h=c3h3+h2                             6.62E+03    3.1     5522.0
792. c3h4-a+ch3=c3h3+ch4                          6.61E-04    5.0     8300.0
793. c3h4-a+c3h5-a=c3h3+c3h6                      2.00E+11    0.0     7700.0
        Reverse Arrhenius coefficients:           2.64E+19   -2.7    42140.0
794. c3h4-a+ho2=>c2h4+co+oh                       1.00E+12    0.0    14000.0
795. c3h4-a+c2h=c3h3+c2h2                         1.00E+13    0.0        0.0
796. c3h4-a+c3h4-a=c2h4+c4h4                      1.09E+15    0.0    48090.0
797. c3h4o2h=c2h3cho+oh                           3.10E+37  -10.1    28588.0
798. c3h4o2h=c3h4o+oh                             1.49E+41   -9.5    22589.0
799. c3h4o=>c2h3cho                               2.45E+14    0.0    58485.0
800. c3h4o+o2=>c3h3o+ho2                          4.00E+13    0.0    61500.0
801. c3h4o+ho2=>ch2co+ch2o+oh                     1.00E+12    0.0    14340.0
802. c3h4o+ho2=>c3h3o+h2o2                        4.00E+12    0.0    17000.0
803. c3h4o+oh=>c3h3o+h2o                          4.79E+13    0.0     5955.0
804. c3h4o+h=>c3h3o+h2                            2.00E+13    0.0     8300.0
805. c3h3o=>c2h3co                                8.51E+14    0.0    14000.0
806. c3h3o+o2=>hcco+hco+oh                        5.01E+12    0.0    19192.0
807. c3h3+h(+m)=>c3h4-p(+m)                       3.00E+13    0.0        0.0
     Low pressure limit:  0.16000E+58 -0.12590E+02  0.83760E+04
     TROE centering:      0.24500E+00  0.33000E+03  0.37060E+04  0.67770E+04
808. c3h4-p+o2=c3h3+ho2                           2.00E+13    0.0    41600.0
        Reverse Arrhenius coefficients:           6.37E+11   -0.2     1021.0
809. c3h4-p+o2=>ch3co+hco                         1.00E+07    1.5    25000.0
810. c3h4-p+o2=>hcco+oh+ch2                       1.00E+07    1.5    30100.0
811. c3h4-p+ho2=>c2h4+co+oh                       3.00E+12    0.0    19000.0
812. c3h4-p+ho2=ch3co+ch2o                        3.00E+12    0.0    16000.0
813. c3h4-p+ho2=ch3cho+hco                        4.50E+12    0.0    16000.0
814. c3h4-p+ho2=c3h3+h2o2                         5.00E+11    0.0    19000.0
815. c3h4-p+oh=c3h3+h2o                           3.87E+05    2.3     2173.0
     Declared duplicate reaction...
816. c3h4-p+oh=c3h3+h2o                           4.93E+04    2.5      -62.0
     Declared duplicate reaction...
817. c3h4-p+oh=ch2co+ch3                          4.07E+26   -4.3    12560.0
     Declared duplicate reaction...
818. c3h4-p+oh=ch2co+ch3                          4.68E+06    1.6     3216.0
     Declared duplicate reaction...
819. c3h4-p+o=ch2co+ch2                           6.40E+12    0.0     2100.0
820. c3h4-p+o=c2h3+hco                            3.20E+12    0.0     2100.0
821. c3h4-p+o=hcco+ch3                            9.18E+12    0.0     2100.0
822. c3h4-p+o=ch2o+c2h2                           3.20E+11    0.0     2100.0
823. c3h4-p+h=c3h3+h2                             3.57E+04    2.8     4821.0
824. c3h4-p+ch3=c3h3+ch4                          2.19E-04    5.0     8300.0
825. c3h4-p+c2h3=c3h3+c2h4                        1.00E+12    0.0     7700.0
826. c3h4-p+c2h=c3h3+c2h2                         1.00E+13    0.0        0.0
827. c3h4-p+o=c3h3+oh                             3.44E+04    2.2     4830.0
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828. c2h2+ch2=c3h4-p                          4.20E+12    0.0     6620.0
829. c3h4-p+oh=ch3cohch                       5.69E+39   -8.2    14510.0
     Declared duplicate reaction...
830. c3h4-p+oh=ch3cohch                       6.09E+24   -4.3     3734.0
     Declared duplicate reaction...
831. c3h4-p+oh=ch3cchoh                       9.76E+43   -9.5    15070.0
     Declared duplicate reaction...
832. c3h4-p+oh=ch3cchoh                       1.03E+27   -4.8     3902.0
     Declared duplicate reaction...
833. ch3cohch=ch3coch2                        4.07E+51  -11.7    50020.0
     Declared duplicate reaction...
834. ch3cohch=ch3coch2                        4.93E+26   -4.9    32250.0
     Declared duplicate reaction...
835. ch3cohch=ch3+ch2co                       1.17E+41   -8.6    44710.0
     Declared duplicate reaction...
836. ch3cohch=ch3+ch2co                       5.81E+15   -1.7    29940.0
     Declared duplicate reaction...
837. c3h4-a+oh=ch2cch2oh                      3.26E+39   -8.1    13360.0
     Declared duplicate reaction...
838. c3h4-a+oh=ch2cch2oh                      5.00E+22   -3.5     2109.0
     Declared duplicate reaction...
839. c3h4-a+oh=ch2cohch2                      1.14E+27   -4.0    11210.0
     Declared duplicate reaction...
840. c3h4-a+oh=ch2cohch2                      9.63E+19   -2.6     1696.0
     Declared duplicate reaction...
841. ch2cohch2=ch2co+ch3                      4.36E+31   -5.5    60870.0
     Declared duplicate reaction...
842. ch2cohch2=ch2co+ch3                      2.66E+10    0.1    46020.0
     Declared duplicate reaction...
843. ch2cohch2+ho2=ch2o+ch2cho+oh             1.00E+12    0.0        0.0
844. c3h3+o2=ch2co+hco                        1.70E+05    1.7     1500.0
845. c3h3+ho2=oh+co+c2h3                      8.00E+11    0.0        0.0
846. c3h3+oh=c3h2+h2o                         2.00E+13    0.0        0.0
847. c3h3+oh=hco+c2h3                         1.33E+13    0.0        0.0
848. c3h3+o=>c2h2+hco                         1.38E+14    0.0        0.0
849. c3h3+o=c2h3+co                           4.62E+13    0.0        0.0
850. c3h3+o=c2h+ch2o                          4.62E+13    0.0        0.0
851. c3h3+o=>c2h2+co+h                        4.62E+13    0.0        0.0
852. c3h3+h=c3h2+h2                           5.00E+13    0.0     3000.0
853. c3h3+ch=ic4h3+h                          7.00E+13    0.0        0.0
854. c3h3+ch=nc4h3+h                          7.00E+13    0.0        0.0
855. c3h3+ch2=c4h4+h                          4.00E+13    0.0        0.0
856. c3h3+ch3=c4h6                            5.00E+12    0.0        0.0
857. c3h3+ch3(+M)=c4h612(+M)                  1.50E+12    0.0        0.0
     Low pressure limit:  0.26000E+58 -0.11940E+02  0.97700E+04
     TROE centering:      0.17500E+00  0.13406E+04  0.60000E+05  0.97698E+04
        h2               Enhanced by    2.000E+00
        h2o              Enhanced by    6.000E+00
        ch4              Enhanced by    2.000E+00
        co               Enhanced by    1.500E+00
        co2              Enhanced by    2.000E+00
        c2h6             Enhanced by    3.000E+00
        ar               Enhanced by    7.000E-01
858. c3h3+hco=c3h4-a+co                       2.50E+13    0.0        0.0
859. c3h3+hco=c3h4-p+co                       2.50E+13    0.0        0.0
860. c3h3+hcco=c4h4+co                        2.50E+13    0.0        0.0
861. c3h3+ch3=c2h5+c2h                        4.56E+17   -1.1    48730.0
        Reverse Arrhenius coefficients:       1.81E+13    0.0        0.0
862. ch3+c2h=c3h3+h                           2.41E+13    0.0        0.0
863. c2h2+ch=c3h3                             3.00E+13    0.0        0.0
864. ch+c2h2=c3h2+h                           1.00E+14    0.0        0.0
865. c3h2+o2=hcco+h+co                        2.00E+12    0.0     1000.0
866. c3h2+o=c2h2+co                           6.80E+13    0.0        0.0
867. c3h2+oh=c2h2+hco                         5.00E+13    0.0        0.0
868. c3h2+ch=c4h2+h                           5.00E+13    0.0        0.0
869. c3h2+ch2=nc4h3+h                         5.00E+13    0.0        0.0
870. c3h2+ch3=c4h4+h                          5.00E+12    0.0        0.0
871. c3h2+hcco=nc4h3+co                       1.00E+13    0.0        0.0
872. c3h5o+o2=c2h3cho+ho2                     1.00E+12    0.0     6000.0
873. c3h5o=c2h3+ch2o                          3.39E+14    0.0    22658.0
874. c3h5o=c2h3cho+h                          1.10E+13    0.0    18451.0
875. c2h5cho=c2h5co+h                         5.00E+15    0.0    85000.0
876. c2h5cho=ch3chcho+h                       5.00E+15    0.0    94990.0
877. c2h5cho=pc2h4cho+h                       8.00E+15    0.0    98000.0
878. c2h5cho=c2h5+hco                         6.00E+14    0.0    79100.0
879. c2h5cho=ch2cho+ch3                       1.00E+17    0.0    84650.0
880. c2h5cho+o2=c2h5co+ho2                    3.01E+13    0.0    39150.0
881. c2h5cho+o2=ch3chcho+ho2                  3.97E+13    0.0    47690.0
882. c2h5cho+o2=pc2h4cho+ho2                  1.98E+13    0.0    50870.0
883. c2h5cho+h=c2h5co+h2                      1.20E+14    0.0     7000.0
884. c2h5cho+h=ch3chcho+h2                    1.30E+06    2.4     4471.0
885. c2h5cho+h=pc2h4cho+h2                    9.50E+04    2.8     6280.0
886. c2h5cho+o=c2h5co+oh                      5.85E+12    0.0     1808.0
887. c2h5cho+o=ch3chcho+oh                    4.77E+04    2.7     2106.0
888. c2h5cho+o=pc2h4cho+oh                    9.50E+04    2.7     3716.0
889. c2h5cho+oh=c2h5co+h2o                    2.35E+10    0.7    -1113.0
890. c2h5cho+oh=ch3chcho+h2o                  4.68E+07    1.6      -35.0
891. c2h5cho+oh=pc2h4cho+h2o                  5.25E+09    1.0     1590.0
892. c2h5cho+ho2=c2h5co+h2o2                  3.10E+12    0.0    11920.0
893. c2h5cho+ho2=ch3chcho+h2o2                5.60E+12    0.0    17690.0
894. c2h5cho+ho2=pc2h4cho+h2o2                8.50E+12    0.0    20440.0
895. c2h5cho+ch3=c2h5co+ch4                   1.70E+12    0.0     8440.0
896. c2h5cho+ch3=ch3chcho+ch4                 2.70E+04    2.3     7287.0
897. c2h5cho+ch3=pc2h4cho+ch4                 4.50E-02    3.6     7154.0
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898. c2h5cho+hco=c2h5co+ch2o                      1.70E+12    0.0     8440.0
899. c2h5cho+ch3o=c2h5co+ch3oh                    1.15E+11    0.0     1280.0
900. c2h5cho+ch3o2=c2h5co+ch3o2h                  1.00E+12    0.0     9500.0
901. c2h5cho+c2h5=c2h5co+c2h6                     1.70E+12    0.0     8440.0
902. c2h5cho+c2h3=c2h5co+c2h4                     1.70E+12    0.0     8440.0
903. c2h5co+m=c2h5+co+m                           8.64E+15    0.0    14400.0
904. pc2h4cho=c2h4+hco                            8.25E+12   -0.2    21900.0
905. pc2h4cho+o2=o2pc2h4cho                       9.00E+18   -2.5        0.0
906. o2pc2h4cho+ho2=c3ket13+o2                    2.29E+11    0.0    -1790.0
907. o2pc2h4cho+h2o2=c3ket13+ho2                  2.41E+12    0.0     9936.0
908. o2pc2h4cho+ho2=>opc2h4cho+oh+o2              1.40E+16   -1.6     1860.0
909. o2pc2h4cho+ch3o2=>opc2h4cho+ch3o+o2          1.40E+16   -1.6     1860.0
910. opc2h4cho=ch2o+ch2cho                        2.00E+13    0.0    20000.0
911. opc2h4cho+o2=choch2cho+ho2                   8.43E+09    0.0      220.0
912. c2h3+hco=c2h3cho                             1.80E+13    0.0        0.0
913. c2h3cho=c2h4+co                              3.90E+14    0.0    69000.0
914. c2h3cho+o=oh+c2h3co                          5.01E+12    0.0     1790.0
915. c2h3cho+h=c2h3co+h2                          1.20E+14    0.0     7000.0
916. c2h3cho+oh=c2h3co+h2o                        2.35E+10    0.7    -1113.0
917. c2h3cho+ho2=c2h3co+h2o2                      3.10E+12    0.0    11920.0
918. c2h3cho+ch3=c2h3co+ch4                       1.70E+12    0.0     8440.0
919. c2h3cho+c2h5=c2h3co+c2h6                     5.01E+10    0.0     6280.0
920. c2h3cho+c2h3=c2h4+c2h3co                     1.74E+12    0.0     8440.0
921. c2h3co+m=>c2h3+co+m                          8.60E+15    0.0    23000.0
        h2o              Enhanced by    1.625E+01
        co               Enhanced by    1.875E+00
        co2              Enhanced by    3.750E+00
        ch4              Enhanced by    1.625E+01
        c2h6             Enhanced by    1.625E+01
922. c2h3+ch3co=ch3+c2h3co                        1.81E+13    0.0        0.0
923. ch3coch3(+M)=ch3co+ch3(+M)                   7.02E+21   -1.6    84680.0
     Low pressure limit:  0.70130E+90 -0.20380E+02  0.10722E+06
     TROE centering:      0.86000E+00  0.10000E+11  0.41600E+03  0.32900E+10
924. ch3coch3+o2=ch3coch2+ho2                     6.03E+13    0.0    48500.0
925. ch3coch3+o2=>ch3co+ch3o2                     3.00E+13    0.5    42200.0
926. ch3coch3+o=ch3coch2+oh                       5.13E+11    0.2     4890.0
927. ch3coch3+o=ch3co+ch3o                        5.01E+12    0.0     1800.0
928. ch3coch3+h=ch3coch2+h2                       9.80E+05    2.4     5160.0
929. ch3coch3+oh=ch3coch2+h2o                     3.44E+05    2.4      815.0
930. ch3coch3+oh=ch3co+ch3oh                      1.50E+12    0.0        0.0
931. ch3coch3+ho2=ch3coch2+h2o2                   1.70E+13    0.0    20460.0
932. ch3coch3+ch3=ch3coch2+ch4                    3.96E+11    0.0     9784.0
933. ch3coch3+ch3=ch3co+c2h6                      7.94E+10    0.0     6000.0
934. ch3cho+ch3=h+ch3coch3                        1.66E+10    0.0    12420.0
935. ch3coch2=ch2co+ch3                           1.74E+46   -9.5    58370.0
     Declared duplicate reaction...
936. ch3coch2=ch2co+ch3                           3.96E+24   -3.6    43740.0
     Declared duplicate reaction...
937. ch3coch2+o2=acetoo2                          1.20E+11    0.0    -1100.0
938. acetoo2+ho2=c3ket21+o2                       2.29E+11    0.0    -1790.0
939. acetoo2+h2o2=c3ket21+ho2                     2.41E+12    0.0     9936.0
940. acetoo2+ho2=>acetoo+oh+o2                    1.40E+16   -1.6     1860.0
941. acetoo2+ch3o2=>acetoo+ch3o+o2                1.40E+16   -1.6     1860.0
942. acetoo=ch2o+ch3co                            3.73E+20   -2.2    17260.0
943. acetoo+o2=ch3cocho+ho2                       8.43E+09    0.0      220.0
944. ch3coco+o2=co2+co2+ch3                       3.00E+10    0.0     2870.0
945. ch3coco+ho2=oh+co2+ch3co                     2.00E+13    0.0        0.0
946. ch3co+hco=ch3cocho                           1.00E+13    0.0        0.0
947. ch3cocho+h=ch3coco+h2                        4.00E+13    0.0     4200.0
948. ch3cocho+oh=ch3coco+h2o                      2.69E+10    0.8     -340.0
949. ch3cocho+o=ch3coco+oh                        5.00E+12    0.0     1790.0
950. ch3cocho+ch3=ch3coco+ch4                     1.70E+12    0.0     8440.0
951. ch3cocho+ho2=ch3coco+h2o2                    2.80E+12    0.0    13600.0
952. ch3co+co=ch3coco                             1.50E+11    0.0     3000.0
953. ch2cco+h=c2h3co                              8.00E+11    0.0     2000.0
954. ch2cco+oh=>hccco+h2o                         2.20E+06    2.0     2780.0
955. ch2cco+h=>hccco+h2                           8.20E+05    2.5    12280.0
956. hccco+o2=>hco+co+co                          4.60E+16   -1.4     1010.0
957. choch2cho+o2=choch2co+ho2                    4.00E+13    0.5    42200.0
958. choch2cho+oh=choch2co+h2o                    5.40E+10    0.8     -340.0
959. choch2cho+h=choch2co+h2                      8.00E+13    0.0     4200.0
960. choch2cho+o=choch2co+oh                      1.00E+13    0.0     1790.0
961. choch2cho+ho2=choch2co+h2o2                  5.60E+12    0.0    13600.0
962. choch2cho+ch3o=choch2co+ch3oh                2.30E+11    0.0     1280.0
963. choch2cho+ch3o2=choch2co+ch3o2h              2.00E+12    0.0     9500.0
964. choch2co=>ch2cho+co                          1.83E+15   -0.7    12910.0
965. ch2chchco+h=cjhchchco+h2                     4.21E-03    4.6     2583.0
966. ch2chchco+oh=cjhchchco+h2o                   1.01E+13    0.0     5955.0
967. ch2chchco+ch3=cjhchchco+ch4                  3.31E+00    3.7     9500.0
968. ch2chchco+o=cjhchchco+oh                     1.20E+11    0.7     8959.0
969. ch2chchco+ho2=cjhchchco+h2o2                 8.50E+13    0.0    30430.0
970. ch2chchco+h=co+c3h5-a                        1.10E+13    0.0     3400.0
971. ch2chchco+h=c2h4+hcco                        1.10E+13    0.0     3400.0
972. c2h2+hcco=cjhchchco                          1.61E+40   -8.6    20331.0
973. c2h3+hcco=ch2chchco                          8.00E+12    0.0        0.0
974. ch3+c2h3co=c2h5chco                          1.00E+13    0.0        0.0
975. c4ald3oxo+o2=mecomeco+ho2                    2.00E+13    0.5    42200.0
976. c4ald3oxo+oh=mecomeco+h2o                    2.69E+10    0.8     -340.0
977. c4ald3oxo+h=mecomeco+h2                      4.00E+13    0.0     4200.0
978. c4ald3oxo+o=mecomeco+oh                      5.00E+12    0.0     1790.0
979. c4ald3oxo+ho2=mecomeco+h2o2                  2.80E+12    0.0    13600.0
980. c4ald3oxo+ch3o=mecomeco+ch3oh                1.15E+11    0.0     1280.0
981. c4ald3oxo+ch3o2=mecomeco+ch3o2h              1.00E+12    0.0     9500.0
982. mecomeco=>ch3coch2+co                        1.83E+15   -0.7    12910.0
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 983. c4ald2oxo+o2=c2h5coco+ho2                    2.00E+13    0.5    42200.0
 984. c4ald2oxo+oh=c2h5coco+h2o                    2.69E+10    0.8     -340.0
 985. c4ald2oxo+h=c2h5coco+h2                      4.00E+13    0.0     4200.0
 986. c4ald2oxo+o=c2h5coco+oh                      5.00E+12    0.0     1790.0
 987. c4ald2oxo+ho2=c2h5coco+h2o2                  2.80E+12    0.0    13600.0
 988. c4ald2oxo+ch3o=c2h5coco+ch3oh                1.15E+11    0.0     1280.0
 989. c4ald2oxo+ch3o2=c2h5coco+ch3o2h              1.00E+12    0.0     9500.0
 990. c2h5coco=>c2h5co+co                          1.83E+15   -0.7    12910.0
 991. nc4h10=pc4h9+h                               1.58E+16    0.0    97970.0
 992. nc4h10=sc4h9+h                               1.00E+16    0.0    94990.0
 993. nc4h10+o2=pc4h9+ho2                          3.97E+13    0.0    50870.0
 994. nc4h10+o2=sc4h9+ho2                          7.94E+13    0.0    47690.0
 995. nc4h10(+M)=c2h5+c2h5(+M)                     2.72E+15    0.0    75610.0
      Low pressure limit:  0.47200E+19  0.00000E+00  0.49576E+05
      TROE centering:      0.72000E+00  0.15000E+04  0.10000E-09  0.10000E+11
 996. nc4h10(+M)=nc3h7+ch3(+M)                     4.28E+14    0.0    69900.0
      Low pressure limit:  0.53400E+18  0.00000E+00  0.42959E+05
      TROE centering:      0.72000E+00  0.15000E+04  0.10000E-09  0.10000E+11
 997. nc4h10+h=pc4h9+h2                            1.88E+05    2.8     6280.0
 998. nc4h10+h=sc4h9+h2                            2.60E+06    2.4     4471.0
 999. nc4h10+o=pc4h9+oh                            1.93E+05    2.7     3716.0
1000. nc4h10+o=sc4h9+oh                            9.54E+04    2.7     2106.0
1001. nc4h10+oh=pc4h9+h2o                          2.73E+07    1.8      868.0
1002. nc4h10+oh=sc4h9+h2o                          1.41E+10    0.9      505.0
1003. nc4h10+ho2=pc4h9+h2o2                        1.68E+13    0.0    20440.0
1004. nc4h10+ho2=sc4h9+h2o2                        1.12E+13    0.0    17690.0
1005. nc4h10+ch3=pc4h9+ch4                         6.00E-01    4.0     8200.0
1006. nc4h10+ch3=sc4h9+ch4                         4.00E+11    0.0     9600.0
1007. nc4h10+ch3o=pc4h9+ch3oh                      4.34E+11    0.0     6460.0
1008. nc4h10+ch3o=sc4h9+ch3oh                      2.90E+11    0.0     4570.0
1009. nc4h10+ch2oh=pc4h9+ch3oh                     1.98E+02    3.0    13970.0
1010. nc4h10+ch2oh=sc4h9+ch3oh                     1.21E+02    3.0    11980.0
1011. nc4h10+ch3o2=pc4h9+ch3o2h                    1.39E+00    4.0    18280.0
1012. nc4h10+ch3o2=sc4h9+ch3o2h                    2.04E+01    3.6    14810.0
1013. nc4h10+c2h3=pc4h9+c2h4                       1.02E+12    0.0    18000.0
1014. nc4h10+c2h3=sc4h9+c2h4                       8.00E+11    0.0    16800.0
1015. nc4h10+c2h5=pc4h9+c2h6                       1.02E+11    0.0    13400.0
1016. nc4h10+c2h5=sc4h9+c2h6                       1.00E+11    0.0    10400.0
1017. nc4h10+c3h5-a=pc4h9+c3h6                     2.40E+02    3.3    19840.0
1018. nc4h10+c3h5-a=sc4h9+c3h6                     1.60E+02    3.3    18170.0
1019. nc4h10+c4h713=pc4h9+c4h8-1                   8.00E+01    3.3    19840.0
1020. nc4h10+c4h713=sc4h9+c4h8-1                   5.33E+01    3.3    18170.0
1021. nc4h10+c4h713=pc4h9+c2c4h8                   8.00E+01    3.3    19840.0
1022. nc4h10+c4h713=sc4h9+c2c4h8                   5.33E+01    3.3    18170.0
1023. nc4h10+c4h713=pc4h9+t2c4h8                   8.00E+01    3.3    19840.0
1024. nc4h10+c4h713=sc4h9+t2c4h8                   5.33E+01    3.3    18170.0
1025. nc4h10+pc4h9o=pc4h9+pc4h9oh                  3.16E+11    0.0     7000.0
1026. nc4h10+pc4h9o=sc4h9+pc4h9oh                  2.19E+11    0.0     5000.0
1027. nc4h10+sc4h9o=pc4h9+sc4h9oh                  3.16E+11    0.0     7000.0
1028. nc4h10+sc4h9o=sc4h9+sc4h9oh                  2.19E+11    0.0     5000.0
1029. pc4h9=sc4h9                                  3.80E+10    0.7    36600.0
1030. pc4h9=c2h5+c2h4                              3.58E+12    0.5    29480.0
1031. pc4h9=c4h8-1+h                               2.65E+12    0.2    35710.0
1032. pc4h9+o2=c4h8-1+ho2                          5.32E+01    2.8     2086.0
      Declared duplicate reaction...
1033. pc4h9+o2=c4h8-1+ho2                          1.42E+37   -7.3    20864.0
      Declared duplicate reaction...
1034. pc4h9+o2=c4h8-1+ho2                          1.31E-09    5.7     6060.0
      Declared duplicate reaction...
1035. pc4h9+o2=c4h8-1+ho2                          8.06E+00    3.3    12856.0
      Declared duplicate reaction...
1036. pc4h9+ho2=c4h8-1+h2o2                        2.41E+13    0.0        0.0
1037. pc4h9+oh=c4h8-1+h2o                          2.40E+13    0.0        0.0
1038. pc4h9+h=c4h8-1+h2                            1.25E+13    0.0        0.0
1039. pc4h9+ch3=c4h8-1+ch4                         2.00E+12    0.0        0.0
1040. pc4h9+c2h5=c4h8-1+c2h6                       1.60E+12    0.0        0.0
1041. pc4h9+c3h5-a=c4h8-1+c3h6                     1.00E+12    0.0        0.0
1042. pc4h9+c4h713=c4h8-1+c4h8-1                   1.00E+12    0.0        0.0
1043. sc4h9+o=c2h5coch3+h                          4.82E+13    0.0        0.0
1044. sc4h9+o=ch3cho+c2h5                          4.82E+13    0.0        0.0
1045. pc4h9+o=ch2o+nc3h7                           4.82E+13    0.0        0.0
1046. pc4h9+o=nc3h7cho+h                           4.82E+13    0.0        0.0
1047. sc4h9=c3h6+ch3                               4.79E+10    1.0    30360.0
1048. sc4h9=c4h8-1+h                               2.99E+11    0.6    36820.0
1049. sc4h9=t2c4h8+h                               2.85E+11    0.3    35520.0
1050. sc4h9=c2c4h8+h                               2.85E+11    0.3    35520.0
1051. sc4h9+o2=c4h8-1+ho2                          4.35E+07    1.2     2523.0
      Declared duplicate reaction...
1052. sc4h9+o2=c4h8-1+ho2                          2.23E+43   -9.6    18181.0
      Declared duplicate reaction...
1053. sc4h9+o2=c4h8-1+ho2                          8.01E-06    4.6     4928.0
      Declared duplicate reaction...
1054. sc4h9+o2=c4h8-1+ho2                          2.65E+01    3.2    10591.0
      Declared duplicate reaction...
1055. sc4h9+o2=t2c4h8+ho2                          3.55E+01    2.8     2086.0
      Declared duplicate reaction...
1056. sc4h9+o2=t2c4h8+ho2                          9.47E+36   -7.3    20864.0
      Declared duplicate reaction...
1057. sc4h9+o2=t2c4h8+ho2                          8.73E-10    5.7     6060.0
      Declared duplicate reaction...
1058. sc4h9+o2=t2c4h8+ho2                          5.37E+00    3.3    12856.0
      Declared duplicate reaction...
1059. sc4h9+o2=c2c4h8+ho2                          1.77E+01    2.8     2086.0
      Declared duplicate reaction...
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1060. sc4h9+o2=c2c4h8+ho2                          4.73E+36   -7.3    20864.0
      Declared duplicate reaction...
1061. sc4h9+o2=c2c4h8+ho2                          4.37E-10    5.7     6060.0
      Declared duplicate reaction...
1062. sc4h9+o2=c2c4h8+ho2                          2.69E+00    3.3    12856.0
      Declared duplicate reaction...
1063. sc4h9+ho2=c4h8-1+h2o2                        2.40E+13    0.0        0.0
1064. sc4h9+ho2=t2c4h8+h2o2                        2.40E+13    0.0        0.0
1065. sc4h9+ho2=c2c4h8+h2o2                        2.40E+13    0.0        0.0
1066. sc4h9+oh=c4h8-1+h2o                          2.40E+13    0.0        0.0
1067. sc4h9+oh=t2c4h8+h2o                          2.40E+13    0.0        0.0
1068. sc4h9+oh=c2c4h8+h2o                          2.40E+13    0.0        0.0
1069. sc4h9+h=c4h8-1+h2                            5.00E+13    0.0        0.0
1070. sc4h9+h=t2c4h8+h2                            5.00E+13    0.0        0.0
1071. sc4h9+h=c2c4h8+h2                            5.00E+13    0.0        0.0
1072. sc4h9+ch3=c4h8-1+ch4                         1.00E+12    0.0        0.0
1073. sc4h9+ch3=t2c4h8+ch4                         1.00E+12    0.0        0.0
1074. sc4h9+ch3=c2c4h8+ch4                         1.00E+12    0.0        0.0
1075. c2c4h8=t2c4h8                                3.62E+13    0.0    61330.0
1076. c2c4h8=c4h6+h2                               1.00E+13    0.0    65500.0
1077. c2c4h8=c4h713+h                              1.06E+85  -20.0   132787.0
1078. c2c4h8=c3h5-a+ch3                            2.00E+66  -15.6    97300.0
1079. c3h5-s+ch3(+m)=c2c4h8(+m)                    2.50E+13    0.0        0.0
      Low pressure limit:  0.42700E+59 -0.11940E+02  0.97698E+04
      TROE centering:      0.17500E+00  0.13406E+04  0.60000E+05  0.10140E+05
         h2o              Enhanced by    6.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         ch4              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
         h2               Enhanced by    2.000E+00
         c2h2             Enhanced by    3.000E+00
         c2h4             Enhanced by    3.000E+00
         ar               Enhanced by    7.000E-01
1080. c2c4h8+o2=c4h713+ho2                         4.20E+12    0.0    34400.0
1081. c2c4h8+h=c4h713+h2                           1.00E+13    0.0     3500.0
1082. c2c4h8+o=c4h713+oh                           3.48E+11    0.7     5900.0
1083. c2c4h8+oh=c4h713+h2o                         9.00E+06    2.0      -60.0
1084. c2c4h8+ho2=c4h713+h2o2                       1.92E+04    2.6    13900.0
1085. c2c4h8+ch3=c4h713+ch4                        1.00E+11    0.0     8200.0
1086. c2c4h8+o=ch3co+c2h5                          2.17E+05    2.3    -1050.0
1087. c2c4h8+o=ch3chcho+ch3                        1.81E+05    2.3    -1050.0
1088. c2c4h8+o=ch3cho+c2h4                         3.25E+05    2.3    -1050.0
1089. c2c4h8+h=c3h6+ch3                            3.46E+17   -1.1     6461.0
1090. c2c4h8+h=c4h722+h2                           8.20E+05    2.5     9790.0
1091. c2c4h8+o=c4h722+oh                           1.20E+11    0.7     7630.0
1092. c2c4h8+oh=c4h722+h2o                         2.20E+06    2.0     1450.0
1093. c2c4h8+ch3=c4h722+ch4                        1.96E+00    3.5    11700.0
1094. c2c4h8+ho2=c4h8cy2o3+oh                      4.07E+11    0.0    11940.0
1095. t2c4h8=c4h713+h                              1.06E+85  -20.0   132787.0
1096. t2c4h8=c3h5-a+ch3                            2.00E+66  -15.6    97300.0
1097. c3h5-s+ch3(+m)=t2c4h8(+m)                    2.50E+13    0.0        0.0
      Low pressure limit:  0.42700E+59 -0.11940E+02  0.97698E+04
      TROE centering:      0.17500E+00  0.13406E+04  0.60000E+05  0.10140E+05
         h2o              Enhanced by    6.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         ch4              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
         h2               Enhanced by    2.000E+00
         c2h2             Enhanced by    3.000E+00
         c2h4             Enhanced by    3.000E+00
         ar               Enhanced by    7.000E-01
1098. t2c4h8+o2=c4h713+ho2                         4.20E+12    0.0    34400.0
1099. sc4h9+c4h713=t2c4h8+t2c4h8                   4.33E+14   -0.8     -130.0
1100. sc4h9+c4h713=c2c4h8+t2c4h8                   4.33E+14   -0.8     -130.0
1101. sc4h9+c4h713=c2c4h8+c2c4h8                   4.33E+14   -0.8     -130.0
1102. t2c4h8+h=c4h713+h2                           5.00E+12    0.0     3500.0
1103. t2c4h8+o=c4h713+oh                           3.48E+11    0.7     5900.0
1104. t2c4h8+oh=c4h713+h2o                         9.00E+06    2.0      -60.0
1105. t2c4h8+ho2=c4h713+h2o2                       1.92E+04    2.6    13900.0
1106. t2c4h8+ch3=c4h713+ch4                        1.00E+11    0.0     8200.0
1107. t2c4h8+o=ch3co+c2h5                          2.17E+05    2.3    -1050.0
1108. t2c4h8+o=ch3chcho+ch3                        1.81E+05    2.3    -1050.0
1109. t2c4h8+o=ch3cho+c2h4                         3.25E+05    2.3    -1050.0
1110. t2c4h8+h=c3h6+ch3                            3.46E+17   -1.1     6461.0
1111. t2c4h8+h=c4h722+h2                           8.20E+05    2.5     9790.0
1112. t2c4h8+o=c4h722+oh                           1.20E+11    0.7     7630.0
1113. t2c4h8+oh=c4h722+h2o                         2.20E+06    2.0     1450.0
1114. t2c4h8+ch3=c4h722+ch4                        1.96E+00    3.5    11700.0
1115. t2c4h8+ho2=c4h8cy2o3+oh                      4.07E+11    0.0    11940.0
1116. c4h8-1=c4h713+h                              4.08E+18   -1.0    97350.0
1117. c4h8-1=c3h5-a+ch3                            1.00E+16    0.0    72930.0
1118. c4h8-1=c2h3+c2h5                             1.00E+19   -1.0    96770.0
1119. c4h8-1+o2=c4h713+ho2                         1.40E+12    0.0    35000.0
1120. c4h8-1+o2=c4h714+ho2                         2.10E+13    0.0    52300.0
1121. c4h8-1+ho2=c4h713+h2o2                       6.40E+03    2.6    12400.0
1122. c4h8-1+ho2=c4h714+h2o2                       6.00E+11    0.0    17000.0
1123. c4h8-1+ho2=c4h8cy1o2+oh                      4.07E+11    0.0    11940.0
1124. c4h8-1+oh=c4h713+h2o                         3.00E+06    2.0    -1520.0
1125. c4h8-1+oh=c4h714+h2o                         2.67E+06    2.0      450.0
1126. c4h8-1+oh=c4h712+h2o                         1.10E+06    2.0     1450.0
1127. c4h8-1+oh=c4h711+h2o                         2.20E+06    2.0     2780.0
1128. c4h8-1+o=c3h6+ch2o                           2.50E+12    0.0        0.0
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1129. c4h8-1+o=ch3cho+c2h4                          1.25E+13    0.0      850.0
1130. c4h8-1+o=c2h5+ch3+co                          1.62E+13    0.0      850.0
1131. c4h8-1+o=c4h713+oh                            8.80E+10    0.7     3250.0
1132. c4h8-1+o=c4h714+oh                            5.10E+13    0.0     7850.0
1133. c4h8-1+o=c4h712+oh                            6.00E+10    0.7     7630.0
1134. c4h8-1+o=c4h711+oh                            1.20E+11    0.7     8960.0
1135. c4h8-1+h=c4h713+h2                            5.40E+04    2.5    -1900.0
1136. c4h8-1+h=c4h714+h2                            2.85E+07    2.0     7700.0
1137. c4h8-1+h=c4h712+h2                            4.10E+05    2.5     9790.0
1138. c4h8-1+h=c4h711+h2                            8.20E+05    2.5    12280.0
1139. c4h8-1+ch3=c4h714+ch4                         1.00E+11    0.0     7300.0
1140. c4h8-1+ch3=c4h713+ch4                         1.00E+11    0.0     7300.0
1141. c4h8-1+ch3=c4h712+ch4                         9.80E-01    3.5    11700.0
1142. c4h8-1+ch3=c4h711+ch4                         1.38E+00    3.5    12900.0
1143. c4h8-1+hco=c4h713+ch2o                        1.08E+07    1.9    17010.0
1144. c4h8-1+c2h3=c4h713+c2h4                       7.20E+11    0.0     5008.0
1145. c4h8-1+c2h5=c4h713+c2h6                       1.00E+11    0.0     8300.0
1146. c4h8-1+c3h5-a=c4h713+c3h6                     8.00E+10    0.0    12400.0
1147. c4h8-1+c3h5-s=c4h713+c3h6                     8.00E+10    0.0    12400.0
1148. c4h8-1+c3h5-t=c4h713+c3h6                     8.00E+10    0.0    12400.0
1149. c4h8-1+h=c3h6+ch3                             3.20E+22   -2.4    11180.0
1150. c4h8-1+h=c2h4+c2h5                            8.80E+16   -1.1     6461.0
1151. c4h714+o2=c4h6+ho2                            1.02E+12    0.0    22654.0
1152. c4h714+ho2=c4h6+h2o2                          1.80E+12    0.0        0.0
1153. c4h714+ho2=>c3h5-a+ch2o+oh                    1.00E+12    0.0        0.0
1154. c4h714+oh=c4h6+h2o                            4.00E+13    0.0        0.0
1155. c4h714+o=c4h6+oh                              4.00E+13    0.0        0.0
1156. c4h714+c2h3=c4h6+c2h4                         4.00E+12    0.0        0.0
1157. c4h714+c2h5=c4h6+c2h6                         4.00E+12    0.0        0.0
1158. c4h714+c2h5=c4h8-1+c2h4                       5.00E+11    0.0        0.0
1159. c4h714+c3h3=c4h6+c3h4-p                       4.00E+12    0.0        0.0
1160. c4h714+c3h3=c4h6+c3h4-a                       4.00E+12    0.0        0.0
1161. c4h714+c3h5-a=c4h6+c3h6                       6.30E+12    0.0        0.0
1162. c4h714+c4h714=c4h6+c4h8-1                     3.16E+12    0.0        0.0
1163. c4h714+c2h6=c4h8-1+c2h5                       3.00E+13    0.0    12300.0
1164. c4h714+c2h4=c4h8-1+c2h3                       1.00E+11    0.0    15000.0
1165. c4h714+c3h6=c4h8-1+c3h5-a                     1.00E+11    0.0     9800.0
1166. c4h714+c4h8-1=c4h8-1+c4h713                   1.00E+11    0.0     8300.0
1167. c4h714=c4h713                                 3.31E-03    4.4    23806.0
1168. c4h714+h(+M)=c4h8-1(+M)                       3.60E+13    0.0        0.0
      Low pressure limit:  0.30100E+49 -0.93200E+01  0.58336E+04
      TROE centering:      0.49800E+00  0.13140E+04  0.13140E+04  0.50000E+05
         h2               Enhanced by    2.000E+00
         h2o              Enhanced by    6.000E+00
         ch4              Enhanced by    2.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
         ar               Enhanced by    7.000E-01
1169. c4h714+h=ch3+c3h5-a                           2.00E+21   -2.0    11000.0
1170. c4h714+h=c4h6+h2                              1.80E+12    0.0        0.0
1171. c4h714+hco=c4h8-1+co                          6.00E+13    0.0        0.0
1172. c4h714+ch3=c4h6+ch4                           1.10E+13    0.0        0.0
1173. c4h6+c4h714=nc4h5+c4h8-1                      6.32E+02    3.1    20010.0
1174. c4h6+c4h714=ic4h5+c4h8-1                      6.32E+02    3.1    18010.0
1175. c4h713=c4h6+h                                 3.00E+13    0.0    51500.0
1176. c4h713=c4h612+h                               1.40E+13    0.0    60000.0
1177. c4h713+o2=c4h6+ho2                            6.90E+11    0.0    15200.0
1178. c4h713+o2=c4h612+ho2                          1.00E+12    0.0    22730.0
1179. c4h713+ho2=c4h6+h2o2                          1.00E+12    0.0        0.0
1180. c4h713+ho2=>c2h3cho+ch3+oh                    4.50E+12    0.0        0.0
1181. c4h713+oh=c4h6+h2o                            6.00E+12    0.0        0.0
1182. c4h713+oh=c4h612+h2o                          6.00E+12    0.0        0.0
1183. c4h713+o=c4h6+oh                              4.00E+13    0.0        0.0
1184. c4h713+o=c2h3cho+ch3                          6.03E+13    0.0        0.0
1185. c4h713+h=c4h6+h2                              1.80E+13    0.0        0.0
1186. c4h713+h=c4h612+h2                            1.80E+13    0.0        0.0
1187. c4h714+h=c4h713+h                             1.00E+13    0.0        0.0
1188. c4h713+ch3=c4h6+ch4                           1.00E+13    0.0        0.0
1189. c4h713+c2h3=c4h6+c2h4                         1.00E+13    0.0        0.0
1190. c4h713+c2h3=c4h612+c2h4                       1.00E+13    0.0        0.0
1191. c4h713+c2h5=c4h6+c2h6                         4.00E+12    0.0        0.0
1192. c4h713+c2h5=c4h8-1+c2h4                       5.00E+11    0.0        0.0
1193. c4h713+c3h3=c4h6+c3h4-p                       4.00E+12    0.0        0.0
1194. c4h713+c3h3=c4h6+c3h4-a                       4.00E+12    0.0        0.0
1195. c4h713+c3h5-a=c4h6+c3h6                       6.30E+12    0.0        0.0
1196. c4h713+c3h5-a=c4h8-1+c3h4-a                   1.00E+12    0.0        0.0
1197. c4h713+c4h713=c4h6+c4h8-1                     3.00E+12    0.0        0.0
1198. c4h712=c3h4-a+ch3                             2.00E+13    0.0    32500.0
1199. c4h712=butyne+h                               4.00E+12    0.0    38000.0
1200. c4h712=c4h612+h                               3.00E+13    0.0    38000.0
1201. c4h712+o2=>c2h5co+ch2o                        4.60E+16   -1.4     1010.0
1202. c4h722=c3h4-p+ch3                             2.00E+13    0.0    31500.0
1203. c4h722=c4h612+h                               3.00E+13    0.0    40000.0
1204. c4h722=butyn2+h                               4.00E+12    0.0    36500.0
1205. c4h722+o2=>ch3cho+ch3co                       4.60E+16   -1.4     1010.0
1206. c4h711=c2h2+c2h5                              2.00E+13    0.0    33000.0
1207. c4h711+o2=>hco+c2h5cho                        4.60E+16   -1.4     1010.0
1208. c4h711+ch2o=c4h8-1+hco                        5.42E+03    2.8     5862.0
1209. butyne=c3h3+ch3                               3.00E+15    0.0    75800.0
1210. butyne+ho2=nc4h5+h2o2                         5.00E+11    0.0    17000.0
1211. butyne+ho2=ic4h5+h2o2                         5.00E+11    0.0    17000.0
1212. butyne+oh=nc4h5+h2o                           2.60E+02    3.0      200.0
1213. butyne+oh=ic4h5+h2o                           2.60E+02    3.0      200.0
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1214. butyne+oh=ch2co+c2h5	4.00E-04	4.5	-1000.0
1215. butyne+o=c3h6+co	2.00E+13	0.0	1660.0
1216. butyne+h=c3h4-a+ch3	1.30E+05	2.5	1000.0
1217. butyne+h=c2h5+c2h2	6.50E+04	2.5	1000.0
1218. butyne+h=ic4h5+h2	6.50E+13	0.0	9400.0
1219. butyne+h=nc4h5+h2	6.50E+13	0.0	9400.0
1220. butyne+ch3=ic4h5+ch4	1.00E+14	0.0	19500.0
1221. butyne+ch3=nc4h5+ch4	1.00E+14	0.0	19500.0
1222. butyne=c4h612	2.50E+13	0.0	65000.0
1223. butyn2=c4h6	3.00E+13	0.0	65000.0
1224. butyn2=c4h612	6.90E+13	0.0	64600.0
1225. butyn2+h=c4h612+h	2.00E+13	0.0	4000.0
1226. butyn2+h=c4h5-2+h2	3.40E+05	2.5	2490.0
1227. butyn2+h=c3h4-p+ch3	2.60E+05	2.5	1000.0
1228. butyn2=c4h5-2+h	3.80E+15	0.0	89200.0
1229. butyn2+ch3=c4h5-2+ch4	1.40E+14	0.0	18500.0
1230. c4h5-2=ic4h5	5.00E+12	0.0	50500.0
1231. ic4h5+h=c4h5-2+h	3.10E+26	-3.4	17423.0
1232. c4h5-2+ho2=oh+c2h2+ch3co	8.00E+11	0.0	0.0
1233. c3h3+ch3=c4h612	5.00E+12	0.0	0.0
1234. c4h612=c4h6	2.50E+13	0.0	63000.0
1235. c4h612+h=c3h4-a+ch3	2.00E+13	0.0	2000.0
1236. c4h612+h=c3h4-p+ch3	2.00E+13	0.0	2000.0
1237. c4h612=ic4h5+h	4.20E+15	0.0	92600.0
1238. c4h612+h=c4h6+h	2.00E+13	0.0	4000.0
1239. c4h612+h=ic4h5+h2	1.70E+05	2.5	2490.0
1240. c4h612+ch3=ic4h5+ch4	7.00E+13	0.0	18500.0
1241. c4h612+o=ch2co+c2h4	1.20E+08	1.6	327.0
1242. c4h612+o=ic4h5+oh	1.80E+11	0.7	5880.0
1243. c4h612+oh=ic4h5+h2o	3.10E+06	2.0	-298.0
1244. c2h3+c2h3=c4h6	1.50E+42	-8.8	12483.0
1245. c2h3+c2h4=c4h6+h	5.00E+11	0.0	7310.0
1246. c4h6+h=nc4h5+h2	1.33E+06	2.5	12240.0
1247. c4h6+h=ic4h5+h2	6.65E+05	2.5	9240.0
1248. c4h6+o=nc4h5+oh	7.50E+06	1.9	3740.0
1249. c4h6+o=ic4h5+oh	7.50E+06	1.9	3740.0
1250. c4h6+o=c3h5-a+hco	4.69E+07	1.6	-628.0
1251. c4h6+o=c3h4-p+ch2o	7.02E+07	1.6	-628.0
1252. c4h6+o=c2h3+ch2cho	3.90E+07	1.6	-628.0
1253. c4h6+oh=nc4h5+h2o	1.53E+06	2.1	1905.5
Declared duplicate reaction...			
1254. c4h6+oh=nc4h5+h2o	3.49E+06	2.0	4292.0
Declared duplicate reaction...			
1255. c4h6+oh=ic4h5+h2o	1.54E+06	2.1	1440.6
Declared duplicate reaction...			
1256. c4h6+oh=ic4h5+h2o	1.62E+06	2.0	2150.0
Declared duplicate reaction...			
1257. c4h6+ch3=nc4h5+ch4	2.00E+14	0.0	22800.0
1258. c4h6+ch3=ic4h5+ch4	1.00E+14	0.0	19800.0
1259. c4h6+c2h3=nc4h5+c2h4	5.00E+13	0.0	22800.0
1260. c4h6+c2h3=ic4h5+c2h4	2.50E+13	0.0	19800.0
1261. ic3h7+c2h2=c4h6+ch3	2.77E+10	0.0	6504.0
1262. c4h6=c2h4+c2h2	7.00E+12	0.0	67100.0
1263. c4h6=c4h4+h2	2.50E+15	0.0	94700.0
1264. c4h6+oh=c3h5-a+ch2o	2.80E+12	0.0	-900.0
1265. c4h6+oh=c2h3cho+ch3	2.80E+12	0.0	-900.0
1266. c4h6+oh=ch3cho+c2h3	2.80E+12	0.0	-900.0
1267. c4h6+h=c3h4-a+ch3	6.00E+12	0.0	7100.0
1268. c4h6+h=c3h4-p+ch3	6.00E+12	0.0	7100.0
1269. c2h3cho+c2h3=c4h6+hco	2.80E+21	-2.4	14720.0
1270. c4h6+ho2=c4h6o25+oh	1.20E+12	0.0	14000.0
1271. c4h6+ho2=c2h3choch2+oh	4.80E+12	0.0	14000.0
1272. c4h6o23=sc3h5cho	1.95E+13	0.0	49400.0
1273. c4h6o23=c2h4+ch2co	5.75E+15	0.0	69300.0
1274. c4h6o23=c2h2+c2h4o1,2	1.00E+16	0.0	75800.0
1275. c4h6o25=c4h4o+h2	5.30E+12	0.0	48500.0
1276. c4h4o=co+c3h4-p	1.78E+15	0.0	77500.0
1277. c4h4o=c2h2+ch2co	5.01E+14	0.0	77500.0
1278. c4h6+oh=hoc4h6	1.84E+12	0.0	-1170.0
Declared duplicate reaction...			
1279. c4h6+oh=hoc4h6	5.70E+12	0.0	-570.0
Declared duplicate reaction...			
1280. hoc4h6=>c2h3choch2+h	5.00E+14	0.0	28000.0
1281. hoc4h6=>c2h3coch3+h	1.50E+14	0.0	28000.0
1282. hoc4h6=>ac3h5cho+h	1.50E+14	0.0	28000.0
1283. c4h6+o=>c2h3choch2	1.70E+13	0.0	80.0
1284. c4h6+o=>c2h3coch3	5.00E+12	0.0	80.0
1285. c4h6+o=>ac3h5cho	5.00E+12	0.0	80.0
1286. c2h3choch2=>c2h4+ch2co	5.00E+16	0.0	73000.0
1287. c4h6+ho2=>c4h6o2h	2.00E+11	0.0	8000.0
1288. c4h6o2h=>c2h3cho+oh+ch2	1.00E+10	0.0	19500.0
1289. c4h6o2h=>c2h3choch2+oh	2.00E+11	0.0	19500.0
1290. c4h6o2h=>c2h3coch3+oh	7.00E+10	0.0	19500.0
1291. c4h6o2h=>ac3h5cho+oh	7.00E+10	0.0	19500.0
1292. c4h5o+o2=>c2h3cho+co+oh	1.00E+12	0.0	25000.0
1293. c4h5o=>ch2co+c2h3	1.00E+15	0.0	65000.0
1294. c4h5o=>co+c3h5-a	5.00E+14	0.0	60000.0
1295. ic4h5+h=c4h4+h2	3.00E+13	0.0	0.0
1296. ic4h5+h=c3h3+ch3	2.00E+13	0.0	2000.0
1297. ic4h5+oh=c4h4+h2o	4.00E+12	0.0	0.0
1298. ic4h5+hco=c4h6+co	5.00E+12	0.0	0.0
1299. ic4h5+ho2=c4h6+o2	6.00E+11	0.0	0.0
1300. ic4h5+h2o2=c4h6+ho2	1.21E+10	0.0	-596.0
1301. ic4h5+o=>ch2co+c2h3	1.00E+13	0.0	2000.0

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1302. ic4h5+ch2o=c4h6+hco                          4.00E+12    0.0     8840.0
1303. nc4h5+o=>c3h5-a+co                           1.00E+13    0.0     2000.0
1304. nc4h5+ch2o=c4h6+hco                          4.00E+12    0.0     8840.0
1305. nc4h5+h=c4h4+h2                              1.50E+13    0.0        0.0
1306. nc4h5+oh=c4h4+h2o                            2.00E+12    0.0        0.0
1307. nc4h5+hco=c4h6+co                            5.00E+12    0.0        0.0
1308. nc4h5+h2o2=c4h6+ho2                          1.21E+10    0.0     -596.0
1309. nc4h5+ho2=c4h6+o2                            6.00E+11    0.0        0.0
1310. nc4h5+o2=c4h4+ho2                            3.25E+19   -2.3     7932.0
1311. c2h6+nc4h5=c2h5+c4h6                         6.00E+12    0.0        0.0
1312. c2h+c2h3=c4h4                                1.00E+14    0.0        0.0
1313. c4h4=c2h2+c2h2                               3.40E+13    0.0    77102.0
1314. c4h4=c4h2+h2                                 1.30E+15    0.0    94680.0
1315. c4h4+o2=nc4h3+ho2                            1.00E+13    0.0    63200.0
1316. c4h4+o2=ic4h3+ho2                            1.00E+13    0.0    44640.0
1317. c4h4+ho2=nc4h3+h2o2                          2.00E+11    0.0    12600.0
1318. c4h4+ho2=ic4h3+h2o2                          1.00E+11    0.0     9920.0
1319. c4h4+h=nc4h3+h2                              6.65E+05    2.5    12240.0
1320. c4h4+h=ic4h3+h2                              3.33E+05    2.5     9240.0
1321. c4h4+oh=nc4h3+h2o                            3.10E+07    2.0     3430.0
1322. c4h4+oh=ic4h3+h2o                            1.55E+07    2.0      430.0
1323. c4h4+o=c3h3+hco                              6.00E+08    1.4     -860.0
1324. c2h4+c2h=c4h4+h                              1.20E+13    0.0        0.0
1325. c2h2+c2h2=ic4h3+h                            1.13E+14    0.0    56000.0
1326. ic4h3+o2=ch2co+hcco                          1.00E+12    0.0        0.0
1327. ic4h3+oh=c4h2+h2o                            3.00E+13    0.0        0.0
1328. ic4h3+o=h2c4o+h                              2.00E+13    0.0        0.0
1329. ic4h3+h=c4h2+h2                              1.02E+13    0.0        0.0
1330. ic4h3(+M)=c4h2+h(+M)                         1.00E+14    0.0    55000.0
      Low pressure limit:  0.25000E+16  0.00000E+00  0.48000E+05
1331. nc4h3(+M)=c4h2+h(+M)                         1.00E+14    0.0    36000.0
      Low pressure limit:  0.10000E+15  0.00000E+00  0.30000E+05
1332. nc4h3+oh=c4h2+h2o                            3.00E+13    0.0        0.0
1333. nc4h3+h=c4h2+h2                              5.00E+13    0.0        0.0
1334. c2h2+c2h(+M)=nc4h3(+M)                       8.30E+10    0.9     -363.0
      Low pressure limit:  0.12400E+32 -0.47180E+01  0.18710E+04
      TROE centering:      0.10000E+01  0.10000E+03  0.56130E+04  0.13387E+05
         h2               Enhanced by    2.000E+00
         h2o              Enhanced by    6.000E+00
         ch4              Enhanced by    2.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
         c2h2             Enhanced by    2.500E+00
         c2h4             Enhanced by    2.500E+00
1335. c2h2+c2h(+M)=ic4h3(+M)                       8.30E+10    0.9     -363.0
      Low pressure limit:  0.12400E+32 -0.47180E+01  0.18710E+04
      TROE centering:      0.10000E+01  0.10000E+03  0.56130E+04  0.13387E+05
         h2               Enhanced by    2.000E+00
         h2o              Enhanced by    6.000E+00
         ch4              Enhanced by    2.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
         c2h2             Enhanced by    2.500E+00
         c2h4             Enhanced by    2.500E+00
1336. h2c4o+oh=ch2co+hcco                          1.00E+07    2.0     2000.0
1337. h2c4o+h=c2h2+hcco                            5.00E+13    0.0     3000.0
1338. c2h2+c2h=c4h2+h                              1.94E+13    0.2      -70.0
1339. c4h2+M=c4h+h+M                               3.50E+17    0.0    80065.0
1340. c4h2+oh=h2c4o+h                              6.66E+12    0.0     -410.0
1341. c4h2+o=c3h2+co                               1.20E+12    0.0        0.0
1342. pc4h9oh(+M)=h2o+c4h8-1(+M)                   3.52E+13    0.0    67230.0
      Low pressure limit:  0.16900E+76 -0.17040E+02  0.64750E+05
      TROE centering:      0.80000E-01  0.10000E+01  0.99240E+10  0.99240E+10
1343. h+pc4h8oh-1=pc4h9oh                          4.00E+13    0.0        0.0
1344. h+pc4h8oh-2=pc4h9oh                          4.00E+13    0.0        0.0
1345. h+pc4h8oh-3=pc4h9oh                          4.00E+13    0.0        0.0
1346. h+pc4h8oh-4=pc4h9oh                          4.00E+13    0.0        0.0
1347. pc4h9oh(+M)=pc4h9o+h(+M)                     6.04E+14    0.1   103800.0
      Low pressure limit:  0.24080E+40 -0.70300E+01  0.95960E+05
      TROE centering:      0.38650E+00  0.56491E+03  0.44380E+10  0.67100E+10
1348. pc4h9oh(+m)<=>ch3+nc3h6oh-3(+m)              3.79E+24   -2.2    88070.0
      Low pressure limit:  0.17820E+61 -0.12280E+02  0.83980E+05
      TROE centering:      0.23520E+00  0.72400E+03  0.50000E+10  0.50000E+10
1349. pc4h9oh(+m)<=>c2h5+pc2h4oh(+m)               5.53E+24   -2.2    89010.0
      Low pressure limit:  0.66320E+60 -0.12130E+02  0.84720E+05
      TROE centering:      0.24380E+00  0.74406E+03  0.50000E+10  0.50000E+10
1350. pc4h9oh(+M)=ch2oh+nc3h7(+M)                  3.02E+23   -1.9    85710.0
      Low pressure limit:  0.14160E+60 -0.11930E+02  0.83980E+05
      TROE centering:      0.76460E+00  0.83440E+10  0.72480E+03  0.82140E+10
1351. pc4h9oh(+M)=pc4h9+oh(+M)                     6.33E+20   -1.4    94930.0
      Low pressure limit:  0.69020E+52 -0.10210E+02  0.89200E+05
      TROE centering:      0.70300E+00  0.98820E+10  0.63468E+03  0.17860E+10
1352. pc4h9oh+o2=ho2+pc4h8oh-4                     3.00E+13    0.0    52340.0
1353. pc4h9oh+o2=ho2+pc4h8oh-3                     2.00E+13    0.0    49800.0
1354. pc4h9oh+o2=ho2+pc4h8oh-2                     2.00E+13    0.0    49800.0
1355. pc4h9oh+o2=ho2+pc4h8oh-1                     2.00E+13    0.0    46800.0
1356. pc4h9oh+o2=ho2+pc4h9o                        1.00E+13    0.0    56340.0
1357. pc4h9oh+h<=>pc4h9o+h2                        5.55E-23   10.6    -4459.0
1358. pc4h9oh+oh<=>pc4h9o+h2o                      2.81E+02    3.0     -580.0
1359. pc4h9oh+o<=>pc4h9o+oh                        1.46E-03    4.7     1727.0
1360. pc4h9oh+ho2<=>pc4h9o+h2o2                    2.50E+12    0.0    24000.0
1361. pc4h9oh+ch3<=>pc4h9o+ch4                     2.04E+00    3.6     7722.0
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1362. pc4h9oh+ch3o<=>pc4h9o+ch3oh	2.30E+10	0.0	2900.0
1363. pc4h9oh+ch3o2<=>pc4h9o+ch3o2h	1.50E+12	0.0	15000.0
1364. pc4h9oh+c2h5<=>pc4h9o+c2h6	1.00E+11	0.0	9200.0
1365. pc4h9oh+o=pc4h8oh-1+oh	1.45E+05	2.4	876.0
1366. pc4h9oh+o=pc4h8oh-2+oh	4.77E+04	2.7	2106.0
1367. pc4h9oh+o=pc4h8oh-3+oh	4.77E+04	2.7	2106.0
1368. pc4h9oh+o=pc4h8oh-4+oh	1.93E+05	2.7	3716.0
1369. pc4h9oh+h=pc4h8oh-1+h2	1.79E+05	2.5	3420.0
1370. pc4h9oh+h=pc4h8oh-2+h2	1.30E+06	2.4	4471.0
1371. pc4h9oh+h=pc4h8oh-3+h2	1.30E+06	2.4	4471.0
1372. pc4h9oh+h=pc4h8oh-4+h2	1.88E+05	2.8	6280.0
1373. pc4h9oh+oh=pc4h8oh-1+h2o	1.31E+05	2.4	-1457.0
1374. pc4h9oh+oh=pc4h8oh-2+h2o	4.68E+07	1.6	-35.0
1375. pc4h9oh+oh=pc4h8oh-3+h2o	4.68E+07	1.6	-35.0
1376. pc4h9oh+oh=pc4h8oh-4+h2o	1.05E+10	1.0	1590.0
1377. pc4h9oh+ho2=pc4h8oh-1+h2o2	8.20E+03	2.5	10750.0
1378. pc4h9oh+ho2=pc4h8oh-2+h2o2	5.60E+12	0.0	17690.0
1379. pc4h9oh+ho2=pc4h8oh-3+h2o2	5.60E+12	0.0	17690.0
1380. pc4h9oh+ho2=pc4h8oh-4+h2o2	1.68E+13	0.0	20440.0
1381. pc4h9oh+ch3=pc4h8oh-1+ch4	1.99E+01	3.4	7635.0
1382. pc4h9oh+ch3=pc4h8oh-2+ch4	2.70E+04	2.3	7287.0
1383. pc4h9oh+ch3=pc4h8oh-3+ch4	2.70E+04	2.3	7287.0
1384. pc4h9oh+ch3=pc4h8oh-4+ch4	9.04E-01	3.6	7154.0
1385. pc4h8oh-1=ch3cho+c2h5	1.52E+12	0.6	29120.0
1386. pc4h8oh-2=c2h5cho+ch3	2.00E+13	0.0	31000.0
1387. pc4h8oh-3=c3h6+ch2oh	4.23E+10	1.0	28170.0
1388. pc4h8oh-4=pc2h4oh+c2h4	2.00E+13	0.0	28700.0
1389. nc3h7cho+h<=>pc4h8oh-1	8.00E+12	0.0	9500.0
1390. pc4h9o<=>pc4h8oh-4	1.32E-01	3.6	2689.0
1391. pc4h9o<=>pc4h8oh-3	5.32E-10	6.2	6710.0
1392. pc4h8oh-4<=>pc4h8oh-1	3.30E-19	8.6	5268.0
1393. c2h3oh<=>c2h3+oh	6.90E+21	-1.6	110700.0
Reverse Arrhenius coefficients:	2.41E+13	0.0	0.0
1394. c2h3oh<=>ch2cho+h	3.64E+15	-0.4	95390.0
Reverse Arrhenius coefficients:	2.40E+13	0.0	12510.0
1395. c2h3oh+o2<=>ch2cho+ho2	5.31E+11	0.2	39830.0
Reverse Arrhenius coefficients:	7.33E+09	0.5	5816.0
1396. c2h3oh+h<=>ch2cho+h2	9.81E+02	3.4	3537.0
Reverse Arrhenius coefficients:	2.58E+00	4.0	24210.0
1397. c2h3oh+o<=>ch2cho+oh	1.88E+06	1.9	-860.0
Reverse Arrhenius coefficients:	2.56E+03	2.6	18410.0
1398. c2h3oh+oh<=>ch2cho+h2o	3.33E+09	1.1	540.5
Reverse Arrhenius coefficients:	9.29E+07	1.7	36110.0
1399. c2h3oh+ch3<=>ch2cho+ch4	2.03E-08	5.9	1052.0
Reverse Arrhenius coefficients:	4.87E-08	6.1	23270.0
1400. c2h3oh+ho2<=>ch2cho+h2o2	3.40E+03	2.5	8922.0
Reverse Arrhenius coefficients:	5.18E+03	2.5	13600.0
1401. c2h3oh+ch3o2<=>ch2cho+ch3o2h	3.40E+03	2.5	8922.0
Reverse Arrhenius coefficients:	1.01E+05	2.0	12000.0
1402. sc4h9oh+h<=>sc4h9o+h2	5.55E-23	10.6	-4459.0
1403. sc4h9oh+oh<=>sc4h9o+h2o	2.81E+02	3.0	-580.0
1404. sc4h9oh+o<=>sc4h9o+oh	1.46E-03	4.7	1727.0
1405. sc4h9oh+ho2<=>sc4h9o+h2o2	2.50E+12	0.0	24000.0
1406. sc4h9oh+ch3<=>sc4h9o+ch4	2.04E+00	3.6	7722.0
1407. sc4h9oh+hco<=>sc4h9o+ch2o	3.40E+04	2.5	13500.0
1408. sc4h9oh+ch3o<=>sc4h9o+ch3oh	2.30E+10	0.0	2900.0
1409. sc4h9oh+ch3o2<=>sc4h9o+ch3o2h	1.50E+12	0.0	15000.0
1410. sc4h9oh+c2h5<=>sc4h9o+c2h6	1.00E+11	0.0	9200.0
1411. sc4h9oh+o=sc4h8oh-1+oh	1.93E+05	2.7	3716.0
1412. sc4h9oh+o=sc4h8oh-3+oh	4.77E+04	2.7	2106.0
1413. sc4h9oh+h=sc4h8oh-1+h2	1.88E+05	2.8	6280.0
1414. sc4h9oh+h=sc4h8oh-3+h2	1.30E+06	2.4	4471.0
1415. sc4h9oh+oh=sc4h8oh-1+h2o	1.05E+10	1.0	1590.0
1416. sc4h9oh+oh=sc4h8oh-3+h2o	4.68E+07	1.6	-35.0
1417. sc4h9oh+ho2=sc4h8oh-1+h2o2	1.68E+13	0.0	20440.0
1418. sc4h9oh+ho2=sc4h8oh-3+h2o2	5.60E+12	0.0	17690.0
1419. sc4h9oh+ch3=sc4h8oh-1+ch4	9.04E-01	3.6	7154.0
1420. sc4h9oh+ch3=sc4h8oh-3+ch4	2.70E+04	2.3	7287.0
1421. nc3h7cho=nc3h7co+h	5.00E+15	0.0	85000.0
1422. nc3h7cho=c3h6cho-2+h	5.00E+15	0.0	94990.0
1423. nc3h7cho=c3h6cho-3+h	5.00E+15	0.0	94990.0
1424. nc3h7cho=c3h6cho-4+h	8.00E+15	0.0	98000.0
1425. nc3h7cho=>nc3h7+hco	6.00E+14	0.0	79100.0
1426. nc3h7cho=pc2h4cho+ch3	1.00E+17	0.0	84650.0
1427. nc3h7cho=c2h5+ch2cho	1.58E+17	0.0	80280.0
1428. nc3h7cho+o2=nc3h7co+ho2	3.00E+13	0.0	39150.0
1429. nc3h7cho+o2=c3h6cho-2+ho2	4.00E+13	0.0	47690.0
1430. nc3h7cho+o2=c3h6cho-3+ho2	4.00E+13	0.0	47690.0
1431. nc3h7cho+o2=c3h6cho-4+ho2	4.00E+13	0.0	50870.0
1432. nc3h7cho+h=nc3h7co+h2	4.10E+09	1.2	2405.0
1433. nc3h7cho+h=c3h6cho-2+h2	1.30E+06	2.4	4471.0
1434. nc3h7cho+h=c3h6cho-3+h2	1.30E+06	2.4	4471.0
1435. nc3h7cho+h=c3h6cho-4+h2	9.50E+04	2.8	6280.0
1436. nc3h7cho+o=nc3h7co+oh	5.85E+12	0.0	1808.0
1437. nc3h7cho+o=c3h6cho-2+oh	4.77E+04	2.7	2106.0
1438. nc3h7cho+o=c3h6cho-3+oh	4.77E+04	2.7	2106.0
1439. nc3h7cho+o=c3h6cho-4+oh	9.50E+04	2.7	3716.0
1440. nc3h7cho+oh=nc3h7co+h2o	2.35E+10	0.7	-1113.0
1441. nc3h7cho+oh=c3h6cho-2+h2o	4.68E+07	1.6	-35.0
1442. nc3h7cho+oh=c3h6cho-3+h2o	4.68E+07	1.6	-35.0
1443. nc3h7cho+oh=c3h6cho-4+h2o	5.25E+09	1.0	1590.0
1444. nc3h7cho+ho2=nc3h7co+h2o2	3.10E+12	0.0	11920.0
1445. nc3h7cho+ho2=c3h6cho-2+h2o2	5.60E+12	0.0	17690.0
1446. nc3h7cho+ho2=c3h6cho-3+h2o2	5.60E+12	0.0	17690.0

1447.	nc3h7cho+ho2=c3h6cho-4+h2o2	8.50E+12	0.0	20440.0
1448.	nc3h7cho+ch3=nc3h7co+ch4	1.70E+12	0.0	8440.0
1449.	nc3h7cho+ch3=c3h6cho-2+ch4	2.70E+04	2.3	7287.0
1450.	nc3h7cho+ch3=c3h6cho-3+ch4	2.70E+04	2.3	7287.0
1451.	nc3h7cho+ch3=c3h6cho-4+ch4	4.50E-03	3.6	7154.0
1452.	nc3h7cho+hco=nc3h7co+ch2o	1.70E+12	0.0	8440.0
1453.	nc3h7cho+ch3o=nc3h7co+ch3oh	1.15E+11	0.0	1280.0
1454.	nc3h7cho+ch3o=c3h6cho-2+ch3oh	1.10E+11	0.0	5000.0
1455.	nc3h7cho+ch3o=c3h6cho-3+ch3oh	1.10E+11	0.0	5000.0
1456.	nc3h7cho+ch3o=c3h6cho-4+ch3oh	1.58E+11	0.0	7000.0
1457.	nc3h7cho+ch3o2=nc3h7co+ch3o2h	1.00E+12	0.0	9500.0
1458.	nc3h7cho+c2h5=nc3h7co+c2h6	1.70E+12	0.0	8440.0
1459.	nc3h7cho+c2h3=nc3h7co+c2h4	1.70E+12	0.0	8440.0
1460.	nc3h7co=c2h5chco+h	4.66E+10	0.8	42550.0
1461.	nc3h7co=ch2co+c2h5	2.74E+09	1.4	35830.0
1462.	nc3h7co+m=nc3h7+co+m	8.64E+15	0.0	14400.0
1463.	c3h6cho-4+o2=c3h6cho-4o2	9.00E+18	-2.5	0.0
1464.	c3h6cho-4o2+ho2=but4ooh1*o+o2	2.29E+11	0.0	-1790.0
1465.	c3h6cho-4o2+h2o2=but4ooh1*o+ho2	2.41E+12	0.0	9936.0
1466.	c3h6cho-4o2+ho2=>c3h6cho-4o+oh+o2	1.40E+16	-1.6	1860.0
1467.	c3h6cho-4o2+ch3o2=>c3h6cho-4o+ch3o+o2	1.40E+16	-1.6	1860.0
1468.	c3h6cho-4o=ch2o+pc2h4cho	2.00E+13	0.0	20000.0
1469.	c3h6cho-4o+o2=choc2h4cho+ho2	8.43E+09	0.0	220.0
1470.	c3h6cho-3+o2=c3h6cho-3o2	9.00E+18	-2.5	0.0
1471.	c3h6cho-3o2+ho2=but3ooh1*o+o2	2.29E+11	0.0	-1790.0
1472.	c3h6cho-3o2+h2o2=but3ooh1*o+ho2	2.41E+12	0.0	9936.0
1473.	c3h6cho-3o2+ho2=>c3h6cho-3o+oh+o2	1.40E+16	-1.6	1860.0
1474.	c3h6cho-3o2+ch3o2=>c3h6cho-3o+ch3o+o2	1.40E+16	-1.6	1860.0
1475.	c3h6cho-3o=ch3cho+ch2cho	2.00E+13	0.0	20000.0
1476.	c3h6cho-3o+o2=c4ald2oxo+ho2	8.43E+09	0.0	220.0
1477.	c3h6cho-2+o2=c3h6cho-2o2	9.00E+18	-2.5	0.0
1478.	c3h6cho-2o2+ho2=but2ooh1*o+o2	2.29E+11	0.0	-1790.0
1479.	c3h6cho-2o2+h2o2=but2ooh1*o+ho2	2.41E+12	0.0	9936.0
1480.	c3h6cho-2o2+ho2=>c3h6cho-2o+oh+o2	1.40E+16	-1.6	1860.0
1481.	c3h6cho-2o2+ch3o2=>c3h6cho-2o+ch3o+o2	1.40E+16	-1.6	1860.0
1482.	c3h6cho-2o=chocho+c2h5	2.00E+13	0.0	20000.0
1483.	c3h6cho-2o+o2=c4ald3oxo+ho2	8.43E+09	0.0	220.0
1484.	c4h8-1+oh=pc4h8oh-2	5.00E+53	-12.2	22976.0
	Declared duplicate reaction...			
1485.	c4h8-1+oh=pc4h8oh-2	4.28E+41	-9.3	8921.0
	Declared duplicate reaction...			
1486.	c4h8-1+oh=sc4h8oh-1	5.00E+53	-12.2	22976.0
	Declared duplicate reaction...			
1487.	c4h8-1+oh=sc4h8oh-1	4.28E+41	-9.3	8921.0
	Declared duplicate reaction...			
1488.	c2c4h8+oh=sc4h8oh-3	5.00E+53	-12.2	22976.0
	Declared duplicate reaction...			
1489.	c2c4h8+oh=sc4h8oh-3	4.28E+41	-9.3	8921.0
	Declared duplicate reaction...			
1490.	t2c4h8+oh=sc4h8oh-3	5.00E+53	-12.2	22976.0
	Declared duplicate reaction...			
1491.	t2c4h8+oh=sc4h8oh-3	4.28E+41	-9.3	8921.0
	Declared duplicate reaction...			
1492.	pc4h8oh-2+o2=pc4h8oh-2oo	1.80E+19	-2.5	0.0
1493.	sc4h8oh-1+o2=sc4h8oh-1oo	1.50E+18	-2.5	0.0
1494.	sc4h8oh-3+o2=sc4h8oh-3oo	9.50E+18	-2.5	0.0
1495.	pc4h8oh-2oo=c2h5cho+ch2o+oh	1.00E+09	0.0	30.0
1496.	sc4h8oh-1oo=c2h5cho+ch2o+oh	1.00E+09	0.0	30.0
1497.	sc4h8oh-3oo=ch3cho+ch3cho+oh	1.00E+09	0.0	30.0
1498.	pc4h8oh-1+o2=nc3h7cho+ho2	1.00E+13	0.0	5564.0
1499.	pc4h8oh-2+o2=nc3h7cho+ho2	1.00E+13	0.0	2500.0
1500.	sc4h8oh-1=ch3cho+c2h5	1.52E+12	0.6	31120.0
1501.	sc4h8oh-1+o2=c2h5coch3+ho2	2.25E+11	0.0	2500.0
1502.	sc4h8oh-3=ch3+c2h5cho	1.52E+12	0.6	31120.0
1503.	sc4h8oh-3+o2=c2h5coch3+ho2	2.25E+11	0.0	2500.0
1504.	nc4h10+c4h91o2=pc4h9+c4h91o2h	1.68E+13	0.0	20440.0
1505.	nc4h10+c4h91o2=sc4h9+c4h91o2h	1.12E+13	0.0	17690.0
1506.	nc4h10+c4h92o2=pc4h9+c4h92o2h	1.68E+13	0.0	20440.0
1507.	nc4h10+c4h92o2=sc4h9+c4h92o2h	1.12E+13	0.0	17690.0
1508.	pc4h9+o2=c4h91o2	1.15E+20	-2.4	2451.3
1509.	sc4h9+o2=c4h92o2	6.74E+27	-4.8	3779.8
1510.	c2h5o2+ch3o2=>c2h5oh+ch2o+o2	1.34E+11	0.0	0.0
1511.	c2h5o2+ch3o2=>ch3cho+ch3oh+o2	1.34E+11	0.0	0.0
1512.	c4h91o2+ch3o2=>pc4h9oh+ch2o+o2	1.34E+11	0.0	0.0
1513.	c4h91o2+ch3o2=>nc3h7cho+ch3oh+o2	1.34E+11	0.0	0.0
1514.	c4h92o2+ch3o2=>sc4h9oh+ch2o+o2	1.34E+11	0.0	0.0
1515.	c4h92o2+ch3o2=>c2h5coch3+ch3oh+o2	1.34E+11	0.0	0.0
1516.	c4h91o2+c4h91o2=>pc4h9oh+nc3h7cho+o2	5.00E+10	0.0	0.0
1517.	c4h91o2+c4h92o2=>pc4h9oh+c2h5coch3+o2	5.00E+10	0.0	0.0
1518.	c4h91o2+c4h92o2=>nc3h7cho+sc4h9oh+o2	5.00E+10	0.0	0.0
1519.	c4h92o2+c4h92o2=>sc4h9oh+c2h5coch3+o2	5.00E+10	0.0	0.0
1520.	but1ooh2o2+ch3o2=>but2ooh1*o+ch3oh+o2	1.34E+11	0.0	0.0
1521.	but1ooh3o2+ch3o2=>but3ooh1*o+ch3oh+o2	1.34E+11	0.0	0.0
1522.	but1ooh4o2+ch3o2=>but4ooh1*o+ch3oh+o2	1.34E+11	0.0	0.0
1523.	but2ooh1o2+ch3o2=>but1ooh2*o+ch3oh+o2	1.34E+11	0.0	0.0
1524.	but2ooh3o2+ch3o2=>but3ooh2*o+ch3oh+o2	1.34E+11	0.0	0.0
1525.	but2ooh4o2+ch3o2=>but4ooh2*o+ch3oh+o2	1.34E+11	0.0	0.0
1526.	c4h91o2=c4h81ooh2j	2.54E-01	3.7	24800.0
1527.	c4h91o2=c4h81ooh3j	6.36E+04	1.8	17200.0
1528.	c4h91o2=c4h81ooh4j	2.62E+03	2.2	19100.0
1529.	c4h92o2=c4h82ooh1j	9.13E-04	4.6	26900.0
1530.	c4h92o2=c4h82ooh3j	2.54E-01	3.7	24800.0
1531.	c4h92o2=c4h82ooh4j	1.41E+04	2.2	19800.0
1532.	c4h81ooh2j+o2=but1ooh2o2	9.00E+18	-2.5	0.0

1533. c4h81ooh3j+o2=but1ooh3o2	8.50E+18	-2.5	0.0
1534. c4h81ooh4j+o2=but1ooh4o2	4.50E+18	-2.5	0.0
1535. c4h82ooh1j+o2=but2ooh1o2	7.50E+17	-2.5	0.0
1536. c4h82ooh3j+o2=but2ooh3o2	4.75E+18	-2.5	0.0
1537. c4h82ooh4j+o2=but2ooh4o2	4.50E+18	-2.5	0.0
1538. but1ooh2o2=>but2ooh1*o+oh	2.54E-01	3.7	22800.0
1539. but1ooh3o2=>but3ooh1*o+oh	6.36E+04	1.8	17200.0
1540. but1ooh4o2=>but4ooh1*o+oh	2.00E+04	1.7	16100.0
1541. but2ooh1o2=>but1ooh2*o+oh	1.20E+01	3.1	22500.0
1542. but2ooh3o2=>but3ooh2*o+oh	1.20E+01	3.1	22500.0
1543. but2ooh4o2=>but4ooh2*o+oh	1.29E+05	1.7	14600.0
1544. but2ooh1*o=>c2h5cho+hco+oh	2.50E+15	0.0	43000.0
1545. but3ooh1*o=>ch3cho+ch2cho+oh	2.50E+15	0.0	43000.0
1546. but4ooh1*o=>ch2o+pc2h4cho+oh	2.50E+15	0.0	43000.0
1547. but1ooh2*o=>c2h5co+ch2o+oh	2.50E+15	0.0	43000.0
1548. but3ooh2*o=>ch3co+ch3cho+oh	2.50E+15	0.0	43000.0
1549. but4ooh2*o=>ch2o+ch3coch2+oh	2.50E+15	0.0	43000.0
1550. but4ooh2*o=>ch3cooh+ch3cho	2.10E+08	0.0	24500.0
1551. but3ooh1*o=>ch3coch3+hcooh	2.10E+08	0.0	24500.0
1552. but3ooh1*o=>ch3cooh+ch3cho	2.10E+08	0.0	24500.0
1553. c4h81ooh2j=c4h8cy1o2+oh	3.30E+10	0.5	12600.0
1554. c4h81ooh3j=c4h8cy1o3+oh	1.20E+10	0.3	17700.0
1555. c4h81ooh4j=c4h8cy1o4+oh	2.26E+09	0.3	12800.0
1556. c4h82ooh1j=c4h8cy1o2+oh	1.24E+11	0.5	14500.0
1557. c4h82ooh3j=c4h8cy2o3+oh	3.30E+10	0.5	12600.0
1558. c4h82ooh4j=c4h8cy1o3+oh	3.05E+10	0.3	20200.0
1559. c4h8cy1o2+h=>h2+c3h6cho-2	9.60E+08	1.5	2785.0
1560. c4h8cy1o2+h=>h2+c2h5+ch2co	9.60E+08	1.5	2785.0
1561. c4h8cy1o2+h=>h2+c2h5coch2	4.80E+08	1.5	2005.0
1562. c4h8cy1o3+h=>h2+c3h6cho-3	9.60E+08	1.5	2785.0
1563. c4h8cy1o3+h=>h2+acetoch2	4.80E+08	1.5	2005.0
1564. c4h8cy1o4+h=>h2+c3h6cho-4	1.92E+09	1.5	2005.0
1565. c4h8cy2o3+h=>h2+ch3chcoch3	4.80E+08	1.5	2005.0
1566. c4h8cy1o2+oh=>h2o+c3h6cho-2	4.80E+06	2.0	-1192.0
1567. c4h8cy1o2+oh=>h2o+c2h5+ch2co	4.80E+06	2.0	-1192.0
1568. c4h8cy1o2+oh=>h2o+c2h5coch2	2.40E+06	2.0	-1192.0
1569. c4h8cy1o3+oh=>h2o+c3h6cho-3	4.80E+06	2.0	-1192.0
1570. c4h8cy1o3+oh=>h2o+acetoch2	2.40E+06	2.0	-1192.0
1571. c4h8cy1o4+oh=>h2o+c3h6cho-4	9.60E+06	2.0	-1192.0
1572. c4h8cy2o3+oh=>h2o+ch3chcoch3	2.40E+06	2.0	-1192.0
1573. c4h8cy1o2+ho2=>h2o2+c3h6cho-2	8.00E+12	0.0	14400.0
1574. c4h8cy1o2+ho2=>h2o2+c2h5+ch2co	8.00E+12	0.0	14400.0
1575. c4h8cy1o2+ho2=>h2o2+c2h5coch2	4.00E+12	0.0	13260.0
1576. c4h8cy1o3+ho2=>h2o2+c3h6cho-3	8.00E+12	0.0	14400.0
1577. c4h8cy1o3+ho2=>h2o2+acetoch2	4.00E+12	0.0	13260.0
1578. c4h8cy1o4+ho2=>h2o2+c3h6cho-4	1.60E+13	0.0	14400.0
1579. c4h8cy2o3+ho2=>h2o2+ch3chcoch3	4.00E+12	0.0	13260.0
1580. c4h8cy1o2=nc3h7cho	1.59E+12	-0.8	46420.0
1581. c4h8cy1o2=c2h5coch3	1.59E+12	-0.8	46420.0
1582. c4h8cy2o3=c2h5coch3	3.18E+12	-0.8	46420.0
1583. c4h91o2=c4h8-1+ho2	1.26E+08	1.4	28900.0
1584. c4h92o2=c4h8-1+ho2	1.03E+10	1.0	30400.0
1585. c4h92o2=c2c4h8+ho2	3.40E+10	0.7	30700.0
1586. c4h92o2=t2c4h8+ho2	1.45E+10	0.8	29900.0
1587. but3ooh2*o=>ch3cococh3+h2o	1.28E+07	2.2	44950.0
1588. but2ooh1*o=>c4ald2oxo+h+oh	2.50E+14	0.0	43000.0
1589. but3ooh1*o=>c4ald3oxo+h+oh	2.50E+14	0.0	43000.0
1590. but4ooh1*o=>choc2h4cho+h+oh	2.50E+14	0.0	43000.0
1591. but1ooh2*o=>c4ald2oxo+h+oh	2.50E+14	0.0	43000.0
1592. but3ooh2*o=>ch3cococh3+h+oh	2.50E+14	0.0	43000.0
1593. but4ooh2*o=>c4ald3oxo+h+oh	2.50E+14	0.0	43000.0
1594. but2ooh1*o+oh=>c4ald2oxo+oh+h2o	3.62E+12	0.0	-380.0
1595. but3ooh1*o+oh=>c4ald3oxo+oh+h2o	3.62E+12	0.0	-380.0
1596. but4ooh1*o+oh=>choc2h4cho+oh+h2o	3.62E+12	0.0	-380.0
1597. but1ooh2*o+oh=>c4ald2oxo+oh+h2o	3.62E+12	0.0	-380.0
1598. but3ooh2*o+oh=>ch3cococh3+oh+h2o	3.62E+12	0.0	-380.0
1599. but4ooh2*o+oh=>c4ald3oxo+oh+h2o	3.62E+12	0.0	-380.0
1600. c4h91o2+ho2=c4h91o2h+o2	2.29E+11	0.0	-1790.0
1601. c4h91o2+h2o2=c4h91o2h+ho2	2.41E+12	0.0	9936.0
1602. c4h91o2+ch2o=c4h91o2h+hco	1.99E+12	0.0	11660.0
1603. c4h91o2+ch3cho=c4h91o2h+ch3co	1.00E+12	0.0	11660.0
1604. c4h91o2+ho2=>pc4h9o+oh+o2	1.40E+16	-1.6	1860.0
1605. c4h91o2+ch3o2=>pc4h9o+ch3o+o2	1.40E+16	-1.6	1860.0
1606. c4h91o2+c4h91o2=>pc4h9o+pc4h9o+o2	2.41E+10	0.0	0.0
1607. c4h91o2h=pc4h9o+oh	2.50E+15	0.0	43000.0
1608. pc4h9o=nc3h7cho+h	1.70E+13	0.0	20510.0
1609. pc4h9o=ch2o+nc3h7	9.12E+13	0.0	14360.0
1610. pc4h9o+o2=nc3h7cho+ho2	3.61E+10	0.0	1090.0
1611. c4h92o2+ho2=c4h92o2h+o2	2.29E+11	0.0	-1790.0
1612. c4h92o2+h2o2=c4h92o2h+ho2	2.41E+12	0.0	9936.0
1613. c4h92o2+ch2o=c4h92o2h+hco	1.99E+12	0.0	11660.0
1614. c4h92o2+ch3cho=c4h92o2h+ch3co	1.00E+12	0.0	11660.0
1615. c4h92o2+ho2=>sc4h9o+oh+o2	1.40E+16	-1.6	1860.0
1616. c4h92o2+ch3o2=>sc4h9o+ch3o+o2	1.40E+16	-1.6	1860.0
1617. c4h92o2+c4h91o2=>sc4h9o+pc4h9o+o2	2.41E+10	0.0	0.0
1618. c4h92o2+c4h92o2=>sc4h9o+sc4h9o+o2	2.41E+10	0.0	0.0
1619. c4h92o2h=sc4h9o+oh	2.50E+15	0.0	43000.0
1620. sc4h9o=c2h5coch3+h	1.51E+13	0.0	18070.0
1621. sc4h9o=ch3cho+c2h5	5.25E+13	0.0	11690.0
1622. sc4h9o=ch3+c2h5cho	1.78E+13	0.0	14890.0
1623. sc4h9o+o2=c2h5coch3+ho2	8.43E+09	0.0	420.0
1624. c4h8-1+ho2=c4h81ooh2j	2.47E+04	2.1	12160.0
1625. c4h8-1+ho2=c4h82ooh1j	7.74E+03	2.3	11080.0
1626. c2c4h8+ho2=c4h82ooh3j	1.55E+04	2.3	11080.0

1627. t2c4h8+ho2=c4h82ooh3j	1.55E+04	2.3	11080.0
1628. c4h81ooh3j=>c3h6+ch2o+oh	1.23E+09	1.3	24900.0
1629. c4h81ooh4j=>c2h4+c2h4o2h	2.33E+12	0.6	29000.0
1630. c4h82ooh4j=>c2h4+ch3cho+oh	3.08E+08	1.5	23500.0
1631. c4h82ooh4j=>c3h6+ch2o+oh	3.08E+08	1.5	23500.0
1632. c4h82ooh1j=>ch2cho+c2h5+oh	4.87E+12	0.3	29600.0
1633. c4h81ooh2j=>c3h5o+ch3+oh	1.09E+09	1.4	29500.0
1634. c4h82ooh3j=>ch3chcho+ch3+oh	2.78E+11	0.7	32500.0
1635. c4h91o2+pc4h9=pc4h9o+pc4h9o	7.00E+12	0.0	-1000.0
1636. c4h91o2+sc4h9=pc4h9o+sc4h9o	7.00E+12	0.0	-1000.0
1637. c4h92o2+pc4h9=sc4h9o+pc4h9o	7.00E+12	0.0	-1000.0
1638. c4h92o2+sc4h9=sc4h9o+sc4h9o	7.00E+12	0.0	-1000.0
1639. pc4h9+ho2=pc4h9o+oh	7.00E+12	0.0	-1000.0
1640. sc4h9+ho2=sc4h9o+oh	7.00E+12	0.0	-1000.0
1641. c4h91o2+ch3=pc4h9o+ch3o	7.00E+12	0.0	-1000.0
1642. c4h92o2+ch3=sc4h9o+ch3o	7.00E+12	0.0	-1000.0
1643. pc4h9+ch3o2=pc4h9o+ch3o	7.00E+12	0.0	-1000.0
1644. sc4h9+ch3o2=sc4h9o+ch3o	7.00E+12	0.0	-1000.0
1645. c4h713+o2=c4h73o2	6.00E+09	0.0	-2300.0
1646. c4h713+o2=c4h71o2	6.00E+09	0.0	-2300.0
1647. c4h73o2=c4h6+ho2	5.13E+09	1.0	28400.0
1648. c4h73o2=c4h63ooh4j	8.62E+08	1.0	35500.0
1649. c4h71o2=c4h61ooh4j	1.48E+08	1.0	21000.0
1650. c4h63ooh4j+o2=c4h63ooh4o2	1.50E+18	-2.5	0.0
1651. c4h61ooh4j+o2=c4h61ooh4o2	1.20E+10	0.0	-2300.0
1652. c4h63ooh4o2=>c4h54o2h3*o+oh	2.87E+08	1.0	25500.0
1653. c4h61ooh4o2=>c4h54o2h1*o+oh	9.87E+07	1.0	26500.0
1654. c4h54o2h3*o=>ch2o+c2h3co+oh	2.50E+15	0.0	43000.0
1655. c4h54o2h1*o=>ch2o+c2h2+hco+oh	2.50E+15	0.0	43000.0
1656. c4h73o2=ch3cho+ch2cho	1.70E+09	1.0	26400.0
1657. c4h71o2=ch3chcho+ch2o	1.70E+09	1.0	26400.0
1658. ch3coch3+ch3o=ch3coch2+ch3oh	1.00E+11	0.0	7000.0
Reverse Arrhenius coefficients:	1.00E+10	0.0	9000.0
1659. c3h6o1-2=c2h4+ch2o	6.00E+14	0.0	60000.0
Reverse Arrhenius coefficients:	2.97E+11	0.0	50000.0
1660. c3h6o1-3=c2h4+ch2o	6.00E+14	0.0	60000.0
Reverse Arrhenius coefficients:	2.97E+11	0.0	31080.0
1661. tc3h6cho=ic3h5cho+h	2.88E+16	-0.6	41280.0
Reverse Arrhenius coefficients:	1.30E+13	0.0	1200.0
1662. tc3h6cho=ic3h6co+h	8.88E+16	-0.7	44350.0
Reverse Arrhenius coefficients:	1.30E+13	0.0	4800.0
1663. tc3h6cho+h2=ic3h7cho+h	2.16E+05	2.4	18990.0
Reverse Arrhenius coefficients:	1.32E+05	2.5	3550.0
1664. ic3h7cho=tc3h6cho+h	2.30E+18	-0.9	92000.0
Reverse Arrhenius coefficients:	2.00E+14	0.0	0.0
1665. tc3h6cho+ch2o=ic3h7cho+hco	2.52E+08	1.9	18190.0
Reverse Arrhenius coefficients:	1.23E+07	2.0	17420.0
1666. ic3h6co+oh=ic3h7+co2	1.73E+12	0.0	-1010.0
Reverse Arrhenius coefficients:	2.58E+14	-0.4	55480.0
1667. ic3h7cho+ho2=ic3h7co+h2o2	3.00E+12	0.0	11920.0
Reverse Arrhenius coefficients:	7.71E+12	-0.3	11990.0
1668. ic3h7cho+ho2=tc3h6cho+h2o2	8.00E+10	0.0	11920.0
Reverse Arrhenius coefficients:	3.37E+12	-0.4	11050.0
1669. ic3h7cho+ch3=ic3h7co+ch4	3.98E+12	0.0	8700.0
Reverse Arrhenius coefficients:	2.32E+13	-0.1	25630.0
1670. ic3h7cho+o=ic3h7co+oh	7.18E+12	0.0	1389.0
Reverse Arrhenius coefficients:	7.05E+11	-0.1	15740.0
1671. ic3h7cho+o2=ic3h7co+ho2	4.00E+13	0.0	37600.0
Reverse Arrhenius coefficients:	1.62E+11	0.3	-3432.0
1672. ic3h7cho+oh=ic3h7co+h2o	2.41E+12	0.0	-781.0
Reverse Arrhenius coefficients:	2.33E+12	-0.1	30820.0
1673. ic3h7cho+oh=tc3h6cho+h2o	1.68E+12	0.0	-781.0
Reverse Arrhenius coefficients:	1.19E+13	-0.1	29810.0
1674. ic3h7cho+h=ic3h7co+h2	2.60E+12	0.0	2600.0
Reverse Arrhenius coefficients:	1.00E+00	0.0	0.0
1675. ic3h7cho=ic3h7+hco	1.13E+17	0.0	79760.0
Reverse Arrhenius coefficients:	1.81E+13	0.0	0.0
1676. ic3h7co=ic3h7+co	1.43E+13	0.0	10950.0
Reverse Arrhenius coefficients:	1.50E+11	0.0	4810.0
1677. ic3h7cho+oh=ic3h6cho+h2o	3.12E+06	2.0	-298.0
Reverse Arrhenius coefficients:	6.39E+05	2.0	19130.0
1678. ic3h7cho+ho2=ic3h6cho+h2o2	2.74E+04	2.5	15500.0
Reverse Arrhenius coefficients:	3.33E+04	2.2	3468.0
1679. tc3h6cho+o2=ic3h5cho+ho2	2.72E-19	0.0	7240.0
Reverse Arrhenius coefficients:	1.39E+11	-0.2	17310.0
1680. tc3h6cho+o2=ch3coch3+co+oh	3.62E-20	0.0	0.0
Reverse Arrhenius coefficients:	0.00E+00	0.0	0.0
1681. tc3h6cho+ho2=ic3h7cho+o2	3.68E+12	0.0	1310.0
Reverse Arrhenius coefficients:	1.24E+14	-0.2	43350.0
1682. tc3h6cho+ch3=ic3h5cho+ch4	3.01E+12	-0.3	-131.0
Reverse Arrhenius coefficients:	2.21E+15	-0.8	67900.0
1683. ic3h5cho+oh=ic3h5co+h2o	1.07E+13	0.0	-348.0
Reverse Arrhenius coefficients:	0.00E+00	0.0	0.0
1684. ic3h5cho+ho2=ic3h5co+h2o2	1.00E+12	0.0	11920.0
Reverse Arrhenius coefficients:	3.76E+12	-0.3	12000.0
1685. ic3h5cho+ch3=ic3h5co+ch4	3.98E+12	0.0	8700.0
Reverse Arrhenius coefficients:	1.52E+13	0.0	25570.0
1686. ic3h5cho+o=ic3h5co+oh	7.18E+12	0.0	1389.0
Reverse Arrhenius coefficients:	4.61E+11	0.0	15680.0
1687. ic3h5cho+o2=ic3h5co+ho2	2.00E+13	0.0	40700.0
Reverse Arrhenius coefficients:	5.31E+10	0.3	-394.0
1688. ic3h5cho+h=ic3h5co+h2	2.60E+12	0.0	2600.0
Reverse Arrhenius coefficients:	3.80E+11	0.0	18990.0
1689. ic3h5co=c3h5-t+co	4.78E+12	0.0	27470.0

Reverse Arrhenius coefficients:	1.51E+11	0.0	4809.0
1690. ic3h7+oh=c3h6+h2o	2.41E+13	0.0	0.0
Reverse Arrhenius coefficients:	2.98E+12	0.6	83820.0
1691. ic3h6co+h=ic3h7+co	4.40E+12	0.0	1459.0
Reverse Arrhenius coefficients:	0.00E+00	0.0	0.0
1692. ic3h6co+o=ch3coch3+co	3.20E+12	0.0	-437.0
Reverse Arrhenius coefficients:	0.00E+00	0.0	0.0
1693. c2h5chco+oh=nc3h7+co2	3.73E+12	0.0	-1010.0
Reverse Arrhenius coefficients:	0.00E+00	0.0	0.0
1694. c2h5chco+h=nc3h7+co	4.40E+12	0.0	1459.0
Reverse Arrhenius coefficients:	0.00E+00	0.0	0.0
1695. c2h5chco+o=c3h6+co2	3.20E+12	0.0	-437.0
Reverse Arrhenius coefficients:	0.00E+00	0.0	0.0
1696. ch3chcho+ho2=ch3chocho+oh	9.64E+12	0.0	0.0
Reverse Arrhenius coefficients:	1.31E+19	-1.5	28580.0
1697. ch3chocho=ch3cho+hco	3.98E+13	0.0	9700.0
Reverse Arrhenius coefficients:	4.34E+05	1.7	8282.0
1698. ch3chcho=ch3chco+h	1.34E+13	-0.2	33460.0
Reverse Arrhenius coefficients:	5.00E+12	0.0	1200.0
1699. ch3chcho+o2=ch3chco+ho2	1.81E+11	0.0	1840.0
Reverse Arrhenius coefficients:	2.31E+13	-0.5	19540.0
1700. ch3chcho+o2=c2h3cho+ho2	2.72E+11	0.0	7240.0
Reverse Arrhenius coefficients:	1.46E+14	-0.7	25880.0
1701. ch3chcho+o2=ch3cho+co+oh	3.62E+10	0.0	0.0
Reverse Arrhenius coefficients:	0.00E+00	0.0	0.0
1702. sc3h5cho+o=sc3h5co+oh	7.18E+12	0.0	1389.0
Reverse Arrhenius coefficients:	1.31E+12	0.0	21570.0
1703. sc3h5cho+o2=sc3h5co+ho2	4.00E+13	0.0	37600.0
Reverse Arrhenius coefficients:	3.01E+11	0.3	2394.0
1704. sc3h5co=c3h5-s+co	8.60E+15	0.0	23000.0
Reverse Arrhenius coefficients:	1.00E+11	0.0	6000.0
1705. sc3h5cho=c3h6+co	3.90E+14	0.0	69000.0
1706. sc3h5cho+h=sc3h5co+h2	1.00E+05	2.5	2490.0
1707. sc3h5cho+ch3=sc3h5co+ch4	1.10E+00	3.5	5675.0
1708. sc3h5cho+c2h3=sc3h5co+c2h4	1.11E+00	3.5	4682.0
1709. c3h6cho-2=c2h5chco+h	8.43E+15	-0.6	40400.0
Reverse Arrhenius coefficients:	5.00E+12	0.0	1200.0
1710. c3h6cho-2=c2h3cho+ch3	1.30E+12	0.0	39200.0
1711. c3h6cho-3=sc3h5cho+h	4.95E+12	-0.1	31300.0
Reverse Arrhenius coefficients:	5.00E+12	0.0	2900.0
1712. c3h6cho-3=c3h6+hco	8.25E+12	-0.2	21900.0
1713. c3h6cho-4=c2h4+ch2cho	2.00E+13	0.0	28700.0
1714. etcoet+oh=etcoetp+h2o	1.05E+10	1.0	1586.0
Reverse Arrhenius coefficients:	1.19E+09	0.9	21030.0
1715. etcoet+oh=etcoets+h2o	1.69E+12	0.0	-228.0
Reverse Arrhenius coefficients:	3.30E+13	-0.3	28740.0
1716. etcoet+ho2=etcoetp+h2o2	4.76E+04	2.5	16490.0
Reverse Arrhenius coefficients:	3.20E+04	2.2	4472.0
1717. etcoet+ho2=etcoets+h2o2	4.00E+11	0.0	8698.0
Reverse Arrhenius coefficients:	4.63E+13	-0.7	6200.0
1718. etcoet+o2=etcoetp+ho2	4.10E+13	0.0	51310.0
Reverse Arrhenius coefficients:	1.95E+10	0.3	-1882.0
1719. etcoet+o2=etcoets+ho2	3.10E+13	0.0	41970.0
Reverse Arrhenius coefficients:	2.54E+12	0.0	-1702.0
1720. etcoet+h=etcoetp+h2	1.83E+07	2.0	7700.0
Reverse Arrhenius coefficients:	4.79E+05	2.0	11990.0
1721. etcoet+h=etcoets+h2	8.96E+06	2.0	3200.0
Reverse Arrhenius coefficients:	4.04E+07	1.7	17010.0
1722. etcoet+c2h3=etcoetp+c2h4	1.00E+12	0.0	10400.0
Reverse Arrhenius coefficients:	3.85E+08	0.8	14040.0
1723. etcoet+c2h3=etcoets+c2h4	6.00E+11	0.0	5600.0
Reverse Arrhenius coefficients:	3.98E+10	0.5	18760.0
1724. etcoet+c2h5=etcoetp+c2h6	1.00E+11	0.0	13400.0
Reverse Arrhenius coefficients:	1.07E+13	-0.6	14000.0
1725. etcoet+c2h5=etcoets+c2h6	6.00E+10	0.0	8600.0
Reverse Arrhenius coefficients:	1.10E+15	-0.9	18720.0
1726. etcoet+ch3o=etcoetp+ch3oh	4.34E+11	0.0	6460.0
Reverse Arrhenius coefficients:	5.48E+09	0.0	9020.0
1727. etcoet+ch3o=etcoets+ch3oh	2.90E+11	0.0	2771.0
Reverse Arrhenius coefficients:	6.30E+11	-0.3	14850.0
1728. etcoet+ch3o2=etcoetp+ch3o2h	6.02E+12	0.0	19380.0
Reverse Arrhenius coefficients:	1.66E+13	-0.5	6642.0
1729. etcoet+ch3o2=etcoets+ch3o2h	4.00E+12	0.0	15250.0
Reverse Arrhenius coefficients:	1.90E+15	-0.8	12030.0
1730. etcoets=etcoc2h3+h	8.70E+16	-0.8	42130.0
Reverse Arrhenius coefficients:	1.30E+13	0.0	1560.0
1731. etcoetp=c2h5co+c2h4	1.55E+17	-1.5	27840.0
Reverse Arrhenius coefficients:	7.00E+10	0.0	9600.0
1732. etcoc2h3+oh=c2h5coch2+ch2o	1.00E+10	0.0	0.0
Reverse Arrhenius coefficients:	1.67E+11	-0.4	18220.0
1733. etcoc2h3+oh=petcoc2h3+h2o	7.55E+09	1.0	1586.0
Reverse Arrhenius coefficients:	1.28E+08	2.5	20210.0
1734. etcoc2h3+oh=setcoc2h3+h2o	8.45E+11	0.0	-228.0
Reverse Arrhenius coefficients:	1.35E+13	-0.2	28600.0
1735. etcoc2h3+ho2=c2h5co+ch2cho+oh	6.03E+09	0.0	7949.0
Reverse Arrhenius coefficients:	1.00E+00	0.0	0.0
1736. etcoc2h3+ho2=petcoc2h3+h2o2	2.38E+04	2.5	16490.0
Reverse Arrhenius coefficients:	2.40E+03	3.8	3652.0
1737. etcoc2h3+ho2=setcoc2h3+h2o2	2.00E+11	0.0	8698.0
Reverse Arrhenius coefficients:	1.90E+13	-0.5	6065.0
1738. etcoc2h3+ch3o2=c2h5co+ch2cho+ch3o	3.97E+11	0.0	17050.0
Reverse Arrhenius coefficients:	1.00E+00	0.0	0.0
1739. etcoc2h3+ch3o2=petcoc2h3+ch3o2h	3.01E+12	0.0	19380.0
Reverse Arrhenius coefficients:	1.25E+12	1.1	5822.0

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1740. etcoc2h3+ch3o2=setcoc2h3+ch3o2h          2.00E+12   0.0    15250.0
        Reverse Arrhenius coefficients:        7.79E+14  -0.7    11900.0
1741. petcoc2h3=c2h3co+c2h4                    2.02E+15   0.3    26400.0
        Reverse Arrhenius coefficients:        8.00E+10   0.0    11300.0
1742. setcoc2h3=ch3chco+c2h3                   1.64E+16  -0.7    54590.0
        Reverse Arrhenius coefficients:        8.00E+10   0.0    12600.0
1743. nc3h7coch3+oh=prcoch3-1+h2o              2.06E+07   1.7      753.0
        Reverse Arrhenius coefficients:        3.60E+06   1.8    20170.0
1744. nc3h7coch3+oh=prcoch3-2+h2o              3.62E+07   1.6     -247.0
        Reverse Arrhenius coefficients:        3.67E+05   2.0    21660.0
1745. nc3h7coch3+oh=prcoch3-3+h2o              8.45E+11   0.0     -228.0
        Reverse Arrhenius coefficients:        2.37E+13  -0.3    28700.0
1746. nc3h7coch3+oh=nc3h7coch2+h2o             5.10E+11   0.0     1192.0
        Reverse Arrhenius coefficients:        9.29E+13  -0.7    27730.0
1747. nc3h7coch3+ho2=prcoch3-1+h2o2            2.38E+04   2.5    16490.0
        Reverse Arrhenius coefficients:        2.46E+04   2.2     4442.0
1748. nc3h7coch3+ho2=prcoch3-2+h2o2            5.60E+12   0.0    17700.0
        Reverse Arrhenius coefficients:        3.37E+11   0.1     8142.0
1749. nc3h7coch3+ho2=prcoch3-3+h2o2            2.00E+11   0.0     8698.0
        Reverse Arrhenius coefficients:        3.33E+13  -0.6     6160.0
1750. nc3h7coch3+ho2=nc3h7coch2+h2o2           2.38E+04   2.5    14690.0
        Reverse Arrhenius coefficients:        2.57E+07   1.5     9762.0
1751. nc3h7coch3+ch3o2=prcoch3-1+ch3o2h        3.01E+12   0.0    19380.0
        Reverse Arrhenius coefficients:        1.28E+13  -0.5     6607.0
1752. nc3h7coch3+ch3o2=prcoch3-2+ch3o2h        1.99E+12   0.0    17050.0
        Reverse Arrhenius coefficients:        4.93E+11  -0.1     6774.0
1753. nc3h7coch3+ch3o2=prcoch3-3+ch3o2h        2.00E+12   0.0    15250.0
        Reverse Arrhenius coefficients:        1.37E+15  -0.8    11990.0
1754. nc3h7coch3+ch3o2=nc3h7coch2+ch3o2h       3.01E+12   0.0    17580.0
        Reverse Arrhenius coefficients:        1.34E+16  -1.2    11930.0
1755. prcoch3-2=c3h6+ch3co                     2.72E+16  -1.1    25590.0
        Reverse Arrhenius coefficients:        1.00E+11   0.0     7800.0
1756. prcoch3-3=c2h3coch3+ch3                  9.62E+15  -0.8    32390.0
        Reverse Arrhenius coefficients:        1.00E+11   0.0     7800.0
1757. nc3h7coch2=nc3h7+ch2co                   1.23E+18  -1.4    43450.0
        Reverse Arrhenius coefficients:        1.00E+11   0.0    11600.0
1758. nprcoet+oh=prcoet-1+h2o                  2.06E+07   1.7      753.0
        Reverse Arrhenius coefficients:        5.17E+06   1.7    20220.0
1759. nprcoet+oh=prcoet-2+h2o                  3.62E+07   1.6     -247.0
        Reverse Arrhenius coefficients:        7.23E+05   1.9    21760.0
1760. nprcoet+oh=prcoet-3+h2o                  8.45E+11   0.0     -228.0
        Reverse Arrhenius coefficients:        3.31E+13  -0.3    28740.0
1761. nprcoet+oh=nprcoetp+h2o                  5.10E+11   0.0     1192.0
        Reverse Arrhenius coefficients:        1.28E+11   0.0    20660.0
1762. nprcoet+oh=nprcoets+h2o                  8.45E+11   0.0     -228.0
        Reverse Arrhenius coefficients:        3.31E+13  -0.3    28740.0
1763. nprcoet+ho2=prcoet-1+h2o2                2.38E+04   2.5    16490.0
        Reverse Arrhenius coefficients:        3.54E+04   2.2     4492.0
1764. nprcoet+ho2=prcoet-2+h2o2                5.60E+12   0.0    17700.0
        Reverse Arrhenius coefficients:        6.65E+11  -0.1     8242.0
1765. nprcoet+ho2=prcoet-3+h2o2                2.00E+11   0.0     8698.0
        Reverse Arrhenius coefficients:        4.65E+13  -0.7     6200.0
1766. nprcoet+ho2=nprcoetp+h2o2                2.38E+04   2.5    14690.0
        Reverse Arrhenius coefficients:        3.54E+04   2.2     2692.0
1767. nprcoet+ho2=nprcoets+h2o2                2.00E+11   0.0     8698.0
        Reverse Arrhenius coefficients:        4.65E+13  -0.7     6200.0
1768. nprcoet+ch3o2=prcoet-1+ch3o2h            3.01E+12   0.0    19380.0
        Reverse Arrhenius coefficients:        1.84E+13  -0.5     6657.0
1769. nprcoet+ch3o2=prcoet-2+ch3o2h            1.99E+12   0.0    17050.0
        Reverse Arrhenius coefficients:        9.71E+11  -0.2     6874.0
1770. nprcoet+ch3o2=prcoet-3+ch3o2h            2.00E+12   0.0    15250.0
        Reverse Arrhenius coefficients:        1.91E+15  -0.8    12030.0
1771. nprcoet+ch3o2=nprcoetp+ch3o2h            3.01E+12   0.0    17580.0
        Reverse Arrhenius coefficients:        1.84E+13  -0.5     4862.0
1772. nprcoet+ch3o2=nprcoets+ch3o2h            2.00E+12   0.0    15250.0
        Reverse Arrhenius coefficients:        1.91E+15  -0.8    12030.0
1773. prcoet-1=c2h4+c2h5coch2                  2.22E+15  -0.8    23590.0
        Reverse Arrhenius coefficients:        2.50E+11   0.0     7800.0
1774. prcoet-2=c3h6+c2h5co                     4.05E+16  -1.1    26150.0
        Reverse Arrhenius coefficients:        1.00E+11   0.0     8300.0
1775. prcoet-3=etcoc2h3+ch3                    2.92E+15  -0.7    32300.0
        Reverse Arrhenius coefficients:        1.00E+11   0.0     7800.0
1776. nprcoetp=nc3h7co+c2h4                    5.40E+17  -1.4    26040.0
        Reverse Arrhenius coefficients:        2.50E+11   0.0     7800.0
1777. ac3h5cho=c3h5-a+hco                      1.81E+19  -1.1    68480.0
        Reverse Arrhenius coefficients:        1.00E+13   0.0        0.0
1778. ac3h5cho+oh=ac3h5co+h2o                  3.37E+12   0.0      616.0
        Reverse Arrhenius coefficients:        2.18E+12   0.0    32150.0
1779. ac3h5cho+oh=c2h3chcho+h2o                3.12E+06   2.0     -298.0
        Reverse Arrhenius coefficients:        1.25E+08   1.8    34930.0
1780. ac3h5cho+ho2=ac3h5co+h2o2                3.00E+12   0.0    11920.0
        Reverse Arrhenius coefficients:        1.15E+13  -0.3    11990.0
1781. ac3h5cho+ho2=c2h3chcho+h2o2              9.63E+03   2.6    13910.0
        Reverse Arrhenius coefficients:        2.28E+06   2.1    17670.0
1782. ac3h5cho+ch3o2=ac3h5co+ch3o2h            1.00E+12   0.0    11920.0
        Reverse Arrhenius coefficients:        1.58E+13  -0.5    11270.0
1783. ac3h5cho+ch3o2=c2h3chcho+ch3o2h          1.99E+12   0.0    17050.0
        Reverse Arrhenius coefficients:        1.94E+15  -0.7    20090.0
1784. ac3h5co=c3h5-a+co                        6.20E+15  -1.1     -330.0
        Reverse Arrhenius coefficients:        1.50E+11   0.0     4810.0
1785. c2h3chcho+ho2=c2h3cho+hco+oh             8.91E+12   0.0        0.0
        Reverse Arrhenius coefficients:        0.00E+00   0.0        0.0
1786. c2h3chcho=c3h5-a+co                      1.00E+14   0.0    25000.0
1787. c2h3chcho+h=ac3h5cho                     1.00E+14   0.0        0.0
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1788. butyne+oh=ch3chcch+h2o                      1.00E+07    2.0     2000.0
1789. c4h612+oh=ch3ccch2+h2o                      1.00E+07    2.0     2000.0
1790. c4h612+oh=ch3chcch+h2o                      2.00E+07    2.0     2500.0
1791. c4h612+h=ch3ccch2+h2                        1.50E+07    2.0     6000.0
1792. c4h612+h=ch3chcch+h2                        3.00E+07    2.0     6500.0
1793. ch3chcch+h=ch3+c3h3                         1.00E+14    0.0        0.0
1794. ch3chcch+oh=c4h4+h2o                        3.00E+13    0.0        0.0
1795. ic4h5+h=ch3ccch2+h                          3.00E+13    0.0        0.0
1796. ch3ccch2+h=ch3+c3h3                         1.00E+14    0.0        0.0
1797. ch3ccch2+o2=ch3co+ch2co                     4.16E+10    0.0     2510.0
1798. ch3ccch2+h=h2cccch2+h2                      1.00E+14    0.0     8000.0
1799. ch3ccch2+oh=h2cccch2+h2o                    1.00E+13    0.0        0.0
1800. ch3chcch(+M)=c4h4+h(+M)                     1.00E+13    0.0    49000.0
      Low pressure limit:  0.20000E+15  0.00000E+00  0.41000E+05
1801. ch3ccch2(+M)=h2cccch2+h(+M)                 1.00E+13    0.0    56000.0
      Low pressure limit:  0.20000E+15  0.00000E+00  0.48000E+05
1802. h2cccch2+oh=ic4h3+h2o                       2.00E+07    2.0     2000.0
1803. h2cccch2+h=ic4h3+h2                         3.00E+07    2.0     6000.0
1804. ic4h9+h=ic4h10                              1.00E+14    0.0        0.0
1805. tc4h9+h=ic4h10                              1.00E+14    0.0        0.0
1806. ic4h7+h=ic4h8                               1.00E+14    0.0        0.0
1807. ic4h9+h=ic4h8+h2                            9.04E+11    0.0        0.0
1808. ic4h9=tc4h9                                 3.56E+10    0.9    34600.0
1809. ic4h9=c3h6+ch3                              9.59E+11    0.8    30710.0
1810. ic4h9o2+c3h6=ic4h9o2h+c3h5-a                3.24E+11    0.0    14900.0
         Reverse Arrhenius coefficients:          2.00E+10    0.0    15000.0
1811. ic4h9o2+ic4h8=ic4h9o2h+ic4h7                1.40E+12    0.0    14900.0
         Reverse Arrhenius coefficients:          3.16E+11    0.0    13000.0
1812. ic4h9o2+c4h8-1=ic4h9o2h+c4h713              1.40E+12    0.0    14900.0
         Reverse Arrhenius coefficients:          3.16E+11    0.0    13000.0
1813. ic4h9o=ch2o+ic3h7                           2.00E+14    0.0    17500.0
         Reverse Arrhenius coefficients:          2.16E+11    0.1    11510.0
1814. ic4h9o+o2=ic3h7cho+ho2                      1.93E+11    0.0     1660.0
         Reverse Arrhenius coefficients:          1.88E+09    0.4    32620.0
1815. ic4h9o2h=ic4h9o+oh                          1.50E+16    0.0    42500.0
         Reverse Arrhenius coefficients:          1.66E+08    1.7    -3245.0
1816. ic4h9o2+ho2=ic4h9o2h+o2                     1.75E+10    0.0    -3275.0
         Reverse Arrhenius coefficients:          5.11E+13   -0.8    34480.0
1817. ic4h9o2+h2o2=ic4h9o2h+ho2                   2.40E+12    0.0    10000.0
         Reverse Arrhenius coefficients:          2.40E+12    0.0    10000.0
1818. ic4h9o2+ch2o=ic4h9o2h+hco                   1.30E+11    0.0     9000.0
         Reverse Arrhenius coefficients:          2.50E+10    0.0    10100.0
1819. ic4h9o2+ch3o2=>ic4h9o+ch3o+o2               1.40E+16   -1.6     1860.0
1820. ic4h9o2+ic4h9o2=>o2+ic4h9o+ic4h9o           1.40E+16   -1.6     1860.0
1821. ic4h9o2+ho2=>ic4h9o+oh+o2                   1.40E-14   -1.6     1860.0
1822. ic4h9o2+ch3=ic4h9o+ch3o                     7.00E+12    0.0    -1000.0
         Reverse Arrhenius coefficients:          1.77E+12    0.2    26240.0
1823. ic4h9o2+c2h5=ic4h9o+ch3ch2o                 7.00E+12    0.0    -1000.0
         Reverse Arrhenius coefficients:          3.90E+12    0.2    29180.0
1824. ic4h9o2+ic4h9=ic4h9o+ic4h9o                 7.00E+12    0.0    -1000.0
         Reverse Arrhenius coefficients:          7.33E+13   -0.2    29370.0
1825. ic4h9o2+c3h5-a=ic4h9o+c3h5o                 7.00E+12    0.0    -1000.0
         Reverse Arrhenius coefficients:          1.18E+11    0.4    14950.0
1826. ic4h9o2+ic4h7=ic4h9o+ic4h7o                 7.00E+12    0.0    -1000.0
         Reverse Arrhenius coefficients:          1.27E+11    0.4    14740.0
1827. ic4h9+ho2=ic4h9o+oh                         7.00E+12    0.0    -1000.0
         Reverse Arrhenius coefficients:          1.26E+16   -0.7    26680.0
1828. ch3o2+ic4h9=ch3o+ic4h9o                     7.00E+12    0.0    -1000.0
         Reverse Arrhenius coefficients:          1.23E+18   -1.3    31440.0
1829. ic4h9o=ic3h7cho+h                           4.00E+14    0.0    21500.0
         Reverse Arrhenius coefficients:          1.14E+10    1.1     2500.0
1830. ic4h9o+ho2=ic3h7cho+h2o2                    1.00E+12    0.0        0.0
         Reverse Arrhenius coefficients:          1.38E+13   -0.2    72130.0
1831. ic4h9o+oh=ic3h7cho+h2o                      1.81E+13    0.0        0.0
         Reverse Arrhenius coefficients:          4.21E+13    0.1   103600.0
1832. ic4h9o+ch3=ic3h7cho+ch4                     2.40E+13    0.0        0.0
         Reverse Arrhenius coefficients:          3.37E+14    0.1    88920.0
1833. ic4h9o+o=ic3h7cho+oh                        6.00E+12    0.0        0.0
         Reverse Arrhenius coefficients:          1.42E+12    0.1    86350.0
1834. ic4h9o+h=ic3h7cho+h2                        1.99E+13    0.0        0.0
         Reverse Arrhenius coefficients:          1.07E+13    0.1    88440.0
1835. ic4h8+h=ic4h9                               6.25E+11    0.5     2620.0
1836. ic4h8+h=tc4h9                               1.06E+12    0.5     1230.0
1837. ic4h8+o=oh+ic4h7                            2.64E+11    0.7     3250.0
1838. ic4h8+h=h2+ic4h7                            1.72E+14    0.0     7990.0
1839. ic4h8+oh=h2o+ic4h7                          6.00E+06    2.0     -298.0
1840. ic4h8+ho2=h2o2+ic4h7                        1.92E+04    2.6    13900.0
1841. ic4h8+ch3=ch4+ic4h7                         3.00E+11    0.0     7300.0
1842. ic4h8+o2=ic4h7+ho2                          6.00E+12    0.0    39900.0
         Reverse Arrhenius coefficients:          2.21E+12   -0.3       30.0
1843. c3h5-t+ch3(+m)=ic4h8(+m)                    2.50E+13    0.0        0.0
      Low pressure limit:  0.42700E+59 -0.11940E+02  0.97698E+04
      TROE centering:      0.17500E+00  0.13406E+04  0.60000E+05  0.10140E+05
         h2o              Enhanced by    6.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         ch4              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
         h2               Enhanced by    2.000E+00
         c2h2             Enhanced by    3.000E+00
         c2h4             Enhanced by    3.000E+00
         ar               Enhanced by    7.000E-01
1844. ic4h8+o=ch2co+ch3+ch3                       3.33E+07    1.8       76.0
         Reverse Arrhenius coefficients:          0.00E+00    0.0        0.0
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1845. ic4h8+o=ic3h7+hco	1.58E+07	1.8	-1216.0
Reverse Arrhenius coefficients:	1.75E+09	0.5	27580.0
1846. ic4h8+ch3o2=ic4h7+ch3o2h	1.93E+04	2.6	13910.0
Reverse Arrhenius coefficients:	2.09E+07	1.5	12190.0
1847. ic4h8+c3h5-t=ic4h7+c3h6	7.94E+11	0.0	20500.0
Reverse Arrhenius coefficients:	5.59E+20	-1.3	80170.0
1848. ic4h8+c3h5-s=ic4h7+c3h6	7.94E+11	0.0	20500.0
Reverse Arrhenius coefficients:	5.59E+20	-1.3	82170.0
1849. ic4h8+c3h5-a=ic4h7+c3h6	7.94E+11	0.0	20500.0
Reverse Arrhenius coefficients:	4.40E+20	-1.3	60610.0
1850. tc4h9+o2=ic4h8+ho2	2.07E+12	0.0	5000.0
1851. ic4h9+o2=ic4h8+ho2	4.50E+11	0.0	5000.0
1852. ic4h8+h=ch3+c3h6	1.72E+13	0.0	3600.0
1853. ic4h8o+oh=>ic3h6cho+h2o	1.25E+12	0.0	0.0
1854. ic4h8o+h=>ic3h6cho+h2	1.25E+12	0.0	0.0
1855. ic4h8o+ho2=>ic3h6cho+h2o2	2.50E+12	0.0	15000.0
1856. ic4h8o+ch3o2=>ic3h6cho+ch3o2h	2.50E+12	0.0	19000.0
1857. ic4h8o+ch3=>ic3h6cho+ch4	5.00E+10	0.0	10000.0
1858. ic4h8o+o=>ic3h6cho+oh	1.25E+12	0.0	0.0
1859. ic4h7=c3h4-a+ch3	7.10E+10	1.4	56360.0
Reverse Arrhenius coefficients:	3.02E+41	-8.7	26620.0
1860. ic4h7+o=ic3h5cho+h	6.03E+13	0.0	0.0
Reverse Arrhenius coefficients:	5.01E+15	-0.3	66490.0
1861. ic4h8+ho2=ic4h8o+oh	1.29E+12	0.0	13340.0
Reverse Arrhenius coefficients:	1.00E+12	0.0	7500.0
1862. ic4h8oh=ic4h8+oh	9.65E+13	-0.4	28500.0
Reverse Arrhenius coefficients:	9.93E+11	0.0	-960.0
1863. ic4h9+o2=ic4h9o2	1.50E+18	-2.5	0.0
1864. ic4h9o2=tc4h8io2h	1.67E+09	1.0	29500.0
1865. ic4h9o2=ic4h8io2h	1.53E+08	1.0	28000.0
1866. tc4h8io2h+o2=o2tc4h8io2h	2.50E+19	-2.5	0.0
1867. ic4h8io2h+o2=o2ic4h8io2h	1.50E+18	-2.5	0.0
1868. o2tc4h8io2h=ho2tc4h7io+oh	3.34E+09	1.0	30500.0
1869. o2ic4h8io2h=ho2ic4h7io+oh	5.75E+08	1.0	20000.0
1870. ho2tc4h7io=>hco+ch3coch3+oh	1.00E+16	0.0	42000.0
1871. ho2ic4h7io=>ch2o+ch3chcho+oh	1.00E+16	0.0	42000.0
1872. ic4h8to2h=ic4h8+ho2	7.16E+19	-2.1	20660.0
Reverse Arrhenius coefficients:	3.97E+11	0.0	12620.0
1873. tc4h8io2h=ic4h8+ho2	1.02E+16	-1.1	18820.0
Reverse Arrhenius coefficients:	3.97E+11	0.0	12620.0
1874. tc4h8io2h=>ic4h8o+oh	4.00E+11	0.0	22000.0
1875. ic4h8io2h=>oh+ch2o+c3h6	8.45E+15	-0.7	29170.0
1876. ic4h7oh=ic4h7o+h	5.97E+16	-0.6	105900.0
Reverse Arrhenius coefficients:	4.00E+13	0.0	0.0
1877. ic4h8oh=ic4h7oh+h	3.71E+14	-0.4	40790.0
Reverse Arrhenius coefficients:	1.00E+13	0.0	1200.0
1878. ic4h7o+h2=ic4h7oh+h	9.05E+06	2.0	17830.0
Reverse Arrhenius coefficients:	7.16E+05	2.4	16310.0
1879. ic4h7oh=ic4h7+oh	7.31E+16	-0.4	79700.0
Reverse Arrhenius coefficients:	3.00E+13	0.0	0.0
1880. ic4h8+o=>ic3h6co+h+h	1.66E+07	1.8	76.0
1881. ic4h8o=ic3h7cho	4.18E+13	0.0	52720.0
Reverse Arrhenius coefficients:	1.39E+10	0.6	72050.0
1882. ic4h7o=ic3h5cho+h	5.00E+13	0.0	29100.0
Reverse Arrhenius coefficients:	3.07E+11	0.5	16470.0
1883. ic3h6cho=c3h6+hco	1.03E+15	-0.6	23170.0
Reverse Arrhenius coefficients:	1.00E+11	0.0	7800.0
1884. ic3h6cho=c2h3cho+ch3	2.42E+13	-0.3	22470.0
Reverse Arrhenius coefficients:	1.00E+11	0.0	7800.0
1885. ic4h7+o2=ic3h5cho+oh	2.47E+13	-0.5	23020.0
Reverse Arrhenius coefficients:	1.62E+14	-0.8	73390.0
1886. ic4h7+o2=ch3coch2+ch2o	7.14E+15	-1.2	21050.0
Reverse Arrhenius coefficients:	1.23E+15	-1.2	90190.0
1887. ic4h7+o2=>c3h4-a+ch2o+oh	7.29E+29	-5.7	21450.0
1888. ic4h7o+o2=ic3h5cho+ho2	3.00E+10	0.0	1649.0
Reverse Arrhenius coefficients:	6.31E+10	-0.1	38980.0
1889. ic4h7o+ho2=ic3h5cho+h2o2	3.00E+11	0.0	0.0
Reverse Arrhenius coefficients:	8.93E+14	-0.8	78500.0
1890. ic4h7o+ch3=ic3h5cho+ch4	2.40E+13	0.0	0.0
Reverse Arrhenius coefficients:	7.26E+16	-0.5	95290.0
1891. ic4h7o+o=ic3h5cho+oh	6.00E+12	0.0	0.0
Reverse Arrhenius coefficients:	3.05E+14	-0.5	92720.0
1892. ic4h7o+oh=ic3h5cho+h2o	1.81E+13	0.0	0.0
Reverse Arrhenius coefficients:	9.08E+15	-0.5	110000.0
1893. ic4h7o+h=ic3h5cho+h2	1.99E+13	0.0	0.0
Reverse Arrhenius coefficients:	2.30E+15	-0.5	94810.0
1894. ic4h7o=ic4h6oh	1.39E+11	0.0	15600.0
Reverse Arrhenius coefficients:	4.23E+11	-0.2	31670.0
1895. ic4h6oh+h2=ic4h7oh+h	2.16E+04	2.4	18990.0
Reverse Arrhenius coefficients:	5.61E+02	3.0	1399.0
1896. ic4h6oh+ho2=ic4h7oh+o2	4.19E+13	-0.3	9.0
Reverse Arrhenius coefficients:	6.00E+13	0.0	39900.0
1897. ic4h6oh+ch2o=ic4h7oh+hco	6.30E+08	1.9	18190.0
Reverse Arrhenius coefficients:	1.31E+06	2.5	15270.0
1898. ic4h6oh+ic4h8=ic4h7oh+ic4h7	4.70E+02	3.3	19840.0
Reverse Arrhenius coefficients:	2.81E-01	3.9	6521.0
1899. ic4h6oh+h2o=ic4h7oh+oh	5.20E+08	1.4	32450.0
Reverse Arrhenius coefficients:	3.12E+06	2.0	-298.0
1900. ic4h6oh+ch4=ic4h7oh+ch3	2.22E+03	2.9	23750.0
Reverse Arrhenius coefficients:	2.21E+00	3.5	5675.0
1901. ic4h6oh+c3h6=ic4h7oh+c3h5-a	4.82E+04	2.5	19230.0
Reverse Arrhenius coefficients:	5.75E+02	3.1	18670.0
1902. ic4h6oh+ch3cho=ic4h7oh+ch3co	1.30E+09	1.4	17440.0
Reverse Arrhenius coefficients:	5.30E+06	2.0	16240.0

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1903. ic4h7oh=ic4h6oh+h                          4.90E+16   -0.4    89850.0
        Reverse Arrhenius coefficients:          1.00E+14    0.0        0.0
1904. ic4h7oh+ho2=ic4h6oh+h2o2                   7.92E+02    3.0    12300.0
        Reverse Arrhenius coefficients:          7.83E+05    2.0    13580.0
1905. ic4h6oh=c3h4-a+ch2oh                       1.72E+22   -2.7    54980.0
        Reverse Arrhenius coefficients:          1.00E+11    0.0     9200.0
1906. ic4h6oh+ho2=>c3h4oh+ch2o+oh                1.45E+13    0.0        0.0
1907. c2h5coch3+h<=>c2h5+ch3cho                  3.55E+12   -0.1     7920.7
1908. c2h5coch3+h<=>c2h5cho+ch3                  9.98E+10    0.3     9474.7
1909. c2h5coch3(+m)<=>c2h5+ch3co(+m)             3.56E+27   -3.2    85748.1
      Low pressure limit:  0.25780E+80 -0.17020E+02  0.96875E+05
      TROE centering:      0.20000E-03  0.91070E+03  0.22707E+05  0.56355E+04
         h2               Enhanced by    2.000E+00
         h2o              Enhanced by    6.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         ch4              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
1910. c2h5coch3(+m)<=>c2h5co+ch3(+m)             3.36E+27   -3.4    88546.3
      Low pressure limit:  0.11750E+73 -0.15361E+02  0.90947E+05
      TROE centering:      0.76000E-01  0.70200E+03  0.74415E+05  0.50698E+04
         h2               Enhanced by    2.000E+00
         h2o              Enhanced by    6.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         ch4              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
1911. c2h5coch3(+m)<=>ch3coch2+ch3(+m)           2.24E+24   -2.5    87646.2
      Low pressure limit:  0.44170E+70 -0.14656E+02  0.94756E+05
      TROE centering:      0.12440E+00  0.10579E+04  0.10430E+07  0.61129E+04
         h2               Enhanced by    2.000E+00
         h2o              Enhanced by    6.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         ch4              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
1912. c2h5coch3(+m)<=>h+c2h5coch2(+m)            3.05E+16   -0.3    97579.1
      Low pressure limit:  0.46750E+32 -0.45850E+01  0.83405E+05
      TROE centering:      0.66330E+00  0.15028E+06  0.32000E+01  0.10054E+04
         h2               Enhanced by    2.000E+00
         h2o              Enhanced by    6.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         ch4              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
1913. c2h5coch3(+m)<=>h+ch3chcoch3(+m)           1.23E+14    0.4    91068.9
      Low pressure limit:  0.74800E+33 -0.51040E+01  0.70813E+05
      TROE centering:      0.50000E+00  0.12000E+01  0.12000E+01  0.14285E+04
         h2               Enhanced by    2.000E+00
         h2o              Enhanced by    6.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         ch4              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
1914. c2h5coch3(+m)<=>h+acetoch2(+m)             3.23E+13    0.7    99725.1
      Low pressure limit:  0.40220E+27 -0.30930E+01  0.85410E+05
      TROE centering:      0.20400E-01  0.22467E+04  0.17054E+04  0.10730E+04
         h2               Enhanced by    2.000E+00
         h2o              Enhanced by    6.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         ch4              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
1915. c2h5coch3+oh<=>acetoch2+h2o                1.35E+00    3.8    -2900.0
1916. c2h5coch3+oh<=>ch3chcoch3+h2o              2.36E+02    3.1    -3050.0
1917. c2h5coch3+oh<=>c2h5coch2+h2o               3.99E+02    3.1     -944.0
1918. c2h5coch3+ho2<=>acetoch2+h2o2              6.18E-05    4.9    11100.0
1919. c2h5coch3+ho2<=>ch3chcoch3+h2o2            8.42E-02    3.9    10400.0
1920. c2h5coch3+ho2<=>c2h5coch2+h2o2             5.58E-03    4.3    13400.0
1921. c2h5coch3+ch3<=>acetoch2+ch4               3.60E+00    3.5    11228.3
1922. c2h5coch3+ch3<=>ch3chcoch3+ch4             2.00E+00    3.4     6858.1
1923. c2h5coch3+ch3<=>c2h5coch2+ch4              2.04E+01    3.4     9356.1
1924. c2h5coch3+h<=>acetoch2+h2                  7.35E+06    2.3     8780.9
1925. c2h5coch3+h<=>ch3chcoch3+h2                1.99E+06    2.3     4083.8
1926. c2h5coch3+h<=>c2h5coch2+h2                 1.20E+07    2.2     6937.8
1927. c2h5coch3+o<=>acetoch2+oh                  9.81E+05    2.4     4750.0
1928. c2h5coch3+o<=>ch3chcoch3+oh                1.44E+11    0.2     2970.0
1929. c2h5coch3+o<=>c2h5coch2+oh                 5.00E+12    0.0     5962.0
1930. c2h5coch3+o2<=>acetoch2+ho2                3.00E+13    0.0    52290.0
1931. c2h5coch3+o2<=>ch3chcoch3+ho2              2.02E+13    0.0    45850.0
1932. c2h5coch3+o2<=>c2h5coch2+ho2               2.05E+13    0.0    49150.0
1933. c2h5coch3+ch3o<=>acetoch2+ch3oh            2.17E+11    0.0     6460.0
1934. c2h5coch3+ch3o<=>ch3chcoch3+ch3oh          5.76E+11    0.0     4573.0
1935. c2h5coch3+ch3o<=>c2h5coch2+ch3oh           2.17E+11    0.0     4660.0
1936. c2h5coch3+ch3o2<=>acetoch2+ch3o2h          6.90E-01    4.0    18280.0
1937. c2h5coch3+ch3o2<=>ch3chcoch3+ch3o2h        3.44E+12    0.1    17880.0
1938. c2h5coch3+ch3o2<=>c2h5coch2+ch3o2h         3.01E+12    0.0    17580.0
1939. c2h5coch3+c2h3<=>acetoch2+c2h4             5.00E+11    0.0    10400.0
1940. c2h5coch3+c2h3<=>ch3chcoch3+c2h4           3.00E+11    0.0     5600.0
1941. c2h5coch3+c2h3<=>c2h5coch2+c2h4            6.15E+10    0.0     4278.0
1942. c2h5coch3+c2h5<=>acetoch2+c2h6             5.00E+10    0.0    13400.0
1943. c2h5coch3+c2h5<=>ch3chcoch3+c2h6           3.00E+11    0.0     8600.0
1944. c2h5coch3+c2h5<=>c2h5coch2+c2h6            5.00E+10    0.0    11600.0
1945. acetoch2+o2<=>ho2+c2h3coch3                2.63E+00    3.5     1481.2
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1946. acetoch2<=>c2h4+ch3co                        3.83E+32   -6.0    32835.5
1947. acetoch2<=>h+c2h3coch3                       1.40E+35   -7.3    44868.4
1948. acetoch2<=>ch3chcoch3                        1.01E+40   -8.8    42042.9
1949. acetoch2<=>c2h5coch2                         3.35E+33   -7.1    34478.6
1950. acetoch2<=>ch3+ch3chco                       6.44E+11   -0.1    43433.5
1951. acetoch2<=>c2h5+ch2co                        1.21E+29   -5.4    46577.5
1952. h+acetoch2<=>c2h5+ch3co                      1.47E+35   -5.8    20746.4
1953. h+acetoch2<=>c2h5co+ch3                      9.35E+33   -5.5    20860.3
1954. h+acetoch2<=>ch3coch2+ch3                    8.13E+32   -5.2    20915.9
1955. ch3chcoch3+o2<=>c2h3coch3+ho2                3.86E-07    4.2     4221.5
      Declared duplicate reaction...
1956. ch3chcoch3+o2<=>c2h3coch3+ho2                1.50E-02    4.0    13140.8
      Declared duplicate reaction...
1957. ch3chcoch3+o2<=>c2h3coch3+ho2                2.27E+11   -0.2     7653.1
      Declared duplicate reaction...
1958. ch3chcoch3+o2<=>ch3choococh3                 2.60E+39   -9.2     4825.7
      Declared duplicate reaction...
1959. ch3chcoch3+o2<=>ch3choococh3                 2.37E+79  -19.5    50634.6
      Declared duplicate reaction...
1960. ch3choococh3<=>c2h3coch3+ho2                 1.78E+25   -5.1    25130.0
1961. ch3chcoch3<=>ch3+ch3chco                     1.52E+31   -5.2    53980.4
1962. ch3chcoch3<=>h+c2h3coch3                     1.67E+29   -4.8    53356.2
1963. ch3chcoch3<=>c2h5coch2                       1.22E+48  -10.9    67143.5
1964. ch3chcoch3<=>c2h4+ch3co                      8.42E+39   -7.9    59709.2
1965. ch3chcoch3<=>c2h5+ch2co                      7.13E+50  -11.1    79262.1
1966. h+ch3chcoch3<=>c2h5+ch3co                    3.32E+36   -6.1    24776.3
1967. h+ch3chcoch3<=>ch3coch2+ch3                  3.08E+38   -6.7    28683.2
1968. h+ch3chcoch3<=>c2h5co+ch3                    4.41E+39   -7.0    28667.2
1969. c2h5coch2<=>c2h5+ch2co                       1.70E+29   -4.8    42920.1
1970. c2h5coch2<=>ch3+ch3chco                      6.92E+48  -10.6    74370.0
1971. c2h5coch2<=>c2h4+ch3co                       6.32E+42   -9.0    52442.6
1972. c2h5coch2<=>h+c2h3coch3                      1.35E+35   -7.1    57179.5
1973. h+c2h5coch2<=>c2h5+ch3co                     2.24E+39   -6.9    25024.3
1974. h+c2h5coch2<=>c2h5co+ch3                     3.24E+44   -8.3    30920.4
1975. h+c2h5coch2<=>ch3coch2+ch3                   1.76E+35   -5.7    23742.0
1976. ch3chco+h<=>c2h3co+h2                        1.43E+06    2.3     4022.7
1977. ch3chco+oh<=>c2h3co+h2o                      2.27E+03    3.0     -793.5
1978. ch3chco+ch3<=>c2h3co+ch4                     1.17E-01    4.0     7457.4
1979. ch3chco+ho2<=>c2h3co+h2o2                    6.72E-04    4.5     8803.1
1980. ch3chco+o<=>c2h3co+oh                        1.75E+11    0.7     5884.0
1981. ch3chco+o2<=>c2h3co+ho2                      5.96E+19   -1.7    46192.1
1982. ch3chco+oh=>c2h5+co2                         2.62E+08    0.9    11817.9
1983. ch3chco+oh=>ch3choh+co                       6.25E+04    2.1    -3207.4
1984. ch3chco+o=>ch3cho+co                         3.20E+12    0.0     -437.0
1985. ch3chco(+m)<=>c2h4+co(+m)                    1.81E+10    0.9    78030.6
      Low pressure limit:  0.10020E+55 -0.99890E+01  0.87553E+05
      TROE centering:      0.50000E+00  0.13586E+04  0.13586E+04  0.77374E+04
1986. ch3chco+h<=>c2h3cho+h                        5.45E+17   -0.9    20684.2
1987. ch3chco+h<=>c2h5+co                          3.09E+08    1.3     1834.7
1988. c2h3coch3(+m)<=>ch3co+c2h3(+m)               2.58E+22   -1.7    92775.2
      Low pressure limit:  0.43080E+64 -0.12945E+02  0.10164E+06
      TROE centering:      0.24820E+00  0.57015E+04  0.36000E+02  0.10539E+05
         h2               Enhanced by    2.000E+00
         h2o              Enhanced by    6.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         ch4              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
1989. c2h3coch3(+m)<=>c2h3co+ch3(+m)               9.77E+20   -1.2    84070.1
      Low pressure limit:  0.23380E+74 -0.15321E+02  0.93700E+05
      TROE centering:      0.31730E+00  0.92670E+03  0.39500E+02  0.66310E+04
         h2               Enhanced by    2.000E+00
         h2o              Enhanced by    6.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         ch4              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
1990. c2h3coch3(+m)<=>c2h3coch2+h(+m)              3.52E+18   -0.9    99383.8
      Low pressure limit:  0.31600E+40 -0.66860E+01  0.93378E+05
      TROE centering:      0.34720E+00  0.70000E+00  0.20800E+02  0.13920E+03
         h2               Enhanced by    2.000E+00
         h2o              Enhanced by    6.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         ch4              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
1991. c2h3coch3+oh<=>c2h3coch2+h2o                 4.17E+13    0.0     4700.0
1992. c2h3coch3+ho2<=>c2h3coch2+h2o2               1.67E-02    4.3    16400.0
1993. c2h3coch3+o<=>c2h3coch2+oh                   5.00E+12    0.0     5962.0
1994. c2h3coch3+h<=>c2h3coch2+h2                   5.62E+04    2.6     5287.1
1995. c2h3coch3+ch3<=>c2h3coch2+ch4                2.69E-01    3.8     7971.5
1996. c2h3coch3+c2h3=c2h3coch2+c2h4                6.15E+10    0.0     4278.0
1997. c2h3coch3+oh<=>ch3cho+ch3co                  6.68E+17   -1.4     6375.0
1998. h+c2h3coch3<=>c2h4+ch3co                     1.26E+21   -2.0    12593.5
1999. h+c2h3coch3<=>ch3+ch3chco                    4.94E+22   -2.0    23813.6
2000. c2h3coch3+ch3<=>c3h6+ch3co                   4.69E+20   -2.5    19711.0
2001. h+c2h3coch2<=>c2h3co+ch3                     2.69E+28   -3.8    15586.8
2002. h+c2h3coch2<=>c2h3+ch3co                     3.14E+26   -3.4    18155.7
2003. c2h3coch2(+m)<=>ch2co+c2h3(+m)               4.87E+14   -0.1    48621.5
      Low pressure limit:  0.59560E+33 -0.46130E+01  0.37873E+05
      TROE centering:      0.50500E-01  0.80870E+03  0.40299E+04  0.61983E+04
         h2               Enhanced by    2.000E+00
         h2o              Enhanced by    6.000E+00
         co               Enhanced by    1.500E+00
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         co2              Enhanced by    2.000E+00
         ch4              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
2004. c2h3coch2+o<=>c2h3co+ch2o                     6.02E+13    0.0        0.0
2005. c2h3coch2+ho2<=>c2h3coch2o2h                  2.13E+50  -12.0    11723.1
2006. c2h3coch2+ho2<=>c2h3coch2o+oh                 1.58E+22   -2.7     5972.3
2007. c2h3coch2o2h<=>c2h3coch2o+oh                  2.39E+36   -6.5    49429.0
2008. c2h3coch2o(+m)<=>c2h3co+ch2o(+m)              2.06E+01    3.6     -487.4
      Low pressure limit:  0.37950E+20 -0.13040E+01  0.52154E+04
      TROE centering:      0.31000E-02  0.15370E+03  0.16000E+01  0.96880E+03
         h2               Enhanced by    2.000E+00
         h2o              Enhanced by    6.000E+00
         co               Enhanced by    1.500E+00
         co2              Enhanced by    2.000E+00
         ch4              Enhanced by    2.000E+00
         c2h6             Enhanced by    3.000E+00
2009. c4h9oc4h8-a+h<=>c4h9oc4h9                     1.00E+14    0.0        0.0
2010. c4h9oc4h8-b+h<=>c4h9oc4h9                     1.00E+14    0.0        0.0
2011. c4h9oc4h8-c+h<=>c4h9oc4h9                     1.00E+14    0.0        0.0
2012. c4h9oc4h8-d+h<=>c4h9oc4h9                     1.00E+14    0.0        0.0
2013. c4h9oc4h9(+m)<=>ch3+c4h9oc3h6(+m)             3.79E+24   -2.2    88070.0
      Low pressure limit:  0.17820E+61 -0.12280E+02  0.83980E+05
      TROE centering:      0.23520E+00  0.72400E+03  0.50000E+10  0.50000E+10
2014. c4h9oc4h9(+m)<=>c2h5+c4h9oc2h4(+m)            5.53E+24   -2.2    89010.0
      Low pressure limit:  0.66320E+60 -0.12130E+02  0.84720E+05
      TROE centering:      0.24380E+00  0.74406E+03  0.50000E+10  0.50000E+10
2015. c4h9oc4h9(+m)=c4h9och2+nc3h7(+m)              3.02E+23   -1.9    85710.0
      Low pressure limit:  0.14160E+60 -0.11930E+02  0.83980E+05
      TROE centering:      0.76460E+00  0.83440E+10  0.72480E+03  0.82140E+10
2016. c4h9oc4h9(+m)=pc4h9+pc4h9o(+m)                6.33E+20   -1.4    89930.0
      Low pressure limit:  0.69020E+52 -0.10210E+02  0.84200E+05
      TROE centering:      0.70300E+00  0.98820E+10  0.63468E+03  0.17860E+10
2017. c4h9oc4h9<=>pc4h9oh+c4h8-1                    2.30E+41   -8.6    77125.0
2018. c4h9oc4h9+h<=>c4h9oc4h8-a+h2                  6.00E+07    1.8     3107.0
      Declared duplicate reaction...
2019. c4h9oc4h9+h<=>c4h9oc4h8-a+h2                  7.80E+07    1.8     3203.0
      Declared duplicate reaction...
2020. c4h9oc4h9+h<=>c4h9oc4h8-b+h2                  3.20E+08    1.6     6596.0
      Declared duplicate reaction...
2021. c4h9oc4h9+h<=>c4h9oc4h8-b+h2                  6.10E+07    1.8     6095.0
      Declared duplicate reaction...
2022. c4h9oc4h9+h<=>c4h9oc4h8-c+h2                  8.30E+07    1.8     4995.0
      Declared duplicate reaction...
2023. c4h9oc4h9+h<=>c4h9oc4h8-c+h2                  7.00E+07    1.8     5091.0
      Declared duplicate reaction...
2024. c4h9oc4h9+h<=>c4h9oc4h8-d+h2                  3.30E+07    1.9     7600.0
      Declared duplicate reaction...
2025. c4h9oc4h9+h<=>c4h9oc4h8-d+h2                  9.20E+07    1.8     7791.0
      Declared duplicate reaction...
2026. c4h9oc4h9+h<=>c4h9oc4h8-d+h2                  9.40E+07    1.9     8102.0
      Declared duplicate reaction...
2027. c4h9oc4h9+oh<=>c4h9oc4h8-a+h2o                2.61E+05    2.4    -1457.0
2028. c4h9oc4h9+oh<=>c4h9oc4h8-b+h2o                9.36E+07    1.6      -35.0
2029. c4h9oc4h9+oh<=>c4h9oc4h8-c+h2o                9.36E+07    1.6      -35.0
2030. c4h9oc4h9+oh<=>c4h9oc4h8-d+h2o                2.10E+10    1.0     1590.0
2031. c4h9oc4h9+o<=>c4h9oc4h8-a+oh                  2.90E+05    2.4      876.0
2032. c4h9oc4h9+o<=>c4h9oc4h8-b+oh                  9.54E+04    2.7     2106.0
2033. c4h9oc4h9+o<=>c4h9oc4h8-c+oh                  9.54E+04    2.7     2106.0
2034. c4h9oc4h9+o<=>c4h9oc4h8-d+oh                  3.86E+05    2.7     3716.0
2035. c4h9oc4h9+ho2<=>c4h9oc4h8-a+h2o2              7.85E-01    3.7     9168.0
2036. c4h9oc4h9+ho2<=>c4h9oc4h8-b+h2o2              8.05E-03    4.2    12942.0
2037. c4h9oc4h9+ho2<=>c4h9oc4h8-c+h2o2              3.05E-01    3.7    13627.0
2038. c4h9oc4h9+ho2<=>c4h9oc4h8-d+h2o2              5.88E+01    3.2    17198.0
2039. c4h9oc4h9+ch3<=>c4h9oc4h8-a+ch4               3.99E+01    3.4     7634.0
2040. c4h9oc4h9+ch3<=>c4h9oc4h8-b+ch4               1.60E+00    3.2     6461.0
2041. c4h9oc4h9+ch3<=>c4h9oc4h8-c+ch4               3.02E+00    3.5     5481.0
2042. c4h9oc4h9+ch3<=>c4h9oc4h8-d+ch4               9.06E-01    3.6     7154.0
2043. c4h9oc4h9+o2<=>c4h9oc4h8-a+ho2                4.00E+13    0.0    46800.0
2044. c4h9oc4h9+o2<=>c4h9oc4h8-b+ho2                4.00E+13    0.0    49800.0
2045. c4h9oc4h9+o2<=>c4h9oc4h8-c+ho2                4.00E+13    0.0    49800.0
2046. c4h9oc4h9+o2<=>c4h9oc4h8-d+ho2                6.00E+13    0.0    52340.0
2047. c4h9oc4h9+c2h5<=>c4h9oc4h8-a+c2h6             4.02E+11    0.0     7900.0
2048. c4h9oc4h9+c2h5<=>c4h9oc4h8-b+c2h6             1.00E+11    0.0    10400.0
2049. c4h9oc4h9+c2h5<=>c4h9oc4h8-c+c2h6             1.00E+11    0.0    10400.0
2050. c4h9oc4h9+c2h5<=>c4h9oc4h8-d+c2h6             1.00E+11    0.0    13400.0
2051. c4h9oc4h9+ch3o<=>c4h9oc4h8-a+ch3oh            3.00E+11    0.0     4500.0
2052. c4h9oc4h9+ch3o<=>c4h9oc4h8-b+ch3oh            6.04E+10    0.2     4703.0
2053. c4h9oc4h9+ch3o<=>c4h9oc4h8-c+ch3oh            2.90E+11    0.0     4571.0
2054. c4h9oc4h9+ch3o<=>c4h9oc4h8-d+ch3oh            4.34E+11    0.0     6458.0
2055. c4h9oc4h9+ch3o2<=>c4h9oc4h8-a+ch3o2h          6.00E+12    0.0    17500.0
2056. c4h9oc4h9+ch3o2<=>c4h9oc4h8-b+ch3o2h          3.16E+03    2.8    14050.0
2057. c4h9oc4h9+ch3o2<=>c4h9oc4h8-c+ch3o2h          1.93E+04    2.6    13910.0
2058. c4h9oc4h9+ch3o2<=>c4h9oc4h8-d+ch3o2h          4.76E+04    2.5    16490.0
2059. c4h9oc2h3+h<=>c2h3oc4h8-1+h2                  1.79E+05    2.5     3420.0
2060. c4h9oc2h3+h<=>c2h3oc4h8-2+h2                  1.30E+06    2.4     4471.0
2061. c4h9oc2h3+h<=>c2h3oc4h8-3+h2                  1.30E+06    2.4     4471.0
2062. c4h9oc2h3+h<=>c2h3oc4h8-4+h2                  1.88E+05    2.8     6280.0
2063. c4h9oc2h3+oh<=>c2h3oc4h8-1+h2o                1.31E+05    2.4    -1457.0
2064. c4h9oc2h3+oh<=>c2h3oc4h8-2+h2o                4.68E+07    1.6      -35.0
2065. c4h9oc2h3+oh<=>c2h3oc4h8-3+h2o                4.68E+07    1.6      -35.0
2066. c4h9oc2h3+oh<=>c2h3oc4h8-4+h2o                1.05E+10    1.0     1590.0
2067. c4h9oc2h3+o<=>c2h3oc4h8-1+oh                  1.45E+05    2.4      876.0
2068. c4h9oc2h3+o<=>c2h3oc4h8-2+oh                  4.77E+04    2.7     2106.0
2069. c4h9oc2h3+o<=>c2h3oc4h8-3+oh                  4.77E+04    2.7     2106.0
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2070.	c4h9oc2h3+o<=>c2h3oc4h8-4+oh	1.93E+05	2.7	3716.0
2071.	c4h9oc2h3+ho2<=>c2h3oc4h8-1+h2o2	8.20E+03	2.5	10750.0
2072.	c4h9oc2h3+ho2<=>c2h3oc4h8-2+h2o2	5.60E+12	0.0	17690.0
2073.	c4h9oc2h3+ho2<=>c2h3oc4h8-3+h2o2	5.60E+12	0.0	17690.0
2074.	c4h9oc2h3+ho2<=>c2h3oc4h8-4+h2o2	1.68E+13	0.0	20440.0
2075.	c4h9oc2h3+ch3<=>c2h3oc4h8-1+ch4	1.99E+01	3.4	7634.0
2076.	c4h9oc2h3+ch3<=>c2h3oc4h8-2+ch4	8.02E-01	3.2	6461.0
2077.	c4h9oc2h3+ch3<=>c2h3oc4h8-3+ch4	1.51E+00	3.5	5481.0
2078.	c4h9oc2h3+ch3<=>c2h3oc4h8-4+ch4	4.53E-01	3.6	7154.0
2079.	c4h9oc2h3+o2<=>c2h3oc4h8-1+ho2	2.00E+13	0.0	46800.0
2080.	c4h9oc2h3+o2<=>c2h3oc4h8-2+ho2	2.00E+13	0.0	49800.0
2081.	c4h9oc2h3+o2<=>c2h3oc4h8-3+ho2	2.00E+13	0.0	49800.0
2082.	c4h9oc2h3+o2<=>c2h3oc4h8-4+ho2	3.00E+13	0.0	52340.0
2083.	c4h9oc2h3+c2h5<=>c2h3oc4h8-1+c2h6	2.01E+11	0.0	7900.0
2084.	c4h9oc2h3+c2h5<=>c2h3oc4h8-2+c2h6	5.00E+10	0.0	10400.0
2085.	c4h9oc2h3+c2h5<=>c2h3oc4h8-3+c2h6	5.00E+10	0.0	10400.0
2086.	c4h9oc2h3+c2h5<=>c2h3oc4h8-4+c2h6	5.00E+10	0.0	13400.0
2087.	c4h9oc2h3+ch3o<=>c2h3oc4h8-1+ch3oh	1.50E+11	0.0	4500.0
2088.	c4h9oc2h3+ch3o<=>c2h3oc4h8-2+ch3oh	3.02E+10	0.2	4703.0
2089.	c4h9oc2h3+ch3o<=>c2h3oc4h8-3+ch3oh	1.45E+11	0.0	4571.0
2090.	c4h9oc2h3+ch3o<=>c2h3oc4h8-4+ch3oh	2.17E+11	0.0	6458.0
2091.	c4h9oc2h3+ch3o2<=>c2h3oc4h8-1+ch3o2h	3.00E+12	0.0	17500.0
2092.	c4h9oc2h3+ch3o2<=>c2h3oc4h8-2+ch3o2h	1.58E+03	2.8	14050.0
2093.	c4h9oc2h3+ch3o2<=>c2h3oc4h8-3+ch3o2h	9.64E+03	2.6	13910.0
2094.	c4h9oc2h3+ch3o2<=>c2h3oc4h8-4+ch3o2h	2.38E+04	2.5	16490.0
2095.	c4h9oc2h3+c2h3<=>c2h3oc4h8-1+c2h4	4.00E+11	0.0	16800.0
2096.	c4h9oc2h3+c2h3<=>c2h3oc4h8-2+c2h4	4.00E+11	0.0	16800.0
2097.	c4h9oc2h3+c2h3<=>c2h3oc4h8-3+c2h4	4.00E+11	0.0	16800.0
2098.	c4h9oc2h3+c2h3<=>c2h3oc4h8-4+c2h4	5.00E+11	0.0	18000.0
2099.	c4h9oc2h3+hco<=>c2h3oc4h8-1+ch2o	5.60E+12	0.0	17690.0
2100.	c4h9oc2h3+hco<=>c2h3oc4h8-2+ch2o	5.60E+12	0.0	17690.0
2101.	c4h9oc2h3+hco<=>c2h3oc4h8-3+ch2o	5.60E+12	0.0	17690.0
2102.	c4h9oc2h3+hco<=>c2h3oc4h8-4+ch2o	8.40E+12	0.0	20440.0
2103.	c4h9oc3h5-3+h<=>c4oc3h4-3-1+h2	8.80E+04	2.7	2915.0
2104.	c4h9oc3h5-3+h<=>c4h8-1oc3h5+h2	8.80E+04	2.7	2915.0
2105.	c4h9oc3h5-3+h<=>c4h8-2oc3h5+h2	1.08E+05	2.7	4440.0
2106.	c4h9oc3h5-3+h<=>c4h8-3oc3h5+h2	1.30E+06	2.4	4471.0
2107.	c4h9oc3h5-3+h<=>c4h8-4oc3h5+h2	6.65E+05	2.5	6756.0
2108.	c4h9oc3h5-3+oh<=>c4oc3h4-3-1+h2o	6.32E+03	2.9	-2291.0
2109.	c4h9oc3h5-3+oh<=>c4h8-1oc3h5+h2o	6.32E+03	2.9	-2291.0
2110.	c4h9oc3h5-3+oh<=>c4h8-2oc3h5+h2o	3.08E+00	3.7	-3736.0
2111.	c4h9oc3h5-3+oh<=>c4h8-3oc3h5+h2o	2.28E+03	2.9	-2926.0
2112.	c4h9oc3h5-3+oh<=>c4h8-4oc3h5+h2o	1.06E+10	1.0	1586.0
2113.	c4h9oc3h5-3+o<=>c4oc3h4-3-1+oh	1.45E+05	2.5	876.0
2114.	c4h9oc3h5-3+o<=>c4h8-1oc3h5+oh	1.45E+05	2.5	876.0
2115.	c4h9oc3h5-3+o<=>c4h8-2oc3h5+oh	1.44E+05	2.6	3029.0
2116.	c4h9oc3h5-3+o<=>c4h8-3oc3h5+oh	5.50E+05	2.5	2830.0
2117.	c4h9oc3h5-3+o<=>c4h8-4oc3h5+oh	9.80E+05	2.4	4750.0
2118.	c4h9oc3h5-3+ho2<=>c4oc3h4-3-1+h2o2	3.50E-05	5.3	8268.0
2119.	c4h9oc3h5-3+ho2<=>c4h8-1oc3h5+h2o2	3.50E-05	5.3	8268.0
2120.	c4h9oc3h5-3+ho2<=>c4h8-2oc3h5+h2o2	7.51E-03	4.5	14710.0
2121.	c4h9oc3h5-3+ho2<=>c4h8-3oc3h5+h2o2	2.76E-04	4.8	11850.0
2122.	c4h9oc3h5-3+ho2<=>c4h8-4oc3h5+h2o2	8.80E-03	4.3	17270.0
2123.	c4h9oc3h5-3+ch3<=>c4oc3h4-3-1+ch4	1.99E+01	3.4	7634.0
2124.	c4h9oc3h5-3+ch3<=>c4h8-1oc3h5+ch4	1.99E+01	3.4	7634.0
2125.	c4h9oc3h5-3+ch3<=>c4h8-2oc3h5+ch4	8.02E-01	3.2	6461.0
2126.	c4h9oc3h5-3+ch3<=>c4h8-3oc3h5+ch4	1.51E+00	3.5	5481.0
2127.	c4h9oc3h5-3+ch3<=>c4h8-4oc3h5+ch4	4.53E-01	3.6	7154.0
2128.	c4h9oc3h5-3+o2<=>c4oc3h4-3-1+ho2	2.00E+13	0.0	46800.0
2129.	c4h9oc3h5-3+o2<=>c4h8-1oc3h5+ho2	2.00E+13	0.0	46800.0
2130.	c4h9oc3h5-3+o2<=>c4h8-2oc3h5+ho2	2.00E+13	0.0	49800.0
2131.	c4h9oc3h5-3+o2<=>c4h8-3oc3h5+ho2	2.00E+13	0.0	49800.0
2132.	c4h9oc3h5-3+o2<=>c4h8-4oc3h5+ho2	3.00E+13	0.0	52340.0
2133.	c4h9oc3h5-3+c2h5<=>c4oc3h4-3-1+c2h6	2.01E+11	0.0	7900.0
2134.	c4h9oc3h5-3+c2h5<=>c4h8-1oc3h5+c2h6	2.01E+11	0.0	7900.0
2135.	c4h9oc3h5-3+c2h5<=>c4h8-2oc3h5+c2h6	5.00E+10	0.0	10400.0
2136.	c4h9oc3h5-3+c2h5<=>c4h8-3oc3h5+c2h6	5.00E+10	0.0	10400.0
2137.	c4h9oc3h5-3+c2h5<=>c4h8-4oc3h5+c2h6	5.00E+10	0.0	13400.0
2138.	c4h9oc3h5-3+ch3o<=>c4oc3h4-3-1+ch3oh	1.50E+11	0.0	4500.0
2139.	c4h9oc3h5-3+ch3o<=>c4h8-1oc3h5+ch3oh	1.50E+11	0.0	4500.0
2140.	c4h9oc3h5-3+ch3o<=>c4h8-2oc3h5+ch3oh	3.02E+10	0.2	4703.0
2141.	c4h9oc3h5-3+ch3o<=>c4h8-3oc3h5+ch3oh	1.45E+11	0.0	4571.0
2142.	c4h9oc3h5-3+ch3o<=>c4h8-4oc3h5+ch3oh	2.17E+11	0.0	6458.0
2143.	c4h9oc3h5-3+ch3o2<=>c4oc3h4-3-1+ch3o2h	3.00E+12	0.0	17500.0
2144.	c4h9oc3h5-3+ch3o2<=>c4h8-1oc3h5+ch3o2h	3.00E+12	0.0	17500.0
2145.	c4h9oc3h5-3+ch3o2<=>c4h8-2oc3h5+ch3o2h	1.58E+03	2.8	14050.0
2146.	c4h9oc3h5-3+ch3o2<=>c4h8-3oc3h5+ch3o2h	9.64E+03	2.6	13910.0
2147.	c4h9oc3h5-3+ch3o2<=>c4h8-4oc3h5+ch3o2h	2.38E+04	2.5	16490.0
2148.	c4h9oc3h5-3+c2h3<=>c4oc3h4-3-1+c2h4	4.00E+11	0.0	16800.0
2149.	c4h9oc3h5-3+c2h3<=>c4h8-1oc3h5+c2h4	4.00E+11	0.0	16800.0
2150.	c4h9oc3h5-3+c2h3<=>c4h8-2oc3h5+c2h4	4.00E+11	0.0	16800.0
2151.	c4h9oc3h5-3+c2h3<=>c4h8-3oc3h5+c2h4	4.00E+11	0.0	16800.0
2152.	c4h9oc3h5-3+c2h3<=>c4h8-4oc3h5+c2h4	5.00E+11	0.0	18000.0
2153.	c4h9oc3h6<=>c4h9och2+c2h4	5.27E+21	-2.8	30991.2
2154.	c4h9och2<=>pc4h9+ch2o	1.14E+32	-5.8	29120.3
2155.	c4h9oc2h4<=>pc4h9o+c2h4	1.27E+20	-2.4	25468.7
2156.	c4h9oc4h8-a<=>pc4h9+nc3h7cho	1.14E+32	-5.8	29120.3
2157.	c4h9oc4h8-a<=>c2h5+c4h9oc2h3	1.15E+32	-5.6	35793.1
2158.	c4h9oc4h8-b<=>ch3+c4h9oc3h5-3	1.30E+20	-2.2	30468.3
2159.	c4h9oc4h8-b<=>pc4h9o+c4h8-1	1.27E+20	-2.4	25468.7
2160.	c4h9oc4h8-c<=>c3h6+c4h9och2	5.26E+21	-2.8	28991.6
2161.	c4h9oc4h8-d<=>c2h4+c4h9oc2h4	5.27E+21	-2.8	30991.2
2162.	c4h9oc4h8-a<=>h+c4h9oc4h7-2	2.85E+11	0.3	32520.0
2163.	c4h9oc4h8-b<=>h+c4h9oc4h7-2	2.85E+11	0.3	35520.0

2164.	c4h9oc4h8-b<=>h+c4h9oc4h7-3	2.85E+11	0.3	35520.0
2165.	c4h9oc4h8-c<=>h+c4h9oc4h7-3	2.85E+11	0.3	35520.0
2166.	c4h9oc4h8-c<=>h+c4h9oc4h7-4	2.85E+11	0.3	35520.0
2167.	c4h9oc4h8-d<=>h+c4h9oc4h7-4	2.85E+11	0.3	35520.0
2168.	c4h9oc3h6<=>h+c4h9oc3h5-3	2.85E+11	0.3	35520.0
2169.	c4h9oc2h4<=>h+c4h9oc2h3	2.85E+11	0.3	35520.0
2170.	ch3oc4h8-2<=>ch3o+c4h8-1	1.27E+20	-2.4	25468.7
2171.	ch3oc4h8-2<=>ch3oc3h5+ch3	1.30E+20	-2.2	30468.3
2172.	ch3oc4h8-3<=>c3h6+ch3och2	5.26E+21	-2.8	28991.6
2173.	c2h5oc4h8-1<=>c2h5+nc3h7cho	1.14E+32	-5.8	29120.3
2174.	c2h5oc4h8-1<=>c2h5oc2h3+c2h5	1.15E+32	-5.6	35793.1
2175.	c2h5oc4h8-2<=>c2h5oc3h5+ch3	1.30E+20	-2.2	30468.3
2176.	c2h5oc4h8-2<=>c4h8-1+ch3ch2o	1.27E+20	-2.4	25468.7
2177.	c2h5oc4h8-4<=>c2h5oc2h4+c2h4	5.27E+21	-2.8	30991.2
2178.	c2h5och2<=>c2h5+ch2o	1.14E+32	-5.8	29120.3
2179.	c2h4och3<=>c2h4+ch3o	1.14E+32	-5.8	29120.3
2180.	c2h5oc2h4<=>ch3ch2o+c2h4	1.14E+32	-5.8	29120.3
2181.	c2h4oc2h5<=>ch3cho+c2h5	1.14E+32	-5.8	29120.3
2182.	c2h3oc4h8-1<=>c2h3+nc3h7cho	1.14E+32	-5.8	29120.3
2183.	c2h3oc4h8-1<=>c2h3oc2h3+c2h5	1.15E+32	-5.6	35793.1
2184.	c2h3oc4h8-4<=>c2h3oc2h4-2+c2h4	5.27E+21	-2.8	30991.2
2185.	c2h3oc4h8-3<=>c2h3och2+c3h6	5.26E+21	-2.8	28991.6
2186.	c2h3oc4h8-2<=>ch2cho+c4h8-1	1.27E+20	-2.4	25468.7
2187.	c2h3oc4h8-2<=>ch3+c2h3oc3h5-3	1.30E+20	-2.2	30468.3
2188.	c2h3och2<=>ch2o+c2h3	1.14E+32	-5.8	29120.3
2189.	c2h3oc2h4-2<=>ch2cho+c2h4	1.27E+20	-2.4	25468.7
2190.	c4oc3h4-3-1<=>c2h3cho+pc4h9	1.14E+32	-5.8	29120.3
2191.	c4h8-3oc3h5<=>ch2oc3h5-3+c3h6	5.26E+21	-2.8	28991.6
2192.	ch2oc3h5-3<=>c3h5-a+ch2o	1.14E+32	-5.8	29120.3
2193.	c4h8-2oc3h5<=>c3h5o+c4h8-1	1.14E+32	-5.8	29120.3
2194.	c4h8-2oc3h5<=>c3h5oc3h5+ch3	1.30E+20	-2.2	30468.3
2195.	c4h8-4oc3h5<=>c2h4-2oc3h5+c2h4	5.27E+21	-2.8	30991.2
2196.	c2h4-2oc3h5<=>c2h4+c3h5o	1.14E+32	-5.8	29120.3
2197.	c4h8-1oc3h5<=>c3h5-a+nc3h7cho	1.14E+32	-5.8	29120.3
2198.	c4h8-1oc3h5<=>c2h3oc3h5-3+c2h5	1.15E+32	-5.6	35793.1
2199.	c4h9oc4h8-a<=>c4h9oc4h8-b	9.73E+17	-2.1	25068.8
2200.	c4h9oc4h8-a<=>c4h9oc4h8-c	1.25E+15	-1.3	18882.2
2201.	c4h9oc4h8-a<=>c4h9oc4h8-d	9.33E+16	-1.8	26657.4
2202.	c4h9och2<=>ch3oc4h8-2	9.73E+17	-2.1	25068.8
2203.	c4h9och2<=>ch3oc4h8-3	1.25E+15	-1.3	18882.2
2204.	c2h5oc4h8-1<=>c4h9oc2h4	9.73E+17	-2.1	25068.8
2205.	c4h9oc2h4<=>c2h5oc4h8-2	1.25E+15	-1.3	18882.2
2206.	c2h5oc4h8-1<=>c2h5oc4h8-2	9.73E+17	-2.1	25068.8
2207.	c2h5oc4h8-1<=>c2h5oc4h8-4	9.73E+17	-2.1	25068.8
2208.	c2h5och2<=>c2h4och3	9.73E+17	-2.1	25068.8
2209.	c2h5oc2h4<=>c2h4oc2h5	9.73E+17	-2.1	25068.8
2210.	c2h3oc4h8-1<=>c2h3oc4h8-4	9.33E+16	-1.8	26657.4
2211.	c4oc3h4-3-1<=>c4h8-2oc3h5	9.33E+16	-1.8	26657.4
2212.	c4oc3h4-3-1<=>c4h8-3oc3h5	9.33E+16	-1.8	26657.4
2213.	c4h8-1oc3h5<=>c4h8-4oc3h5	9.33E+16	-1.8	26657.4
2214.	c4h9oc4h7-2+ho2<=>c4h9oc4h6+h2o2	5.06E+02	3.4	13719.9
2215.	c4h9oc4h7-3+ho2<=>c4h9oc4h6+h2o2	5.06E+02	3.4	13719.9
2216.	c4h9oc4h7-4+ho2<=>c4h9oc4h6+h2o2	5.06E+02	3.4	13719.9
2217.	c4h9oc4h7-2+oh<=>c4h9oc4h6+h2o	3.74E+08	1.6	-34.9
2218.	c4h9oc4h7-3+oh<=>c4h9oc4h6+h2o	3.74E+08	1.6	-34.9
2219.	c4h9oc4h7-4+oh<=>c4h9oc4h6+h2o	3.74E+08	1.6	-34.9
2220.	c4h9oc4h7-2+h<=>c4h9oc4h6+h2	1.04E+07	2.4	4471.1
2221.	c4h9oc4h7-3+h<=>c4h9oc4h6+h2	1.04E+07	2.4	4471.1
2222.	c4h9oc4h7-4+h<=>c4h9oc4h6+h2	1.04E+07	2.4	4471.1
2223.	c4h9oc4h7-2+ch3<=>c4h9oc4h6+ch4	1.21E+01	3.5	5481.1
2224.	c4h9oc4h7-3+ch3<=>c4h9oc4h6+ch4	1.21E+01	3.5	5481.1
2225.	c4h9oc4h7-4+ch3<=>c4h9oc4h6+ch4	1.21E+01	3.5	5481.1
2226.	c4h9oc4h7-2+o<=>c4h9oc4h6+oh	4.42E+06	2.5	2830.1
2227.	c4h9oc4h7-3+o<=>c4h9oc4h6+oh	4.42E+06	2.5	2830.1
2228.	c4h9oc4h7-4+o<=>c4h9oc4h6+oh	4.42E+06	2.5	2830.1
2229.	c4h9oc4h7-2+oh<=>nc3h7cho+pc4h9o	1.00E+11	0.0	-4000.0
2230.	c4h9oc4h7-2+oh<=>c2h5cho+c4h9och2	1.00E+11	0.0	-4000.0
2231.	c4h9oc4h7-3+oh<=>ch3cho+c4h9oc2h4	1.00E+11	0.0	-4000.0
2232.	c4h9oc4h7-4+oh<=>ch2o+c4h9oc3h6	1.00E+11	0.0	-4000.0
2233.	c4h9oc4h7-4+oh<=>ch3cho+c4h9oc2h4	1.00E+11	0.0	-4000.0
2234.	c4h9oc4h7-2+o<=>nc3h7cho+c4h8cy1o4	1.00E+11	0.0	-4000.0
2235.	c4h9oc4h7-2+o<=>c2h5cho+c4h7och3	1.00E+11	0.0	-4000.0
2236.	c4h9oc4h7-3+o<=>ch3cho+c4h9oc2h3	1.00E+11	0.0	-4000.0
2237.	c4h9oc4h7-4+o<=>ch2o+c4h9oc3h5-3	1.00E+11	0.0	-4000.0
2238.	c4h9oc4h7-4+o<=>ch3cho+c4h9oc2h3	1.00E+11	0.0	-4000.0
2239.	c4h9oc4h6+ho2<=>sc3h5cho+pc4h9o+oh	9.64E+12	0.0	0.0
2240.	c4h9oc4h6+ch3o2<=>sc3h5cho+pc4h9o+ch3o	9.64E+12	0.0	0.0
2241.	c4h9oc4h6+c2h5o2<=>sc3h5cho+pc4h9o+ch3ch2o	9.64E+12	0.0	0.0
2242.	c4h9oc4h6<=>c4h712+c4h8cy1o4	2.50E+13	0.0	30000.0
	Reverse Arrhenius coefficients:	1.00E+11	0.0	9600.0
2243.	c4h9oc4h6<=>c3h5-s+c4h7och3	2.50E+13	0.0	30000.0
	Reverse Arrhenius coefficients:	1.00E+11	0.0	9600.0
2244.	c4h9oc4h6<=>c3h5-a+c4h7och3	2.50E+13	0.0	30000.0
	Reverse Arrhenius coefficients:	1.00E+11	0.0	9600.0
2245.	c4h9oc4h7-2<=>c4h712+pc4h9o	2.50E+16	0.0	71000.0
	Reverse Arrhenius coefficients:	1.00E+13	0.0	0.0
2246.	c4h9oc4h7-3<=>c3h5-s+c4h9och2	2.50E+16	0.0	71000.0
	Reverse Arrhenius coefficients:	1.00E+13	0.0	0.0
2247.	c4h9oc4h7-4<=>c3h5-a+c4h9och2	2.50E+16	0.0	71000.0
	Reverse Arrhenius coefficients:	1.00E+13	0.0	0.0
2248.	c4h9oc3h5-3<=>c3h5-a+pc4h9o	2.50E+16	0.0	71000.0
	Reverse Arrhenius coefficients:	1.00E+13	0.0	0.0
2249.	c4h7och3<=>ch3+ch2o+c3h5-a	2.50E+16	0.0	71000.0
	Reverse Arrhenius coefficients:	1.00E+13	0.0	0.0

2250.	c4h9oc4h7-2<=>c4h9oc2h3+c2h4	3.98E+12	0.0	57629.1
2251.	c4h9oc4h7-4<=>c4h7och3+c3h6	3.98E+12	0.0	57629.1
2252.	c4h9oc3h5-3<=>c4h8cy1o4+c3h6	3.98E+12	0.0	57629.1
2253.	ch3oc3h5<=>c2h3+ch3och2	3.98E+12	0.0	57629.1
2254.	c2h5oc3h5<=>c2h3+c2h5och2	3.98E+12	0.0	57629.1
2255.	c2h5oc2h3<=>c2h3+ch3ch2o	3.98E+12	0.0	57629.1
2256.	c2h3oc2h3<=>c2h3+ch2cho	3.98E+12	0.0	57629.1
2257.	c2h3oc2h3+oh=>ch2o+ch2o+c2h3	1.37E+12	0.0	-1040.0
2258.	c2h3oc3h5-3<=>c2h3+c3h5o	3.98E+12	0.0	57629.1
2259.	c2h3oc3h5-3<=>ch2cho+c3h5-a	3.98E+12	0.0	57629.1
2260.	c3h5oc3h5<=>c3h5-a+c3h5o	3.98E+12	0.0	57629.1
2261.	c4h9oc4h8-a+o2<=>c4oc4h8oo-a	6.74E+27	-4.8	4779.8
2262.	c4h9oc4h8-b+o2<=>c4oc4h8oo-b	6.74E+27	-4.8	3779.8
2263.	c4h9oc4h8-c+o2<=>c4oc4h8oo-c	6.74E+27	-4.8	3779.8
2264.	c4h9oc4h8-d+o2<=>c4oc4h8oo-d	1.15E+20	-2.4	2451.3
2265.	c4h9oc4h8-a+o2<=>ho2+c4h9oc4h7-2	3.70E+16	-1.6	3418.0
2266.	c4h9oc4h8-b+o2<=>ho2+c4h9oc4h7-2	3.70E+16	-1.6	3418.0
2267.	c4h9oc4h8-b+o2<=>ho2+c4h9oc4h7-3	3.70E+16	-1.6	3418.0
2268.	c4h9oc4h8-c+o2<=>ho2+c4h9oc4h7-3	3.70E+16	-1.6	3418.0
2269.	c4h9oc4h8-c+o2<=>ho2+c4h9oc4h7-4	3.35E+20	-3.0	2504.0
2270.	c4h9oc4h8-d+o2<=>ho2+c4h9oc4h7-4	3.70E+16	-1.6	3418.0
2271.	c4h9oc4h8-a+c4oc4h8oo-a<=>2c4h9oc4h8o-a	4.50E+12	0.0	-500.0
2272.	c4h9oc4h8-a+c4oc4h8oo-b<=>c4h9oc4h8o-a+c4h9oc4h8o-b	4.50E+12	0.0	0.0
2273.	c4h9oc4h8-a+c4oc4h8oo-c<=>c4h9oc4h8o-a+c4h9oc4h8o-c	4.50E+12	0.0	0.0
2274.	c4h9oc4h8-a+c4oc4h8oo-d<=>c4h9oc4h8o-a+c4h9oc4h8o-d	4.50E+12	0.0	0.0
2275.	c4h9oc4h8-b+c4oc4h8oo-a<=>c4h9oc4h8o-b+c4h9oc4h8o-a	4.50E+12	0.0	-500.0
2276.	c4h9oc4h8-b+c4oc4h8oo-b<=>2c4h9oc4h8o-b	4.50E+12	0.0	0.0
2277.	c4h9oc4h8-b+c4oc4h8oo-c<=>c4h9oc4h8o-b+c4h9oc4h8o-c	4.50E+12	0.0	0.0
2278.	c4h9oc4h8-b+c4oc4h8oo-d<=>c4h9oc4h8o-b+c4h9oc4h8o-d	4.50E+12	0.0	0.0
2279.	c4h9oc4h8-c+c4oc4h8oo-a<=>c4h9oc4h8o-c+c4h9oc4h8o-a	4.50E+12	0.0	-500.0
2280.	c4h9oc4h8-c+c4oc4h8oo-b<=>c4h9oc4h8o-c+c4h9oc4h8o-b	4.50E+12	0.0	0.0
2281.	c4h9oc4h8-c+c4oc4h8oo-c<=>2c4h9oc4h8o-c	4.50E+12	0.0	0.0
2282.	c4h9oc4h8-c+c4oc4h8oo-d<=>c4h9oc4h8o-c+c4h9oc4h8o-d	4.50E+12	0.0	0.0
2283.	c4h9oc4h8-d+c4oc4h8oo-a<=>c4h9oc4h8o-c+c4h9oc4h8o-a	4.50E+12	0.0	-500.0
2284.	c4h9oc4h8-d+c4oc4h8oo-b<=>c4h9oc4h8o-c+c4h9oc4h8o-b	4.50E+12	0.0	0.0
2285.	c4h9oc4h8-d+c4oc4h8oo-c<=>2c4h9oc4h8o-c	4.50E+12	0.0	0.0
2286.	c4h9oc4h8-d+c4oc4h8oo-d<=>c4h9oc4h8o-c+c4h9oc4h8o-d	4.50E+12	0.0	0.0
2287.	pc4h9+c4oc4h8oo-a<=>pc4h9o+c4h9oc4h8o-a	4.50E+12	0.0	-500.0
2288.	pc4h9+c4oc4h8oo-b<=>pc4h9o+c4h9oc4h8o-b	4.50E+12	0.0	0.0
2289.	pc4h9+c4oc4h8oo-c<=>pc4h9o+c4h9oc4h8o-c	4.50E+12	0.0	0.0
2290.	pc4h9+c4oc4h8oo-d<=>pc4h9o+c4h9oc4h8o-d	4.50E+12	0.0	0.0
2291.	nc3h7+c4oc4h8oo-a<=>nc3h7o+c4h9oc4h8o-a	4.50E+12	0.0	-500.0
2292.	nc3h7+c4oc4h8oo-b<=>nc3h7o+c4h9oc4h8o-b	4.50E+12	0.0	0.0
2293.	nc3h7+c4oc4h8oo-c<=>nc3h7o+c4h9oc4h8o-c	4.50E+12	0.0	0.0
2294.	nc3h7+c4oc4h8oo-d<=>nc3h7o+c4h9oc4h8o-d	4.50E+12	0.0	0.0
2295.	hco+c4oc4h8oo-a<=>hco2+c4h9oc4h8o-a	4.50E+12	0.0	-500.0
2296.	hco+c4oc4h8oo-b<=>hco2+c4h9oc4h8o-b	4.50E+12	0.0	0.0
2297.	hco+c4oc4h8oo-c<=>hco2+c4h9oc4h8o-c	4.50E+12	0.0	0.0
2298.	hco+c4oc4h8oo-d<=>hco2+c4h9oc4h8o-d	4.50E+12	0.0	0.0
2299.	c4h9oc4h8-a+ho2<=>c4h9oc4h8o-a+oh	7.00E+12	0.0	-1000.0
2300.	c4h9oc4h8-b+ho2<=>c4h9oc4h8o-b+oh	7.00E+12	0.0	-1000.0
2301.	c4h9oc4h8-c+ho2<=>c4h9oc4h8o-c+oh	7.00E+12	0.0	-1000.0
2302.	c4h9oc4h8-d+ho2<=>c4h9oc4h8o-d+oh	7.00E+12	0.0	-1000.0
2303.	c4h9oc4h8-a+ch3o2<=>c4h9oc4h8o-a+ch3o	4.50E+12	0.0	0.0
2304.	c4h9oc4h8-b+ch3o2<=>c4h9oc4h8o-b+ch3o	4.50E+12	0.0	0.0
2305.	c4h9oc4h8-c+ch3o2<=>c4h9oc4h8o-c+ch3o	4.50E+12	0.0	0.0
2306.	c4h9oc4h8-d+ch3o2<=>c4h9oc4h8o-d+ch3o	4.50E+12	0.0	0.0
2307.	c4oc4h8oo-a<=>c4oc4-ao2h-b	4.32E+08	1.3	28600.0
2308.	c4oc4h8oo-a<=>c4oc4-ao2h-c	6.18E+08	0.9	18400.0
2309.	c4oc4h8oo-a<=>c4oc4-ao2h-d	7.83E+06	1.3	20800.0
2310.	c4oc4h8oo-a<=>c4oc4-ao2h-1	6.18E+08	0.9	17400.0
2311.	c4oc4h8oo-a<=>c4oc4-ao2h-2	2.86E+06	1.3	21000.0
2312.	c4oc4h8oo-a<=>c4oc4-ao2h-3	5.34E+05	1.1	15700.0
2313.	c4oc4h8oo-b<=>c4oc4-bo2h-a	6.15E+08	1.1	27600.0
2314.	c4oc4h8oo-b<=>c4oc4-bo2h-c	6.15E+08	1.1	28600.0
2315.	c4oc4h8oo-b<=>c4oc4-bo2h-d	1.49E+08	1.1	21500.0
2316.	c4oc4h8oo-b<=>c4oc4-bo2h-1	2.86E+06	1.3	20000.0
2317.	c4oc4h8oo-b<=>c4oc4-bo2h-2	5.34E+05	1.1	15700.0
2318.	c4oc4h8oo-c<=>c4oc4-co2h-a	6.18E+08	0.9	17400.0
2319.	c4oc4h8oo-c<=>c4oc4-co2h-b	4.32E+08	1.3	28600.0
2320.	c4oc4h8oo-c<=>c4oc4-co2h-d	1.24E+07	1.6	32200.0
2321.	c4oc4h8oo-c<=>c4oc4-co2h-1	5.34E+05	1.1	14700.0
2322.	c4oc4h8oo-d<=>c4oc4-do2h-a	2.86E+06	1.3	20000.0
2323.	c4oc4h8oo-d<=>c4oc4-do2h-b	8.52E+06	1.4	17900.0
2324.	c4oc4h8oo-d<=>c4oc4-do2h-c	4.32E+08	1.3	28600.0
2325.	c4oc4h8oo-a<=>c4h9oc4h7-2+ho2	4.48E+09	0.9	29200.0
2326.	c4oc4h8oo-b<=>c4h9oc4h7-2+ho2	4.48E+09	0.9	29200.0
2327.	c4oc4h8oo-b<=>c4h9oc4h7-3+ho2	4.48E+09	0.9	29200.0
2328.	c4oc4h8oo-c<=>c4h9oc4h7-3+ho2	4.48E+09	0.9	29200.0
2329.	c4oc4h8oo-c<=>c4h9oc4h7-4+ho2	2.40E+09	1.1	30100.0
2330.	c4oc4h8oo-d<=>c4h9oc4h7-4+ho2	2.58E+07	1.6	28500.0
2331.	c4oc4h8oo-a+ho2<=>c4oc4h8ooh-a+o2	2.00E+11	0.0	650.0

2332.	c4oc4h8oo-b+ho2<=>c4oc4h8ooh-b+o2	2.00E+11	0.0	650.0
2333.	c4oc4h8oo-c+ho2<=>c4oc4h8ooh-c+o2	2.00E+11	0.0	650.0
2334.	c4oc4h8oo-d+ho2<=>c4oc4h8ooh-d+o2	2.00E+11	0.0	650.0
2335.	c4oc4h8oo-a+h2o2<=>c4oc4h8ooh-a+ho2	2.40E+12	0.0	5000.0
2336.	c4oc4h8oo-b+h2o2<=>c4oc4h8ooh-b+ho2	2.40E+12	0.0	5000.0
2337.	c4oc4h8oo-c+h2o2<=>c4oc4h8ooh-c+ho2	2.40E+12	0.0	5000.0
2338.	c4oc4h8oo-d+h2o2<=>c4oc4h8ooh-d+ho2	2.40E+12	0.0	5000.0
2339.	c4oc4h8oo-a+ch3o2=>c4h9oc4h8o-a+ch3o+o2	3.40E+16	-1.6	1500.0
2340.	c4oc4h8oo-b+ch3o2=>c4h9oc4h8o-b+ch3o+o2	3.40E+16	-1.6	2000.0
2341.	c4oc4h8oo-c+ch3o2=>c4h9oc4h8o-c+ch3o+o2	3.40E+16	-1.6	2000.0
2342.	c4oc4h8oo-d+ch3o2=>c4h9oc4h8o-d+ch3o+o2	3.40E+16	-1.6	2000.0
2343.	2c4oc4h8oo-a=>2c4h9oc4h8o-a+o2	6.80E+16	-1.6	2000.0
2344.	c4oc4h8oo-a+c4oc4h8oo-b =>c4h9oc4h8o-a+c4h9oc4h8o-b+o2	6.80E+16	-1.6	2500.0
2345.	c4oc4h8oo-a+c4oc4h8oo-c =>c4h9oc4h8o-a+c4h9oc4h8o-c+o2	6.80E+16	-1.6	2500.0
2346.	c4oc4h8oo-a+c4oc4h8oo-d =>c4h9oc4h8o-a+c4h9oc4h8o-d+o2	6.80E+16	-1.6	2500.0
2347.	2c4oc4h8oo-b=>2c4h9oc4h8o-b+o2	6.80E+16	-1.6	3000.0
2348.	c4oc4h8oo-b+c4oc4h8oo-c =>c4h9oc4h8o-b+c4h9oc4h8o-c+o2	6.80E+16	-1.6	3000.0
2349.	c4oc4h8oo-b+c4oc4h8oo-d =>c4h9oc4h8o-b+c4h9oc4h8o-d+o2	6.80E+16	-1.6	3000.0
2350.	2c4oc4h8oo-c=>2c4h9oc4h8o-c+o2	6.80E+16	-1.6	3000.0
2351.	c4oc4h8oo-c+c4oc4h8oo-d =>c4h9oc4h8o-c+c4h9oc4h8o-d+o2	6.80E+16	-1.6	3000.0
2352.	2c4oc4h8oo-d=>2c4h9oc4h8o-d+o2	6.80E+16	-1.6	3000.0
2353.	c4oc4h8oo-a+c4h91o2=>c4h9oc4h8o-a+o2+pc4h9o	6.80E+16	-1.6	2500.0
2354.	c4oc4h8oo-b+c4h91o2=>c4h9oc4h8o-b+o2+pc4h9o	6.80E+16	-1.6	3000.0
2355.	c4oc4h8oo-c+c4h91o2=>c4h9oc4h8o-c+o2+pc4h9o	6.80E+16	-1.6	3000.0
2356.	c4oc4h8oo-d+c4h91o2=>c4h9oc4h8o-d+o2+pc4h9o	6.80E+16	-1.6	3000.0
2357.	c4oc4h8oo-a+nc3h7o2=>nc3h7o+c4h9oc4h8o-a+o2	6.80E+16	-1.6	2500.0
2358.	c4oc4h8oo-b+nc3h7o2=>nc3h7o+c4h9oc4h8o-b+o2	6.80E+16	-1.6	3000.0
2359.	c4oc4h8oo-c+nc3h7o2=>nc3h7o+c4h9oc4h8o-c+o2	6.80E+16	-1.6	3000.0
2360.	c4oc4h8oo-d+nc3h7o2=>nc3h7o+c4h9oc4h8o-d+o2	6.80E+16	-1.6	3000.0
2361.	c4oc4h8oo-a+hco3=>c4h9oc4h8o-a+o2+hco2	6.80E+16	-1.6	2500.0
2362.	c4oc4h8oo-b+hco3=>c4h9oc4h8o-b+o2+hco2	6.80E+16	-1.6	3000.0
2363.	c4oc4h8oo-c+hco3=>c4h9oc4h8o-c+o2+hco2	6.80E+16	-1.6	3000.0
2364.	c4oc4h8oo-d+hco3=>c4h9oc4h8o-d+o2+hco2	6.80E+16	-1.6	3000.0
2365.	c4oc4h8ooh-a<=>c4h9oc4h8o-a+oh	1.00E+16	0.0	37000.0
2366.	c4oc4h8ooh-b<=>c4h9oc4h8o-b+oh	4.00E+15	0.0	43000.0
2367.	c4oc4h8ooh-c<=>c4h9oc4h8o-c+oh	4.00E+15	0.0	43000.0
2368.	c4oc4h8ooh-d<=>c4h9oc4h8o-d+oh	4.00E+15	0.0	43000.0
2369.	c4h9oc4h8o-a=>pc4h9o+nc3h7cho	3.15E+43	-9.4	30900.0
2370.	c4h9oc4h8o-b=>c4h9och2+c2h5cho	3.53E+36	-7.2	35800.0
2371.	c4h9oc4h8o-c=>c4h9oc2h4+ch3cho	4.38E+40	-8.4	39900.0
2372.	c4h9oc4h8o-d=>c4h9oc3h6+ch2o	4.27E+39	-8.1	38700.0
2373.	c4oc4-ao2h-b<=>c4oc4oa-b+oh	4.78E+09	0.8	9600.0
2374.	c4oc4-bo2h-a<=>c4oc4oa-b+oh	4.78E+09	0.8	9600.0
2375.	c4oc4-bo2h-c<=>c4oc4ob-c+oh	4.78E+09	0.8	9600.0
2376.	c4oc4-co2h-b<=>c4oc4ob-c+oh	4.78E+09	0.8	9600.0
2377.	c4oc4-co2h-d<=>c4oc4oc-d+oh	1.16E+11	0.4	10700.0
2378.	c4oc4-do2h-c<=>c4oc4oc-d+oh	1.71E+09	1.1	10900.0
2379.	c4oc4-ao2h-c<=>c4oc4oa-c+oh	2.68E+09	0.6	15900.0
2380.	c4oc4-ao2h-1<=>c4oc4oa-1+oh	2.68E+09	0.6	15900.0
2381.	c4oc4-bo2h-d<=>c4oc4ob-d+oh	2.03E+10	0.5	17700.0
2382.	c4oc4-co2h-a<=>c4oc4oa-c+oh	2.68E+09	0.6	15900.0
2383.	c4oc4-do2h-b<=>c4oc4ob-d+oh	8.45E+08	0.9	15300.0
2384.	c4oc4-ao2h-d<=>c4oc4oa-d+oh	2.48E+09	0.3	11200.0
2385.	c4oc4-ao2h-2<=>c4oc4oa-2+oh	2.42E+07	1.0	10300.0
2386.	c4oc4-bo2h-1<=>c4oc4oa-2+oh	2.42E+07	1.0	10300.0
2387.	c4oc4-do2h-a<=>c4oc4oa-d+oh	2.42E+07	1.0	8300.0
2388.	c4oc4-ao2h-3<=>c4oc4oa-3+oh	3.05E+07	0.8	8800.0
2389.	c4oc4-bo2h-2<=>c4oc4ob-2+oh	3.05E+07	0.8	8800.0
2390.	c4oc4-co2h-1<=>c4oc4oa-3+oh	3.05E+07	0.8	8800.0
2391.	c4oc4-ao2h-b<=>c4h9oc4h7-2+ho2	3.01E+11	0.3	15200.0
2392.	c4oc4-bo2h-a<=>c4h9oc4h7-2+ho2	7.82E+09	0.9	14900.0
2393.	c4oc4-bo2h-c<=>c4h9oc4h7-3+ho2	3.50E+11	0.4	14900.0
2394.	c4oc4-co2h-b<=>c4h9oc4h7-3+ho2	3.50E+11	0.4	14900.0
2395.	c4oc4-co2h-d<=>c4h9oc4h7-4+ho2	2.21E+12	0.2	15600.0
2396.	c4oc4-do2h-c<=>c4h9oc4h7-4+ho2	1.04E+10	0.9	15100.0
2397.	c4oc4-ao2h-1=>nc3h7cho+nc3h7cho+oh	3.15E+43	-9.4	39900.0
2398.	c4oc4-co2h-a=>c4h9oc2h3+ch3cho+oh	5.32E+44	-9.5	47397.0
2399.	c4oc4-do2h-b=>c4h9oc3h5-3+ch2o+oh	4.27E+39	-8.1	31180.0
2400.	c4oc4-do2h-b=>oh+ch2o+c3h5-a+pc4h9o	4.27E+39	-8.1	31180.0
2401.	c4oc4-ao2h-c=>c3h6+oh+c4h9ocho	3.53E+36	-7.2	42824.0
2402.	c4oc4-ao2h-b+o2<=>c8o-ao2h-bo2	6.74E+27	-4.8	3779.8
2403.	c4oc4-ao2h-c+o2<=>c8o-ao2h-co2	6.74E+27	-4.8	3779.8
2404.	c4oc4-ao2h-d+o2<=>c8o-ao2h-do2	1.15E+20	-2.4	2451.3
2405.	c4oc4-ao2h-1+o2<=>c8o-ao2h-1o2	6.74E+27	-4.8	3779.8
2406.	c4oc4-ao2h-2+o2<=>c8o-ao2h-2o2	6.74E+27	-4.8	3779.8
2407.	c4oc4-ao2h-3+o2<=>c8o-ao2h-3o2	6.74E+27	-4.8	3779.8
2408.	c4oc4-bo2h-a+o2<=>c8o-bo2h-ao2	6.74E+27	-4.8	3779.8
2409.	c4oc4-bo2h-c+o2<=>c8o-bo2h-co2	6.74E+27	-4.8	3779.8
2410.	c4oc4-bo2h-d+o2<=>c8o-bo2h-do2	1.15E+20	-2.4	2451.3
2411.	c4oc4-bo2h-1+o2<=>c8o-bo2h-1o2	6.74E+27	-4.8	3779.8
2412.	c4oc4-bo2h-2+o2<=>c8o-bo2h-2o2	6.74E+27	-4.8	3779.8
2413.	c4oc4-co2h-a+o2<=>c8o-co2h-ao2	6.74E+27	-4.8	3779.8
2414.	c4oc4-co2h-b+o2<=>c8o-co2h-bo2	6.74E+27	-4.8	3779.8
2415.	c4oc4-co2h-d+o2<=>c8o-co2h-do2	1.15E+20	-2.4	2451.3
2416.	c4oc4-co2h-1+o2<=>c8o-co2h-1o2	6.74E+27	-4.8	3779.8
2417.	c4oc4-do2h-a+o2<=>c8o-do2h-ao2	6.74E+27	-4.8	3779.8
2418.	c4oc4-do2h-b+o2<=>c8o-do2h-bo2	6.74E+27	-4.8	3779.8
2419.	c4oc4-do2h-c+o2<=>c8o-do2h-co2	6.74E+27	-4.8	3779.8

2420.	c8o-ao2h-bo2<=>c4oc4keta-b+oh	2.86E+07	1.4	19600.0
2421.	c8o-ao2h-co2<=>c4oc4keta-c+oh	2.79E+07	1.1	9400.0
2422.	c8o-ao2h-do2<=>c4oc4keta-d+oh	1.63E+07	0.9	8700.0
2423.	c8o-ao2h-1o2<=>c4oc4keta-1+oh	2.79E+07	1.1	9400.0
2424.	c8o-ao2h-2o2<=>c4oc4keta-2+oh	1.49E+08	0.7	9000.0
2425.	c8o-ao2h-3o2<=>c4oc4keta-3+oh	1.13E+06	0.8	7800.0
2426.	c8o-bo2h-ao2<=>c4oc4ketb-a+oh	2.86E+07	1.4	25600.0
2427.	c8o-bo2h-co2<=>c4oc4ketb-c+oh	2.86E+07	1.4	25600.0
2428.	c8o-bo2h-do2<=>c4oc4ketb-d+oh	2.79E+07	1.1	15400.0
2429.	c8o-bo2h-1o2<=>c4oc4ketb-1+oh	1.49E+08	0.7	15000.0
2430.	c8o-bo2h-2o2<=>c4oc4ketb-2+oh	1.13E+06	0.8	13800.0
2431.	c8o-co2h-ao2<=>c4oc4ketc-a+oh	2.79E+07	1.1	15400.0
2432.	c8o-co2h-bo2<=>c4oc4ketc-b+oh	2.86E+07	1.4	25600.0
2433.	c8o-co2h-do2<=>c4oc4ketc-d+oh	2.86E+07	1.4	25600.0
2434.	c8o-co2h-1o2<=>c4oc4ketc-1+oh	1.13E+06	0.8	13800.0
2435.	c8o-do2h-ao2<=>c4oc4ketd-a+oh	1.63E+07	0.9	14700.0
2436.	c8o-do2h-bo2<=>c4oc4ketd-b+oh	2.79E+07	1.1	15400.0
2437.	c8o-do2h-co2<=>c4oc4ketd-c+oh	2.86E+07	1.4	25600.0
2438.	c4oc4keta-b=>c4h9oco+c2h5cho+oh	4.00E+15	0.0	43000.0
2439.	c4oc4keta-c=>ch3cho+c4ococh2+oh	4.00E+15	0.0	43000.0
2440.	c4oc4keta-d=>c4h9oco+c2h4+ch2o+oh	4.00E+15	0.0	43000.0
2441.	c4oc4keta-1=>nc3h7+co2+nc3h7cho+oh	1.00E+16	0.0	37000.0
2442.	c4oc4keta-2=>nc3h7co+ch2o+c2h5cho+oh	4.00E+15	0.0	41000.0
2443.	c4oc4keta-3=>nc3h7+co2+c2h4+ch3cho+oh	4.00E+15	0.0	43000.0
2444.	c4oc4ketb-a=>c4h9ocho+c2h5co+oh	1.00E+16	0.0	37000.0
2445.	c4oc4ketb-c=>pc4h9o+ch2co+ch3cho+oh	4.00E+15	0.0	43000.0
2446.	c4oc4ketb-1=>nc3h7cho+c2h5co+ch2o+oh	1.00E+16	0.0	37000.0
2447.	c4oc4ketb-2=>c2h5cho+c2h5+ch2co+ch2o+oh	4.00E+15	0.0	41000.0
2448.	c4oc4ketc-a=>ch3coch2+c4h9ocho+oh	1.00E+16	0.0	37000.0
2449.	c4oc4ketc-a=>pc4h9o+ch3coch2coh+oh	1.00E+16	0.0	37000.0
2450.	c4oc4ketc-b=>ch3co+c4h9och2cho+oh	4.00E+15	0.0	43000.0
2451.	c4oc4ketc-d=>2ch2o+pc4h9+ch2co+oh	4.00E+15	0.0	43000.0
2452.	c4oc4ketc-1=>nc3h7cho+ch3coch2+ch2o+oh	1.00E+16	0.0	37000.0
2453.	c4oc4ketd-a=>pc2h4cho+c4h9ocho+oh	1.00E+16	0.0	37000.0
2454.	c4oc4ketd-b=>ch2cho+c4h9och2cho+oh	4.00E+15	0.0	43000.0
2455.	c4oc4ketd-c=>hco+c4h9oc2h4cho+oh	4.00E+15	0.0	43000.0
2456.	c4oc4ketb-d=>ch2o+ch2co+c4h9och2+oh	4.00E+15	0.0	43000.0
2457.	c4oc4keta-c=>co2+ch3coch3+pc4h9oh	2.10E+08	0.0	20000.0
2458.	c4oc4keta-1=>c3h7cooh+c3h8+co2	2.10E+08	0.0	20000.0
2459.	c4oc4oa-d+oh=>pc4h9o+ch2co+c2h4+h2o	2.40E+06	2.0	-3000.0
2460.	c4oc4oa-d+oh=>c4h9oc2h3+ch2cho+h2o	4.80E+06	2.0	-3000.0
2461.	c4oc4oa-d+oh=>pc4h9o+c4h6o23+h2o	4.80E+06	2.0	-3000.0
2462.	c4oc4oa-3+oh=>nc3h7cho+acetoch2+h2o	9.60E+06	2.0	-3000.0
2463.	c4oc4oa-3+oh=>c3h6+nc3h7co+ch2o+h2o	2.40E+06	2.0	-3000.0
2464.	c4oc4ob-2+oh=>c4h8-1+c2h5co+ch2o+h2o	2.40E+06	2.0	-3000.0
2465.	c4oc4ob-2+oh=>c2h5cho+ch2o+c4h711+h2o	1.92E+07	2.0	-3000.0
2466.	c4oc4oa-b+oh=>pc4h9o+c2h5chco+h2o	2.40E+06	2.0	-3000.0
2467.	c4oc4oa-b+oh=>c4h9ochco+c2h5+h2o	2.40E+06	2.0	-3000.0
2468.	c4oc4oa-c+oh=>c4h9oco+c3h6+h2o	2.40E+06	2.0	-3000.0
2469.	c4oc4oa-c+oh=>c4h9oc2h3+ch3co+h2o	2.40E+06	2.0	-3000.0
2470.	c4oc4oa-1+oh=>nc3h7cho+nc3h7co+h2o	4.80E+06	2.0	-3000.0
2471.	c4oc4oa-2+oh=>c4h8-1+nc3h7+co2+h2o	4.80E+06	2.0	-3000.0
2472.	c4oc4oa-2+oh=>nc3h7cho+c2h5coch2+h2o	2.40E+06	2.0	-3000.0
2473.	c4oc4oa-2+oh=>nc3h7cho+ch2co+c2h5+h2o	2.40E+06	2.0	-3000.0
2474.	c4oc4ob-c+oh=>c4h9och2+ch3chco+h2o	2.40E+06	2.0	-3000.0
2475.	c4oc4ob-c+oh=>pc4h9o+c2h3coch3+h2o	2.40E+06	2.0	-3000.0
2476.	c4oc4ob-d+oh=>c2h4+pc4h9o+ch2co+h2o	2.40E+06	2.0	-3000.0
2477.	c4oc4ob-d+oh=>hco+c4h9oc3h5-3+h2o	4.80E+06	2.0	-3000.0
2478.	c4oc4oc-d+oh=>ch2co+c4h9oc2h4+h2o	2.40E+06	2.0	-3000.0
2479.	c4oc4oc-d+oh=>c2h3cho+c4h9och2+h2o	4.80E+06	2.0	-3000.0
2480.	c4oc4oa-d+ho2=>pc4h9o+ch2co+c2h4+h2o2	4.00E+12	0.0	11260.0
2481.	c4oc4oa-d+ho2=>c4h9oc2h3+ch2cho+h2o2	8.00E+12	0.0	11260.0
2482.	c4oc4oa-d+ho2=>pc4h9o+c4h6o23+h2o2	8.00E+12	0.0	11260.0
2483.	c4oc4oa-3+ho2=>nc3h7cho+acetoch2+h2o2	1.60E+13	0.0	11260.0
2484.	c4oc4oa-3+ho2=>c3h6+nc3h7co+ch2o+h2o2	4.00E+12	0.0	11260.0
2485.	c4oc4ob-2+ho2=>c4h8-1+c2h5co+ch2o+h2o2	4.00E+12	0.0	11260.0
2486.	c4oc4ob-2+ho2=>c2h5cho+ch2o+c4h711+h2o2	3.20E+13	0.0	11260.0
2487.	c4oc4oa-b+ho2=>pc4h9o+c2h5chco+h2o2	4.00E+12	0.0	11260.0
2488.	c4oc4oa-b+ho2=>c4h9ochco+c2h5+h2o2	4.00E+12	0.0	11260.0
2489.	c4oc4oa-c+ho2=>c4h9oco+c3h6+h2o2	4.00E+12	0.0	11260.0
2490.	c4oc4oa-c+ho2=>c4h9oc2h3+ch3co+h2o2	4.00E+12	0.0	11260.0
2491.	c4oc4oa-1+ho2=>nc3h7cho+nc3h7co+h2o2	8.00E+12	0.0	11260.0
2492.	c4oc4oa-2+ho2=>c4h8-1+nc3h7+co2+h2o2	8.00E+12	0.0	11260.0
2493.	c4oc4oa-2+ho2=>nc3h7cho+c2h5coch2+h2o2	4.00E+12	0.0	11260.0
2494.	c4oc4oa-2+ho2=>nc3h7cho+ch2co+c2h5+h2o2	4.00E+12	0.0	11260.0
2495.	c4oc4ob-c+ho2=>c4h9och2+ch3chco+h2o2	4.00E+12	0.0	11260.0
2496.	c4oc4ob-c+ho2=>pc4h9o+c2h3coch3+h2o2	4.00E+12	0.0	11260.0
2497.	c4oc4ob-d+ho2=>c2h4+pc4h9o+ch2co+h2o2	4.00E+12	0.0	11260.0
2498.	c4oc4ob-d+ho2=>hco+c4h9oc3h5-3+h2o2	8.00E+12	0.0	11260.0
2499.	c4oc4oc-d+ho2=>ch2co+c4h9oc2h4+h2o2	4.00E+12	0.0	11260.0
2500.	c4oc4oc-d+ho2=>c2h3cho+c4h9och2+h2o2	8.00E+12	0.0	11260.0
2501.	c4oc4oa-d+h=>pc4h9o+ch2co+c2h4+h2	4.80E+08	1.5	2005.0
2502.	c4oc4oa-d+h=>c4h9oc2h3+ch2cho+h2	9.60E+08	1.5	2005.0
2503.	c4oc4oa-d+h=>pc4h9o+c4h6o23+h2	9.60E+08	1.5	2005.0
2504.	c4oc4oa-3+h=>nc3h7cho+acetoch2+h2	1.92E+09	1.5	2005.0
2505.	c4oc4oa-3+h=>c3h6+nc3h7co+ch2o+h2	4.80E+08	1.5	2005.0
2506.	c4oc4ob-2+h=>c4h8-1+c2h5co+ch2o+h2	4.80E+08	1.5	2005.0
2507.	c4oc4ob-2+h=>c2h5cho+ch2o+c4h711+h2	3.84E+19	1.5	2005.0
2508.	c4oc4oa-b+h=>pc4h9o+c2h5chco+h2	4.80E+08	1.5	2005.0
2509.	c4oc4oa-b+h=>c4h9ochco+c2h5+h2	4.80E+08	1.5	2005.0
2510.	c4oc4oa-c+h=>c4h9oco+c3h6+h2	4.80E+08	1.5	2005.0
2511.	c4oc4oa-c+h=>c4h9oc2h3+ch3co+h2	4.80E+08	1.5	2005.0
2512.	c4oc4oa-1+h=>nc3h7cho+nc3h7co+h2	9.60E+08	1.5	2005.0
2513.	c4oc4oa-2+h=>c4h8-1+nc3h7+co2+h2	9.60E+08	1.5	2005.0

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2514. c4oc4oa-2+h=>nc3h7cho+c2h5coch2+h2          4.80E+08    1.5     2005.0
2515. c4oc4oa-2+h=>nc3h7cho+ch2co+c2h5+h2         4.80E+08    1.5     2005.0
2516. c4oc4ob-c+h=>c4h9och2+ch3chco+h2            4.80E+08    1.5     2005.0
2517. c4oc4ob-c+h=>pc4h9o+c2h3coch3+h2            4.80E+08    1.5     2005.0
2518. c4oc4ob-d+h=>c2h4+pc4h9o+ch2co+h2           4.80E+08    1.5     2005.0
2519. c4oc4ob-d+h=>hco+c4h9oc3h5-3+h2             9.60E+08    1.5     2005.0
2520. c4oc4oc-d+h=>ch2co+c4h9oc2h4+h2             4.80E+08    1.5     2005.0
2521. c4oc4oc-d+h=>c2h3cho+c4h9och2+h2            9.60E+08    1.5     2005.0
2522. c4ococh2=ch2co+pc4h9o                       9.24E+20   -2.3    24916.9
2523. c4h9ocho+oh=c4h9oco+h2o                     1.40E+03    3.0       98.0
      Declared duplicate reaction...
2524. c4h9ocho+oh=c4h9oco+h2o                     1.94E+03    3.1      289.0
      Declared duplicate reaction...
2525. c4h9ocho+oh=a-c4h8ocho+h2o                  1.60E+02    3.0    -2844.0
      Declared duplicate reaction...
2526. c4h9ocho+oh=a-c4h8ocho+h2o                  1.84E+02    3.0    -2574.0
      Declared duplicate reaction...
2527. c4h9ocho+oh=b-c4h8ocho+h2o                  3.55E+02    3.0    -1381.0
      Declared duplicate reaction...
2528. c4h9ocho+oh=b-c4h8ocho+h2o                  1.81E+03    3.0     -167.0
      Declared duplicate reaction...
2529. c4h9ocho+oh=c-c4h8ocho+h2o                  2.98E+02    3.0    -2144.0
      Declared duplicate reaction...
2530. c4h9ocho+oh=c-c4h8ocho+h2o                  2.12E+03    3.0    -1355.0
      Declared duplicate reaction...
2531. c4h9ocho+oh=d-c4h8ocho+h2o                  2.20E+03    3.0      535.0
      Declared duplicate reaction...
2532. c4h9ocho+oh=d-c4h8ocho+h2o                  5.96E+03    3.0     1408.0
      Declared duplicate reaction...
2533. c4h9ocho+ho2=c4h9oco+h2o2                   1.39E-01    4.2    12973.3
2534. c4h9ocho+ho2=a-c4h8ocho+h2o2                1.74E-03    4.5    11886.9
2535. c4h9ocho+ho2=b-c4h8ocho+h2o2                4.68E-02    4.4    13478.0
2536. c4h9ocho+ho2=c-c4h8ocho+h2o2                2.65E-04    4.5    10257.3
2537. c4h9ocho+ho2=d-c4h8ocho+h2o2                7.05E-02    4.3    15029.8
2538. c4h9ocho+h=c4h9oco+h2                       7.53E+05    2.4     6748.8
2539. c4h9ocho+h=a-c4h8ocho+h2                    1.06E+06    2.4     6250.7
2540. c4h9ocho+h=b-c4h8ocho+h2                    9.04E+06    2.1     7288.8
2541. c4h9ocho+h=c-c4h8ocho+h2                    6.14E+05    2.5     5738.8
2542. c4h9ocho+h=d-c4h8ocho+h2                    1.15E+06    2.4     8089.7
2543. c4h9ocho+ch3=c4h9oco+ch4                    1.51E+00    3.5     5480.0
2544. c4h9ocho+ch3=a-c4h8ocho+ch4                 3.98E+11    0.0     9500.0
2545. c4h9ocho+ch3=b-c4h8ocho+ch4                 8.60E+11    0.0    11600.0
2546. c4h9ocho+ch3=c-c4h8ocho+ch4                 1.51E+00    3.5     5480.0
2547. c4h9ocho+ch3=d-c4h8ocho+ch4                 4.53E-01    3.6     7150.0
2548. c4h9ocho+ch3o2=c4h9oco+ch3o2h               1.57E+05    2.2    16544.0
2549. c4h9ocho+ch3o2=a-c4h8ocho+ch3o2h            8.49E+03    2.4    16594.0
2550. c4h9ocho+ch3o2=b-c4h8ocho+ch3o2h            2.26E+04    2.4    16594.0
2551. c4h9ocho+ch3o2=c-c4h8ocho+ch3o2h            8.49E+03    2.4    16594.0
2552. c4h9ocho+ch3o2=d-c4h8ocho+ch3o2h            1.70E+04    2.4    16594.0
2553. c4h9ocho+ch3o=c4h9oco+ch3oh                 5.27E+09    0.8     2912.0
2554. c4h9ocho+ch3o=a-c4h8ocho+ch3oh              1.50E+11    0.0     4500.0
2555. c4h9ocho+ch3o=b-c4h8ocho+ch3oh              3.02E+10    0.2     4703.0
2556. c4h9ocho+ch3o=c-c4h8ocho+ch3oh              1.45E+11    0.0     4571.0
2557. c4h9ocho+ch3o=d-c4h8ocho+ch3oh              2.17E+11    0.0     6458.0
2558. c4h9ocho+o=c4h9oco+oh                       5.51E+05    2.5     2830.0
2559. c4h9ocho+o=a-c4h8ocho+oh                    2.81E+13    0.0     5200.0
2560. c4h9ocho+o=b-c4h8ocho+oh                    6.87E+13    0.0     7850.0
2561. c4h9ocho+o=c-c4h8ocho+oh                    5.52E+05    2.5     2830.0
2562. c4h9ocho+o=d-c4h8ocho+oh                    9.81E+05    2.4     4750.0
2563. c4h9ocho+o2=c4h9oco+ho2                     2.00E+13    0.0    49700.0
2564. c4h9ocho+o2=a-c4h8ocho+ho2                  4.00E+13    0.0    46800.0
2565. c4h9ocho+o2=b-c4h8ocho+ho2                  4.00E+13    0.0    49800.0
2566. c4h9ocho+o2=c-c4h8ocho+ho2                  4.00E+13    0.0    49800.0
2567. c4h9ocho+o2=d-c4h8ocho+ho2                  6.00E+13    0.0    52300.0
2568. c4h9ocho+hco=c4h9oco+ch2o                   5.40E+06    1.9    17010.0
2569. c4h9ocho+hco=a-c4h8ocho+ch2o                1.53E+04    2.5    18430.0
2570. c4h9ocho+hco=b-c4h8ocho+ch2o                4.08E+04    2.5    18430.0
2571. c4h9ocho+hco=c-c4h8ocho+ch2o                1.53E+04    2.5    18430.0
2572. c4h9ocho+hco=d-c4h8ocho+ch2o                3.06E+04    2.5    18430.0
2573. c4h9ocho+c2h5=c4h9oco+c2h6                  1.00E+11    0.0    10400.0
2574. c4h9ocho+c2h5=a-c4h8ocho+c2h6               1.50E+10    0.0    10400.0
2575. c4h9ocho+c2h5=b-c4h8ocho+c2h6               4.00E+10    0.0    10400.0
2576. c4h9ocho+c2h5=c-c4h8ocho+c2h6               1.50E+10    0.0    10400.0
2577. c4h9ocho+c2h5=d-c4h8ocho+c2h6               3.00E+10    0.0    10400.0
2578. c4h9ocho+c2h3=c4h9oco+c2h4                  1.00E+11    0.0    10400.0
2579. c4h9ocho+c2h3=a-c4h8ocho+c2h4               1.50E+10    0.0    10400.0
2580. c4h9ocho+c2h3=b-c4h8ocho+c2h4               4.00E+10    0.0    10400.0
2581. c4h9ocho+c2h3=c-c4h8ocho+c2h4               1.50E+10    0.0    10400.0
2582. c4h9ocho+c2h3=d-c4h8ocho+c2h4               3.00E+10    0.0    10400.0
2583. c4h9ocho(+m)=nc4h10+co2(+m)                 1.50E+12    0.0    59700.0
      Low pressure limit:  0.56300E+62 -0.12790E+02  0.71100E+05
      TROE centering:      0.17940E+00  0.35754E+03  0.99187E+10  0.32899E+10
         h2              Enhanced by    3.000E+00
         h2o             Enhanced by    6.000E+00
         o2              Enhanced by    1.100E+00
         co              Enhanced by    2.700E+00
         co2             Enhanced by    5.400E+00
         he              Enhanced by    1.200E+00
2584. c4h9ocho(+m)=nc3h7cho+ch2o(+m)              1.00E+12    0.0    60500.0
      Low pressure limit:  0.15500E+58 -0.11570E+02  0.71700E+05
      TROE centering:      0.78075E+00  0.64901E+10  0.61880E+03  0.67101E+10
         h2              Enhanced by    3.000E+00
         h2o             Enhanced by    6.000E+00
         o2              Enhanced by    1.100E+00
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      co              Enhanced by    2.700E+00
      co2             Enhanced by    5.400E+00
      he              Enhanced by    1.200E+00
2585. c4h9ocho(+m)=pc4h9+hco2(+m)                  2.17E+24   -2.4    92600.0
    Low pressure limit:  0.57100E+48 -0.84300E+01  0.98490E+05
    TROE centering:      0.68932E-14  0.47341E+04  0.93302E+10  0.17860E+10
      h2              Enhanced by    3.000E+00
      h2o             Enhanced by    6.000E+00
      o2              Enhanced by    1.100E+00
      co              Enhanced by    2.700E+00
      co2             Enhanced by    5.400E+00
      he              Enhanced by    1.200E+00
2586. c4h9ocho(+m)=pc4h9o+hco(+m)                  4.18E+16    0.0    97000.0
    Low pressure limit:  0.52700E+64 -0.12320E+02  0.10918E+06
    TROE centering:      0.89375E+00  0.74991E+10  0.64704E+03  0.66980E+09
      h2              Enhanced by    3.000E+00
      h2o             Enhanced by    6.000E+00
      o2              Enhanced by    1.100E+00
      co              Enhanced by    2.700E+00
      co2             Enhanced by    5.400E+00
      he              Enhanced by    1.200E+00
2587. c4h9ocho=>c4h8-1+hcooh                       2.43E+10    0.9    50061.0
2588. c4h9ocho=pc4h9oh+co                          4.92E+11    0.8    63906.0
2589. c4h9ocho=nc3h7+ch2ocho                       1.00E+17    0.0    84650.0
2590. c4h9ocho=c2h5+ch2ch2ocho                     7.94E+16    0.0    80280.0
2591. c4h9ocho=ch3+c3h6ocho                        1.00E+17    0.0    84650.0
2592. c4h9ocho=hco2+pc4h9                          1.00E+17    0.0    90000.0
2593. c4h9oco+h=c4h9ocho                           1.00E+14    0.0        0.0
2594. a-c4h8ocho+h=c4h9ocho                        1.00E+14    0.0        0.0
2595. b-c4h8ocho+h=c4h9ocho                        1.00E+14    0.0        0.0
2596. c-c4h8ocho+h=c4h9ocho                        1.00E+14    0.0        0.0
2597. d-c4h8ocho+h=c4h9ocho                        1.00E+14    0.0        0.0
2598. c3h6ocho=c2h4+ch2ocho                        3.75E+12    0.4    30104.0
2599. a-c4h8ocho=nc3h7cho+hco                      6.46E+12    0.1    28197.0
2600. a-c4h8ocho=c2h3ocho+c2h5                     2.28E+12    0.5    30862.0
2601. b-c4h8ocho=c4h8-1+hco2                       2.57E+11    0.2    18558.0
2602. b-c4h8ocho=c3h5ocho+ch3                      7.75E+11    0.6    32021.0
2603. c-c4h8ocho=c3h6+ch2ocho                      6.89E+11    0.4    29693.0
2604. d-c4h8ocho=c2h4+ch2ch2ocho                   3.75E+12    0.4    30104.0
2605. c4h9oco=co+pc4h9o                            2.08E+13    0.3    24053.0
2606. c4h9oco=co2+pc4h9                            2.39E+12    0.5    14044.0
2607. b-c4h8ocho=c4h7ocho1-2+h                     2.84E+11    0.3    35500.0
2608. b-c4h8ocho=c4h7ocho1-1+h                     3.03E+11    0.6    36800.0
2609. b-c4h8ocho=hcooh+c4h713                      3.54E+09    0.9    28100.0
2610. a-c4h8ocho=c4h7ocho1-1+h                     2.62E+12    0.3    35700.0
2611. c-c4h8ocho=c4h7ocho1-2+h                     2.84E+11    0.3    35500.0
2612. c-c4h8ocho=c4h7ocho1-3+h                     2.84E+11    0.3    35500.0
2613. d-c4h8ocho=c4h7ocho1-3+h                     2.84E+11    0.3    35500.0
2614. ch2ch2ocho=c2h4+hco2                         6.46E+12    0.1    28197.0
2615. ch2ch2ocho=c2h5oco                           3.18E+10    0.7    21998.0
2616. c2h5oco=co+ch3ch2o                           2.08E+13    0.3    24053.0
2617. c2h5oco=co2+c2h5                             2.39E+12    0.5    14044.0
2618. c4h9oco<=>b-c4h8ocho                         3.18E+10    0.7    21998.0
2619. a-c4h8ocho<=>d-c4h8ocho                      1.96E+10    0.6    25917.0
2620. c4h9oco<=>c-c4h8ocho                         8.93E+09    0.7    18666.0
2621. c4h7ocho1-1+h<=>c4h6ocho1-21+h2              3.38E+05    2.4      207.0
2622. c4h7ocho1-1+o<=>c4h6ocho1-21+oh              9.59E+12    0.0     1967.0
2623. c4h7ocho1-1+oh<=>c4h6ocho1-21+h2o            2.76E+04    2.6    -1919.0
2624. c4h7ocho1-1+ch3<=>c4h6ocho1-21+ch4           3.69E+00    3.3     4002.0
2625. c4h7ocho1-1+ho2<=>c4h6ocho1-21+h2o2          4.82E+03    2.5    10530.0
2626. c4h7ocho1-1+ch3o2<=>c4h6ocho1-21+ch3o2h      4.82E+03    2.5    10530.0
2627. c4h7ocho1-1+ch3o<=>c4h6ocho1-21+ch3oh        4.00E+01    2.9     8609.0
2628. c4h7ocho1-2+h<=>c4h6ocho1-21+h2              3.38E+05    2.4      207.0
2629. c4h7ocho1-2+o<=>c4h6ocho1-21+oh              9.59E+12    0.0     1967.0
2630. c4h7ocho1-2+oh<=>c4h6ocho1-21+h2o            2.76E+04    2.6    -1919.0
2631. c4h7ocho1-2+ch3<=>c4h6ocho1-21+ch4           3.69E+00    3.3     4002.0
2632. c4h7ocho1-2+ho2<=>c4h6ocho1-21+h2o2          4.82E+03    2.5    10530.0
2633. c4h7ocho1-2+ch3o2<=>c4h6ocho1-21+ch3o2h      4.82E+03    2.5    10530.0
2634. c4h7ocho1-2+ch3o<=>c4h6ocho1-21+ch3oh        4.00E+01    2.9     8609.0
2635. c4h7ocho1-2+h<=>c4h6ocho1-32+h2              3.38E+05    2.4      207.0
2636. c4h7ocho1-2+o<=>c4h6ocho1-32+oh              9.59E+12    0.0     1967.0
2637. c4h7ocho1-2+oh<=>c4h6ocho1-32+h2o            2.76E+04    2.6    -1919.0
2638. c4h7ocho1-2+ch3<=>c4h6ocho1-32+ch4           3.69E+00    3.3     4002.0
2639. c4h7ocho1-2+ho2<=>c4h6ocho1-32+h2o2          4.82E+03    2.5    10530.0
2640. c4h7ocho1-2+ch3o2<=>c4h6ocho1-32+ch3o2h      4.82E+03    2.5    10530.0
2641. c4h7ocho1-2+ch3o<=>c4h6ocho1-32+ch3oh        4.00E+01    2.9     8609.0
2642. c4h7ocho1-3+h<=>c4h6ocho1-32+h2              3.38E+05    2.4      207.0
2643. c4h7ocho1-3+o<=>c4h6ocho1-32+oh              9.59E+12    0.0     1967.0
2644. c4h7ocho1-3+oh<=>c4h6ocho1-32+h2o            2.76E+04    2.6    -1919.0
2645. c4h7ocho1-3+ch3<=>c4h6ocho1-32+ch4           3.69E+00    3.3     4002.0
2646. c4h7ocho1-3+ho2<=>c4h6ocho1-32+h2o2          4.82E+03    2.5    10530.0
2647. c4h7ocho1-3+ch3o2<=>c4h6ocho1-32+ch3o2h      4.82E+03    2.5    10530.0
2648. c4h7ocho1-3+ch3o<=>c4h6ocho1-32+ch3oh        4.00E+01    2.9     8609.0
2649. c4h6ocho1-21=sc3h5cho+hco                    4.17E+15   -0.9    14040.0
2650. c4h6ocho1-32=c4h6+hco2                       1.34E+13   -0.4    24610.0
2651. c4h7ocho1-1(+m)=c4h8-1+co2(+m)               1.50E+12    0.0    59700.0
    Low pressure limit:  0.56300E+62 -0.12790E+02  0.71100E+05
    TROE centering:      0.17940E+00  0.35754E+03  0.99187E+10  0.32899E+10
      h2              Enhanced by    3.000E+00
      h2o             Enhanced by    6.000E+00
      o2              Enhanced by    1.100E+00
      co              Enhanced by    2.700E+00
      co2             Enhanced by    5.400E+00
      he              Enhanced by    1.200E+00
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2652. c4h7ocho1-1(+m)=sc3h5cho+ch2o(+m)             1.00E+12    0.0    60500.0
      Low pressure limit:  0.15500E+58 -0.11570E+02  0.71700E+05
      TROE centering:      0.78075E+00  0.64901E+10  0.61880E+03  0.67101E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2653. c4h7ocho1-1(+m)=c4h711+hco2(+m)               2.17E+24   -2.4    92600.0
      Low pressure limit:  0.57100E+48 -0.84300E+01  0.98490E+05
      TROE centering:      0.68932E-14  0.47341E+04  0.93302E+10  0.17860E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2654. c4h7ocho1-1(+m)=c3h6cho-3+hco(+m)             4.18E+16    0.0    97000.0
      Low pressure limit:  0.52700E+64 -0.12320E+02  0.10918E+06
      TROE centering:      0.89375E+00  0.74991E+10  0.64704E+03  0.66980E+09
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2655. c4h7ocho1-2(+m)=t2c4h8+co2(+m)                1.50E+12    0.0    59700.0
      Low pressure limit:  0.56300E+62 -0.12790E+02  0.71100E+05
      TROE centering:      0.17940E+00  0.35754E+03  0.99187E+10  0.32899E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2656. c4h7ocho1-2(+m)=sc3h5cho+ch2o(+m)             1.00E+12    0.0    60500.0
      Low pressure limit:  0.15500E+58 -0.11570E+02  0.71700E+05
      TROE centering:      0.78075E+00  0.64901E+10  0.61880E+03  0.67101E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2657. c4h7ocho1-2(+m)=c4h713+hco2(+m)               2.17E+24   -2.4    92600.0
      Low pressure limit:  0.57100E+48 -0.84300E+01  0.98490E+05
      TROE centering:      0.68932E-14  0.47341E+04  0.93302E+10  0.17860E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2658. c4h7ocho1-2(+m)=c3h5-a+ch2o+hco(+m)           4.18E+16    0.0    97000.0
      Low pressure limit:  0.52700E+64 -0.12320E+02  0.10918E+06
      TROE centering:      0.89375E+00  0.74991E+10  0.64704E+03  0.66980E+09
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2659. c4h7ocho1-3(+m)=c4h8-1+co2(+m)                1.50E+12    0.0    59700.0
      Low pressure limit:  0.56300E+62 -0.12790E+02  0.71100E+05
      TROE centering:      0.17940E+00  0.35754E+03  0.99187E+10  0.32899E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2660. c4h7ocho1-3(+m)=sc3h5cho+ch2o(+m)             1.00E+12    0.0    60500.0
      Low pressure limit:  0.15500E+58 -0.11570E+02  0.71700E+05
      TROE centering:      0.78075E+00  0.64901E+10  0.61880E+03  0.67101E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2661. c4h7ocho1-3(+m)=c4h714+hco2(+m)               2.17E+24   -2.4    92600.0
      Low pressure limit:  0.57100E+48 -0.84300E+01  0.98490E+05
      TROE centering:      0.68932E-14  0.47341E+04  0.93302E+10  0.17860E+10
         h2               Enhanced by    3.000E+00
         h2o              Enhanced by    6.000E+00
         o2               Enhanced by    1.100E+00
         co               Enhanced by    2.700E+00
         co2              Enhanced by    5.400E+00
         he               Enhanced by    1.200E+00
2662. c4h7ocho1-3(+m)=c3h5-a+ch2o+hco(+m)           4.18E+16    0.0    97000.0
      Low pressure limit:  0.52700E+64 -0.12320E+02  0.10918E+06
      TROE centering:      0.89375E+00  0.74991E+10  0.64704E+03  0.66980E+09
         h2               Enhanced by    3.000E+00
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   h2o              Enhanced by    6.000E+00
   o2               Enhanced by    1.100E+00
   co               Enhanced by    2.700E+00
   co2              Enhanced by    5.400E+00
   he               Enhanced by    1.200E+00
2663. c4h7ocho1-1=>c2h5+c2h3+co2                    2.21E+22   -1.6    97520.0
2664. c4h7ocho1-2=>c3h5-s+ch2o+hco                  2.21E+22   -1.6    97520.0
2665. c4h7ocho1-3=>c2h3+c2h4+hco2                   6.64E+19   -1.1    74590.0
2666. c4h7ocho1-1+h<=>nc3h7cho+hco                  6.26E+13    0.0     4500.0
2667. c4h7ocho1-1+h<=>c4h8-1+hco2                   6.26E+13    0.0     4500.0
2668. c4h7ocho1-2+h<=>c4h8-1+hco2                   6.26E+13    0.0     4500.0
2669. c4h7ocho1-2+h<=>c3h6+ch2ocho                  6.26E+13    0.0     4500.0
2670. c4h7ocho1-3+h<=>c2h4+ch2ch2ocho               6.26E+13    0.0     4500.0
2671. c4h7ocho1-3+h<=>c3h6+ch2ocho                  6.26E+13    0.0     4500.0
2672. c4h7ocho1-1+o2=c4h6ocho1-21+ho2               4.00E+12    0.0    39900.0
2673. c4h7ocho1-2+o2=c4h6ocho1-21+ho2               4.00E+12    0.0    39900.0
2674. c4h7ocho1-3+o2=c4h6ocho1-32+ho2               4.00E+12    0.0    39900.0
2675. c2h3ocho(+m)=c2h4+co2(+m)                     1.50E+12    0.0    59700.0
      Low pressure limit:  0.56300E+62 -0.12790E+02  0.71100E+05
      TROE centering:      0.17940E+00  0.35754E+03  0.99187E+10  0.32899E+10
   h2               Enhanced by    3.000E+00
   h2o              Enhanced by    6.000E+00
   o2               Enhanced by    1.100E+00
   co               Enhanced by    2.700E+00
   co2              Enhanced by    5.400E+00
   he               Enhanced by    1.200E+00
2676. c2h3ocho(+m)=ch2co+ch2o(+m)                   1.00E+12    0.0    60500.0
      Low pressure limit:  0.15500E+58 -0.11570E+02  0.71700E+05
      TROE centering:      0.78075E+00  0.64901E+10  0.61880E+03  0.67101E+10
   h2               Enhanced by    3.000E+00
   h2o              Enhanced by    6.000E+00
   o2               Enhanced by    1.100E+00
   co               Enhanced by    2.700E+00
   co2              Enhanced by    5.400E+00
   he               Enhanced by    1.200E+00
2677. c2h3ocho(+m)=c2h3+hco2(+m)                    2.17E+24   -2.4    92600.0
      Low pressure limit:  0.57100E+48 -0.84300E+01  0.98490E+05
      TROE centering:      0.68932E-14  0.47341E+04  0.93302E+10  0.17860E+10
   h2               Enhanced by    3.000E+00
   h2o              Enhanced by    6.000E+00
   o2               Enhanced by    1.100E+00
   co               Enhanced by    2.700E+00
   co2              Enhanced by    5.400E+00
   he               Enhanced by    1.200E+00
2678. c2h3ocho(+m)=ch2cho+hco(+m)                   4.18E+16    0.0    97000.0
      Low pressure limit:  0.52700E+64 -0.12320E+02  0.10918E+06
      TROE centering:      0.89375E+00  0.74991E+10  0.64704E+03  0.66980E+09
   h2               Enhanced by    3.000E+00
   h2o              Enhanced by    6.000E+00
   o2               Enhanced by    1.100E+00
   co               Enhanced by    2.700E+00
   co2              Enhanced by    5.400E+00
   he               Enhanced by    1.200E+00
2679. c2h3ocho=c2h2+hcooh                           1.00E+13    0.0    58000.0
2680. c2h3ocho+h=c2h3oco+h2                         6.50E+05    2.4     4471.0
2681. c2h3ocho+o=c2h3oco+oh                         5.51E+05    2.5     2830.0
2682. c2h3ocho+oh=c2h3oco+h2o                       2.33E+07    1.6      -35.0
2683. c2h3ocho+ch3=c2h3oco+ch4                      1.51E+00    3.5     5481.0
2684. c2h3ocho+ho2=c2h3oco+h2o2                     9.64E+03    2.6    13910.0
2685. c2h3ocho+o2=c2h3oco+ho2                       2.00E+13    0.0    49700.0
2686. c2h3ocho+ch3o=c2h3oco+ch3oh                   5.48E+11    0.0     5000.0
2687. c2h3ocho+ch3o2=c2h3oco+ch3o2h                 4.82E+03    2.6    13910.0
2688. ch2cho+co=c2h3oco                             1.55E+06    2.0     5734.0
2689. c2h3+co2=c2h3oco                              4.76E+07    1.5    37410.0
2690. c3h5ocho(+m)=c3h6+co2(+m)                     1.50E+12    0.0    59700.0
      Low pressure limit:  0.56300E+62 -0.12790E+02  0.71100E+05
      TROE centering:      0.17940E+00  0.35754E+03  0.99187E+10  0.32899E+10
   h2               Enhanced by    3.000E+00
   h2o              Enhanced by    6.000E+00
   o2               Enhanced by    1.100E+00
   co               Enhanced by    2.700E+00
   co2              Enhanced by    5.400E+00
   he               Enhanced by    1.200E+00
2691. c3h5ocho(+m)=c2h3cho+ch2o(+m)                 1.00E+12    0.0    60500.0
      Low pressure limit:  0.15500E+58 -0.11570E+02  0.71700E+05
      TROE centering:      0.78075E+00  0.64901E+10  0.61880E+03  0.67101E+10
   h2               Enhanced by    3.000E+00
   h2o              Enhanced by    6.000E+00
   o2               Enhanced by    1.100E+00
   co               Enhanced by    2.700E+00
   co2              Enhanced by    5.400E+00
   he               Enhanced by    1.200E+00
2692. c3h5ocho(+m)=c3h5-a+hco2(+m)                  2.17E+24   -2.4    92600.0
      Low pressure limit:  0.57100E+48 -0.84300E+01  0.98490E+05
      TROE centering:      0.68932E-14  0.47341E+04  0.93302E+10  0.17860E+10
   h2               Enhanced by    3.000E+00
   h2o              Enhanced by    6.000E+00
   o2               Enhanced by    1.100E+00
   co               Enhanced by    2.700E+00
   co2              Enhanced by    5.400E+00
   he               Enhanced by    1.200E+00
2693. c3h5ocho(+m)=c3h5o+hco(+m)                    4.18E+16    0.0    97000.0
      Low pressure limit:  0.52700E+64 -0.12320E+02  0.10918E+06
      TROE centering:      0.89375E+00  0.74991E+10  0.64704E+03  0.66980E+09
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        h2              Enhanced by    3.000E+00
        h2o             Enhanced by    6.000E+00
        o2              Enhanced by    1.100E+00
        co              Enhanced by    2.700E+00
        co2             Enhanced by    5.400E+00
        he              Enhanced by    1.200E+00
2694. c3h5ocho=c3h4-p+hcooh                        1.00E+13   0.0    70000.0
2695. c3h5ocho+h=c3h5oco+h2                        6.50E+05   2.4     4471.0
2696. c3h5ocho+o=c3h5oco+oh                        5.51E+05   2.5     2830.0
2697. c3h5ocho+oh=c3h5oco+h2o                      2.33E+07   1.6      -35.0
2698. c3h5ocho+ch3=c3h5oco+ch4                     1.51E+00   3.5     5481.0
2699. c3h5ocho+ho2=c3h5oco+h2o2                    9.64E+03   2.6    13910.0
2700. c3h5ocho+o2=c3h5oco+ho2                      2.00E+13   0.0    49700.0
2701. c3h5ocho+ch3o=c3h5oco+ch3oh                  5.48E+11   0.0     5000.0
2702. c3h5ocho+ch3o2=c3h5oco+ch3o2h                4.82E+03   2.6    13910.0
2703. c3h5o+co=c3h5oco                             1.55E+06   2.0     5734.0
2704. c3h5-a+co2=c3h5oco                           4.76E+07   1.5    37410.0
2705. ch3ocho=>ch2ocho+h                           8.24E+19  -1.1   103000.0
2706. ch2ocho+h=>ch3ocho                           1.00E+14   0.0        0.0
2707. ch3ocho=>ch3oco+h                            1.33E+19  -1.0   100000.0
2708. ch3oco+h=>ch3ocho                            1.00E+14   0.0        0.0
2709. ch3ocho+oh=ch2ocho+h2o                       8.86E+12   0.1     3340.5
2710. ch3ocho+h=ch2ocho+h2                         6.65E+05   2.5     6760.0
2711. ch3ocho+ch3=ch2ocho+ch4                      2.91E-01   3.7     6823.8
2712. ch3ocho+ho2=ch2ocho+h2o2                     5.66E+04   2.4    16594.3
2713. ch3ocho+ch3o2=ch2ocho+ch3o2h                 5.66E+04   2.4    16594.3
2714. ch3ocho+ch3o=ch2ocho+ch3oh                   4.59E+09   0.5     4823.6
2715. ch3ocho+o=ch2ocho+oh                         8.84E+05   2.4     4593.2
2716. ch3ocho+o2=ch2ocho+ho2                       1.53E+13   0.1    51749.8
2717. ch3ocho+hco=ch2ocho+ch2o                     1.03E+05   2.5    18400.0
2718. ch3ocho+c2h5=ch2ocho+c2h6                    1.00E+11   0.0    10400.0
2719. ch3ocho+c2h3=ch2ocho+c2h4                    1.00E+11   0.0    10400.0
2720. ch3ocho+hco2=ch2ocho+hcooh                   5.66E+04   2.4    16594.3
2721. ch3ocho+h=ch3oco+h2                          2.58E+05   2.5     5736.8
2722. ch3ocho+oh=ch3oco+h2o                        1.22E+16  -1.0     4946.1
2723. ch3ocho+ch3=ch3oco+ch4                       9.21E-02   3.7     6052.6
2724. ch3ocho+ch3o2=ch3oco+ch3o2h                  1.57E+05   2.2    16544.4
2725. ch3ocho+ho2=ch3oco+h2o2                      1.57E+05   2.2    16544.4
2726. ch3ocho+ch3o=ch3oco+ch3oh                    5.27E+09   0.8     2912.4
2727. ch3ocho+o=ch3oco+oh                          2.45E+05   2.5     4047.8
2728. ch3ocho+o2=ch3oco+ho2                        3.85E+12   0.1    50759.6
2729. ch3ocho+hco=ch3oco+ch2o                      5.40E+06   1.9    17000.0
2730. ch3ocho+c2h5=ch3oco+c2h6                     1.00E+11   0.0    10400.0
2731. ch3ocho+c2h3=ch3oco+c2h4                     1.00E+11   0.0    10400.0
2732. ch3ocho+hco2=ch3oco+hcooh                    1.57E+05   2.2    16544.4
2733. ch2ocho=>ch3oco                              2.62E+11   0.0    38200.0
2734. ch3oco=>ch2ocho                              1.63E+12  -0.2    40700.0
2735. ch3oco=>ch3+co2                              3.59E+14  -0.2    16000.0
2736. ch3+co2=>ch3oco                              4.76E+07   1.5    34700.0
2737. ch3oco=>ch3o+co                              1.43E+15   0.0    23800.0
2738. ch3o+co=>ch3oco                              1.55E+06   2.0     5730.0
2739. ch2o+hco=ch2ocho                             3.89E+10   0.0    22000.0
2740. ch3och2<=>ch2o+ch3                           1.60E+13   0.0    25500.0
2741. c2h5oc2h5(+m)<=>c2h5+c2h5o(+m)               2.60E+23  -2.0    88386.0
      Low pressure limit:  0.10737E+77 -0.16418E+02  0.98829E+05
      TROE centering:      0.87622E-04  0.58993E+03  0.68923E+04  0.19679E+04
2742. c2h5oc2h5(+m)<=>c2h5och2+ch3(+m)             1.80E+23  -1.9    88635.0
      Low pressure limit:  0.94699E+76 -0.16410E+02  0.99222E+05
      TROE centering:      0.42576E+00  0.10123E+04  0.10346E+03  0.22761E+04
2743. c2h5oc2h5(+m)<=>c2h5oh+c2h4(+m)              1.00E+14   0.0    65200.0
      Low pressure limit:  0.61359E+96 -0.22570E+02  0.80762E+05
      TROE centering:      0.22531E-01  0.19124E+02  0.14140E+11  0.39354E+04
2744. c2h5oc2h5+o2<=>c2h5oc2h4p+ho2                4.00E+13   0.0    52800.0
2745. c2h5oc2h5+o2<=>c2h5oc2h4s+ho2                5.20E+13   0.0    46800.0
2746. c2h5oc2h5+oh<=>c2h5oc2h4p+h2o                1.14E+01   3.4    -2390.0
2747. c2h5oc2h5+oh<=>c2h5oc2h4s+h2o                2.26E+03   2.9    -4039.0
2748. c2h5oc2h5+h<=>c2h5oc2h4p+h2                  1.06E+05   2.8     7496.0
2749. c2h5oc2h5+h<=>c2h5oc2h4s+h2                  1.15E+06   2.5     2300.0
2750. c2h5oc2h5+ho2<=>c2h5oc2h4p+h2o2              1.60E-05   5.1    14871.0
2751. c2h5oc2h5+ho2<=>c2h5oc2h4s+h2o2              3.82E-02   4.2     9023.0
2752. c2h5oc2h5+ch3<=>c2h5oc2h4p+ch4               6.60E+02   3.3    12291.0
2753. c2h5oc2h5+ch3<=>c2h5oc2h4s+ch4               3.98E+01   3.4     7635.0
2754. c2h5oc2h5+o<=>c2h5oc2h4p+oh                  1.94E+03   3.2     4658.0
2755. c2h5oc2h5+o<=>c2h5oc2h4s+oh                  2.90E+05   2.4      876.0
2756. c2h5oc2h5+c2h3<=>c2h5oc2h4p+c2h4             5.00E+11   0.0    10400.0
2757. c2h5oc2h5+c2h3<=>c2h5oc2h4s+c2h4             6.00E+11   0.0     5200.0
2758. c2h5oc2h5+c2h5<=>c2h5oc2h4p+c2h6             5.00E+10   0.0    13400.0
2759. c2h5oc2h5+c2h5<=>c2h5oc2h4s+c2h6             1.00E+11   0.0    10400.0
2760. c2h5oc2h5+ch3o<=>c2h5oc2h4p+ch3oh            4.34E+11   0.0     6458.0
2761. c2h5oc2h5+ch3o<=>c2h5oc2h4s+ch3oh            3.00E+11   0.0     4500.0
2762. c2h5oc2h5+ch3o2<=>c2h5oc2h4p+ch3o2h          1.60E-05   5.1    14871.0
2763. c2h5oc2h5+ch3o2<=>c2h5oc2h4s+ch3o2h          3.82E-02   4.2     9023.0
2764. c2h5oc2h5+ch3co2=c2h5oc2h4p+ch3cooh          1.60E-05   5.1    14871.0
2765. c2h5oc2h5+ch3co2=c2h5oc2h4s+ch3cooh          3.82E-02   4.2     9023.0
2766. c2h5oc2h5+c2h5o2<=>c2h5oc2h4p+c2h5o2h        1.60E-05   5.1    14871.0
2767. c2h5oc2h5+c2h5o2<=>c2h5oc2h4s+c2h5o2h        3.82E-02   4.2     9023.0
2768. c2h5oc2h4p=ch3ch2o+c2h4                      4.41E+12   0.2    24200.0
2769. c2h5oc2h4s=ch3cho+c2h5                       4.92E+15  -0.5    24346.1
2770. c2h5oc2h4p=c2h5oc2h4s                        1.09E+01   2.9    12135.7
2771. c2h5oc2h4s+o2=c2oc2-so2                      6.74E+27  -4.8     3779.8
2772. c2h5oc2h4p+o2=c2oc2-po2                      1.15E+20  -2.4     2451.0
2773. c2oc2-so2=c2oc2sooh4                         1.03E+06   1.5    20200.0
2774. c2oc2-so2=c2oc2sooh3                         9.30E+07   1.1    18200.0
2775. c2oc2-so2=c2oc2sooh1                         6.51E+06   1.7    32000.0
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2776. c2oc2-po2=c2oc2pooh4                          1.03E+05   1.5    19700.0
2777. c2oc2-po2=c2oc2pooh3                          1.03E+06   1.4    16400.0
2778. c2oc2-po2=c2oc2pooh2                          9.56E+07   1.4    28600.0
2779. c2oc2-so2=c2h5oc2h3+ho2                       4.92E+08   1.2    29800.0
2780. c2oc2-po2=c2h5oc2h3+ho2                       7.59E+06   1.7    28400.0
2781. c2h5oc2h4s+c2oc2-so2=c2oc2-so+c2oc2-so        4.50E+12   0.0     -500.0
2782. c2h5oc2h4p+c2oc2-po2=c2oc2-po+c2oc2-po        4.50E+12   0.0        0.0
2783. c2oc2-so2+ho2=c2oc2-so2h+o2                   2.00E+11   0.0      650.0
2784. c2oc2-po2+ho2=c2oc2-po2h+o2                   2.00E+11   0.0      650.0
2785. c2oc2-so2h=c2oc2-so+oh                        1.00E+16   0.0    37000.0
2786. c2oc2-po2h=c2oc2-po+oh                        4.00E+15   0.0    43000.0
2787. c2h5oc2h4s+ho2=c2oc2-so+oh                    7.00E+12   0.0    -1000.0
2788. c2h5oc2h4p+ho2=c2oc2-po+oh                    7.00E+12   0.0    -1000.0
2789. c2oc2-so2+c2oc2-so2=c2oc2-so+c2oc2-so+o2      6.80E+16  -1.6     3000.0
2790. c2oc2-po2+c2oc2-po2=c2oc2-po+c2oc2-po+o2      6.80E+16  -1.6     3000.0
2791. c2oc2-so=ch3cho+c2h5o                         1.27E+20  -2.4    25468.7
2792. c2oc2-po=ch2o+ch2o+c2h5                       2.00E+13   0.0    28700.0
2793. c2oc2pooh2=c2h5+choch2ooh                     1.14E+32  -5.8    29120.3
2794. choch2ooh=>hco+ch2o+oh                        1.00E+16   0.0    43000.0
2795. c2oc2pooh3=ch3cho+c2h4+ho2                    2.21E+12   0.2    15600.0
2796. c2oc2pooh4=c2h4+ch2o+ch2o+oh                  1.27E+20  -2.4    25468.7
2797. c2oc2sooh4=c2h4+ch3cho+ho2                    1.27E+20  -2.4    25468.7
2798. c2oc2sooh3=ch3cho+ch3cho+oh                   6.30E+08   1.3    16100.0
2799. c2oc2sooh1=c2h5oc2h3+ho2                      2.67E+11   0.5    15800.0
2800. c2oc2sooh1=ch3ch2o+ch3cooh                    1.27E+20  -2.4    25468.7
2801. ch2chooh=ch2cho+oh                            1.00E+16   0.0    37000.0
2802. c2oc2sooh4=c2oc2o-cy5+oh                      2.48E+09   0.3     9200.0
2803. c2oc2sooh3=c2oc2o-cy4+oh                      1.38E+09   0.7    15200.0
2804. c2oc2sooh1=c2ococ-cy3+oh                      4.45E+09   0.9    10800.0
2805. c2oc2pooh4=c2oc2o-cy6+oh                      2.89E+07   0.8    11300.0
2806. c2oc2pooh3=c2oc2o-cy5+oh                      4.82E+07   0.9     9000.0
2807. c2oc2pooh2=c2ococ-cy3+oh                      1.71E+09   1.1    10900.0
2808. c2oc2sooh4+o2=c2oc2sooh4o2                    3.37E+27  -4.8     3779.8
2809. c2oc2sooh3+o2=c2oc2sooh3o2                    3.37E+27  -4.8     3779.8
2810. c2oc2sooh1+o2=c2oc2sooh1o2                    5.75E+19  -2.4     2451.0
2811. c2oc2pooh4+o2=c2oc2pooh4o2                    5.75E+19  -2.4     2451.0
2812. c2oc2pooh3+o2=c2oc2pooh3o2                    3.37E+27  -4.8     3779.8
2813. c2oc2pooh2+o2=c2oc2pooh2o2                    3.37E+27  -4.8     3779.8
2814. c2oc2sooh4o2=c2oc24oohket2+oh                 1.63E+07   0.9    14700.0
2815. c2oc2sooh3o2=c2oc23oohket2+oh                 2.69E+07   1.1    16100.0
2816. c2oc2sooh1o2=c2oc21oohket2+oh                 3.07E+07   1.4    25900.0
2817. c2oc2pooh4o2=c2oc24oohald+oh                  1.03E+05   1.4    16200.0
2818. c2oc2pooh3o2=c2oc23oohald+oh                  1.03E+06   1.4    16400.0
2819. c2oc2pooh2o2=c2oc22oohald+oh                  9.56E+07   1.4    28600.0
2820. c2oc23oohket2=>oh+ch3cho+ch3co2               1.00E+16   0.0    37000.0
2821. c2oc21oohket2=>oh+ch2o+co+ch3ch2o             1.00E+16   0.0    43000.0
2822. c2oc24oohket2=>oh+2ch2o+ch3co                 1.00E+16   0.0    43000.0
2823. c2oc24oohald=>oh+2ch2o+ch2cho                 1.00E+16   0.0    43000.0
2824. c2oc23oohald=>oh+ch3cho+ch2o+hco              1.00E+16   0.0    37000.0
2825. c2oc22oohald=>oh+ch3ch2o+chocho               1.00E+16   0.0    37000.0
2826. c2oc24oohald=>2ch2o+ch3cooh                   2.10E+08   0.0    24500.0
2827. c2oc23oohket2=>ch3cooh+ch3cooh                2.10E+08   0.0    24500.0
2828. c2oc2o-cy5+oh=>ch3co2+c2h4+h2o                2.93E+04   2.5    -1659.0
2829. c2oc2o-cy5+h=>ch3co2+c2h4+h2                  6.02E+05   2.4     2583.0
2830. c2oc2o-cy5+ho2=>ch3co2+c2h4+h2o2              4.34E+02   3.0    12094.0
2831. c2oc2o-cy5+oh=>ch3cho+ch2cho+h2o              9.36E+07   1.6      -35.0
2832. c2oc2o-cy5+h=>ch3cho+ch2cho+h2                2.60E+06   2.4     4471.0
2833. c2oc2o-cy5+ho2=>ch3cho+ch2cho+h2o2            1.26E+02   3.4    13719.0
2834. c2oc2o-cy5+oh=>ch2o+c2h3och2+h2o              5.28E+09   1.0     1586.0
2835. c2oc2o-cy5+h=>ch2o+c2h3och2+h2                6.66E+06   2.5     6756.0
2836. c2oc2o-cy5+ho2=>ch2o+c2h3och2+h2o2            2.04E+01   3.6    17161.0
2837. c2oc2o-cy6+oh=>c2h4+ch2o+hco+h2o              1.87E+08   1.6      -35.0
2838. c2oc2o-cy6+h=>c2h4+ch2o+hco+h2                5.20E+06   2.4     4471.0
2839. c2oc2o-cy6+ho2=>c2h4+ch2o+hco+h2o2            2.52E+02   3.4    13719.0
2840. c2ococ-cy3+oh=>ch3cho+c2h3o1,2+h2o            4.68E+07   1.6      -35.0
2841. c2ococ-cy3+h=>ch3cho+c2h3o1,2+h2              1.30E+06   2.4     4471.0
2842. c2ococ-cy3+ho2=>ch3cho+c2h3o1,2+h2o2          6.32E+01   3.4    13719.0
2843. c2ococ-cy3+oh=>ch3ch2o+ch2co+h2o              2.93E+04   2.5    -1659.0
2844. c2ococ-cy3+h=>ch3ch2o+ch2co+h2                6.02E+05   2.4     2583.0
2845. c2ococ-cy3+ho2=>ch3ch2o+ch2co+h2o2            4.34E+02   3.0    12094.0
2846. c2ococ-cy3+oh=>c2h4+hco+ch2o+h2o              1.76E+09   1.0     1586.0
2847. c2ococ-cy3+h=>c2h4+hco+ch2o+h2                2.22E+06   2.5     6756.0
2848. c2ococ-cy3+ho2=>c2h4+hco+ch2o+h2o2            6.80E+00   3.6    17161.0
2849. c2ococ-cy3+oh=>chocho+c2h5+h2o                4.68E+07   1.6      -35.0
2850. c2ococ-cy3+h=>chocho+c2h5+h2                  1.30E+06   2.4     4471.0
2851. c2ococ-cy3+ho2=>chocho+c2h5+h2o2              6.32E+01   3.4    13719.0
2852. c2oc2o-cy4+oh=>ch3cho+ch3co+h2o               5.86E+04   2.5    -1659.0
2853. c2oc2o-cy4+h=>ch3cho+ch3co+h2                 1.20E+06   2.4     2583.0
2854. c2oc2o-cy4+ho2=>ch3cho+ch3co+h2o2             8.68E+02   3.0    12094.0
2855. c2oc2o-cy4+oh=>ch3cho+ch2cho+h2o              1.06E+10   1.0     1586.0
2856. c2oc2o-cy4+h=>ch3cho+ch2cho+h2                1.33E+07   2.5     6756.0
2857. c2oc2o-cy4+ho2=>ch3cho+ch2cho+h2o2            4.08E+01   3.6    17161.0
2858. c2h5oc2h3+oh=c2h4oc2h3+h2o                    5.70E+00   3.4    -2390.0
2859. c2h5oc2h3+h=c2h4oc2h3+h2                      5.31E+04   2.8     7496.0
2860. c2h5oc2h3+ho2=c2h4oc2h3+h2o2                  5.32E-06   5.1    14871.0
2861. c2h5oc2h3+ch3=c2h4oc2h3+ch4                   3.30E+02   3.3    12291.0
2862. c2h4oc2h3=c2h4+ch2cho                         4.41E+12   0.2    24200.0
2863. dpe(+m)<=>nc3h7+nc3h7o(+m)                    2.60E+23  -2.0    88386.0
      Low pressure limit:  0.10737E+77 -0.16418E+02  0.98829E+05
      TROE centering:      0.87622E-04  0.58993E+03  0.68923E+04  0.19679E+04
2864. dpe(+m)<=>c3h7oc2h4+ch3(+m)                   5.53E+24  -2.2    89010.0
      Low pressure limit:  0.66320E+60 -0.12130E+02  0.84720E+05
      TROE centering:      0.24380E+00  0.74406E+03  0.50000E+10  0.50000E+10
2865. dpe(+m)<=>c2h5+c3h7och2(+m)                   1.80E+23  -1.9    88635.0
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      Low pressure limit:  0.94699E+76 -0.16410E+02  0.99222E+05
      TROE centering:      0.42576E+00  0.10123E+04  0.10346E+03  0.22761E+04
2866. dpe(+m)<=>nc3h7oh+c3h6(+m)                     1.00E+14    0.0    65200.0
      Low pressure limit:  0.61359E+96 -0.22570E+02  0.80762E+05
      TROE centering:      0.22531E-01  0.19124E+02  0.14140E+11  0.39354E+04
2867. dpe+o2=dpe1+ho2                                4.00E+13    0.0    46800.0
2868. dpe+o2=dpe2+ho2                                4.00E+13    0.0    49800.0
2869. dpe+o2=dpe3+ho2                                6.00E+13    0.0    52340.0
2870. dpe+oh=dpe1+h2o                                2.26E+03    2.9    -4039.0
2871. dpe+oh=dpe2+h2o                                1.25E+01    3.6    -3237.0
2872. dpe+oh=dpe3+h2o                                2.73E+06    2.1      774.0
2873. dpe+h=dpe1+h2                                  1.15E+06    2.5     2300.0
2874. dpe+h=dpe2+h2                                  2.60E+06    2.4     4471.0
2875. dpe+h=dpe3+h2                                  1.33E+06    2.5     6756.0
2876. dpe+ch3=dpe1+ch4                               3.98E+01    3.4     7635.0
2877. dpe+ch3=dpe2+ch4                               3.02E+00    3.5     5481.0
2878. dpe+ch3=dpe3+ch4                               3.06E+00    3.6     7154.0
2879. dpe+ho2=dpe1+h2o2                              6.86E-02    4.1     9106.0
2880. dpe+ho2=dpe2+h2o2                              1.50E-02    4.3    13076.0
2881. dpe+ho2=dpe3+h2o2                              2.90E-01    3.9    16581.0
2882. dpe+o=dpe1+oh                                  2.90E+05    2.4      876.0
2883. dpe+o=dpe2+oh                                  9.54E+04    2.7     2106.0
2884. dpe+o=dpe3+oh                                  1.94E+03    3.2     4658.0
2885. dpe+c2h5=dpe1+c2h6                             1.00E+11    0.0    10400.0
2886. dpe+c2h5=dpe2+c2h6                             1.00E+11    0.0    10400.0
2887. dpe+c2h5=dpe3+c2h6                             5.00E+10    0.0    13400.0
2888. dpe+ch3o2=dpe1+ch3o2h                          3.82E-02    4.2     9023.0
2889. dpe+ch3o2=dpe2+ch3o2h                          3.16E+03    2.8    14050.0
2890. dpe+ch3o2=dpe3+ch3o2h                          1.60E-05    5.1    14871.0
2891. dpe1=nc3h7+c2h5cho                             1.14E+32   -5.8    29120.3
2892. dpe2=nc3h7o+c3h6                               1.27E+20   -2.4    25468.7
2893. dpe3=c3h7och2+c2h4                             5.27E+21   -2.8    30991.2
2894. c3h7och2=nc3h7+ch2o                            1.14E+32   -5.8    29120.3
2895. c3h7oc2h4=nc3h7o+c2h4                          1.27E+20   -2.4    25468.7
2896. dpe1+o2=dpe1oo                                 6.74E+27   -4.8     3779.8
2897. dpe2+o2=dpe2oo                                 6.74E+27   -4.8     3779.8
2898. dpe3+o2=dpe3oo                                 1.15E+20   -2.4     2451.0
2899. dpe1oo=dpe1ooh1                                9.30E+07    1.1    18200.0
2900. dpe1oo=dpe1ooh3                                4.86E+07    1.2    21500.0
2901. dpe1oo=dpe1ooh2                                9.56E+07    1.4    28600.0
2902. dpe2oo=dpe2ooh1                                9.56E+07    1.4    28600.0
2903. dpe2oo=dpe2ooh3                                6.51E+06    1.7    32000.0
2904. dpe2oo=dpe2ooh4                                1.03E+06    1.4    16400.0
2905. dpe3oo=dpe3ooh1                                9.30E+07    1.1    18200.0
2906. dpe3oo=dpe3ooh2                                9.56E+07    1.4    28600.0
2907. dpe1oo=c3h7oc3h5-1+ho2                         7.59E+06    1.7    28400.0
2908. dpe2oo=c3h7oc3h5-1+ho2                         7.59E+06    1.7    28400.0
2909. dpe2oo=c3h7oc3h5-2+ho2                         4.92E+08    1.2    29800.0
2910. dpe3oo=c3h7oc3h5-2+ho2                         6.29E+07    1.4    28900.0
2911. dpe1+dpe1oo=dpe1o+dpe1o                        4.50E+12    0.0     -500.0
2912. dpe2+dpe2oo=dpe2o+dpe2o                        4.50E+12    0.0     -500.0
2913. dpe3+dpe3oo=dpe3o+dpe3o                        4.50E+12    0.0        0.0
2914. dpe1oo+ho2=dpe1ooh+o2                          2.00E+11    0.0      650.0
2915. dpe2oo+ho2=dpe2ooh+o2                          2.00E+11    0.0      650.0
2916. dpe3oo+ho2=dpe3ooh+o2                          2.00E+11    0.0      650.0
2917. dpe1ooh=dpe1o+oh                               1.00E+16    0.0    37000.0
2918. dpe2ooh=dpe2o+oh                               4.00E+15    0.0    43000.0
2919. dpe3ooh=dpe3o+oh                               4.00E+15    0.0    43000.0
2920. dpe1+ho2=dpe1o+oh                              7.00E+12    0.0    -1000.0
2921. dpe2+ho2=dpe2o+oh                              7.00E+12    0.0    -1000.0
2922. dpe3+ho2=dpe3o+oh                              7.00E+12    0.0    -1000.0
2923. dpe1o=c2h5cho+nc3h7o                           4.92E+15   -0.5    24346.1
2924. dpe2o=c3h7och2+ch3cho                          9.12E+13    0.0    14360.0
2925. dpe3o=c3h7oc2h4+ch2o                           9.12E+13    0.0    14360.0
2926. dpe1ooh1=c2h5cho+c2h5cho+oh                    6.30E+08    1.3    16100.0
2927. dpe1ooh3=c2h4+c3h7ocho+oh                      2.89E+09    1.3    26700.0
2928. dpe1ooh2=c3h7oc3h5-1+ho2                       2.88E+11    0.5    15200.0
2929. dpe2ooh1=c3h7oc3h5-1+ho2                       2.88E+11    0.5    15200.0
2930. dpe2ooh3=c3h7oc3h5-2+ho2                       7.93E+10    0.6    15500.0
2931. dpe2ooh3=ch2chooh+c3h7och2                     8.56E+10    0.8    30700.0
2932. dpe2ooh4=prooh2-1+c2h5cho                      6.30E+08    1.3    16100.0
2933. dpe3ooh1=ho2c2h4cho+nc3h7                      6.30E+08    1.3    16100.0
2934. dpe3ooh2=c3h7oc3h5-2+ho2                       7.93E+10    0.6    15500.0
2935. dpe1ooh1=c3oc3cy411+oh                         1.38E+09    0.7    15200.0
2936. dpe1ooh3=c3oc3cy413+oh                         2.48E+09    0.3     9200.0
2937. dpe1ooh2=c3oc3cy312+oh                         1.38E+09    0.7    15200.0
2938. dpe2ooh1=c3oc3cy312+oh                         1.38E+09    0.7    15200.0
2939. dpe2ooh3=c3oc3cy323+oh                         2.48E+09    0.3     9200.0
2940. dpe2ooh4=c3oc3cy521+oh                         1.38E+09    0.7    15200.0
2941. dpe3ooh1=c3oc3cy413+oh                         2.59E+09    0.7    16000.0
2942. dpe3ooh2=c3oc3cy323+oh                         2.59E+09    0.7    16000.0
2943. dpe1ooh1+o2=dpe1ooh1o2                         3.37E+27   -4.8     3779.8
2944. dpe1ooh3+o2=dpe1ooh3o2                         5.75E+19   -2.4     2451.0
2945. dpe1ooh2+o2=dpe1ooh2o2                         3.37E+27   -4.8     3779.8
2946. dpe2ooh1+o2=dpe2ooh1o2                         3.37E+27   -4.8     3779.8
2947. dpe2ooh3+o2=dpe2ooh3o2                         5.75E+19   -2.4     2451.0
2948. dpe2ooh4+o2=dpe2ooh4o2                         3.37E+27   -4.8     3779.8
2949. dpe3ooh1+o2=dpe3ooh1o2                         3.37E+27   -4.8     3779.8
2950. dpe3ooh2+o2=dpe3ooh2o2                         3.37E+27   -4.8     3779.8
2951. dpe1ooh1o2=c3oc31oohket1+oh                    1.45E+08    0.9    15800.0
2952. dpe1ooh3o2=c3oc33oohket1+oh                    1.45E+08    0.9    15800.0
2953. dpe1ooh2o2=c3oc32oohket1+oh                    2.52E+07    1.4    25300.0
2954. dpe2ooh1o2=c3oc31oohket2+oh                    2.52E+07    1.4    25300.0
2955. dpe2ooh3o2=c3oc33oohket2+oh                    2.52E+07    1.4    25300.0
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2956.	dpe2ooh4o2=c3oc34oohket2+oh	2.02E+07	0.9	14600.0
2957.	dpe3ooh1o2=c3oc31oohald3+oh	9.30E+07	1.1	18200.0
2958.	dpe3ooh2o2=c3oc32oohald3+oh	9.56E+07	1.4	28600.0
2959.	c3oc31oohket1=>c2h5cho+c2h5co2+oh	1.00E+16	0.0	40000.0
2960.	c3oc33oohket1=>ch2o+ch2co+nc3h7o+oh	1.00E+16	0.0	40000.0
2961.	c3oc32oohket1=>ch3cho+co+nc3h7o+oh	1.00E+16	0.0	40000.0
2962.	c3oc31oohket2=>ch3cocho+nc3h7o+oh	1.00E+16	0.0	40000.0
2963.	c3oc31oohket2=>ch2o+co+c3h7och2+oh	1.00E+16	0.0	40000.0
2964.	c3oc34oohket2=>ch2o+ch3co+c2h5cho+oh	1.00E+16	0.0	40000.0
2965.	c3oc31oohald3=>choch2cho+nc3h7o+oh	1.00E+16	0.0	40000.0
2966.	c3oc32oohald3=>chocho+c3h7och2+oh	1.00E+16	0.0	40000.0
2967.	c3oc3cy411+oh=>c2h5cho+c2h5co+h2o	5.86E+04	2.5	-1659.0
2968.	c3oc3cy411+h=>c2h5cho+c2h5co+h2	1.20E+06	2.4	2583.0
2969.	c3oc3cy411+ho2=>c2h5cho+c2h5co+h2o2	8.68E+02	3.0	12094.0
2970.	c3oc3cy413+oh=>c2h4+co+nc3h7o+h2o	2.93E+04	2.5	-1659.0
2971.	c3oc3cy413+h=>c2h4+co+nc3h7o+h2	6.02E+05	2.4	2583.0
2972.	c3oc3cy413+ho2=>c2h4+co+nc3h7o+h2o2	4.34E+02	3.0	12094.0
2973.	c3oc3cy312+oh=>ch3chco+nc3h7o+h2o	2.93E+04	2.5	-1659.0
2974.	c3oc3cy312+h=>ch3chco+nc3h7o+h2	6.02E+05	2.4	2583.0
2975.	c3oc3cy312+ho2=>ch3chco+nc3h7o+h2o2	4.34E+02	3.0	12094.0
2976.	c3oc3cy312+oh=>ch3cocho+nc3h7+h2o	2.93E+04	2.5	-1659.0
2977.	c3oc3cy312+h=>ch3cocho+nc3h7+h2	6.02E+05	2.4	2583.0
2978.	c3oc3cy312+ho2=>ch3cocho+nc3h7+h2o2	4.34E+02	3.0	12094.0
2979.	c3oc3cy323+oh=>ch2co+c3h7och2+h2o	2.93E+04	2.5	-1659.0
2980.	c3oc3cy323+h=>ch2co+c3h7och2+h2	6.02E+05	2.4	2583.0
2981.	c3oc3cy323+ho2=>ch2co+c3h7och2+h2o2	4.34E+02	3.0	12094.0
2982.	c3oc3cy521+oh=>ch3cho+c2h5coch2+h2o	2.93E+04	2.5	-1659.0
2983.	c3oc3cy521+h=>ch3cho+c2h5coch2+h2	6.02E+05	2.4	2583.0
2984.	c3oc3cy521+ho2=>ch3cho+c2h5coch2+h2o2	4.34E+02	3.0	12094.0
2985.	ho2c2h4cho+oh=>c2h4+ho2+co+h2o	3.40E+12	0.0	-619.0
2986.	ho2c2h4cho+h=>c2h4+ho2+co+h2	1.20E+14	0.0	7000.0
2987.	ho2c2h4cho+ho2=>c2h4+ho2+co+h2o2	2.00E+12	0.0	11700.0
2988.	ho2c2h4cho+ch3=>c2h4+ho2+co+ch4	5.54E+03	2.8	5862.0
2989.	c3h7ocho+oh=>nc3h7o+co+h2o	3.40E+12	0.0	-619.0
2990.	c3h7ocho+h=>nc3h7o+co+h2	1.20E+14	0.0	7000.0
2991.	c3h7ocho+ho2=>nc3h7o+co+h2o2	2.00E+12	0.0	11700.0
2992.	c3h7ocho+ch3=>nc3h7o+co+ch4	5.54E+03	2.8	5862.0
2993.	c3h7oc3h5-1+oh=c3h7oc3h4-1+h2o	9.00E+06	2.0	-298.0
2994.	c3h7oc3h5-1+h=c3h7oc3h4-1+h2	5.22E+05	2.5	2510.0
2995.	c3h7oc3h5-1+ho2=c3h7oc3h4-1+h2o2	2.88E+04	2.6	13900.0
2996.	c3h7oc3h5-1+ch3=c3h7oc3h4-1+ch4	6.66E+00	3.5	5670.0
2997.	c3h7oc3h5-2+oh=c3h7oc3h4-1+h2o	6.00E+06	2.0	-298.0
2998.	c3h7oc3h5-2+h=c3h7oc3h4-1+h2	3.48E+05	2.5	2510.0
2999.	c3h7oc3h5-2+ho2=c3h7oc3h4-1+h2o2	1.92E+04	2.6	13900.0
3000.	c3h7oc3h5-2+ch3=c3h7oc3h4-1+ch4	4.44E+00	3.5	5670.0
3001.	c3h7oc3h4-1=c2h3cho+nc3h7	4.92E+15	-0.5	24346.1
3002.	c2h5cooh=ch3chco+h2o	4.47E+14	0.0	79890.0
3003.	c2h5cooh=c2h6+co2	7.08E+13	0.0	74520.0
3004.	c2h5co+oh=c2h5cooh	1.00E+14	0.0	0.0
3005.	c2h5cooh=c2h5co2+h	2.30E+14	0.0	106345.3
3006.	c2h5cooh=c2h5+hoco	8.20E+16	0.0	88817.0
3007.	c2h5cooh=ch3+ch2cooh	2.90E+16	0.0	81917.1
3008.	c2h5cooh+h=ch2ch2cooh+h2	1.66E+05	2.6	8360.0
3009.	c2h5cooh+h=ch3chcooh+h2	8.94E+03	2.9	4402.0
3010.	c2h5cooh+h=c2h5co2+h2	1.62E+06	2.3	14796.0
3011.	c2h5cooh+o=ch2ch2cooh+oh	9.65E+04	2.7	3716.0
3012.	c2h5cooh+o=ch3chcooh+oh	4.77E+04	2.7	2106.0
3013.	c2h5cooh+o=c2h5co2+oh	1.46E-03	4.7	1727.0
3014.	c2h5cooh+oh=ch2ch2cooh+h2o	1.29E-02	4.4	-2859.0
3015.	c2h5cooh+oh=ch3chcooh+h2o	1.87E+03	2.9	-1260.0
3016.	c2h5cooh+oh=c2h5co2+h2o	1.18E-04	4.8	-4029.0
3017.	c2h5cooh+ch3=ch2ch2cooh+ch4	7.52E-02	4.0	9691.0
3018.	c2h5cooh+ch3=ch3chcooh+ch4	1.18E-01	3.9	6066.0
3019.	c2h5cooh+ch3=c2h5co2+ch4	1.32E+02	3.0	10421.0
3020.	c2h5cooh+ho2=ch2ch2cooh+h2o2	2.51E-06	5.5	14219.0
3021.	c2h5cooh+ho2=>ch3chcooh+h2o2	1.03E-06	5.4	11311.0
3022.	c2h5cooh+ho2=c2h5co2+h2o2	1.86E-02	4.2	20585.0
3023.	c2h5cooh+ch3o2=ch2ch2cooh+ch3o2h	8.40E+12	0.0	20440.0
3024.	c2h5cooh+ch3o2=ch3chcooh+ch3o2h	5.60E+12	0.0	17690.0
3025.	c2h5cooh+ch3o=ch2ch2cooh+ch3oh	1.58E+11	0.0	7000.0
3026.	c2h5cooh+ch3o=ch3chcooh+ch3oh	1.10E+11	0.0	5000.0
3027.	c2h5co2+m=c2h5+co2+m	4.40E+15	0.0	10500.0
3028.	ch2ch2cooh=c2h4+hoco	3.03E+13	0.3	34667.0
3029.	ch2ch2cooh=c2h3cooh+h	3.20E+13	0.0	34800.0
3030.	ch3chcooh=ch3chco+oh	3.05E+21	-1.6	57300.0
3031.	ch3chcooh=c2h3cooh+h	3.00E+13	0.0	51500.0
3032.	ch3chcooh=>co2+c2h5	1.70E+09	1.0	38640.0
3033.	c2h3cooh+oh=>ch2o+ch2cooh	1.37E+12	0.0	-1040.0
3034.	c2h3cooh+oh=>ch3+hco+hoco	1.37E+12	0.0	-1040.0
3035.	c2h3cooh=c2h3+hoco	3.75E+21	-1.9	112900.0
3036.	c2h3cooh=c2h3co+oh	5.21E+20	-1.2	100900.0
3037.	c2h3cooh=c2h4+co2	7.08E+13	0.0	74520.0
3038.	c2h3cooh+h=>h2+co2+c2h3	4.20E+06	2.1	6900.0
3039.	c2h3cooh+oh=>h2o+co2+c2h3	5.40E+04	2.0	-340.0
3040.	c2h3cooh+ho2=>h2o2+co2+c2h3	1.00E+11	0.0	11500.0
3041.	c2h3cooh+ch3=>ch4+co2+c2h3	1.40E+01	3.1	9940.0
3042.	c2h3cooh+c2h5=>c2h6+co2+c2h3	1.40E+01	3.1	8940.0
3043.	ch3chco+oh=ch3cho+hco	1.00E+12	0.0	0.0
3044.	nc3h7oh(+m)=c3h6+h2o(+m)	3.52E+13	0.0	67230.0
	Low pressure limit: 0.16900E+76 -0.17040E+02 0.64750E+05			
	TROE centering: 0.80000E-01 0.10000E+01 0.99240E+10 0.99240E+10			
3045.	nc3h7oh(+m)<=>ch3+pc2h4oh(+m)	3.79E+24	-2.2	88070.0
	Low pressure limit: 0.17820E+61 -0.12280E+02 0.83980E+05			
	TROE centering: 0.23520E+00 0.72400E+03 0.50000E+10 0.50000E+10			

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3046. nc3h7oh(+m)=ch2oh+c2h5(+m)                    3.02E+23   -1.9    85710.0
      Low pressure limit:  0.14160E+60 -0.11930E+02  0.83980E+05
      TROE centering:      0.76460E+00  0.83440E+10  0.72480E+03  0.82140E+10
3047. nc3h6oh-1+h=nc3h7oh                           1.00E+14    0.0        0.0
3048. c3h61oh+h=nc3h7oh                             1.00E+14    0.0        0.0
3049. nc3h6oh-3+h=nc3h7oh                           1.00E+14    0.0        0.0
3050. nc3h7oh+oh=nc3h6oh-1+h2o                      1.31E+05    2.4    -1460.0
3051. nc3h7oh+h=nc3h6oh-1+h2                        1.79E+05    2.5     3420.0
3052. nc3h7oh+ch3=nc3h6oh-1+ch4                     1.99E+01    3.4     7635.0
3053. nc3h7oh+c2h5=nc3h6oh-1+c2h6                   1.99E+01    3.4     7635.0
3054. nc3h7oh+oh=c3h61oh+h2o                        4.68E+07    1.6      -35.0
3055. nc3h7oh+h=c3h61oh+h2                          1.30E+06    2.4     4471.0
3056. nc3h7oh+ch3=c3h61oh+ch4                       2.70E+04    2.3     7287.0
3057. nc3h7oh+c2h5=c3h61oh+c2h6                     2.70E+04    2.3     7287.0
3058. nc3h7oh+oh=nc3h6oh-3+h2o                      5.25E+09    1.0     1590.0
3059. nc3h7oh+h=nc3h6oh-3+h2                        9.50E+04    2.8     6280.0
3060. nc3h7oh+ch3=nc3h6oh-3+ch4                     4.50E-03    3.6     7154.0
3061. nc3h7oh+c2h5=nc3h6oh-3+c2h6                   4.50E-03    3.6     7154.0
3062. nc3h6oh-1=c2h5cho+h                           7.03E+09    1.0    32600.0

  NOTE:  A units mole-cm-sec-K, E units cal/mole
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Annexe 4 : Mécanisme d'oxydation du DMM

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                                                  (k = A T**b exp(-E/RT))
   REACTIONS                                        A        b        E

 1. H2+M<=>H+H+M                                 4.58E+19   -1.4   104400.0
    H2              Enhanced by    2.500E+00
    H2O             Enhanced by    1.200E+01
    CO              Enhanced by    1.900E+00
    CO2             Enhanced by    3.800E+00
    HE              Enhanced by    8.300E-01
    CH4             Enhanced by    2.000E+00
    C2H6            Enhanced by    3.000E+00
 2. H2+O<=>H+OH                                  5.08E+04    2.7     6292.0
 3. H2+OH<=>H+H2O                                4.38E+13    0.0     6990.0
 4. O+O+M<=>O2+M                                 6.16E+15   -0.5        0.0
    H2              Enhanced by    2.500E+00
    H2O             Enhanced by    1.200E+01
    AR              Enhanced by    8.300E-01
    CO              Enhanced by    1.900E+00
    CO2             Enhanced by    3.800E+00
    HE              Enhanced by    8.300E-01
    CH4             Enhanced by    2.000E+00
    C2H6            Enhanced by    3.000E+00
 5. O2+H<=>O+OH                                  1.04E+14    0.0    15286.0
 6. H+OH+M<=>H2O+M                               3.50E+22   -2.0        0.0
    H2              Enhanced by    7.300E-01
    H2O             Enhanced by    3.650E+00
    CH4             Enhanced by    2.000E+00
    C2H6            Enhanced by    3.000E+00
    AR              Enhanced by    3.800E-01
 7. O+H2O<=>OH+OH                                6.70E+07    1.7    14986.8
 8. O+H+M<=>OH+M                                 4.71E+18   -1.0        0.0
    H2              Enhanced by    2.500E+00
    H2O             Enhanced by    1.200E+01
    AR              Enhanced by    7.500E-01
    CO              Enhanced by    1.500E+00
    CO2             Enhanced by    2.000E+00
    HE              Enhanced by    7.500E-01
    CH4             Enhanced by    2.000E+00
    C2H6            Enhanced by    3.000E+00
 9. H+O+M<=>OHV+M                                1.50E+13    0.0     5975.0
    H2              Enhanced by    1.000E+00
    H2O             Enhanced by    6.500E+00
    O2              Enhanced by    4.000E-01
    N2              Enhanced by    4.000E-01
    AR              Enhanced by    3.500E-01
10. OHV+H2O<=>OH+H2O                             5.93E+12    0.5     -860.0
11. OHV+H2<=>OH+H2                               2.95E+12    0.5     -444.0
12. OHV+N2<=>OH+N2                               1.08E+11    0.5    -1242.0
13. OHV+OH<=>OH+OH                               6.01E+12    0.5     -764.0
14. OHV+H<=>OH+H                                 1.31E+12    0.5     -167.0
15. OHV+AR<=>OH+AR                               1.69E+12    0.0     4135.0
16. OHV<=>OH                                     1.45E+06    0.0        0.0
17. OHV+O2<=>OH+O2                               2.10E+12    0.5     -478.0
18. OHV+CO2<=>OH+CO2                             2.75E+12    0.5     -968.0
19. OHV+CO<=>OH+CO                               3.23E+12    0.5     -787.0
20. OHV+CH4<=>OH+CH4                             3.36E+12    0.5     -635.0
21. H2O2(+M)<=>OH+OH(+M)                         2.00E+12    0.9    48749.0
    Low pressure limit:  0.24900E+25 -0.23000E+01  0.48749E+05
    TROE centering:      0.43000E+00  0.10000E-29  0.10000E+31
    H2O             Enhanced by    7.650E+00
    CO2             Enhanced by    1.600E+00
    N2              Enhanced by    1.500E+00
    O2              Enhanced by    1.200E+00
    HE              Enhanced by    6.500E-01
    H2O2            Enhanced by    7.700E+00
    H2              Enhanced by    3.700E+00
    CO              Enhanced by    2.800E+00
22. H2O2+H<=>H2O+OH                              2.41E+13    0.0     3970.0
23. H2O2+H<=>H2+HO2                              2.15E+10    1.0     6000.0
24. H2O2+O<=>OH+HO2                              9.55E+06    2.0     3970.0
25. H2O2+OH<=>H2O+HO2                            1.74E+12    0.0      318.0
    Declared duplicate reaction...
26. H2O2+OH<=>H2O+HO2                            7.59E+13    0.0     7269.0
    Declared duplicate reaction...
27. HO2+H<=>OH+OH                                7.08E+13    0.0      295.0
28. HO2+H<=>H2+O2                                1.14E+10    1.1      553.8
29. HO2+O<=>OH+O2                                3.25E+13    0.0        0.0
30. OH+HO2<=>H2O+O2                              7.00E+12    0.0    -1093.0
    Declared duplicate reaction...
31. OH+HO2<=>H2O+O2                              4.50E+14    0.0    10929.6
    Declared duplicate reaction...
32. HO2+HO2<=>H2O2+O2                            1.00E+14    0.0    11040.9
    Declared duplicate reaction...
33. HO2+HO2<=>H2O2+O2                            1.90E+11    0.0    -1408.9
    Declared duplicate reaction...
34. H+O2(+M)<=>HO2(+M)                           4.65E+12    0.4        0.0
    Low pressure limit:  0.17370E+20 -0.12300E+01  0.00000E+00
    TROE centering:      0.67000E+00  0.10000E-29  0.10000E+31  0.10000E+31
    H2              Enhanced by    1.300E+00
    CO              Enhanced by    1.900E+00
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    CO2             Enhanced by    3.800E+00
    HE              Enhanced by    6.400E-01
    H2O             Enhanced by    1.000E+01
    AR              Enhanced by    5.000E-01
    CH4             Enhanced by    2.000E+00
    C2H6            Enhanced by    3.000E+00
35. CO+O(+M)<=>CO2(+M)                          1.36E+10    0.0     2384.0
    Low pressure limit:  0.11730E+25 -0.27900E+01  0.41910E+04
    H2              Enhanced by    2.000E+00
    H2O             Enhanced by    1.200E+01
    CO              Enhanced by    1.750E+00
    CO2             Enhanced by    3.600E+00
    AR              Enhanced by    7.000E-01
    HE              Enhanced by    7.000E-01
36. CO+OH<=>CO2+H                               7.02E+04    2.1     -355.7
    Declared duplicate reaction...
37. CO+OH<=>CO2+H                               5.76E+12   -0.7      331.8
    Declared duplicate reaction...
38. CO+HO2<=>CO2+OH                             1.57E+05    2.2    17940.0
39. CO+O2<=>CO2+O                               1.12E+12    0.0    47700.0
40. H+CO2<=>OCHO                                7.50E+13    0.0    29000.0
41. HOCO<=>CO+OH                                6.30E+32   -6.0    32470.0
    Rate coefficients at P=1.00E-03(atm)       1.55E-08    2.9     8768.0
    Rate coefficients at P=3.00E-03(atm)       1.77E+03    0.3    18076.0
    Rate coefficients at P=2.96E-02(atm)       2.02E+13   -1.9    22755.0
    Rate coefficients at P=9.87E-02(atm)       1.68E+18   -3.0    24323.0
    Rate coefficients at P=2.96E-01(atm)       2.50E+24   -4.6    27067.0
    Rate coefficients at P=9.87E-01(atm)       4.54E+26   -5.1    27572.0
    Rate coefficients at P=2.96E+00(atm)       7.12E+28   -5.6    28535.0
    Rate coefficients at P=9.87E+00(atm)       5.48E+29   -5.7    28899.0
    Rate coefficients at P=2.96E+01(atm)       9.89E+31   -6.2    30518.0
    Rate coefficients at P=9.87E+01(atm)       5.74E+33   -6.5    32068.0
    Rate coefficients at P=2.96E+02(atm)       2.61E+33   -6.3    32231.0
    Rate coefficients at P=9.87E+02(atm)       6.30E+32   -6.0    32470.0
42. HOCO<=>CO2+H                                1.90E+38   -8.0    34240.0
    Rate coefficients at P=1.00E-03(atm)       4.76E+18   -3.8    17676.0
    Rate coefficients at P=3.00E-03(atm)       2.22E+20   -4.1    19037.0
    Rate coefficients at P=9.90E-03(atm)       7.56E+21   -4.4    20325.0
    Rate coefficients at P=2.96E-02(atm)       9.11E+24   -5.2    22419.0
    Rate coefficients at P=9.87E-02(atm)       3.14E+29   -6.4    25233.0
    Rate coefficients at P=2.96E-01(atm)       1.15E+32   -7.0    26662.0
    Rate coefficients at P=9.87E-01(atm)       1.07E+36   -8.1    29064.0
    Rate coefficients at P=2.96E+00(atm)       2.44E+36   -8.2    29336.0
    Rate coefficients at P=9.87E+00(atm)       6.66E+35   -7.9    29217.0
    Rate coefficients at P=2.96E+01(atm)       1.72E+38   -8.5    31273.0
    Rate coefficients at P=9.87E+01(atm)       3.01E+41   -9.3    33966.0
    Rate coefficients at P=2.96E+02(atm)       6.77E+36   -7.8    31613.0
    Rate coefficients at P=9.87E+02(atm)       1.90E+38   -8.0    34240.0
43. CH3+H(+M)<=>CH4(+M)                         1.27E+16   -0.6      383.0
    Low pressure limit:  0.24770E+34 -0.47600E+01  0.24400E+04
    TROE centering:      0.78300E+00  0.74000E+02  0.29410E+04  0.69640E+04
    H2              Enhanced by    2.000E+00
    H2O             Enhanced by    6.000E+00
    AR              Enhanced by    7.000E-01
    CO              Enhanced by    1.500E+00
    CO2             Enhanced by    2.000E+00
    CH4             Enhanced by    2.000E+00
    C2H6            Enhanced by    3.000E+00
    HE              Enhanced by    7.000E-01
44. CH4+H<=>CH3+H2                              6.14E+05    2.5     9587.0
45. CH4+O<=>CH3+OH                              1.02E+09    1.5     8600.0
46. CH4+OH<=>CH3+H2O                            5.83E+04    2.6     2190.0
47. CH4+HO2<=>CH3+H2O2                          1.13E+01    3.7    21010.0
48. CH4+CH3O2<=>CH3+CH3O2H                      9.60E-01    3.8    17810.0
49. CH3+HO2<=>CH4+O2                            1.16E+05    2.2    -3022.0
50. CH4+CH2<=>CH3+CH3                           2.46E+06    2.0     8270.0
51. CH2(S)+N2<=>CH2+N2                          1.50E+13    0.0      600.0
52. CH2(S)+AR<=>CH2+AR                          9.00E+12    0.0      600.0
53. CH2(S)+H2O<=>CH2+H2O                        3.00E+13    0.0        0.0
54. CH2(S)+CO<=>CH2+CO                          9.00E+12    0.0        0.0
55. CH2(S)+CO2<=>CH2+CO2                        7.00E+12    0.0        0.0
56. CH2(S)+O2=>H+OH+CO                          2.80E+13    0.0        0.0
57. CH2(S)+O2<=>CO+H2O                          1.20E+13    0.0        0.0
58. CH2(S)+O<=>CO+H2                            1.50E+13    0.0        0.0
59. CH2(S)+O<=>HCO+H                            1.50E+13    0.0        0.0
60. CH2(S)+H2<=>CH3+H                           7.00E+13    0.0        0.0
61. CH2(S)+H<=>CH+H2                            3.00E+13    0.0        0.0
62. CH2(S)+OH<=>CH2O+H                          3.00E+13    0.0        0.0
63. CH2(S)+CO2<=>CH2O+CO                        1.40E+13    0.0        0.0
64. CH2+H(+M)<=>CH3(+M)                         2.50E+16   -0.8        0.0
    Low pressure limit:  0.32000E+28 -0.31400E+01  0.12300E+04
    TROE centering:      0.68000E+00  0.78000E+02  0.19950E+04  0.55900E+04
    H2              Enhanced by    2.000E+00
    H2O             Enhanced by    6.000E+00
    AR              Enhanced by    7.000E-01
    CO              Enhanced by    1.500E+00
    CO2             Enhanced by    2.000E+00
    CH4             Enhanced by    2.000E+00
    C2H6            Enhanced by    3.000E+00
    HE              Enhanced by    7.000E-01
65. CH2+O2<=>HCO+OH                             1.06E+13    0.0     1500.0
66. CH2+O2=>CO2+H+H                             2.64E+12    0.0     1500.0
67. CH2+O=>CO+H+H                               5.00E+13    0.0        0.0
68. CH2+H<=>CH+H2                               3.00E+13    0.0        0.0
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69. CH2+OH<=>CH+H2O                                  1.13E+07    2.0     3000.0
70. CHV+AR<=>CH+AR                                   4.00E+11    0.5        0.0
71. CHV+H2O<=>CH+H2O                                 5.30E+13    0.0        0.0
72. CHV+CO<=>CH+CO                                   2.44E+12    0.5        0.0
73. CHV+CO2<=>CH+CO2                                 2.41E-01    4.3    -1694.0
74. CHV+O2<=>CH+O2                                   2.48E+06    2.1    -1720.0
75. CHV+H2<=>CH+H2                                   1.47E+14    0.0     1361.0
76. CHV+CH4<=>CH+CH4                                 1.73E+13    0.0      167.0
77. CHV<=>CH                                         1.86E+06    0.0        0.0
78. CHV+N2<=>CH+N2                                   3.03E+02    3.4     -381.0
79. C+H+M<=>CHV+M                                    6.00E+14    0.0     6940.0
80. CH+O2<=>CO+OHV                                   4.04E+13    0.0        0.0
81. CH+O2<=>HCO+O                                    3.30E+13    0.0        0.0
82. CH+O<=>CO+H                                      5.70E+13    0.0        0.0
83. CH+H<=>C+H2                                      1.10E+14    0.0        0.0
84. CH+OH<=>HCO+H                                    3.00E+13    0.0        0.0
85. CH+H2O<=>H+CH2O                                  1.77E+16   -1.2       23.8
86. CH+CO2<=>HCO+CO                                  1.70E+12    0.0      685.0
87. C+OH<=>CO+H                                      5.00E+13    0.0        0.0
88. C+O2<=>CO+O                                      5.00E+13    0.0        0.0
89. CH3+O2(+M)<=>CH3O2(+M)                           7.81E+09    0.9        0.0
    Low pressure limit:  0.68500E+25 -0.30000E+01  0.00000E+00
    TROE centering:      0.60000E+00  0.10000E+04  0.70000E+02  0.17000E+04
90. CH3+O2<=>CH3O+O                                  7.55E+12    0.0    28320.0
91. CH3+O2<=>CH2O+OH                                 2.64E+00    3.3     8105.0
92. CH3+O<=>CH2O+H                                   5.54E+13    0.1     -136.0
93. CH3+OH<=>CH2(S)+H2O                              4.94E+14   -0.7     -445.8
    Rate coefficients at P=1.00E-02(atm)            4.94E+14   -0.7     -445.8
    Rate coefficients at P=1.00E-01(atm)            1.21E+15   -0.8     -175.6
    Rate coefficients at P=1.00E+00(atm)            5.28E+17   -1.5     1772.0
    Rate coefficients at P=1.00E+01(atm)            4.79E+23   -3.2     7003.0
    Rate coefficients at P=1.00E+02(atm)            8.43E+19   -2.0     8244.0
94. CH3+OH<=>CH2O+H2                                 3.50E+05    1.4    -3244.0
    Rate coefficients at P=1.00E-02(atm)            3.50E+05    1.4    -3244.0
    Rate coefficients at P=1.00E-01(atm)            8.85E+05    1.3    -2975.0
    Rate coefficients at P=1.00E+00(atm)            1.65E+07    1.0    -2010.0
    Rate coefficients at P=1.00E+01(atm)            5.37E+09    0.3      280.0
    Rate coefficients at P=1.00E+02(atm)            9.49E+18   -2.2     9769.0
95. CH3+OH<=>CH2OH+H                                 1.62E+10    1.0     3210.0
    Rate coefficients at P=1.00E-02(atm)            1.62E+10    1.0     3214.0
    Rate coefficients at P=1.00E-01(atm)            1.81E+10    0.9     3247.0
    Rate coefficients at P=1.00E+00(atm)            4.69E+10    0.8     3566.0
    Rate coefficients at P=1.00E+01(atm)            1.52E+13    0.1     5641.0
    Rate coefficients at P=1.00E+02(atm)            3.59E+14   -0.2     8601.0
96. CH3+OH<=>H+CH3O                                  1.19E+09    1.0    11940.0
    Rate coefficients at P=1.00E-02(atm)            1.19E+09    1.0    11940.0
    Rate coefficients at P=1.00E-01(atm)            1.19E+09    1.0    11940.0
    Rate coefficients at P=1.00E+00(atm)            1.23E+09    1.0    11950.0
    Rate coefficients at P=1.00E+01(atm)            1.80E+09    1.0    12060.0
    Rate coefficients at P=1.00E+02(atm)            5.24E+10    0.6    13070.0
97. CH3+OH<=>HCOH+H2                                 8.67E+08    0.8    -3046.0
    Rate coefficients at P=1.00E-02(atm)            8.67E+08    0.8    -3046.0
    Rate coefficients at P=1.00E-01(atm)            3.12E+09    0.6    -2669.0
    Rate coefficients at P=1.00E+00(atm)            1.56E+11    0.2    -1368.0
    Rate coefficients at P=1.00E+01(atm)            1.70E+21   -2.6     6412.0
    Rate coefficients at P=1.00E+02(atm)            7.25E+20   -2.4     9639.0
98. CH3+OH<=>CH2+H2O                                 4.29E+04    2.6     3997.8
99. CH3+HO2<=>CH3O+OH                                1.00E+12    0.3     -687.5
100. CH3O2+O<=>CH3O+O2                               3.60E+13    0.0        0.0
101. CH3O2+H<=>CH3O+OH                               9.60E+13    0.0        0.0
102. CH3O2+OH<=>CH3OH+O2                             6.00E+13    0.0        0.0
103. CH3O2+HO2<=>CH3O2H+O2                           2.47E+11    0.0    -1570.0
104. CH3O2+H2O2<=>CH3O2H+HO2                         2.41E+12    0.0     9936.0
105. CH3O2+CH3<=>CH3O+CH3O                           5.08E+12    0.0    -1411.0
106. CH3O2+CH3O2=>CH2O+CH3OH+O2                      3.11E+14   -1.6    -1051.0
107. CH3O2+CH3O2=>O2+CH3O+CH3O                       1.40E+16   -1.6     1860.0
108. H2+CH3O2<=>H+CH3O2H                             1.50E+14    0.0    26030.0
109. CH3O2H<=>CH3O+OH                                6.31E+14    0.0    42300.0
110. CH2O2H<=>CH2O+OH                                9.00E+14    0.0     1500.0
111. CH3OH(+M)<=>CH3+OH(+M)                          2.08E+18   -0.6    92540.6
     Low pressure limit:  0.15000E+44 -0.69950E+01  0.97992E+05
     TROE centering:     -0.47480E+00  0.35580E+05  0.11160E+04  0.90230E+04
112. CH3OH(+M)<=>CH2(S)+H2O(+M)                      3.12E+18   -1.0    91712.0
     Low pressure limit:  0.14300E+48 -0.82270E+01  0.99417E+05
     TROE centering:      0.25450E+01  0.32900E+04  0.47320E+05  0.47110E+05
113. CH3OH(+M)<=>CH2OH+H(+M)                         7.90E-03    5.0    84467.4
     Low pressure limit:  0.33900E+43 -0.72440E+01  0.10523E+06
     TROE centering:     -0.73910E+02  0.37050E+05  0.41500E+05  0.52200E+04
114. CH3OH+H<=>CH3O+H2                               1.99E+05    2.6    10300.0
115. CH3OH+H<=>CH2OH+H2                              3.07E+05    2.5     5440.0
116. CH3OH+O<=>CH3O+OH                               3.88E+04    2.5     3080.0
117. CH3OH+O<=>CH2OH+OH                              3.88E+05    2.5     3080.0
118. CH3OH+OH<=>CH3O+H2O                             1.50E+02    3.0     -763.0
119. CH3OH+OH<=>CH2OH+H2O                            3.08E+04    2.6     -806.7
120. CH3OH+O2<=>CH3O+HO2                             3.00E+14    0.0    54800.0
121. CH3OH+O2<=>CH2OH+HO2                            3.58E+05    2.3    42764.5
122. CH3OH+HO2<=>CH3O+H2O2                           1.22E+12    0.0    20070.7
123. CH3OH+HO2<=>CH2OH+H2O2                          3.26E+13    0.0    18782.2
124. CH3OH+CH3<=>CH2OH+CH4                           2.13E-01    4.0     7055.1
125. CH3OH+CH3<=>CH3O+CH4                            3.22E+03    2.4     8579.5
126. CH3OH+HCO<=>CH2OH+CH2O                          9.63E+03    2.9    13110.0
127. CH3OH+CH3O<=>CH2OH+CH3OH                        3.00E+11    0.0     4074.0
128. CH3OH+CH3O2<=>CH2OH+CH3O2H                      1.81E+12    0.0    13710.0
129. CH2OH+O2<=>CH2O+HO2                             1.51E+15   -1.0        0.0
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     Declared duplicate reaction...
130. CH2OH+O2<=>CH2O+HO2                          2.41E+14    0.0     5017.0
     Declared duplicate reaction...
131. CH2OH+H<=>CH2O+H2                            6.00E+12    0.0        0.0
132. CH2OH+HO2<=>CH2O+H2O2                        1.20E+13    0.0        0.0
133. CH2OH+HCO<=>CH2O+CH2O                        1.80E+14    0.0        0.0
134. CH2OH+HCO<=>CH3OH+CO                         1.00E+13    0.0        0.0
135. CH2OH+CH3O<=>CH2O+CH3OH                      2.40E+13    0.0        0.0
136. CH2OH+OH<=>H2O+CH2O                          2.40E+13    0.0        0.0
137. CH2OH+O<=>OH+CH2O                            4.20E+13    0.0        0.0
138. CH2OH+CH2OH<=>CH2O+CH3OH                     3.00E+12    0.0        0.0
139. CH2OH+HO2<=>HOCH2O+OH                        1.00E+13    0.0        0.0
140. CH3O+O2<=>CH2O+HO2                           4.38E-19    9.5    -5501.0
141. CH3O+H<=>CH2O+H2                             2.00E+13    0.0        0.0
142. CH3O+HO2<=>CH2O+H2O2                         3.01E+11    0.0        0.0
143. CH3O+CH3<=>CH2O+CH4                          1.20E+13    0.0        0.0
144. CH3O+CH3O<=>CH3OH+CH2O                       6.03E+13    0.0        0.0
145. HCOH+O2=>CO2+H+OH                            5.00E+12    0.0        0.0
146. HCOH+O2<=>CO2+H2O                            3.00E+13    0.0        0.0
147. HCOH+O=>CO2+H+H                              5.00E+13    0.0        0.0
148. HCOH+O=>CO+OH+H                              3.00E+13    0.0        0.0
149. HCOH+H<=>CH2O+H                              2.00E+14    0.0        0.0
150. HCOH+OH<=>HCO+H2O                            2.00E+13    0.0        0.0
151. HCO+H(+M)<=>CH2O(+M)                         1.09E+12    0.5     -260.0
     Low pressure limit:  0.13500E+25 -0.25700E+01  0.14250E+04
     TROE centering:      0.78240E+00  0.27100E+03  0.27550E+04  0.65700E+04
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     AR              Enhanced by    7.000E-01
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
     HE              Enhanced by    7.000E-01
152. CO+H2(+M)<=>CH2O(+M)                         4.30E+07    1.5    79600.0
     Low pressure limit:  0.50700E+28 -0.34200E+01  0.84348E+05
     TROE centering:      0.93200E+00  0.19700E+03  0.15400E+04  0.10300E+05
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     AR              Enhanced by    7.000E-01
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
     HE              Enhanced by    7.000E-01
153. CH2O+O2<=>HCO+HO2                            8.07E+15    0.0    53420.0
154. CH2O+O<=>HCO+OH                              6.26E+09    1.1     2260.0
155. CH2O+H<=>HCO+H2                              5.74E+07    1.9     2740.0
156. CH2O+HO2<=>HCO+H2O2                          1.88E+04    2.7    11520.0
157. CH2O+CH3<=>HCO+CH4                           3.83E+01    3.4     4312.0
158. CH2O+O2CHO<=>HCO+HO2CHO                      1.99E+12    0.0    11660.0
159. CH2O+OCHO<=>HCO+HOCHO                        5.60E+12    0.0    13600.0
160. CH2O+CH3O<=>HCO+CH3OH                        6.62E+11    0.0     2294.0
161. CH2O+CH3O2<=>HCO+CH3O2H                      1.99E+12    0.0    11660.0
162. HCO+M<=>H+CO+M                               5.70E+11    0.7    14870.0
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
163. HCO+O2<=>CO+HO2                              7.58E+12    0.0      410.0
164. HCO+O<=>CO+OH                                3.02E+13    0.0        0.0
165. HCO+H<=>CO+H2                                7.34E+13    0.0        0.0
166. HCO+OH<=>CO+H2O                              3.01E+13    0.0        0.0
167. HCO+CH3<=>CH4+CO                             2.65E+13    0.0        0.0
168. HCO+HCO<=>CH2O+CO                            1.80E+13    0.0        0.0
169. HCO+O<=>CO2+H                                3.00E+13    0.0        0.0
170. HCO+HO2=>CO2+H+OH                            3.00E+13    0.0        0.0
171. HCO+HCO=>H2+CO+CO                            3.00E+12    0.0        0.0
172. CH2O+H(+M)<=>CH2OH(+M)                       5.40E+11    0.5     3600.0
     Low pressure limit:  0.12700E+33 -0.48200E+01  0.65300E+04
     TROE centering:      0.71870E+00  0.10300E+03  0.12910E+04  0.41600E+04
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
173. CH3O(+M)<=>CH2O+H(+M)                        6.80E+12    0.0    26170.0
     Low pressure limit:  0.18670E+25 -0.30000E+01  0.24307E+05
     TROE centering:      0.90000E+00  0.25000E+03  0.13000E+04  0.10000+100
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
174. CH2O+OH<=>HCO+H2O                            1.94E+06    2.1    -1690.0
175. CH2O+OH<=>HOCH2O                             6.31E+06    1.6  *********
176. HOCH2O<=>HOCHO+H                             1.00E+14    0.0    14900.0
177. CH2O+HO2<=>OCH2O2H                           1.50E+11    0.0    11900.0
178. OCH2O2H<=>HOCH2O2                            3.00E+11    0.0     8600.0
179. HOCH2O2+HO2<=>HOCH2O2H+O2                    3.50E+10    0.0    -3275.0
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180. HOCH2O+OH<=>HOCH2O2H                          1.00E+13    0.0        0.0
181. HCO+O2<=>O2CHO                                1.20E+11    0.0    -1100.0
182. HOCHO<=>CO+H2O                                2.45E+12    0.0    60470.0
183. HOCHO<=>CO2+H2                                2.95E+09    0.0    48520.0
184. OCHO+HO2<=>HOCHO+O2                           3.50E+10    0.0    -3275.0
185. OCHO+H2O2<=>HOCHO+HO2                         2.40E+12    0.0    10000.0
186. HOCHO+H=>H2+CO2+H                             4.24E+06    2.1     4868.0
187. HOCHO+H=>H2+CO+OH                             6.03E+13   -0.3     2988.0
188. HOCHO+O=>CO+OH+OH                             1.77E+18   -1.9     2975.0
189. HOCHO+OH=>H2O+CO2+H                           2.62E+06    2.1      916.0
190. HOCHO+OH=>H2O+CO+OH                           1.85E+07    1.5     -962.0
191. HOCHO+CH3=>CH4+CO+OH                          3.90E-07    5.8     2200.0
192. HOCHO+HO2=>H2O2+CO+OH                         1.00E+12    0.0    11920.0
193. OCHO+OH<=>HO2CHO                              2.00E+13    0.0        0.0
194. CH3+CH3(+M)<=>C2H6(+M)                        2.28E+15   -0.7      174.9
     Low pressure limit:  0.80540E+32 -0.37500E+01  0.98160E+03
     TROE centering:      0.00000E+00  0.57000E+03  0.10000E+31  0.10000E+31
     H2O             Enhanced by    5.000E+00
     CO              Enhanced by    2.000E+00
     CO2             Enhanced by    3.000E+00
195. C2H5+H(+M)<=>C2H6(+M)                         5.21E+17   -1.0     1580.0
     Low pressure limit:  0.19900E+42 -0.70800E+01  0.66850E+04
     TROE centering:      0.84200E+00  0.12500E+03  0.22190E+04  0.68820E+04
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     AR              Enhanced by    7.000E-01
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
     HE              Enhanced by    7.000E-01
196. C2H6+O2<=>C2H5+HO2                            6.03E+13    0.0    51870.0
197. C2H6+O<=>C2H5+OH                              3.55E+06    2.4     5830.0
198. C2H6+H<=>C2H5+H2                              1.15E+08    1.9     7530.0
199. C2H6+OH<=>C2H5+H2O                            1.48E+07    1.9      950.0
200. C2H6+HO2<=>C2H5+H2O2                          3.46E+01    3.6    16920.0
201. C2H6+CH<=>C2H5+CH2                            1.10E+14    0.0     -260.0
202. C2H6+CH2(S)<=>C2H5+CH3                        1.20E+14    0.0        0.0
203. C2H6+CH3<=>C2H5+CH4                           5.55E-04    4.7     3231.0
204. C2H6+CH3O<=>C2H5+CH3OH                        2.41E+11    0.0     7090.0
205. C2H6+CH3O2<=>C2H5+CH3O2H                      1.94E+01    3.6    17100.0
206. C2H6+C2H5O2<=>C2H5+C2H5O2H                    8.60E+00    3.8    17200.0
207. C2H4+H(+M)<=>C2H5(+M)                         9.57E+08    1.5     1355.0
     Low pressure limit:  0.14190E+40 -0.66420E+01  0.57690E+04
     TROE centering:     -0.56900E+00  0.29900E+03 -0.91470E+04  0.15240E+03
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     CH4             Enhanced by    2.000E+00
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
     AR              Enhanced by    7.000E-01
208. C2H5+H<=>C2H4+H2                              2.00E+12    0.0        0.0
209. C2H4+C2H4<=>C2H5+C2H3                         4.82E+14    0.0    71530.0
210. C2H5+CH3<=>CH4+C2H4                           1.18E+04    2.5    -2921.0
211. C2H5+O<=>CH3CHO+H                             1.10E+14    0.0        0.0
212. C2H5+HO2<=>C2H5O+OH                           1.10E+13    0.0        0.0
213. C2H5+CH3O2<=>C2H5O+CH3O                       8.00E+12    0.0    -1000.0
214. CH3+CH3<=>H+C2H5                              4.74E+12    0.1    10664.3
     Rate coefficients at P=1.00E-02(atm)          4.74E+12    0.1    10664.3
     Rate coefficients at P=1.00E-01(atm)          2.57E+13   -0.1    11406.1
     Rate coefficients at P=1.00E+00(atm)          3.10E+14   -0.4    13372.5
     Rate coefficients at P=1.00E+01(atm)          2.15E+10    0.9    13532.5
     Rate coefficients at P=1.00E+02(atm)          1.03E+02    3.2    11236.1
215. C2H5+O2<=>C2H5O2                              3.40E+53  -13.9     9279.0
     Rate coefficients at P=4.00E-02(atm)          3.40E+53  -13.9     9279.0
     Rate coefficients at P=1.00E+00(atm)          9.36E+59  -15.3    14240.0
     Rate coefficients at P=1.00E+01(atm)          1.26E+60  -14.9    16240.0
216. C2H5+O2<=>C2H4O2H                             2.10E+34   -9.0     5444.0
     Rate coefficients at P=4.00E-02(atm)          2.10E+34   -9.0     5444.0
     Rate coefficients at P=1.00E+00(atm)          4.88E+33   -8.3     7710.0
     Rate coefficients at P=1.00E+01(atm)          1.71E+45  -11.5    14590.0
217. C2H5+O2<=>C2H4+HO2                            2.09E+09    0.5     -391.4
     Rate coefficients at P=4.00E-02(atm)          2.09E+09    0.5     -391.4
     Rate coefficients at P=1.00E+00(atm)          1.84E+07    1.1     -720.6
     Rate coefficients at P=1.00E+01(atm)          7.56E+14   -1.0     4749.0
218. C2H5+O2<=>C2H4O1-2+OH                         1.30E+03    1.9     -502.7
     Rate coefficients at P=4.00E-02(atm)          1.30E+03    1.9     -502.7
     Rate coefficients at P=1.00E+00(atm)          2.44E+02    2.2      -62.5
     Rate coefficients at P=1.00E+01(atm)          4.62E+09    0.1     5409.0
219. C2H5+O2<=>CH3CHO+OH                           4.91E-06    4.8      254.3
     Rate coefficients at P=4.00E-02(atm)          4.91E-06    4.8      254.3
     Rate coefficients at P=1.00E+00(atm)          6.80E-02    3.6     2643.0
     Rate coefficients at P=1.00E+01(atm)          8.26E+02    2.4     5285.0
220. C2H4O2H<=>C2H5O2                              2.65E-16    7.0     2396.0
     Rate coefficients at P=4.00E-02(atm)          2.65E-16    7.0     2396.0
     Rate coefficients at P=1.00E+00(atm)          1.06E+41  -10.1    26030.0
     Rate coefficients at P=1.00E+01(atm)          1.20E+36   -8.1    27020.0
221. C2H5O2<=>CH3CHO+OH                            1.24E+35   -9.4    36360.0
     Rate coefficients at P=4.00E-02(atm)          1.24E+35   -9.4    36360.0
     Rate coefficients at P=1.00E+00(atm)          1.69E+36   -9.2    38700.0
     Rate coefficients at P=1.00E+01(atm)          2.52E+41  -10.2    43710.0
222. C2H5O2<=>C2H4+HO2                             1.78E+32   -7.1    32840.0
     Rate coefficients at P=4.00E-02(atm)          1.78E+32   -7.1    32840.0
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     Rate coefficients at P=1.00E+00(atm)          2.70E+37   -8.5    35840.0
     Rate coefficients at P=1.00E+01(atm)          1.98E+38   -8.5    37900.0
223. C2H5O2<=>C2H4O1-2+OH                           5.78E+45  -11.9     4112.0
     Rate coefficients at P=4.00E-02(atm)          5.78E+45  -11.9     4112.0
     Rate coefficients at P=1.00E+00(atm)          1.92E+43  -10.8    42400.0
     Rate coefficients at P=1.00E+01(atm)          3.96E+43  -10.5    45580.0
224. C2H4O2H<=>C2H4O1-2+OH                          8.96E+38   -9.4    20660.0
     Rate coefficients at P=4.00E-02(atm)          8.96E+38   -9.4    20660.0
     Rate coefficients at P=1.00E+00(atm)          1.22E+37   -8.3    21460.0
     Rate coefficients at P=1.00E+01(atm)          8.85E+30   -6.1    20660.0
225. C2H4O2H<=>C2H4+HO2                             3.92E+40  -10.2    22250.0
     Rate coefficients at P=4.00E-02(atm)          3.92E+40  -10.2    22250.0
     Rate coefficients at P=1.00E+00(atm)          6.82E+40   -9.6    23840.0
     Rate coefficients at P=1.00E+01(atm)          3.98E+34   -7.2    23250.0
226. C2H4O2H<=>CH3CHO+OH                            5.82E+26   -8.0    20860.0
     Rate coefficients at P=4.00E-02(atm)          5.82E+26   -8.0    20860.0
     Rate coefficients at P=1.00E+00(atm)          5.52E+34   -9.9    26230.0
     Rate coefficients at P=1.00E+01(atm)          1.19E+34   -9.0    29210.0
227. H2+C2H5O2<=>H+C2H5O2H                          1.50E+14    0.0    26030.0
228. C2H5O2+HO2<=>C2H5O2H+O2                        1.75E+10    0.0    -3275.0
229. C2H5O2+CH2O<=>C2H5O2H+HCO                      1.99E+12    0.0    11660.0
230. C2H5O2+CH4<=>C2H5O2H+CH3                       1.81E+11    0.0    18480.0
231. C2H5O2+CH3OH<=>C2H5O2H+CH2OH                   1.81E+12    0.0    13710.0
232. C2H5O2H<=>C2H5O+OH                             6.31E+14    0.0    42300.0
233. C2H4O1-2<=>CH3+HCO                             3.63E+13    0.0    57200.0
234. C2H4O1-2<=>CH3CHO                              7.41E+12    0.0    53800.0
235. C2H4O1-2+H<=>C2H3O1-2+H2                       8.00E+13    0.0     9680.0
236. C2H4O1-2+OH<=>C2H3O1-2+H2O                     1.78E+13    0.0     3610.0
237. C2H4O1-2+HO2<=>C2H3O1-2+H2O2                   1.13E+13    0.0    30430.0
238. C2H4O1-2+CH3<=>C2H3O1-2+CH4                    1.07E+12    0.0    11830.0
239. C2H4O1-2+CH3O<=>C2H3O1-2+CH3OH                 1.20E+11    0.0     6750.0
240. C2H4O1-2+CH3O2<=>C2H3O1-2+CH3O2H               1.13E+13    0.0    30430.0
241. C2H4O1-2+C2H5O2<=>C2H3O1-2+C2H5O2H             1.13E+13    0.0    30430.0
242. C2H3O1-2<=>CH3CO                               8.50E+14    0.0    14000.0
243. C2H3O1-2<=>CH2CHO                              1.00E+14    0.0    14000.0
244. C2H3+H(+M)<=>C2H4(+M)                          6.08E+12    0.3      280.0
     Low pressure limit:  0.14000E+31 -0.38600E+01  0.33200E+04
     TROE centering:      0.78200E+00  0.20750E+03  0.26630E+04  0.60950E+04
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     AR              Enhanced by    7.000E-01
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
     HE              Enhanced by    7.000E-01
245. C2H4(+M)<=>H2+H2CC(+M)                         8.00E+12    0.4    88770.0
     Low pressure limit:  0.70000E+51 -0.93100E+01  0.99860E+05
     TROE centering:      0.73450E+00  0.18000E+03  0.10350E+04  0.54170E+04
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     CH4             Enhanced by    2.000E+00
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
     AR              Enhanced by    7.000E-01
246. C2H4+O2<=>C2H3+HO2                             4.22E+13    0.0    57623.1
247. C2H4+H<=>C2H3+H2                               5.07E+07    1.9    12950.0
248. C2H4+OH<=>C2H3+H2O                             2.23E+04    2.7     2215.5
249. C2H4+CH3O<=>C2H3+CH3OH                         1.20E+11    0.0     6750.0
250. C2H4+CH3O2<=>C2H3+CH3O2H                       8.59E+00    3.8    27132.0
251. C2H4+C2H5O2<=>C2H3+C2H5O2H                     8.59E+00    3.8    27132.0
252. C2H4+CH3CO3<=>C2H3+CH3CO3H                     1.13E+13    0.0    30430.0
253. C2H4+CH3<=>C2H3+CH4                            9.76E+02    2.9    15148.0
     Declared duplicate reaction...
254. C2H4+CH3<=>C2H3+CH4                            8.13E-05    4.4     8835.8
     Declared duplicate reaction...
255. C2H4+O<=>CH3+HCO                               7.45E+06    1.9      183.0
256. C2H4+O<=>CH2CHO+H                              6.10E+06    1.9      183.0
257. CH+CH4<=>C2H4+H                                6.00E+13    0.0        0.0
258. CH2(S)+CH3<=>C2H4+H                            2.00E+13    0.0        0.0
259. C2H4+OH<=>CH3+CH2O                             5.35E+00    2.9    -1732.7
     Rate coefficients at P=1.00E-02(atm)          5.35E+00    2.9    -1732.7
     Rate coefficients at P=2.50E-02(atm)          3.19E+01    2.7    -1172.3
     Rate coefficients at P=1.00E-01(atm)          5.55E+02    2.4     -180.8
     Rate coefficients at P=1.00E+00(atm)          1.78E+05    1.7     2060.5
     Rate coefficients at P=1.00E+01(atm)          2.37E+09    0.6     6006.7
     Rate coefficients at P=1.00E+02(atm)          2.76E+13   -0.5    11455.1
260. C2H4+OH<=>CH3CHO+H                             2.37E-07    5.3    -2050.6
     Rate coefficients at P=1.00E-02(atm)          2.37E-07    5.3    -2050.6
     Rate coefficients at P=2.50E-02(atm)          8.73E-05    4.6     -618.0
     Rate coefficients at P=1.00E-01(atm)          4.03E-01    3.5     1881.7
     Rate coefficients at P=1.00E+00(atm)          2.38E-02    3.9     1722.7
     Rate coefficients at P=1.00E+01(atm)          8.25E+08    1.0    10507.3
     Rate coefficients at P=1.00E+02(atm)          6.80E+09    0.8    13867.3
261. C2H4+OH<=>C2H3OH+H                             1.04E+04    2.6     4121.0
     Rate coefficients at P=1.00E-02(atm)          1.04E+04    2.6     4121.0
     Rate coefficients at P=2.50E-02(atm)          1.07E+04    2.6     4129.0
     Rate coefficients at P=1.00E-01(atm)          1.52E+04    2.6     4238.3
     Rate coefficients at P=1.00E+00(atm)          3.19E+05    2.2     5255.6
     Rate coefficients at P=1.00E+01(atm)          1.94E+08    1.4     7828.8
     Rate coefficients at P=1.00E+02(atm)          8.55E+10    0.8    11490.8
262. C2H4+OH<=>PC2H4OH                              1.74E+43  -10.5     7698.7
     Rate coefficients at P=1.00E-02(atm)          1.74E+43  -10.5     7698.7
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     Rate coefficients at P=2.50E-02(atm)          3.25E+37   -8.6     5214.7
     Rate coefficients at P=1.00E-01(atm)          1.84E+35   -7.8     4908.9
     Rate coefficients at P=1.00E+00(atm)          2.56E+36   -7.8     6946.1
     Rate coefficients at P=1.00E+01(atm)          3.70E+33   -6.6     7605.9
     Rate coefficients at P=1.00E+02(atm)          1.12E+26   -4.1     5757.0
263. C2H4+HO2<=>C2H4O1-2+OH                         3.34E+12    0.0    17190.0
264. C2H4+CH3O2<=>C2H4O1-2+CH3O                     2.82E+12    0.0    17110.0
265. C2H4+C2H5O2<=>C2H4O1-2+C2H5O                   2.82E+12    0.0    17110.0
266. C2H2+H(+M)<=>C2H3(+M)                          1.71E+10    1.3     2709.0
     Low pressure limit:  0.63460E+32 -0.46640E+01  0.37800E+04
     TROE centering:      0.78800E+00 -0.10200E+05  0.10000E-29
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     AR              Enhanced by    7.000E-01
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
     HE              Enhanced by    7.000E-01
267. C2H3+O2<=>C2H3OO                               4.07E+27   -4.7     5222.0
     Rate coefficients at P=1.00E-02(atm)          1.55E+24   -5.5     9662.0
     Rate coefficients at P=1.00E-01(atm)          3.48E+56  -15.0    19160.0
     Rate coefficients at P=3.16E-01(atm)          1.25E+64  -17.0    21290.0
     Rate coefficients at P=1.00E+00(atm)          3.34E+61  -15.8    20150.0
     Rate coefficients at P=3.16E+00(atm)          7.34E+53  -13.1    17300.0
     Rate coefficients at P=1.00E+01(atm)          4.16E+48  -11.2    16000.0
     Rate coefficients at P=3.16E+01(atm)          2.33E+43   -9.4    14810.0
     Rate coefficients at P=1.00E+02(atm)          3.41E+39   -8.0    14360.0
     Declared duplicate reaction...
268. C2H3+O2<=>C2H3OO                               4.07E+27   -4.7     5222.0
     Rate coefficients at P=1.00E-02(atm)          1.78E-09    4.2    -4707.0
     Rate coefficients at P=1.00E-01(atm)          2.36E+22   -4.5     2839.0
     Rate coefficients at P=3.16E-01(atm)          2.00E+26   -5.4     2725.0
     Rate coefficients at P=1.00E+00(atm)          6.13E+28   -5.9     3154.0
     Rate coefficients at P=3.16E+00(atm)          2.14E+29   -5.8     3520.0
     Rate coefficients at P=1.00E+01(atm)          3.48E+28   -5.4     3636.0
     Rate coefficients at P=3.16E+01(atm)          3.32E+27   -5.0     3610.0
     Rate coefficients at P=1.00E+02(atm)          1.03E+27   -4.7     3680.0
     Declared duplicate reaction...
269. C2H3+O2<=>CHCHO+OH                             2.84E+14   -0.8     7232.0
     Rate coefficients at P=1.00E-02(atm)          3.91E+11   -0.1     2131.0
     Rate coefficients at P=1.00E-01(atm)          1.13E+09    0.6       46.0
     Rate coefficients at P=3.16E-01(atm)          8.46E+08    0.6        0.7
     Rate coefficients at P=1.00E+00(atm)          2.75E+14   -1.8        4.6
     Rate coefficients at P=3.16E+00(atm)          2.58E+20   -2.8     7530.0
     Rate coefficients at P=1.00E+01(atm)          9.18E+14   -2.3       -0.4
     Rate coefficients at P=3.16E+01(atm)          6.11E+25   -4.2    13050.0
     Rate coefficients at P=1.00E+02(atm)          1.65E+30   -5.3    18430.0
     Declared duplicate reaction...
270. C2H3+O2<=>CHCHO+OH                             2.84E+14   -0.8     7232.0
     Rate coefficients at P=1.00E-02(atm)          9.91E+11   -0.7       -0.6
     Rate coefficients at P=1.00E-01(atm)          6.94E+14   -1.2     4542.0
     Rate coefficients at P=3.16E-01(atm)          2.79E+13   -0.7     3479.0
     Rate coefficients at P=1.00E+00(atm)          4.99E+11   -0.1     1995.0
     Rate coefficients at P=3.16E+00(atm)          2.35E+10    0.2     1573.0
     Rate coefficients at P=1.00E+01(atm)          1.70E+14   -0.8     4450.0
     Rate coefficients at P=3.16E+01(atm)          1.42E+11    0.1     3774.0
     Rate coefficients at P=1.00E+02(atm)          3.17E+11    0.0     5338.0
     Declared duplicate reaction...
271. C2H3+O2<=>CH2CHO+O                             1.76E+12    0.1     4205.0
     Rate coefficients at P=1.00E-02(atm)          7.88E+20   -2.7     6742.0
     Rate coefficients at P=1.00E-01(atm)          7.72E+20   -2.7     6713.0
     Rate coefficients at P=3.16E-01(atm)          9.87E+20   -2.7     6724.0
     Rate coefficients at P=1.00E+00(atm)          7.10E+20   -2.6     6489.0
     Rate coefficients at P=3.16E+00(atm)          4.50E+20   -2.5     6406.0
     Rate coefficients at P=1.00E+01(atm)          1.76E+23   -3.2     8697.0
     Rate coefficients at P=3.16E+01(atm)          3.14E+25   -3.8    11530.0
     Rate coefficients at P=1.00E+02(atm)          1.02E+26   -3.8    13910.0
     Declared duplicate reaction...
272. C2H3+O2<=>CH2CHO+O                             1.76E+12    0.1     4205.0
     Rate coefficients at P=1.00E-02(atm)          1.36E+10    0.6     -277.6
     Rate coefficients at P=1.00E-01(atm)          1.42E+10    0.6     -247.7
     Rate coefficients at P=3.16E-01(atm)          1.66E+10    0.6     -162.5
     Rate coefficients at P=1.00E+00(atm)          2.02E+10    0.6       38.4
     Rate coefficients at P=3.16E+00(atm)          9.75E+09    0.7      248.0
     Rate coefficients at P=1.00E+01(atm)          7.34E+09    0.7      778.1
     Rate coefficients at P=3.16E+01(atm)          1.57E+09    0.9     1219.0
     Rate coefficients at P=1.00E+02(atm)          7.85E+07    1.3     1401.0
     Declared duplicate reaction...
273. C2H3+O2<=>C2H2+HO2                             6.49E+06    1.5     5218.0
     Rate coefficients at P=1.00E-02(atm)          1.08E+07    1.3     3322.0
     Rate coefficients at P=1.00E-01(atm)          7.75E+06    1.3     3216.0
     Rate coefficients at P=3.16E-01(atm)          1.21E+07    1.3     3311.0
     Rate coefficients at P=1.00E+00(atm)          2.15E+07    1.2     3367.0
     Rate coefficients at P=3.16E+00(atm)          1.13E+08    1.0     3695.0
     Rate coefficients at P=1.00E+01(atm)          1.31E+11    0.1     5872.0
     Rate coefficients at P=3.16E+01(atm)          1.19E+09    0.8     5617.0
     Rate coefficients at P=1.00E+02(atm)          1.06E+17   -1.4    12230.0
     Declared duplicate reaction...
274. C2H3+O2<=>C2H2+HO2                             6.49E+06    1.5     5218.0
     Rate coefficients at P=1.00E-02(atm)          4.76E+01    2.8     -796.4
     Rate coefficients at P=1.00E-01(atm)          5.16E+01    2.7     -768.3
     Rate coefficients at P=3.16E-01(atm)          5.55E+01    2.7     -658.5
     Rate coefficients at P=1.00E+00(atm)          4.60E+01    2.8     -492.8
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     Rate coefficients at P=3.16E+00(atm)          3.75E+00    3.1     -601.0
     Rate coefficients at P=1.00E+01(atm)          5.48E+00    3.1       85.7
     Rate coefficients at P=3.16E+01(atm)          4.47E+08    0.0      955.0
     Rate coefficients at P=1.00E+02(atm)          2.02E+01    2.9     1847.0
     Declared duplicate reaction...
275. C2H3+O2<=>CHOCHO+H                             3.08E+12   -0.3     3277.0
     Rate coefficients at P=1.00E-02(atm)          4.79E+14   -1.0      912.0
     Rate coefficients at P=1.00E-01(atm)          5.03E+14   -1.0      922.5
     Rate coefficients at P=3.16E-01(atm)          6.43E+14   -1.1      982.9
     Rate coefficients at P=1.00E+00(atm)          3.73E+15   -1.3     1441.0
     Rate coefficients at P=3.16E+00(atm)          2.44E+18   -2.1     3234.0
     Rate coefficients at P=1.00E+01(atm)          1.30E+15   -1.1     2393.0
     Rate coefficients at P=3.16E+01(atm)          3.57E+33   -6.5    14910.0
     Rate coefficients at P=1.00E+02(atm)          3.28E+31   -5.8    16250.0
     Declared duplicate reaction...
276. C2H3+O2<=>CHOCHO+H                             3.08E+12   -0.3     3277.0
     Rate coefficients at P=1.00E-02(atm)          2.80E-04    4.0    -7019.0
     Rate coefficients at P=1.00E-01(atm)          3.45E-04    4.0    -6978.0
     Rate coefficients at P=3.16E-01(atm)          9.73E-04    3.9    -6768.0
     Rate coefficients at P=1.00E+00(atm)          4.98E-01    3.1    -5496.0
     Rate coefficients at P=3.16E+00(atm)          1.34E+05    1.7    -2931.0
     Rate coefficients at P=1.00E+01(atm)          4.50E+15   -3.1    -4836.0
     Rate coefficients at P=3.16E+01(atm)          3.84E+10    0.2      941.3
     Rate coefficients at P=1.00E+02(atm)          2.75E+08    0.8      857.6
     Declared duplicate reaction...
277. C2H3+O2<=>CH2CO+OH                             1.17E+03    2.4     7074.0
     Rate coefficients at P=1.00E-02(atm)          8.66E+02    2.4     6061.0
     Rate coefficients at P=1.00E-01(atm)          8.91E+02    2.4     6078.0
     Rate coefficients at P=3.16E-01(atm)          9.43E+02    2.4     6112.0
     Rate coefficients at P=1.00E+00(atm)          1.06E+03    2.4     6180.0
     Rate coefficients at P=3.16E+00(atm)          1.09E+03    2.4     6179.0
     Rate coefficients at P=1.00E+01(atm)          1.39E+03    2.4     6074.0
     Rate coefficients at P=3.16E+01(atm)          2.49E+06    1.4     8480.0
     Rate coefficients at P=1.00E+02(atm)          1.66E+10    0.4    12010.0
     Declared duplicate reaction...
278. C2H3+O2<=>CH2CO+OH                             1.17E+03    2.4     7074.0
     Rate coefficients at P=1.00E-02(atm)          1.82E-01    3.1     1331.0
     Rate coefficients at P=1.00E-01(atm)          2.07E-01    3.1     1383.0
     Rate coefficients at P=3.16E-01(atm)          2.71E-01    3.1     1496.0
     Rate coefficients at P=1.00E+00(atm)          5.26E-01    3.0     1777.0
     Rate coefficients at P=3.16E+00(atm)          1.37E+00    2.9     2225.0
     Rate coefficients at P=1.00E+01(atm)          4.19E-01    2.9     2052.0
     Rate coefficients at P=3.16E+01(atm)          1.19E-04    4.2     2043.0
     Rate coefficients at P=1.00E+02(atm)          1.30E-03    4.0     3414.0
     Declared duplicate reaction...
279. C2H3+O2<=>CH2O+HCO                             1.16E+16   -1.1     3791.0
     Rate coefficients at P=1.00E-02(atm)          2.49E+36   -7.6    12640.0
     Rate coefficients at P=1.00E-01(atm)          2.43E+36   -7.6    12610.0
     Rate coefficients at P=3.16E-01(atm)          1.95E+36   -7.6    12490.0
     Rate coefficients at P=1.00E+00(atm)          2.73E+35   -7.3    11820.0
     Rate coefficients at P=3.16E+00(atm)          1.43E+36   -7.5    12460.0
     Rate coefficients at P=1.00E+01(atm)          5.18E+35   -7.2    13430.0
     Rate coefficients at P=3.16E+01(atm)          3.19E+20   -2.6     5578.0
     Rate coefficients at P=1.00E+02(atm)          2.73E+33   -6.3    16000.0
     Declared duplicate reaction...
280. C2H3+O2<=>CH2O+HCO                             1.16E+16   -1.1     3791.0
     Rate coefficients at P=1.00E-02(atm)          4.54E+15   -1.3      515.3
     Rate coefficients at P=1.00E-01(atm)          4.59E+15   -1.3      513.0
     Rate coefficients at P=3.16E-01(atm)          4.81E+15   -1.3      520.6
     Rate coefficients at P=1.00E+00(atm)          6.08E+15   -1.3      645.7
     Rate coefficients at P=3.16E+00(atm)          9.45E+15   -1.4     1066.0
     Rate coefficients at P=1.00E+01(atm)          2.56E+15   -1.2     1429.0
     Rate coefficients at P=3.16E+01(atm)          1.03E+69  -19.2    14760.0
     Rate coefficients at P=1.00E+02(atm)          4.21E+10    0.2      830.6
     Declared duplicate reaction...
281. C2H3+O2=>CH2O+H+CO                             1.16E+16   -1.1     3791.0
     Rate coefficients at P=1.00E-02(atm)          5.82E+36   -7.6    12640.0
     Rate coefficients at P=1.00E-01(atm)          5.66E+36   -7.6    12610.0
     Rate coefficients at P=3.16E-01(atm)          4.55E+36   -7.6    12490.0
     Rate coefficients at P=1.00E+00(atm)          6.36E+35   -7.3    11820.0
     Rate coefficients at P=3.16E+00(atm)          3.35E+36   -7.5    12460.0
     Rate coefficients at P=1.00E+01(atm)          1.21E+36   -7.2    13430.0
     Rate coefficients at P=3.16E+01(atm)          7.43E+20   -2.6     5578.0
     Rate coefficients at P=1.00E+02(atm)          6.36E+33   -6.3    16000.0
     Declared duplicate reaction...
282. C2H3+O2=>CH2O+H+CO                             1.16E+16   -1.1     3791.0
     Rate coefficients at P=1.00E-02(atm)          1.06E+16   -1.3      515.3
     Rate coefficients at P=1.00E-01(atm)          1.07E+16   -1.3      513.0
     Rate coefficients at P=3.16E-01(atm)          1.13E+16   -1.3      520.6
     Rate coefficients at P=1.00E+00(atm)          1.42E+16   -1.3      645.7
     Rate coefficients at P=3.16E+00(atm)          2.20E+16   -1.4     1066.0
     Rate coefficients at P=1.00E+01(atm)          5.98E+15   -1.2     1429.0
     Rate coefficients at P=3.16E+01(atm)          2.39E+69  -19.2    14760.0
     Rate coefficients at P=1.00E+02(atm)          9.81E+10    0.2      830.6
     Declared duplicate reaction...
283. C2H3+O2<=>CO+CH3O                              3.09E+13   -0.9     3682.0
     Rate coefficients at P=1.00E-02(atm)          8.19E+18   -2.7     3201.0
     Rate coefficients at P=1.00E-01(atm)          4.06E+14   -1.3      885.8
     Rate coefficients at P=3.16E-01(atm)          4.34E+14   -1.3      900.6
     Rate coefficients at P=1.00E+00(atm)          1.03E+11   -0.3     -747.8
     Rate coefficients at P=3.16E+00(atm)          1.89E+12   -3.0    -8995.0
     Rate coefficients at P=1.00E+01(atm)          1.93E+24   -5.6        1.8
     Rate coefficients at P=3.16E+01(atm)          1.10E+18   -2.2     5178.0
     Rate coefficients at P=1.00E+02(atm)          5.79E+32   -6.5    16810.0
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     Declared duplicate reaction...
284. C2H3+O2<=>CO+CH3O                          3.09E+13   -0.9     3682.0
     Rate coefficients at P=1.00E-02(atm)       1.29E+09    0.2    -1717.0
     Rate coefficients at P=1.00E-01(atm)       5.99E+11   -2.9    -9564.0
     Rate coefficients at P=3.16E-01(atm)       2.91E+11   -2.9   -10120.0
     Rate coefficients at P=1.00E+00(atm)       5.77E+21   -3.5     4772.0
     Rate coefficients at P=3.16E+00(atm)       4.99E+15   -1.6     1849.0
     Rate coefficients at P=1.00E+01(atm)       9.33E+16   -2.0     3324.0
     Rate coefficients at P=3.16E+01(atm)       1.02E+72  -20.7    15860.0
     Rate coefficients at P=1.00E+02(atm)       1.10E+09    0.3     1024.0
     Declared duplicate reaction...
285. C2H3+O2<=>CO2+CH3                          6.16E+13   -1.1     3743.0
     Rate coefficients at P=1.00E-02(atm)       2.37E+35   -7.8    12630.0
     Rate coefficients at P=1.00E-01(atm)       1.73E+35   -7.7    12520.0
     Rate coefficients at P=3.16E-01(atm)       4.47E+34   -7.5    12140.0
     Rate coefficients at P=1.00E+00(atm)       7.25E+31   -6.7    10440.0
     Rate coefficients at P=3.16E+00(atm)       3.63E+35   -7.8    12830.0
     Rate coefficients at P=1.00E+01(atm)       2.09E+35   -7.5    14050.0
     Rate coefficients at P=3.16E+01(atm)       3.84E+18   -2.4     5408.0
     Rate coefficients at P=1.00E+02(atm)       1.21E+32   -6.3    16190.0
     Declared duplicate reaction...
286. C2H3+O2<=>CO2+CH3                          6.16E+13   -1.1     3743.0
     Rate coefficients at P=1.00E-02(atm)       6.27E+13   -1.2      406.3
     Rate coefficients at P=1.00E-01(atm)       6.24E+13   -1.2      401.4
     Rate coefficients at P=3.16E-01(atm)       6.12E+13   -1.2      397.0
     Rate coefficients at P=1.00E+00(atm)       5.32E+13   -1.1      446.7
     Rate coefficients at P=3.16E+00(atm)       1.45E+14   -1.3      987.7
     Rate coefficients at P=1.00E+01(atm)       5.02E+13   -1.1     1409.0
     Rate coefficients at P=3.16E+01(atm)       1.40E+70  -20.1    15430.0
     Rate coefficients at P=1.00E+02(atm)       9.21E+08    0.2      855.3
     Declared duplicate reaction...
287. C2H3OO<=>CHCHO+OH                          5.89E+36   -7.1    51440.0
     Rate coefficients at P=1.00E-02(atm)       3.64E+49  -12.1    67420.0
     Rate coefficients at P=1.00E-01(atm)       1.44E+36   -9.9    41220.0
     Rate coefficients at P=3.16E-01(atm)       4.18E+40  -10.5    43670.0
     Rate coefficients at P=1.00E+00(atm)       3.79E+46  -10.7    51900.0
     Rate coefficients at P=3.16E+00(atm)       1.60E+49  -11.2    54150.0
     Rate coefficients at P=1.00E+01(atm)       2.38E+51  -11.6    56980.0
     Rate coefficients at P=3.16E+01(atm)       2.00E+54  -12.2    61840.0
     Rate coefficients at P=1.00E+02(atm)       9.54+195  -52.3   163500.0
     Declared duplicate reaction...
288. C2H3OO<=>CHCHO+OH                          5.89E+36   -7.1    51440.0
     Rate coefficients at P=1.00E-02(atm)       1.17E+56  -14.8    60700.0
     Rate coefficients at P=1.00E-01(atm)       2.32E+40   -9.4    50420.0
     Rate coefficients at P=3.16E-01(atm)       1.61E+43  -10.0    50290.0
     Rate coefficients at P=1.00E+00(atm)       2.33+124  -36.8    70100.0
     Rate coefficients at P=3.16E+00(atm)       1.88+103  -29.5    65410.0
     Rate coefficients at P=1.00E+01(atm)       5.96E+86  -23.8    62170.0
     Rate coefficients at P=3.16E+01(atm)       1.51E+57  -13.9    55390.0
     Rate coefficients at P=1.00E+02(atm)       1.79E+34   -6.4    50000.0
     Declared duplicate reaction...
289. C2H3OO<=>CH2CHO+O                          1.22E+29   -4.7    42340.0
     Rate coefficients at P=1.00E-02(atm)       2.70+180  -48.2   169300.0
     Rate coefficients at P=1.00E-01(atm)       3.90E+38   -8.7    42770.0
     Rate coefficients at P=3.16E-01(atm)       4.57E+47  -11.2    47050.0
     Rate coefficients at P=1.00E+00(atm)       7.62E+81  -21.3    65080.0
     Rate coefficients at P=3.16E+00(atm)       1.86E+68  -16.8    60680.0
     Rate coefficients at P=1.00E+01(atm)       2.02E+55  -12.7    55840.0
     Rate coefficients at P=3.16E+01(atm)       1.11E+53  -11.8    56690.0
     Rate coefficients at P=1.00E+02(atm)       4.30E+48  -10.3    56090.0
     Declared duplicate reaction...
290. C2H3OO<=>CH2CHO+O                          1.22E+29   -4.7    42340.0
     Rate coefficients at P=1.00E-02(atm)       1.47E+30   -6.6    41110.0
     Rate coefficients at P=1.00E-01(atm)       9.65E-12    6.0    22890.0
     Rate coefficients at P=3.16E-01(atm)       3.95E+22   -3.7    36270.0
     Rate coefficients at P=1.00E+00(atm)       2.39E+33   -6.6    41280.0
     Rate coefficients at P=3.16E+00(atm)       6.37E+31   -6.0    41260.0
     Rate coefficients at P=1.00E+01(atm)       2.13E+29   -5.1    40710.0
     Rate coefficients at P=3.16E+01(atm)       4.66E+27   -4.5    40530.0
     Rate coefficients at P=1.00E+02(atm)       5.99E+25   -3.9    40120.0
     Declared duplicate reaction...
291. C2H3OO<=>CHOCHO+H                          4.72E+20   -2.7    32320.0
     Rate coefficients at P=1.00E-02(atm)       6.41E+80  -22.2    51750.0
     Rate coefficients at P=1.00E-01(atm)       3.31E+65  -17.0    48090.0
     Rate coefficients at P=3.16E-01(atm)       5.98E+51  -12.6    43000.0
     Rate coefficients at P=1.00E+00(atm)       1.48E+44  -10.1    40790.0
     Rate coefficients at P=3.16E+00(atm)       1.26E+59  -14.3    51390.0
     Rate coefficients at P=1.00E+01(atm)       4.93E+26   -4.7    34320.0
     Rate coefficients at P=3.16E+01(atm)       2.06E+33   -6.4    39520.0
     Rate coefficients at P=1.00E+02(atm)       1.30E+32   -5.9    40660.0
     Declared duplicate reaction...
292. C2H3OO<=>CHOCHO+H                          4.72E+20   -2.7    32320.0
     Rate coefficients at P=1.00E-02(atm)       1.19E+28   -6.0    28740.0
     Rate coefficients at P=1.00E-01(atm)       1.40E+25   -4.8    28940.0
     Rate coefficients at P=3.16E-01(atm)       2.91E+20   -3.3    27550.0
     Rate coefficients at P=1.00E+00(atm)       1.58E+19   -2.8    27620.0
     Rate coefficients at P=3.16E+00(atm)       1.93E+22   -3.5    29980.0
     Rate coefficients at P=1.00E+01(atm)       7.51E+29   -5.8    34490.0
     Rate coefficients at P=3.16E+01(atm)       7.14E+61  -16.2    43280.0
     Rate coefficients at P=1.00E+02(atm)       1.14E+19   -2.6    29670.0
     Declared duplicate reaction...
293. C2H3OO<=>CH2CO+OH                          1.55E+24   -3.9    49850.0
     Rate coefficients at P=1.00E-02(atm)       1.15E+47  -12.3    75330.0
     Rate coefficients at P=1.00E-01(atm)       8.43E+09   -2.1    33720.0
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     Rate coefficients at P=3.16E-01(atm)          6.06E+04    0.2    34220.0
     Rate coefficients at P=1.00E+00(atm)          1.51E+19   -3.6    43060.0
     Rate coefficients at P=3.16E+00(atm)          2.13E+33   -7.4    51610.0
     Rate coefficients at P=1.00E+01(atm)          4.44E+36   -8.0    54680.0
     Rate coefficients at P=3.16E+01(atm)          1.19E+37   -7.8    56460.0
     Rate coefficients at P=1.00E+02(atm)          9.08E+35   -7.2    57550.0
     Declared duplicate reaction...
294. C2H3OO<=>CH2CO+OH                              1.55E+24   -3.9    49850.0
     Rate coefficients at P=1.00E-02(atm)          2.31E+02   -0.7    25710.0
     Rate coefficients at P=1.00E-01(atm)          1.83E-23    7.8    20190.0
     Rate coefficients at P=3.16E-01(atm)          3.82E+63  -20.4    43420.0
     Rate coefficients at P=1.00E+00(atm)          3.18E+27   -7.8    37230.0
     Rate coefficients at P=3.16E+00(atm)          2.32E-05    3.5    31560.0
     Rate coefficients at P=1.00E+01(atm)          1.06E-01    2.6    34160.0
     Rate coefficients at P=3.16E+01(atm)          5.62E+02    1.7    36450.0
     Rate coefficients at P=1.00E+02(atm)          1.11E+07    0.5    38670.0
     Declared duplicate reaction...
295. C2H3OO<=>CH2O+HCO                              1.19E+20   -2.3    30170.0
     Rate coefficients at P=1.00E-02(atm)          1.66+174  -55.5    60320.0
     Rate coefficients at P=1.00E-01(atm)          9.03E+66  -17.2    48120.0
     Rate coefficients at P=3.16E-01(atm)          1.82E+43   -9.9    37960.0
     Rate coefficients at P=1.00E+00(atm)          8.64E+33   -6.9    34370.0
     Rate coefficients at P=3.16E+00(atm)          7.29+171  -43.5   191900.0
     Rate coefficients at P=1.00E+01(atm)          1.03E+32   -6.1    35500.0
     Rate coefficients at P=3.16E+01(atm)          1.85E+34   -6.6    38510.0
     Rate coefficients at P=1.00E+02(atm)          5.70E+29   -5.2    36800.0
     Declared duplicate reaction...
296. C2H3OO<=>CH2O+HCO                              1.19E+20   -2.3    30170.0
     Rate coefficients at P=1.00E-02(atm)          2.27E+35   -8.0    31280.0
     Rate coefficients at P=1.00E-01(atm)          2.08E+26   -5.0    28780.0
     Rate coefficients at P=3.16E-01(atm)          1.45E+20   -3.1    26630.0
     Rate coefficients at P=1.00E+00(atm)          1.06+130  -39.4    54700.0
     Rate coefficients at P=3.16E+00(atm)          2.35E+34   -6.9    35700.0
     Rate coefficients at P=1.00E+01(atm)          2.18+175  -53.8    68500.0
     Rate coefficients at P=3.16E+01(atm)          1.07+185  -54.2    88990.0
     Rate coefficients at P=1.00E+02(atm)          4.68E+02    1.8    18100.0
     Declared duplicate reaction...
297. C2H3OO=>CH2O+H+CO                              1.19E+20   -2.3    30170.0
     Rate coefficients at P=1.00E-02(atm)          3.88+174  -55.5    60320.0
     Rate coefficients at P=1.00E-01(atm)          2.11E+67  -17.2    48120.0
     Rate coefficients at P=3.16E-01(atm)          4.26E+43   -9.9    37960.0
     Rate coefficients at P=1.00E+00(atm)          2.02E+34   -6.9    34370.0
     Rate coefficients at P=3.16E+00(atm)          1.70+172  -43.5   191900.0
     Rate coefficients at P=1.00E+01(atm)          2.40E+32   -6.1    35500.0
     Rate coefficients at P=3.16E+01(atm)          4.32E+34   -6.6    38510.0
     Rate coefficients at P=1.00E+02(atm)          1.33E+30   -5.2    36800.0
     Declared duplicate reaction...
298. C2H3OO=>CH2O+H+CO                              1.19E+20   -2.3    30170.0
     Rate coefficients at P=1.00E-02(atm)          5.29E+35   -8.0    31280.0
     Rate coefficients at P=1.00E-01(atm)          4.85E+26   -5.0    28780.0
     Rate coefficients at P=3.16E-01(atm)          3.37E+20   -3.1    26630.0
     Rate coefficients at P=1.00E+00(atm)          2.46+130  -39.4    54700.0
     Rate coefficients at P=3.16E+00(atm)          5.49E+34   -6.9    35700.0
     Rate coefficients at P=1.00E+01(atm)          5.09+175  -53.8    68500.0
     Rate coefficients at P=3.16E+01(atm)          2.49+185  -54.2    88990.0
     Rate coefficients at P=1.00E+02(atm)          1.09E+03    1.8    18100.0
     Declared duplicate reaction...
299. C2H3OO<=>CO+CH3O                               1.16E-01    3.2    18420.0
     Rate coefficients at P=1.00E-02(atm)          5.20E+33   -7.9    31320.0
     Rate coefficients at P=1.00E-01(atm)          1.26E+98  -27.1    64060.0
     Rate coefficients at P=3.16E-01(atm)          1.80E+33   -7.3    33760.0
     Rate coefficients at P=1.00E+00(atm)          3.83E+33   -7.2    35100.0
     Rate coefficients at P=3.16E+00(atm)          1.28E+79  -19.6    74870.0
     Rate coefficients at P=1.00E+01(atm)          4.07E+32   -6.6    37210.0
     Rate coefficients at P=3.16E+01(atm)          6.86E+44  -10.0    47030.0
     Rate coefficients at P=1.00E+02(atm)          1.00E-10    0.0        0.0
     Declared duplicate reaction...
300. C2H3OO<=>CO+CH3O                               1.16E-01    3.2    18420.0
     Rate coefficients at P=1.00E-02(atm)          2.31+129  -41.9    45850.0
     Rate coefficients at P=1.00E-01(atm)          2.42E+28   -6.0    30540.0
     Rate coefficients at P=3.16E-01(atm)          8.69E-50   16.6    -3900.0
     Rate coefficients at P=1.00E+00(atm)          1.19E-39   13.6    -1317.0
     Rate coefficients at P=3.16E+00(atm)          8.80E+86  -23.1    61010.0
     Rate coefficients at P=1.00E+01(atm)          1.27E+03    1.4    18660.0
     Rate coefficients at P=3.16E+01(atm)          1.97E+17   -2.2    28590.0
     Rate coefficients at P=1.00E+02(atm)          3.25E+04    1.7    23327.6
     Declared duplicate reaction...
301. CHOCHO+OH=>HCO+CO+H2O                          6.13E+04    2.6    -4586.4
302. C2H3+H<=>C2H2+H2                               1.70E+14    0.0        0.0
303. C2H3+H<=>H2CC+H2                               6.00E+13    0.0        0.0
304. C2H3+OH<=>C2H2+H2O                             3.01E+13    0.0        0.0
305. C2H3+CH3<=>CH4+C2H2                            3.92E+11    0.0        0.0
306. C2H3+C2H3<=>C2H2+C2H4                          9.60E+11    0.0        0.0
307. C2H+H(+M)<=>C2H2(+M)                           1.00E+17    0.0        0.0
     Low pressure limit:  0.37500E+34 -0.48000E+01  0.19000E+04
     TROE centering:      0.64600E+00  0.13200E+03  0.13150E+04  0.55660E+04
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     AR              Enhanced by    7.000E-01
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
     HE              Enhanced by    7.000E-01
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308. C2H2(+M)<=>H2CC(+M)                          8.00E+14   -0.5    50750.0
     Low pressure limit:  0.24500E+16 -0.64000E+00  0.49700E+05
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     CH4             Enhanced by    2.000E+00
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
     C2H2            Enhanced by    2.500E+00
     C2H4            Enhanced by    2.500E+00
309. C2H2+O<=>CH2+CO                             7.40E+08    1.3     2472.0
310. C2H2+O<=>HCCO+H                             2.96E+09    1.3     2472.0
311. C2H2+HO2<=>CH2CO+OH                         6.03E+09    0.0     7949.0
312. C2H2+HCO<=>C2H3+CO                          1.00E+07    2.0     6000.0
313. C2H2+CH2<=>C3H3+H                           1.20E+13    0.0     6620.0
314. C2H2+CH2(S)<=>C3H3+H                        2.00E+13    0.0        0.0
315. C2H2+HCCO<=>C3H3+CO                         1.00E+11    0.0     3000.0
316. H2CC+H<=>C2H2+H                             1.00E+14    0.0        0.0
317. H2CC+OH<=>CH2CO+H                           2.00E+13    0.0        0.0
318. H2CC+O2<=>HCO+HCO                           1.00E+13    0.0        0.0
319. C2H2+OH<=>C2H+H2O                           2.63E+06    2.1    17060.0
320. C2H2+OH<=>HCCOH+H                           2.80E+05    2.3    12420.0
     Rate coefficients at P=1.00E-02(atm)       2.80E+05    2.3    12420.0
     Rate coefficients at P=2.50E-02(atm)       7.47E+05    2.2    12550.0
     Rate coefficients at P=1.00E-01(atm)       1.78E+06    2.0    12670.0
     Rate coefficients at P=1.00E+00(atm)       2.42E+06    2.0    12710.0
     Rate coefficients at P=1.00E+01(atm)       3.21E+06    2.0    12810.0
     Rate coefficients at P=1.00E+02(atm)       7.35E+06    1.9    13600.0
321. C2H2+OH<=>CH2CO+H                           1.58E+03    2.6     -844.5
     Rate coefficients at P=1.00E-02(atm)       1.58E+03    2.6     -844.5
     Rate coefficients at P=2.50E-02(atm)       1.52E+04    2.3     -292.1
     Rate coefficients at P=1.00E-01(atm)       3.02E+05    1.9      598.1
     Rate coefficients at P=1.00E+00(atm)       7.53E+06    1.6     2106.0
     Rate coefficients at P=1.00E+01(atm)       5.10E+06    1.6     3400.0
     Rate coefficients at P=1.00E+02(atm)       1.46E+04    2.5     4477.0
322. C2H2+OH<=>CH3+CO                            4.76E+05    1.7     -329.8
     Rate coefficients at P=1.00E-02(atm)       4.76E+05    1.7     -329.8
     Rate coefficients at P=2.50E-02(atm)       4.37E+06    1.4      226.5
     Rate coefficients at P=1.00E-01(atm)       7.65E+07    1.1     1115.0
     Rate coefficients at P=1.00E+00(atm)       1.28E+09    0.7     2579.0
     Rate coefficients at P=1.00E+01(atm)       4.31E+08    0.9     3736.0
     Rate coefficients at P=1.00E+02(atm)       8.25E+05    1.8     4697.0
323. C2H2+OH<=>C2H2OH                            3.91E+32   -7.1     5824.0
     Rate coefficients at P=1.00E-02(atm)       3.91E+32   -7.1     5824.0
     Rate coefficients at P=2.50E-02(atm)       1.07E+32   -6.8     5508.0
     Rate coefficients at P=1.00E-01(atm)       1.65E+32   -6.7     5822.0
     Rate coefficients at P=1.00E+00(atm)       1.39E+31   -6.1     6348.0
     Rate coefficients at P=1.00E+01(atm)       2.89E+29   -5.3     7055.0
     Rate coefficients at P=1.00E+02(atm)       1.37E+25   -3.8     6543.0
324. H+HCCOH<=>H+CH2CO                           1.00E+13    0.0        0.0
325. C2H+O2<=>CO2+CHV                            2.17E+10    0.0        0.0
326. C2H+O2<=>HCO+CO                             5.00E+13    0.0     1500.0
327. C2H+O<=>CO+CHV                              6.20E+12    0.0        0.0
328. C2H+O<=>CO+CH                               5.00E+13    0.0        0.0
329. C2H+H2<=>H+C2H2                             4.90E+05    2.5      560.0
330. C2H+OH<=>H+HCCO                             2.00E+13    0.0        0.0
331. CH3CHO(+M)<=>CH3+HCO(+M)                    2.45E+22   -1.7    86355.0
     Low pressure limit:  0.10300E+60 -0.11300E+02  0.95912E+05
     TROE centering:      0.24900E-02  0.71810E+03  0.60890E+01  0.37800E+04
332. CH3CHO(+M)<=>CH4+CO(+M)                     2.72E+21   -1.7    86355.0
     Low pressure limit:  0.11440E+59 -0.11300E+02  0.95912E+05
     TROE centering:      0.24900E-02  0.71810E+03  0.60890E+01  0.37800E+04
333. CH3CHO+O2<=>CH3CO+HO2                       3.01E+13    0.0    39150.0
334. CH3CHO+O<=>CH3CO+OH                         5.94E+12    0.0     1868.0
335. CH3CHO+H<=>CH3CO+H2                         1.31E+05    2.6     1220.0
336. CH3CHO+OH<=>CH3CO+H2O                       3.37E+12    0.0     -619.0
337. CH3CHO+HO2<=>CH3CO+H2O2                     3.01E+12    0.0    11920.0
338. CH3CHO+CH3<=>CH3CO+CH4                      7.08E-04    4.6     1966.0
339. CH3CHO+CH3O2<=>CH3CO+CH3O2H                 3.01E+12    0.0    11920.0
340. CH3CHO+CH3CO3<=>CH3CO+CH3CO3H               3.01E+12    0.0    11920.0
341. CH3CHO+H<=>CH2CHO+H2                        2.72E+03    3.1     5210.0
342. CH3CHO+OH<=>CH2CHO+H2O                      1.72E+05    2.4      815.0
343. CH3CHO+OH<=>CH3+HOCHO                       3.00E+15   -1.1        0.0
344. CH3CO(+M)<=>CH3+CO(+M)                      1.07E+12    0.6    16900.0
     Low pressure limit:  0.56500E+19 -0.97000E+00  0.14600E+05
     TROE centering:      0.62900E+00  0.87300E+10  0.55200E+01  0.76000E+08
345. CH3CO(+M)<=>CH2CO+H(+M)                     9.41E+07    1.9    44987.2
     Low pressure limit:  0.15160E+52 -0.10270E+02  0.55390E+05
     TROE centering:      0.60090E+00  0.81030E+10  0.66770E+03  0.50000E+10
346. CH3CO+H<=>CH2CO+H2                          2.00E+13    0.0        0.0
347. CH3CO+O<=>CH2CO+OH                          2.00E+13    0.0        0.0
348. CH3CO+CH3<=>CH2CO+CH4                       5.00E+13    0.0        0.0
349. CH3CO+O2<=>CH3CO3                           1.20E+11    0.0    -1100.0
350. CH3CO3+HO2<=>CH3CO3H+O2                     1.75E+10    0.0    -3275.0
351. H2O2+CH3CO3<=>HO2+CH3CO3H                   2.41E+12    0.0     9936.0
352. CH4+CH3CO3<=>CH3+CH3CO3H                    1.81E+11    0.0    18480.0
353. C2H3OH<=>CH3CHO                             7.42E+46  -10.6    67420.0
     Rate coefficients at P=1.00E-01(atm)       7.42E+46  -10.6    67420.0
     Rate coefficients at P=1.00E+00(atm)       4.42E+42   -9.1    67069.2
     Rate coefficients at P=1.00E+02(atm)       2.90E+27   -4.3    61612.9
354. C2H3OH+O2<=>CH2CHO+HO2                      5.31E+11    0.2    39830.0
355. C2H3OH+O<=>CH2CHO+OH                        1.88E+06    1.9     -860.0
356. C2H3OH+H<=>CH2CHO+H2                        1.48E+03    3.1     7220.0
357. C2H3OH+OH<=>CH2CHO+H2O                      3.33E+09    1.1      540.5
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358. C2H3OH+CH3<=>CH2CHO+CH4                        2.03E-08    5.9     1052.0
359. C2H3OH+CH3O2<=>CH2CHO+CH3O2H                   3.40E+03    2.5     8922.0
360. C2H3OH+H<=>C2H2OH+H2                           2.47E+07    2.0    15200.0
361. C2H3OH+H<=>PC2H4OH                             3.01E+08    1.6     3670.0
362. C2H3OH+HO2<=>CH3CHO+HO2                        1.49E+05    1.7     6810.0
363. CH2CHO(+M)<=>CH2CO+H(+M)                       1.43E+15   -0.1    45600.0
     Low pressure limit:  0.60000E+30 -0.38000E+01  0.43424E+05
     TROE centering:      0.98500E+00  0.39300E+03  0.98000E+10  0.50000E+10
364. CH2CHO(+M)<=>CH3+CO(+M)                        2.93E+12    0.3    40300.0
     Low pressure limit:  0.95200E+34 -0.50700E+01  0.41300E+05
     TROE centering:      0.71300E-16  0.11500E+04  0.49900E+10  0.17900E+10
365. CH3CO3H<=>CH3CO2+OH                            5.01E+14    0.0    40150.0
366. CH3CO3+CH2O<=>CH3CO3H+HCO                      1.99E+12    0.0    11660.0
367. CH3CO3+C2H6<=>CH3CO3H+C2H5                     1.70E+13    0.0    20460.0
368. CH3CO2+M<=>CH3+CO2+M                           4.40E+15    0.0    10500.0
369. CH2CHO+O2<=>O2CH2CHO                           1.58E+77  -21.9    19350.0
     Rate coefficients at P=1.00E-02(atm)          1.58E+77  -21.9    19350.0
     Rate coefficients at P=1.00E-01(atm)          3.88E+69  -18.8    19240.0
     Rate coefficients at P=1.00E+00(atm)          7.80E+59  -15.4    17650.0
     Rate coefficients at P=1.00E+01(atm)          3.05E+50  -12.2    15630.0
370. CH2CHO+O2<=>CH2CO+HO2                          1.88E+05    2.4    23730.0
     Rate coefficients at P=1.00E-02(atm)          1.88E+05    2.4    23730.0
     Rate coefficients at P=1.00E-01(atm)          1.88E+05    2.4    27370.0
     Rate coefficients at P=1.00E+00(atm)          2.51E+05    2.3    23800.0
     Rate coefficients at P=1.00E+01(atm)          7.05E+07    1.6    25290.0
371. CH2CHO+O2=>CH2O+CO+OH                          2.68E+17   -1.8     6530.0
     Rate coefficients at P=1.00E-02(atm)          2.68E+17   -1.8     6530.0
     Rate coefficients at P=1.00E-01(atm)          1.52E+20   -2.6     8980.0
     Rate coefficients at P=1.00E+00(atm)          1.65E+19   -2.2    10340.0
     Rate coefficients at P=1.00E+01(atm)          8.95E+13   -0.6    10120.0
372. CH2CHO+O2<=>HO2CH2CO                           3.64E+65  -21.9    19020.0
     Rate coefficients at P=1.00E-02(atm)          3.64E+65  -21.9    19020.0
     Rate coefficients at P=1.00E-01(atm)          3.64E+58  -19.0    19090.0
     Rate coefficients at P=1.00E+00(atm)          6.65E+48  -15.6    17460.0
     Rate coefficients at P=1.00E+01(atm)          4.80E+38  -12.1    14960.0
373. O2CH2CHO<=>HO2CH2CO                            8.27E+30   -6.7    24500.0
     Rate coefficients at P=1.00E-02(atm)          8.27E+30   -6.7    24500.0
     Rate coefficients at P=1.00E-01(atm)          1.73E+26   -5.0    23760.0
     Rate coefficients at P=1.00E+00(atm)          9.03E+19   -2.9    22170.0
     Rate coefficients at P=1.00E+01(atm)          1.43E+16   -1.7    21210.0
374. O2CH2CHO<=>CH2CO+HO2                           2.05E+40  -13.3    52150.0
     Rate coefficients at P=1.00E-02(atm)          2.05E+40  -13.3    52150.0
     Rate coefficients at P=1.00E-01(atm)          5.72E+45  -14.0    52200.0
     Rate coefficients at P=1.00E+00(atm)          4.16E+55  -15.8    55080.0
     Rate coefficients at P=1.00E+01(atm)          1.12E+61  -16.0    60010.0
375. HO2CH2CO=>CO+CH2O+OH                           2.36E+17   -3.0     8100.0
     Rate coefficients at P=1.00E-02(atm)          2.36E+17   -3.0     8100.0
     Rate coefficients at P=1.00E-01(atm)          2.38E+18   -3.0     8100.0
     Rate coefficients at P=1.00E+00(atm)          2.51E+19   -3.0     8110.0
     Rate coefficients at P=1.00E+01(atm)          4.16E+20   -3.0     8240.0
376. HO2CH2CO<=>CH2CO+HO2                           1.12E+07   -3.8    21680.0
     Rate coefficients at P=1.00E-02(atm)          1.12E+07   -3.8    21680.0
     Rate coefficients at P=1.00E-01(atm)          1.10E+08   -3.8    21680.0
     Rate coefficients at P=1.00E+00(atm)          9.20E+08   -3.7    21630.0
     Rate coefficients at P=1.00E+01(atm)          2.09E+09   -3.5    21220.0
377. CH2+CO(+M)<=>CH2CO(+M)                         8.10E+11    0.0        0.0
     Low pressure limit:  0.26900E+34 -0.51100E+01  0.70950E+04
     TROE centering:      0.59070E+00  0.27500E+03  0.12260E+04  0.51850E+04
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     AR              Enhanced by    7.000E-01
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
     HE              Enhanced by    7.000E-01
378. CH2CO+H<=>HCCO+H2                              1.40E+15   -0.2     8783.2
379. CH2CO+O<=>HCCO+OH                              1.00E+13    0.0     8000.0
380. CH2CO+OH<=>HCCO+H2O                            1.00E+13    0.0     2000.0
381. CH2CO+H<=>CH3+CO                               7.70E+13   -0.2     4183.2
382. CH+CH2O<=>H+CH2CO                              9.46E+13    0.0     -515.0
383. CH2CO+O<=>CH2+CO2                              1.75E+12    0.0     1350.0
384. CH2CO+OH<=>CH2OH+CO                            2.00E+12    0.0    -1010.0
385. CH2CO+CH2(S)<=>C2H4+CO                         1.60E+14    0.0        0.0
386. CH2CO+CH3<=>C2H5+CO                            4.77E+04    2.3     9468.0
387. HCCO+OH=>H2+CO+CO                              1.00E+14    0.0        0.0
388. HCCO+O=>H+CO+CO                                8.00E+13    0.0        0.0
389. CH+CO+M<=>HCCO+M                               7.57E+22   -1.9        0.0
390. HCCO+H<=>CH2(S)+CO                             1.00E+14    0.0        0.0
391. HCCO+O2=>OH+CO+CO                              1.91E+11    0.0     1020.0
392. HCCO+O2=>CO2+CO+H                              4.78E+12   -0.1     1150.0
393. CH+HCCO<=>CO+C2H2                              5.00E+13    0.0        0.0
394. C2H5OH<=>C2H4+H2O                              3.41E+59  -14.2    83672.6
     Rate coefficients at P=1.00E-03(atm)          3.41E+59  -14.2    83672.6
     Rate coefficients at P=1.00E-02(atm)          2.62E+57  -13.3    85262.2
     Rate coefficients at P=1.00E-01(atm)          1.65E+52  -11.5    84745.6
     Rate coefficients at P=1.00E+00(atm)          5.23E+43   -8.9    81506.7
     Rate coefficients at P=1.00E+01(atm)          4.59E+32   -5.6    76062.4
     Rate coefficients at P=1.00E+02(atm)          3.84E+20   -2.1    69465.5
395. C2H5OH<=>CH3+CH2OH                             1.20E+54  -12.9   100005.7
     Rate coefficients at P=1.00E-03(atm)          1.20E+54  -12.9   100005.7
     Rate coefficients at P=1.00E-02(atm)          5.18E+59  -14.0    99906.4
     Rate coefficients at P=1.00E-01(atm)          1.62E+66  -15.3   105390.5
     Rate coefficients at P=1.00E+00(atm)          5.55E+64  -14.5   106183.0
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     Rate coefficients at P=1.00E+01(atm)          1.55E+58  -12.3   105768.0
     Rate coefficients at P=1.00E+02(atm)          1.78E+47   -9.0   101058.8
396. C2H5OH<=>C2H5+OH                               8.10E+46  -11.3   111053.4
     Rate coefficients at P=1.00E-03(atm)          8.10E+46  -11.3   111053.4
     Rate coefficients at P=1.00E-02(atm)          1.86E+56  -13.5   107238.4
     Rate coefficients at P=1.00E-01(atm)          4.65E+63  -15.0   109622.8
     Rate coefficients at P=1.00E+00(atm)          4.46E+65  -14.9   112345.0
     Rate coefficients at P=1.00E+01(atm)          2.79E+61  -13.4   113080.2
     Rate coefficients at P=1.00E+02(atm)          6.17E+51  -10.3   109940.7
397. C2H5OH+O<=>C2H5O+OH                            1.46E-03    4.7     1727.0
398. C2H5OH+OH<=>C2H5O+H2O                          5.81E-03    4.3    -3560.0
399. C2H5OH+H<=>C2H5O+H2                            9.45E+02    3.1     8701.1
400. C2H5OH+HO2<=>C2H5O+H2O2                        6.47E-07    5.3    10533.1
401. C2H5OH+CH3<=>C2H5O+CH4                         2.04E+00    3.6     7721.0
402. C2H5OH+CH3O2<=>C2H5O+CH3O2H                    3.24E-07    5.3    10533.1
403. C2H5OH+C2H5<=>PC2H4OH+C2H6                     5.00E+10    0.0    13400.0
404. C2H5OH+O2<=>SC2H4OH+HO2                        1.50E+13    0.0    50150.0
405. C2H5OH+O<=>SC2H4OH+OH                          1.45E+05    2.5      876.0
406. C2H5OH+H<=>SC2H4OH+H2                          8.79E+04    2.7     2910.0
407. C2H5OH+OH<=>SC2H4OH+H2O                        7.52E+04    2.5    -1474.1
408. C2H5OH+HO2<=>SC2H4OH+H2O2                      2.45E-05    5.3     7475.1
409. C2H5OH+CH3<=>SC2H4OH+CH4                       1.99E+01    3.4     7634.0
410. C2H5OH+CH3O2<=>SC2H4OH+CH3O2H                  1.22E-05    5.3     7475.1
411. C2H5OH+C2H5<=>SC2H4OH+C2H6                     5.00E+10    0.0    10400.0
412. C2H5OH+O2<=>PC2H4OH+HO2                        2.00E+13    0.0    52800.0
413. C2H5OH+O<=>PC2H4OH+OH                          9.69E+02    3.2     4658.0
414. C2H5OH+H<=>PC2H4OH+H2                          5.31E+04    2.8     7490.0
415. C2H5OH+OH<=>PC2H4OH+H2O                        3.76E+03    2.8    -1810.2
416. C2H5OH+HO2<=>PC2H4OH+H2O2                      3.99E-02    4.3    15333.0
417. C2H5OH+CH3<=>PC2H4OH+CH4                       3.30E+02    3.3    12290.0
418. C2H5OH+CH3O2<=>PC2H4OH+CH3O2H                  1.99E-02    4.3    15333.0
419. SC2H4OH<=>CH3CHO+H                             5.69E+52  -13.4    45049.0
     Rate coefficients at P=1.00E-03(atm)          5.69E+52  -13.4    45049.0
     Rate coefficients at P=1.00E-02(atm)          3.29E+56  -14.1    48129.0
     Rate coefficients at P=1.00E-01(atm)          8.58E+57  -14.2    50743.0
     Rate coefficients at P=1.00E+00(atm)          5.36E+55  -13.2    51886.0
     Rate coefficients at P=1.00E+01(atm)          1.66E+48  -10.6    50297.0
     Rate coefficients at P=2.00E+01(atm)          8.26E+44   -9.6    49218.0
     Rate coefficients at P=5.00E+01(atm)          1.01E+40   -8.1    47439.0
     Rate coefficients at P=1.00E+02(atm)          1.10E+36   -6.8    45899.0
420. SC2H4OH<=>C2H3OH+H                             5.40E+46  -11.6    44323.0
     Rate coefficients at P=1.00E-03(atm)          5.40E+46  -11.6    44323.0
     Rate coefficients at P=1.00E-02(atm)          1.21E+51  -12.6    47240.0
     Rate coefficients at P=1.00E-01(atm)          2.87E+54  -13.2    50702.0
     Rate coefficients at P=1.00E+00(atm)          3.79E+53  -12.5    52560.0
     Rate coefficients at P=1.00E+01(atm)          6.33E+46  -10.2    51441.0
     Rate coefficients at P=2.00E+01(atm)          3.87E+43   -9.2    50440.0
     Rate coefficients at P=5.00E+01(atm)          5.08E+38   -7.7    48713.0
     Rate coefficients at P=1.00E+02(atm)          5.12E+34   -6.4    47182.0
421. SC2H4OH<=>C2H5O                                5.48E+45  -11.6    44328.0
     Rate coefficients at P=1.00E-03(atm)          5.48E+45  -11.6    44328.0
     Rate coefficients at P=1.00E-02(atm)          2.54E+49  -12.4    46445.0
     Rate coefficients at P=1.00E-01(atm)          1.65E+54  -13.4    50330.0
     Rate coefficients at P=1.00E+00(atm)          1.81E+55  -13.3    53132.0
     Rate coefficients at P=1.00E+01(atm)          4.58E+49  -11.3    52714.0
     Rate coefficients at P=2.00E+01(atm)          4.11E+46  -10.3    51834.0
     Rate coefficients at P=5.00E+01(atm)          6.68E+41   -8.8    50202.0
     Rate coefficients at P=1.00E+02(atm)          6.54E+37   -7.6    48697.0
422. SC2H4OH<=>PC2H4OH                              2.65E+36   -8.9    51019.0
     Rate coefficients at P=1.00E-03(atm)          2.65E+36   -8.9    51019.0
     Rate coefficients at P=1.00E-02(atm)          3.56E+37   -8.9    51114.0
     Rate coefficients at P=1.00E-01(atm)          4.14E+39   -9.2    51912.0
     Rate coefficients at P=1.00E+00(atm)          5.82E+44  -10.3    55296.0
     Rate coefficients at P=1.00E+01(atm)          4.26E+48  -11.1    59458.0
     Rate coefficients at P=2.00E+01(atm)          8.84E+47  -10.7    59901.0
     Rate coefficients at P=5.00E+01(atm)          2.23E+45   -9.8    59604.0
     Rate coefficients at P=1.00E+02(atm)          1.70E+42   -8.8    58737.0
423. CH3+CH2O<=>C2H5O                               3.00E+11    0.0     6336.0
424. CH3CHO+H<=>C2H5O                               4.61E+07    1.7     7090.0
425. C2H5O+O2<=>CH3CHO+HO2                          4.28E+10    0.0     1097.0
426. O2C2H4OH<=>PC2H4OH+O2                          3.90E+16   -1.0    30000.0
427. O2C2H4OH=>OH+CH2O+CH2O                         1.25E+11    0.0    18900.0
428. SC2H4OH+O2<=>CH3CHO+HO2                        5.26E+17   -1.6      869.0
     Rate coefficients at P=1.00E-02(atm)          5.26E+17   -1.6      838.0
     Rate coefficients at P=1.00E-01(atm)          5.26E+17   -1.6      838.0
     Rate coefficients at P=1.00E+00(atm)          5.28E+17   -1.6      839.0
     Rate coefficients at P=1.00E+01(atm)          1.54E+18   -1.8     1120.0
     Rate coefficients at P=1.00E+02(atm)          3.78E+20   -2.4     3090.0
429. SC2H4OH+O2<=>C2H3OH+HO2                        5.51E+03    2.5     -414.0
     Rate coefficients at P=1.00E-02(atm)          5.12E+02    2.5     -414.0
     Rate coefficients at P=1.00E-01(atm)          5.33E+02    2.5     -402.0
     Rate coefficients at P=1.00E+00(atm)          7.62E+02    2.4     -296.0
     Rate coefficients at P=1.00E+01(atm)          8.92E+03    2.1      470.0
     Rate coefficients at P=1.00E+02(atm)          4.38E+05    1.7     2330.0
430. CH3OCH3(+M)<=>CH3+CH3O(+M)                     2.33E+19   -0.7    84139.0
     Low pressure limit:  0.17200E+60 -0.11400E+02  0.93296E+05
     TROE centering:      0.10000E+01  0.10000E-29  0.88000E+03
     H2              Enhanced by    3.000E+00
     CO              Enhanced by    2.250E+00
     CO2             Enhanced by    3.000E+00
     N2              Enhanced by    1.500E+00
     H2O             Enhanced by    9.000E+00
     CH3OCH3         Enhanced by    5.000E+00
     CH4             Enhanced by    3.000E+00
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     C2H6            Enhanced by    4.500E+00
431. CH3OCH3+OH<=>CH3OCH2+H2O                      9.35E+05   2.3    -780.7
432. CH3OCH3+H<=>CH3OCH2+H2                        7.72E+06   2.1    3384.0
433. CH3OCH3+O<=>CH3OCH2+OH                        7.75E+08   1.4    2250.0
434. CH3OCH3+HO2<=>CH3OCH2+H2O2                    3.17E-03   4.6   10556.0
435. CH3OCH3+CH3O2<=>CH3OCH2+CH3O2H                1.27E-03   4.6   10556.0
436. CH3OCH3+CH3<=>CH3OCH2+CH4                     7.02E+00   3.8    9687.1
437. CH3OCH3+O2<=>CH3OCH2+HO2                      4.10E+13   0.0   44910.0
438. CH3OCH3+CH3O<=>CH3OCH2+CH3OH                  6.02E+11   0.0    4074.0
439. CH3OCH3+CH3OCH2O2<=>CH3OCH2+CH3OCH2O2H        5.00E+12   0.0   17690.0
440. CH3OCH3+O2CHO<=>CH3OCH2+HO2CHO                4.42E+04   2.6   13910.0
441. CH3OCH3+OCHO<=>CH3OCH2+HOCHO                  1.00E+13   0.0   17690.0
442. CH3OCH2+CH3O<=>CH3OCH3+CH2O                   2.41E+13   0.0       0.0
443. CH3OCH2+CH2O<=>CH3OCH3+HCO                    5.49E+03   2.8    5862.0
444. CH3OCH2+CH3CHO<=>CH3OCH3+CH3CO                1.26E+12   0.0    8499.0
445. CH3OCH2<=>CH3+CH2O                            8.03E+12   0.4   26490.7
     Rate coefficients at P=1.00E-02(atm)         7.49E+23  -4.5   25236.1
     Rate coefficients at P=1.00E-01(atm)         6.92E+28  -5.7   27494.9
     Rate coefficients at P=1.00E+00(atm)         4.23E+29  -5.6   28898.3
     Rate coefficients at P=1.00E+01(atm)         6.61E+27  -4.7   29735.2
     Rate coefficients at P=1.00E+02(atm)         2.66E+29  -4.9   31785.5
446. CH3OCH2+O2<=>CH3OCH2O2                        1.00E+00   1.0       1.0
     Rate coefficients at P=1.00E-03(atm)         1.12E+18  -3.4   -4294.0
     Rate coefficients at P=1.00E-02(atm)         1.33E+21  -4.0   -2615.0
     Rate coefficients at P=1.00E+00(atm)         1.13E+28  -5.2    4088.0
     Rate coefficients at P=2.00E+00(atm)         3.91E+27  -5.0    4512.0
     Rate coefficients at P=1.00E+01(atm)         2.75E+24  -3.9    4290.0
     Rate coefficients at P=2.00E+01(atm)         2.97E+22  -3.2    3781.0
     Rate coefficients at P=5.00E+01(atm)         5.19E+19  -2.4    2908.0
     Rate coefficients at P=1.00E+02(atm)         5.43E+17  -1.7    2210.0
447. CH3OCH2+O2<=>CH2OCH2O2H                       1.00E+00   1.0       1.0
     Rate coefficients at P=1.00E-03(atm)         5.08E+20  -4.4     469.0
     Rate coefficients at P=1.00E-02(atm)         5.47E+23  -5.0    2183.0
     Rate coefficients at P=1.00E+00(atm)         2.81E+28  -5.6    7848.0
     Rate coefficients at P=2.00E+00(atm)         5.19E+27  -5.3    8144.0
     Rate coefficients at P=1.00E+01(atm)         9.67E+24  -4.4    8417.0
     Rate coefficients at P=2.00E+01(atm)         4.08E+23  -3.9    8494.0
     Rate coefficients at P=5.00E+01(atm)         5.08E+21  -3.3    8585.0
     Rate coefficients at P=1.00E+02(atm)         1.62E+20  -2.8    8619.0
448. CH3OCH2+O2=>CH2O+CH2O+OH                      1.00E+00   1.0       1.0
     Rate coefficients at P=1.00E-03(atm)         8.01E+21  -3.2    3067.0
     Rate coefficients at P=1.00E-02(atm)         1.73E+23  -3.5    4050.0
     Rate coefficients at P=1.00E+00(atm)         2.04E+31  -5.8   11594.0
     Rate coefficients at P=2.00E+00(atm)         5.99E+31  -5.9   12710.0
     Rate coefficients at P=1.00E+01(atm)         9.39E+30  -5.6   14517.0
     Rate coefficients at P=2.00E+01(atm)         1.09E+30  -5.3   15051.0
     Rate coefficients at P=5.00E+01(atm)         3.58E+28  -4.9   15664.0
     Rate coefficients at P=1.00E+02(atm)         2.41E+27  -4.5   16107.0
449. CH3OCH2O2<=>CH2OCH2O2H                        1.00E+00   1.0       1.0
     Rate coefficients at P=1.00E-03(atm)         1.94E+29  -7.0   22446.0
     Rate coefficients at P=1.00E-02(atm)         4.07E+27  -6.2   21619.0
     Rate coefficients at P=1.00E+00(atm)         2.52E+25  -4.8   22691.0
     Rate coefficients at P=2.00E+00(atm)         5.97E+24  -4.5   22868.0
     Rate coefficients at P=1.00E+01(atm)         4.44E+21  -3.4   22386.0
     Rate coefficients at P=2.00E+01(atm)         4.52E+19  -2.7   21803.0
     Rate coefficients at P=5.00E+01(atm)         5.72E+16  -1.8   20829.0
     Rate coefficients at P=1.00E+02(atm)         3.70E+14  -1.1   20034.0
450. CH3OCH2O2=>CH2O+CH2O+OH                       1.00E+00   1.0       1.0
     Rate coefficients at P=1.00E-03(atm)         2.06E+36  -8.3   33415.0
     Rate coefficients at P=1.00E-02(atm)         2.07E+39  -8.9   35842.0
     Rate coefficients at P=1.00E+00(atm)         1.12E+40  -8.4   39835.0
     Rate coefficients at P=2.00E+00(atm)         9.72E+38  -8.0   39923.0
     Rate coefficients at P=1.00E+01(atm)         6.28E+35  -7.0   39900.0
     Rate coefficients at P=2.00E+01(atm)         1.60E+34  -6.5   39850.0
     Rate coefficients at P=5.00E+01(atm)         8.32E+31  -5.8   39719.0
     Rate coefficients at P=1.00E+02(atm)         1.22E+30  -5.2   39549.0
451. CH2OCH2O2H=>CH2O+CH2O+OH                      1.00E+00   1.0       1.0
     Rate coefficients at P=1.00E-03(atm)         1.66E+23  -4.5   22243.0
     Rate coefficients at P=1.00E-02(atm)         5.30E+25  -4.9   24158.0
     Rate coefficients at P=1.00E+00(atm)         7.81E+22  -3.5   23156.0
     Rate coefficients at P=2.00E+00(atm)         4.98E+22  -3.4   23062.0
     Rate coefficients at P=1.00E+01(atm)         8.46E+22  -3.2   23559.0
     Rate coefficients at P=2.00E+01(atm)         9.09E+22  -3.1   23899.0
     Rate coefficients at P=5.00E+01(atm)         4.59E+22  -2.9   24262.0
     Rate coefficients at P=1.00E+02(atm)         1.40E+22  -2.7   24407.0
452. CH2OCH2O2H+O2<=>O2CH2OCH2O2H                  1.00E+00   1.0       1.0
     Rate coefficients at P=1.00E-03(atm)         9.42E+12  -1.7   -4998.0
     Rate coefficients at P=1.00E-02(atm)         8.16E+16  -2.5   -2753.0
     Rate coefficients at P=1.00E+00(atm)         1.06E+22  -3.3    3389.0
     Rate coefficients at P=2.00E+00(atm)         3.48E+20  -2.8    3131.0
     Rate coefficients at P=1.00E+01(atm)         2.86E+16  -1.5    1873.0
     Rate coefficients at P=2.00E+01(atm)         8.55E+14  -1.0    1312.0
     Rate coefficients at P=5.00E+01(atm)         2.68E+13  -0.5     727.0
     Rate coefficients at P=1.00E+02(atm)         4.87E+12  -0.3     428.0
453. CH2OCH2O2H+O2<=>HO2CH2OCHO+OH                 1.00E+00   1.0       1.0
     Rate coefficients at P=1.00E-03(atm)         5.90E+20  -2.9    3234.0
     Rate coefficients at P=1.00E-02(atm)         2.06E+23  -3.6    5116.0
     Rate coefficients at P=1.00E+00(atm)         4.45E+29  -5.3   12791.0
     Rate coefficients at P=2.00E+00(atm)         2.44E+28  -4.9   12891.0
     Rate coefficients at P=1.00E+01(atm)         9.42E+23  -3.7   12049.0
     Rate coefficients at P=2.00E+01(atm)         1.04E+22  -3.2   11505.0
     Rate coefficients at P=5.00E+01(atm)         6.95E+19  -2.6   10861.0
     Rate coefficients at P=1.00E+02(atm)         3.96E+18  -2.3   10500.0
454. O2CH2OCH2O2H<=>HO2CH2OCHO+OH                  1.00E+00   1.0       1.0
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     Rate coefficients at P=1.00E-03(atm)          9.05E+23   -4.9    18805.0
     Rate coefficients at P=1.00E-02(atm)          6.84E+26   -5.3    22533.0
     Rate coefficients at P=1.00E+00(atm)          5.07E+16   -1.8    21175.0
     Rate coefficients at P=2.00E+00(atm)          2.66E+14   -1.1    20310.0
     Rate coefficients at P=1.00E+01(atm)          1.69E+10    0.2    18604.0
     Rate coefficients at P=2.00E+01(atm)          1.11E+09    0.5    18100.0
     Rate coefficients at P=5.00E+01(atm)          1.07E+08    0.8    17661.0
     Rate coefficients at P=1.00E+02(atm)          3.86E+07    1.0    17467.0
455. CH3OCH2O2+CH3OCH2O2=>O2+CH3OCH2O+CH3OCH2O      1.55E+23   -4.5        0.0
456. CH3OCH2O2+CH2O<=>CH3OCH2O2H+HCO                1.00E+12    0.0    11660.0
457. CH3OCH2O2+CH3CHO<=>CH3OCH2O2H+CH3CO            2.80E+12    0.0    13600.0
458. CH3OCH2O+OH<=>CH3OCH2O2H                       2.00E+13    0.0        0.0
459. HO2CH2OCHO<=>OCH2OCHO+OH                       5.00E+16    0.0    43000.0
460. CH2O+OCHO<=>OCH2OCHO                           1.25E+11    0.0    11900.0
461. OCH2OCHO<=>HOCH2OCO                            1.00E+11    0.0    14000.0
462. HOCH2OCO<=>CH2OH+CO2                           1.12E+17   -1.5    20771.9
463. HOCH2OCO<=>HOCH2O+CO                           2.92E+18   -2.0    19619.0
464. CH3O+CH2O<=>CH3OCH2O                           1.00E+11    0.0     7960.0
465. CH3OCH2O+O2<=>CH3OCHO+HO2                      4.38E-19    9.5    -5501.0
466. CH3OCH2O<=>CH3OCHO+H                           3.30E+13    0.0    26136.3
467. CH3O+HCO<=>CH3OCHO                             3.00E+13    0.0        0.0
468. CH3O+HCO<=>CH3OH+CO                            9.00E+13    0.0        0.0
469. CH3+OCHO<=>CH3OCHO                             1.00E+13    0.0        0.0
470. CH2OCHO+H<=>CH3OCHO                            1.00E+14    0.0        0.0
471. CH3OCO+H<=>CH3OCHO                             1.00E+14    0.0        0.0
472. CH3OCHO+O2<=>CH3OCO+HO2                        1.00E+13    0.0    49700.0
473. CH3OCHO+O2<=>CH2OCHO+HO2                       2.05E+13    0.0    52000.0
474. CH3OCHO+OH<=>CH3OCO+H2O                        1.58E+07    1.8      934.0
475. CH3OCHO+OH<=>CH2OCHO+H2O                       5.27E+09    1.0     1586.0
476. CH3OCHO+HO2<=>CH3OCO+H2O2                      4.82E+03    2.6    13910.0
477. CH3OCHO+HO2<=>CH2OCHO+H2O2                     2.38E+04    2.5    16490.0
478. CH3OCHO+O<=>CH3OCO+OH                          2.76E+05    2.5     2830.0
479. CH3OCHO+O<=>CH2OCHO+OH                         9.80E+05    2.4     4750.0
480. CH3OCHO+H<=>CH3OCO+H2                          6.50E+05    2.4     4471.0
481. CH3OCHO+H<=>CH2OCHO+H2                         6.65E+05    2.5     6756.0
482. CH3OCHO+CH3<=>CH3OCO+CH4                       7.55E-01    3.5     5481.0
483. CH3OCHO+CH3<=>CH2OCHO+CH4                      4.52E-01    3.6     7154.0
484. CH3OCHO+CH3O<=>CH3OCO+CH3OH                    5.48E+11    0.0     5000.0
485. CH3OCHO+CH3O<=>CH2OCHO+CH3OH                   2.17E+11    0.0     6458.0
486. CH3OCHO+CH3O2<=>CH3OCO+CH3O2H                  4.82E+03    2.6    13910.0
487. CH3OCHO+CH3O2<=>CH2OCHO+CH3O2H                 2.38E+04    2.5    16490.0
488. CH3OCHO+HCO<=>CH3OCO+CH2O                      5.40E+06    1.9    17010.0
489. CH3OCHO+HCO<=>CH2OCHO+CH2O                     1.02E+05    2.5    18430.0
490. CH3OCO<=>CH2OCHO                               1.63E+12   -0.2    40670.0
491. CH3OCO<=>CH3+CO2                               8.69E+17   -1.8    13656.7
     Rate coefficients at P=5.00E-02(atm)          9.72E+12   -1.3     9416.7
     Rate coefficients at P=1.00E+00(atm)          1.25E+16   -1.8    11340.8
     Rate coefficients at P=1.00E+01(atm)          1.04E+18   -2.1    12826.9
     Rate coefficients at P=1.00E+02(atm)          8.69E+17   -1.8    13656.7
492. CH3OCO<=>CH3O+CO                               8.69E+17   -1.8    13656.7
     Rate coefficients at P=5.00E-02(atm)          1.03E+03    1.3    25401.0
     Rate coefficients at P=1.00E+00(atm)          4.09E+05    0.8    21969.1
     Rate coefficients at P=1.00E+01(atm)          9.02E+14   -1.7    21767.5
     Rate coefficients at P=1.00E+02(atm)          2.83E+22   -3.4    23592.4
493. CH2O+HCO<=>CH2OCHO                             1.50E+11    0.0    11900.0
494. C3H8(+M)<=>CH3+C2H5(+M)                        1.29E+37   -5.8    97380.0
     Low pressure limit:  0.56400E+75 -0.15740E+02  0.98714E+05
     TROE centering:      0.31000E+00  0.50000E+02  0.30000E+04  0.90000E+04
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     AR              Enhanced by    7.000E-01
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
     HE              Enhanced by    7.000E-01
495. NC3H7+H<=>C3H8                                 1.00E+14    0.0        0.0
496. IC3H7+H<=>C3H8                                 1.00E+14    0.0        0.0
497. C3H8+IC3H7<=>NC3H7+C3H8                        3.00E+10    0.0    12900.0
498. C3H8+O2<=>IC3H7+HO2                            2.00E+13    0.0    49640.0
499. C3H8+H<=>IC3H7+H2                              1.30E+06    2.4     4471.0
500. C3H8+O<=>IC3H7+OH                              5.49E+05    2.5     3140.0
501. C3H8+OH<=>IC3H7+H2O                            4.67E+07    1.6      -35.0
502. C3H8+HO2<=>IC3H7+H2O2                          6.32E+01    3.4    13720.0
503. C3H8+CH3<=>IC3H7+CH4                           6.40E+04    2.2     7520.0
504. C3H8+C2H3<=>IC3H7+C2H4                         1.00E+11    0.0    10400.0
505. C3H8+C2H5<=>IC3H7+C2H6                         1.00E+11    0.0    10400.0
506. C3H8+C3H5-A<=>IC3H7+C3H6                       7.94E+11    0.0    16200.0
507. C3H8+CH3O<=>IC3H7+CH3OH                        3.00E+11    0.0     7000.0
508. C3H8+CH3O2<=>IC3H7+CH3O2H                      1.02E+01    3.6    14810.0
509. C3H8+C2H5O2<=>IC3H7+C2H5O2H                    1.02E+01    3.6    14810.0
510. C3H8+NC3H7O2<=>IC3H7+NC3H7O2H                  2.00E+12    0.0    17000.0
511. C3H8+CH3CO3<=>IC3H7+CH3CO3H                    2.00E+12    0.0    17000.0
512. C3H8+O2CHO<=>IC3H7+HO2CHO                      1.48E+04    2.6    13910.0
513. C3H8+IC3H7O2<=>IC3H7+IC3H7O2H                  2.00E+12    0.0    17000.0
514. C3H8+O2<=>NC3H7+HO2                            6.00E+13    0.0    52290.0
515. C3H8+H<=>NC3H7+H2                              3.49E+05    2.7     6450.0
516. C3H8+O<=>NC3H7+OH                              3.71E+06    2.4     5505.0
517. C3H8+OH<=>NC3H7+H2O                            1.05E+10    1.0     1586.0
518. C3H8+HO2<=>NC3H7+H2O2                          4.08E+01    3.6    17160.0
519. C3H8+CH3<=>NC3H7+CH4                           9.04E-01    3.6     7154.0
520. C3H8+C2H3<=>NC3H7+C2H4                         1.00E+11    0.0    10400.0
521. C3H8+C2H5<=>NC3H7+C2H6                         1.00E+11    0.0    10400.0
522. C3H8+C3H5-A<=>NC3H7+C3H6                       7.94E+11    0.0    20500.0
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523. C3H8+CH3O<=>NC3H7+CH3OH	3.00E+11	0.0	7000.0
524. C3H8+CH3O2<=>NC3H7+CH3O2H	1.39E+00	4.0	18280.0
525. C3H8+C2H5O2<=>NC3H7+C2H5O2H	1.39E+00	4.0	18280.0
526. C3H8+NC3H7O2<=>NC3H7+NC3H7O2H	1.70E+13	0.0	20460.0
527. C3H8+IC3H7O2<=>NC3H7+IC3H7O2H	1.70E+13	0.0	20460.0
528. C3H8+CH3CO3<=>NC3H7+CH3CO3H	1.70E+13	0.0	20460.0
529. C3H8+O2CHO<=>NC3H7+HO2CHO	5.52E+04	2.5	16480.0
530. IC3H7+H<=>C2H5+CH3	2.00E+13	0.0	0.0
531. IC3H7+OH<=>C3H6+H2O	2.41E+13	0.0	0.0
532. IC3H7+O<=>CH3COCH3+H	4.82E+13	0.0	0.0
533. IC3H7+O<=>CH3CHO+CH3	4.82E+13	0.0	0.0
534. NC3H7+HO2<=>NC3H7O+OH	7.00E+12	0.0	-1000.0
535. NC3H7+CH3O2<=>NC3H7O+CH3O	7.00E+12	0.0	-1000.0
536. IC3H7+HO2<=>IC3H7O+OH	7.00E+12	0.0	-1000.0
537. IC3H7+CH3O2<=>IC3H7O+CH3O	7.00E+12	0.0	-1000.0
538. C2H5+CH2O<=>NC3H7O	1.00E+11	0.0	3496.0
539. C2H5CHO+H<=>NC3H7O	4.00E+12	0.0	6260.0
540. CH3+CH3CHO<=>IC3H7O	1.00E+11	0.0	9256.0
541. CH3COCH3+H<=>IC3H7O	2.00E+12	0.0	7270.0
542. IC3H7O+O2<=>CH3COCH3+HO2	9.09E+09	0.0	390.0
543. NC3H7+O2<=>C3H6+HO2	3.00E-19	0.0	3000.0
544. NC3H7+O2<=>NC3H7O2	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	9.20E+08	0.4	-4398.6
Rate coefficients at P=1.00E-01(atm)	1.45E+14	-1.0	-1710.8
Rate coefficients at P=1.00E+00(atm)	2.09E+13	-0.5	-938.4
Rate coefficients at P=1.00E+01(atm)	1.15E+20	-2.4	2451.3
Rate coefficients at P=1.00E+02(atm)	2.07E+16	-1.3	803.4
545. IC3H7+O2<=>IC3H7O2	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	7.33E+05	1.3	-6345.6
Rate coefficients at P=1.00E-01(atm)	2.24E+11	-0.1	-3697.9
Rate coefficients at P=1.00E+00(atm)	1.54E+18	-2.0	-498.6
Rate coefficients at P=1.00E+01(atm)	6.74E+27	-4.8	3779.8
Rate coefficients at P=1.00E+02(atm)	1.67E+29	-5.2	5036.4
546. IC3H7O2<=>C3H6+HO2	1.22E+09	1.3	30000.0
547. NC3H7O2<=>C3H6+HO2	6.24E+08	1.2	29600.0
548. NC3H7O2<=>C3H6OOH1-2	4.09E+08	1.1	30100.0
549. NC3H7O2<=>C3H6OOH1-3	3.57E+06	1.6	21000.0
550. IC3H7O2<=>C3H6OOH2-1	2.92E+09	1.1	33500.0
551. C3H6OOH1-2<=>C3H6O1-2+OH	1.21E+09	1.1	11300.0
552. C3H6OOH1-3<=>C3H6O1-3+OH	2.64E+09	0.7	18500.0
553. C3H6OOH1-2<=>C3H6+HO2	2.34E+10	0.8	15300.0
554. C3H6OOH1-3=>OH+CH2O+C2H4	2.89E+09	1.3	26700.0
555. C3H6OOH2-1<=>C2H3OOH+CH3	8.56E+10	0.8	30700.0
556. C3H6OOH1-2=>C2H4+CH2O+OH	1.31E+33	-7.0	48120.0
557. C3H6OOH1-2+O2<=>C3H6OOH1-2O2	1.74E+14	-0.8	-536.5
558. C3H6OOH1-3+O2<=>C3H6OOH1-3O2	3.43E+16	-1.6	198.7
559. C3H6OOH2-1+O2<=>C3H6OOH2-1O2	3.43E+16	-1.6	198.7
560. C3H6OOH1-2O2<=>C3H51-2,3OOH	2.92E+09	1.1	33500.0
561. C3H6OOH1-3O2<=>C3H52-1,3OOH	4.01E+08	1.1	30100.0
562. C3H6OOH2-1O2<=>C3H51-2,3OOH	3.57E+06	1.6	21000.0
563. C3H51-2,3OOH<=>AC3H5OOH+HO2	2.56E+13	-0.5	17770.0
564. C3H52-1,3OOH<=>AC3H5OOH+HO2	1.15E+14	-0.6	17250.0
565. C3H51-2,3OOH<=>C3H5O1-2OOH-3+OH	4.45E+09	0.9	10800.0
566. C3H51-2,3OOH<=>C3H5O1-3OOH-2+OH	2.64E+09	0.7	18500.0
567. C3H52-1,3OOH<=>C3H5O1-2OOH-3+OH	1.21E+09	1.1	11300.0
568. C3H5O1-2OOH-3=>CH2CHO+CH2O+OH	1.00E+16	0.0	43000.0
569. C3H5O1-3OOH-2=>CH2CHO+CH2O+OH	1.00E+16	0.0	43000.0
570. C3H6OOH1-2O2<=>C3KET12+OH	6.00E+11	0.0	26400.0
571. C3H6OOH1-3O2<=>C3KET13+OH	7.50E+10	0.0	21400.0
572. C3H6OOH2-1O2<=>C3KET21+OH	3.00E+11	0.0	23850.0
573. C3KET12=>CH3CHO+HCO+OH	9.50E+15	0.0	42540.0
574. C3KET13=>CH2O+CH2CHO+OH	1.00E+16	0.0	43000.0
575. C3KET21=>CH2O+CH3CO+OH	1.00E+16	0.0	43000.0
576. C3KET21=>OH+CH2O+CO+CH3	1.59E+20	-1.5	42879.5
577. C2H3OOH<=>CH2CHO+OH	8.40E+14	0.0	43000.0
578. C2H3OOH=>CH2CO+H+OH	1.59E+20	-1.5	42879.5
579. C3KET21<=>CH3COCH2O+OH	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	1.49E+58	-13.9	54266.9
Rate coefficients at P=1.00E-01(atm)	1.80E+54	-12.4	54193.8
Rate coefficients at P=1.00E+00(atm)	3.36E+46	-9.8	52468.5
Rate coefficients at P=1.00E+01(atm)	2.39E+36	-6.5	49429.0
Rate coefficients at P=1.00E+02(atm)	1.28E+27	-3.6	46333.1
580. NC3H7O2H<=>NC3H7O+OH	1.50E+16	0.0	42500.0
581. NC3H7O2+H2<=>NC3H7O2H+H	3.01E+13	0.0	26030.0
582. NC3H7O2+HO2<=>NC3H7O2H+O2	1.75E+10	0.0	-3275.0
583. NC3H7O2+CH2O<=>NC3H7O2H+HCO	5.60E+12	0.0	13600.0
584. NC3H7O2+CH4<=>NC3H7O2H+CH3	1.12E+13	0.0	24640.0
585. NC3H7O2+CH3OH<=>NC3H7O2H+CH2OH	6.30E+12	0.0	19360.0
586. NC3H7O2+CH3CHO<=>NC3H7O2H+CH3CO	2.80E+12	0.0	13600.0
587. NC3H7O2+C2H4<=>NC3H7O2H+C2H3	1.13E+13	0.0	30430.0
588. NC3H7O2+C2H6<=>NC3H7O2H+C2H5	1.70E+13	0.0	20460.0
589. NC3H7O2+C2H3CHO<=>NC3H7O2H+C2H3CO	2.80E+12	0.0	13600.0
590. NC3H7O2+C2H5CHO<=>NC3H7O2H+C2H5CO	2.00E+11	0.0	9500.0
591. NC3H7O2+NC3H7O2=>NC3H7O+NC3H7O+O2	1.40E+16	-1.6	1860.0
592. NC3H7O2+CH3CO3=>NC3H7O+CH3CO2+O2	1.40E+16	-1.6	1860.0
593. NC3H7O2+C2H5O2=>NC3H7O+C2H5O+O2	1.40E+16	-1.6	1860.0
594. NC3H7O2+CH3<=>NC3H7O+CH3O	7.00E+12	0.0	-1000.0
595. NC3H7O2+C2H5<=>NC3H7O+C2H5O	7.00E+12	0.0	-1000.0
596. NC3H7O2+IC3H7<=>NC3H7O+IC3H7O	7.00E+12	0.0	-1000.0
597. NC3H7O2+NC3H7<=>NC3H7O+NC3H7O	7.00E+12	0.0	-1000.0
598. NC3H7O2+C3H5-A<=>NC3H7O+C3H5O	7.00E+12	0.0	-1000.0
599. NC3H7O2+CH3O2=>NC3H7O+CH3O+O2	1.40E+16	-1.6	1860.0
600. IC3H7O+OH<=>IC3H7O2H	1.00E+15	-0.8	0.0
601. IC3H7O2+H2<=>IC3H7O2H+H	3.01E+13	0.0	26030.0

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602. IC3H7O2+HO2<=>IC3H7O2H+O2                    1.75E+10    0.0    -3275.0
603. IC3H7O2+CH2O<=>IC3H7O2H+HCO                  5.60E+12    0.0    13600.0
604. IC3H7O2+CH4<=>IC3H7O2H+CH3                   1.12E+13    0.0    24640.0
605. IC3H7O2+CH3CHO<=>IC3H7O2H+CH3CO              2.80E+12    0.0    13600.0
606. IC3H7O2+C2H4<=>IC3H7O2H+C2H3                 1.13E+13    0.0    30430.0
607. IC3H7O2+CH3OH<=>IC3H7O2H+CH2OH               6.30E+12    0.0    19360.0
608. IC3H7O2+C2H6<=>IC3H7O2H+C2H5                 1.70E+13    0.0    20460.0
609. IC3H7O2+C2H3CHO<=>IC3H7O2H+C2H3CO            2.80E+12    0.0    13600.0
610. IC3H7O2+C2H5CHO<=>IC3H7O2H+C2H5CO            2.00E+11    0.0     9500.0
611. IC3H7O2+CH3O2=>IC3H7O+CH3O+O2                1.40E+16   -1.6     1860.0
612. IC3H7O2+CH3CO3=>IC3H7O+CH3CO2+O2             1.40E+16   -1.6     1860.0
613. IC3H7O2+C2H5O2=>IC3H7O+C2H5O+O2              1.40E+16   -1.6     1860.0
614. IC3H7O2+IC3H7O2=>O2+IC3H7O+IC3H7O            1.40E+16   -1.6     1860.0
615. IC3H7O2+NC3H7O2=>IC3H7O+NC3H7O+O2            1.40E+16   -1.6     1860.0
616. IC3H7O2+CH3<=>IC3H7O+CH3O                    7.00E+12    0.0    -1000.0
617. IC3H7O2+C2H5<=>IC3H7O+C2H5O                  7.00E+12    0.0    -1000.0
618. IC3H7O2+IC3H7<=>IC3H7O+IC3H7O                7.00E+12    0.0    -1000.0
619. IC3H7O2+NC3H7<=>IC3H7O+NC3H7O                7.00E+12    0.0    -1000.0
620. IC3H7O2+C3H5-A<=>IC3H7O+C3H5O                7.00E+12    0.0    -1000.0
621. C3H6O1-2<=>C2H4+CH2O                         6.00E+14    0.0    60000.0
622. C3H6O1-2+OH=>CH2O+C2H3+H2O                   5.00E+12    0.0        0.0
623. C3H6O1-2+H=>CH2O+C2H3+H2                     2.63E+07    2.0     5000.0
624. C3H6O1-2+O=>CH2O+C2H3+OH                     8.43E+13    0.0     5200.0
625. C3H6O1-2+HO2=>CH2O+C2H3+H2O2                 1.00E+13    0.0    15000.0
626. C3H6O1-2+CH3O2=>CH2O+C2H3+CH3O2H             1.00E+13    0.0    19000.0
627. C3H6O1-2+CH3=>CH2O+C2H3+CH4                  2.00E+11    0.0    10000.0
628. C3H6O1-3<=>C2H4+CH2O                         6.00E+14    0.0    60000.0
629. C3H6O1-3+OH=>CH2O+C2H3+H2O                   5.00E+12    0.0        0.0
630. C3H6O1-3+O=>CH2O+C2H3+OH                     8.43E+13    0.0     5200.0
631. C3H6O1-3+H=>CH2O+C2H3+H2                     2.63E+07    2.0     5000.0
632. C3H6O1-3+CH3O2=>CH2O+C2H3+CH3O2H             1.00E+13    0.0    19000.0
633. C3H6O1-3+HO2=>CH2O+C2H3+H2O2                 1.00E+13    0.0    15000.0
634. C3H6O1-3+CH3=>CH2O+C2H3+CH4                  2.00E+11    0.0    10000.0
635. C2H3+CH3(+M)<=>C3H6(+M)                      2.50E+13    0.0        0.0
     Low pressure limit:  0.42700E+59 -0.11940E+02  0.97698E+04
     TROE centering:      0.17500E+00  0.13410E+04  0.60000E+05  0.10140E+05
636. CH2(S)+C2H4<=>CC3H6                          1.44E+51  -13.1    14200.0
     Rate coefficients at P=1.00E-02(atm)         1.44E+51  -13.1    14200.0
     Rate coefficients at P=1.00E-01(atm)         3.38E+54  -13.6    16500.0
     Rate coefficients at P=1.00E+00(atm)         1.35E+54  -13.0    18900.0
     Rate coefficients at P=1.00E+01(atm)         2.73E+47  -10.8    14200.0
     Rate coefficients at P=1.00E+02(atm)         2.71E+50  -11.2    16700.0
     Declared duplicate reaction...
637. CH2(S)+C2H4<=>CC3H6                          6.16E+40  -10.5     5428.1
     Rate coefficients at P=1.00E-02(atm)         6.16E+40  -10.5     5428.1
     Rate coefficients at P=1.00E-01(atm)         6.93E+41  -10.3     6188.9
     Rate coefficients at P=1.00E+00(atm)         1.81E+37   -8.6     5521.0
     Rate coefficients at P=1.00E+01(atm)         4.26E+37   -8.3     4770.2
     Rate coefficients at P=1.00E+02(atm)         4.68E+35   -7.4     4689.1
     Declared duplicate reaction...
638. CH2(S)+C2H4<=>C3H6                           4.82E+57  -14.3    17100.0
     Rate coefficients at P=1.00E-02(atm)         4.82E+57  -14.3    17100.0
     Rate coefficients at P=1.00E-01(atm)         3.84E+59  -14.4    18400.0
     Rate coefficients at P=1.00E+00(atm)         2.13E+58  -13.5    20400.0
     Rate coefficients at P=1.00E+01(atm)         8.48E+52  -11.6    20700.0
     Rate coefficients at P=1.00E+02(atm)         6.07E+47   -9.8    22100.0
     Declared duplicate reaction...
639. CH2(S)+C2H4<=>C3H6                           1.15E+45  -11.1     6145.2
     Rate coefficients at P=1.00E-02(atm)         1.15E+45  -11.1     6145.2
     Rate coefficients at P=1.00E-01(atm)         1.83E+45  -10.7     6638.5
     Rate coefficients at P=1.00E+00(atm)         1.30E+40   -8.8     5863.8
     Rate coefficients at P=1.00E+01(atm)         2.27E+32   -6.1     4317.9
     Rate coefficients at P=1.00E+02(atm)         1.28E+24   -3.5     2529.9
     Declared duplicate reaction...
640. CH2(S)+C2H4<=>C3H5-A+H                       8.20E+19   -2.1     1150.0
     Rate coefficients at P=1.00E-02(atm)         8.20E+19   -2.1     1150.0
     Rate coefficients at P=1.00E-01(atm)         2.27E+21   -2.4     2650.0
     Rate coefficients at P=1.00E+00(atm)         4.44E+35   -6.5    13900.0
     Rate coefficients at P=1.00E+01(atm)         1.18E+28   -4.1    14000.0
     Rate coefficients at P=1.00E+02(atm)         6.51E+26   -3.6    18900.0
     Declared duplicate reaction...
641. CH2(S)+C2H4<=>C3H5-A+H                       1.08E+07    1.6    -3174.6
     Rate coefficients at P=1.00E-02(atm)         1.08E+07    1.6    -3174.6
     Rate coefficients at P=1.00E-01(atm)         1.37E+05    2.1    -3799.2
     Rate coefficients at P=1.00E+00(atm)         3.89E+14   -0.4     1237.6
     Rate coefficients at P=1.00E+01(atm)         2.45E+10    0.7      750.9
     Rate coefficients at P=1.00E+02(atm)         1.81E+02    3.0     -746.0
     Declared duplicate reaction...
642. CH2(S)+C2H4<=>C2H3+CH3                       1.77E+19   -1.9     6790.0
     Rate coefficients at P=1.00E-02(atm)         1.77E+19   -1.9     6790.0
     Rate coefficients at P=1.00E-01(atm)         1.68E+19   -1.8     4310.0
     Rate coefficients at P=1.00E+00(atm)         4.16E+24   -3.2     9760.0
     Rate coefficients at P=1.00E+01(atm)         7.89E+24   -3.1    13900.0
     Rate coefficients at P=1.00E+02(atm)         7.36E+29   -4.3    23800.0
     Declared duplicate reaction...
643. CH2(S)+C2H4<=>C2H3+CH3                       4.30E+12    0.2     -110.4
     Rate coefficients at P=1.00E-02(atm)         4.30E+12    0.2     -110.4
     Rate coefficients at P=1.00E-01(atm)         2.26E+11    0.5       47.8
     Rate coefficients at P=1.00E+00(atm)         4.92E+09    1.0      599.8
     Rate coefficients at P=1.00E+01(atm)         1.47E+08    1.3     1228.4
     Rate coefficients at P=1.00E+02(atm)         8.11E+10    0.6     5506.5
     Declared duplicate reaction...
644. C2H3+CH3<=>C3H5-A+H                          4.12E+29   -5.0     8000.0
     Rate coefficients at P=1.00E-02(atm)         4.12E+29   -5.0     8000.0
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     Rate coefficients at P=1.00E-01(atm)          4.86E+30   -5.0    11300.0
     Rate coefficients at P=1.00E+00(atm)          5.30E+29   -4.6    14400.0
     Rate coefficients at P=1.00E+01(atm)          1.32E+30   -4.5    19300.0
     Rate coefficients at P=1.00E+02(atm)          5.16E+28   -4.0    23800.0
     Declared duplicate reaction...
645. C2H3+CH3<=>C3H5-A+H                            5.73E+15   -0.8     1195.9
     Rate coefficients at P=1.00E-02(atm)          5.73E+15   -0.8     1195.9
     Rate coefficients at P=1.00E-01(atm)          2.06E+13   -0.1     1428.7
     Rate coefficients at P=1.00E+00(atm)          4.48E+10    0.6     1421.6
     Rate coefficients at P=1.00E+01(atm)          4.10E+06    1.7     1056.9
     Rate coefficients at P=1.00E+02(atm)          1.37E-01    3.9     -353.6
     Declared duplicate reaction...
646. C3H6<=>C2H3+CH3                                1.88E+78  -18.7   130000.0
     Rate coefficients at P=1.00E-02(atm)          1.88E+78  -18.7   130000.0
     Rate coefficients at P=1.00E-01(atm)          8.73E+76  -17.9   132000.0
     Rate coefficients at P=1.00E+00(atm)          5.80E+75  -17.2   134000.0
     Rate coefficients at P=1.00E+01(atm)          8.12E+71  -15.8   136000.0
     Rate coefficients at P=1.00E+02(atm)          2.15E+64  -13.4   135000.0
     Declared duplicate reaction...
647. C3H6<=>C2H3+CH3                                1.69E+59  -13.6   113290.0
     Rate coefficients at P=1.00E-02(atm)          1.69E+59  -13.6   113290.0
     Rate coefficients at P=1.00E-01(atm)          2.00E+60  -13.7   114890.0
     Rate coefficients at P=1.00E+00(atm)          6.70E+54  -11.8   113840.0
     Rate coefficients at P=1.00E+01(atm)          1.06E+47   -9.3   111510.0
     Rate coefficients at P=1.00E+02(atm)          7.29E+38   -6.7   108740.0
     Declared duplicate reaction...
648. C3H6<=>C3H5-A+H                                9.16E+74  -17.6   120000.0
     Rate coefficients at P=1.00E-02(atm)          9.16E+74  -17.6   120000.0
     Rate coefficients at P=1.00E-01(atm)          1.73E+70  -16.0   120000.0
     Rate coefficients at P=1.00E+00(atm)          1.08E+71  -15.9   124860.0
     Rate coefficients at P=1.00E+01(atm)          6.40E+65  -14.2   125000.0
     Rate coefficients at P=1.00E+02(atm)          8.05E+56  -11.5   122000.0
     Declared duplicate reaction...
649. C3H6<=>C3H5-A+H                                2.98E+54  -12.3   101200.0
     Rate coefficients at P=1.00E-02(atm)          2.98E+54  -12.3   101200.0
     Rate coefficients at P=1.00E-01(atm)          1.37E+43   -8.9    96365.0
     Rate coefficients at P=1.00E+00(atm)          6.28E+42   -8.5    98004.0
     Rate coefficients at P=1.00E+01(atm)          4.73E+35   -6.3    95644.0
     Rate coefficients at P=1.00E+02(atm)          4.34E+28   -4.1    93114.0
     Declared duplicate reaction...
650. C3H6<=>CC3H6                                   1.26E+64  -15.6    95000.0
     Rate coefficients at P=1.00E-02(atm)          1.26E+64  -15.6    95000.0
     Rate coefficients at P=1.00E-01(atm)          3.94E+67  -16.2   101000.0
     Rate coefficients at P=1.00E+00(atm)          6.14E+68  -16.2   106000.0
     Rate coefficients at P=1.00E+01(atm)          9.70E+66  -15.3   109000.0
     Rate coefficients at P=1.00E+02(atm)          1.45E+62  -13.6   110000.0
     Declared duplicate reaction...
651. C3H6<=>CC3H6                                   4.84E+41   -9.6    79528.0
     Rate coefficients at P=1.00E-02(atm)          4.84E+41   -9.6    79528.0
     Rate coefficients at P=1.00E-01(atm)          8.07E+44  -10.2    82671.0
     Rate coefficients at P=1.00E+00(atm)          1.15E+47  -10.6    85502.0
     Rate coefficients at P=1.00E+01(atm)          1.33E+39   -8.0    83303.0
     Rate coefficients at P=1.00E+02(atm)          4.97E+31   -5.6    80987.0
     Declared duplicate reaction...
652. CC3H6<=>C3H5-A+H                               2.33E+63  -14.6   103000.0
     Rate coefficients at P=1.00E-02(atm)          2.33E+63  -14.6   103000.0
     Rate coefficients at P=1.00E-01(atm)          7.03E+63  -14.4   107000.0
     Rate coefficients at P=1.00E+00(atm)          5.07E+64  -14.3   112000.0
     Rate coefficients at P=1.00E+01(atm)          4.92E+61  -13.2   115000.0
     Rate coefficients at P=1.00E+02(atm)          4.82E+57  -11.7   118000.0
     Declared duplicate reaction...
653. CC3H6<=>C3H5-A+H                               1.12E+40   -8.4    85836.0
     Rate coefficients at P=1.00E-02(atm)          1.12E+40   -8.4    85836.0
     Rate coefficients at P=1.00E-01(atm)          1.06E+41   -8.3    88499.0
     Rate coefficients at P=1.00E+00(atm)          8.23E+43   -8.9    92907.0
     Rate coefficients at P=1.00E+01(atm)          1.27E+39   -7.3    93401.0
     Rate coefficients at P=1.00E+02(atm)          1.45E+28   -4.0    90995.0
     Declared duplicate reaction...
654. CC3H6<=>C2H3+CH3                               8.31E+64  -15.1   111000.0
     Rate coefficients at P=1.00E-02(atm)          8.31E+64  -15.1   111000.0
     Rate coefficients at P=1.00E-01(atm)          8.29E+64  -14.7   114000.0
     Rate coefficients at P=1.00E+00(atm)          1.00E+70  -15.7   122000.0
     Rate coefficients at P=1.00E+01(atm)          1.66E+67  -14.6   124000.0
     Rate coefficients at P=1.00E+02(atm)          7.87E+62  -13.1   127000.0
     Declared duplicate reaction...
655. CC3H6<=>C2H3+CH3                               1.51E+49  -11.0    99748.0
     Rate coefficients at P=1.00E-02(atm)          1.51E+49  -11.0    99748.0
     Rate coefficients at P=1.00E-01(atm)          1.05E+45   -9.5    99275.0
     Rate coefficients at P=1.00E+00(atm)          3.39E+50  -10.6   104220.0
     Rate coefficients at P=1.00E+01(atm)          1.76E+47   -9.4   104930.0
     Rate coefficients at P=1.00E+02(atm)          1.88E+39   -6.9   103980.0
     Declared duplicate reaction...
656. C3H5-T+H<=>C3H6                                4.96E+60  -15.2    18000.0
     Rate coefficients at P=1.00E-02(atm)          4.96E+60  -15.2    18000.0
     Rate coefficients at P=1.00E-01(atm)          3.20E+62  -15.1    20100.0
     Rate coefficients at P=1.00E+00(atm)          2.31E+60  -14.0    21900.0
     Rate coefficients at P=1.00E+01(atm)          3.69E+54  -12.0    22100.0
     Rate coefficients at P=1.00E+02(atm)          1.15E+50  -10.4    23300.0
     Declared duplicate reaction...
657. C3H5-T+H<=>C3H6                                1.49E+48  -12.0     7203.3
     Rate coefficients at P=1.00E-02(atm)          1.49E+48  -12.0     7203.3
     Rate coefficients at P=1.00E-01(atm)          6.76E+46  -11.1     7629.9
     Rate coefficients at P=1.00E+00(atm)          1.09E+40   -8.7     6447.8
     Rate coefficients at P=1.00E+01(atm)          2.38E+31   -5.7     4506.0
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Rate coefficients at P=1.00E+02(atm)	5.69E+25	-3.8	3250.4
Declared duplicate reaction...			
658. C3H5-T+H<=>C3H5-A+H	2.11E+17	-1.1	1290.0
Rate coefficients at P=1.00E-02(atm)	2.11E+17	-1.1	1290.0
Rate coefficients at P=1.00E-01(atm)	9.05E+29	-4.9	8540.0
Rate coefficients at P=1.00E+00(atm)	2.98E+30	-4.8	12000.0
Rate coefficients at P=1.00E+01(atm)	8.22E+28	-4.1	15400.0
Rate coefficients at P=1.00E+02(atm)	2.28E+29	-4.1	20900.0
Declared duplicate reaction...			
659. C3H5-T+H<=>C3H5-A+H	6.41E+03	2.6	-3778.4
Rate coefficients at P=1.00E-02(atm)	6.41E+03	2.6	-3778.4
Rate coefficients at P=1.00E-01(atm)	5.19E+14	-0.3	1090.4
Rate coefficients at P=1.00E+00(atm)	8.17E+11	0.5	1184.6
Rate coefficients at P=1.00E+01(atm)	2.79E+09	1.1	1187.5
Rate coefficients at P=1.00E+02(atm)	6.75E+03	2.7	373.8
Declared duplicate reaction...			
660. C3H5-T+H<=>C2H3+CH3	3.31E+16	-0.7	5200.0
Rate coefficients at P=1.00E-02(atm)	3.31E+16	-0.7	5200.0
Rate coefficients at P=1.00E-01(atm)	9.04E+16	-0.8	4800.0
Rate coefficients at P=1.00E+00(atm)	2.01E+24	-2.9	10900.0
Rate coefficients at P=1.00E+01(atm)	2.75E+26	-3.3	15800.0
Rate coefficients at P=1.00E+02(atm)	3.15E+32	-4.8	26000.0
Declared duplicate reaction...			
661. C3H5-T+H<=>C2H3+CH3	8.04E+13	-0.1	1150.0
Rate coefficients at P=1.00E-02(atm)	8.04E+13	-0.1	1150.0
Rate coefficients at P=1.00E-01(atm)	7.17E+10	0.7	673.8
Rate coefficients at P=1.00E+00(atm)	9.97E+08	1.4	1596.4
Rate coefficients at P=1.00E+01(atm)	7.41E+07	1.6	2108.8
Rate coefficients at P=1.00E+02(atm)	2.70E+12	0.3	6791.8
Declared duplicate reaction...			
662. C3H6<=>C3H5-S+H	7.71E+69	-16.1	140000.0
663. C3H6+H<=>C3H5-A+H2	3.64E+05	2.5	4361.2
664. C3H6+O2<=>C3H5-A+HO2	5.96E+19	-1.7	46192.1
665. C3H6+O<=>C3H5-A+OH	5.24E+11	0.7	5884.0
666. C3H6+OH<=>C3H5-A+H2O	4.46E+06	2.1	1050.8
667. C3H6+HO2<=>C3H5-A+H2O2	3.07E-02	4.4	13547.2
668. C3H6+CH3<=>C3H5-A+CH4	2.21E+00	3.5	5675.0
669. C3H6+CH3O<=>C3H5-A+CH3OH	8.40E+10	0.0	2600.0
670. C3H6+CH3O2<=>C3H5-A+CH3O2H	7.68E-02	4.4	13547.2
671. C3H6+C2H5<=>C3H5-A+C2H6	1.00E+11	0.0	9800.0
672. C3H6+C2H5O2<=>C3H5-A+C2H5O2H	7.68E-02	4.4	13547.2
673. C3H6+CH3CO3<=>C3H5-A+CH3CO3H	7.68E-02	4.4	13547.2
674. C3H6+NC3H7O2<=>C3H5-A+NC3H7O2H	7.68E-02	4.4	13547.2
675. C3H6+IC3H7O2<=>C3H5-A+IC3H7O2H	7.68E-02	4.4	13547.2
676. C3H6+H<=>C3H5-T+H2	1.50E+02	3.4	8909.5
677. C3H6+O<=>C3H5-T+OH	6.03E+10	0.7	7632.0
678. C3H6+OH<=>C3H5-T+H2O	1.80E+06	2.0	2235.2
679. C3H6+HO2<=>C3H5-T+H2O2	1.56E+04	2.8	24427.9
680. C3H6+O2<=>C3H5-T+HO2	1.00E+13	0.0	58770.0
681. C3H6+CH3<=>C3H5-T+CH4	8.40E-01	3.5	11660.0
682. C3H6+H<=>C3H5-S+H2	5.10E+02	3.2	12357.0
Declared duplicate reaction...			
683. C3H6+H<=>C3H5-S+H2	3.97E+02	3.3	12007.0
Declared duplicate reaction...			
684. C3H6+O2<=>C3H5-S+HO2	2.00E+13	0.0	62270.0
685. C3H6+O<=>C3H5-S+OH	1.20E+11	0.7	8959.1
686. C3H6+OH<=>C3H5-S+H2O	1.86E+05	2.4	2502.0
687. C3H6+HO2<=>C3H5-S+H2O2	9.57E+02	3.1	20798.6
688. C3H6+CH3<=>C3H5-S+CH4	1.35E+00	3.5	12850.0
689. C3H6+O<=>C2H5+HCO	7.45E+06	1.9	183.0
690. C3H6+O=>CH2CO+CH3+H	3.05E+06	1.9	183.0
691. C3H6+O=>CH3CHCO+H+H	3.05E+06	1.9	183.0
692. C3H6+H<=>NC3H7	1.00E+00	1.0	0.0
Rate coefficients at P=1.30E-03(atm)	7.99E+81	-23.2	22239.0
Rate coefficients at P=4.00E-02(atm)	4.24E+68	-18.4	19665.0
Rate coefficients at P=1.00E+00(atm)	1.04E+49	-11.5	15359.0
Rate coefficients at P=1.00E+01(atm)	6.20E+41	-8.9	14637.0
Rate coefficients at P=1.00E+02(atm)	1.00E-10	0.0	0.0
Declared duplicate reaction...			
693. C3H6+H<=>NC3H7	1.00E+00	1.0	0.0
Rate coefficients at P=1.30E-03(atm)	1.85E+26	-5.8	3865.8
Rate coefficients at P=4.00E-02(atm)	2.82E+30	-6.5	5470.8
Rate coefficients at P=1.00E+00(atm)	3.78E+28	-5.6	5625.1
Rate coefficients at P=1.00E+01(atm)	1.46E+25	-4.3	5247.8
Rate coefficients at P=1.00E+02(atm)	4.22E+27	-4.4	9345.8
Declared duplicate reaction...			
694. C3H6+H<=>C2H4+CH3	1.00E+00	1.0	1.0
Rate coefficients at P=1.30E-03(atm)	1.54E+09	1.4	2542.0
Rate coefficients at P=4.00E-02(atm)	7.88E+10	0.9	3599.6
Rate coefficients at P=1.00E+00(atm)	2.67E+12	0.5	5431.1
Rate coefficients at P=1.00E+01(atm)	9.25E+22	-2.6	12898.0
Rate coefficients at P=1.00E+02(atm)	1.32E+23	-2.4	16500.0
Declared duplicate reaction...			
695. C3H6+H<=>C2H4+CH3	1.00E+00	1.0	1.0
Rate coefficients at P=1.30E-03(atm)	1.00E-10	0.0	0.0
Rate coefficients at P=4.00E-02(atm)	1.00E-10	0.0	0.0
Rate coefficients at P=1.00E+00(atm)	1.00E-10	0.0	0.0
Rate coefficients at P=1.00E+01(atm)	1.24E+05	2.5	3679.1
Rate coefficients at P=1.00E+02(atm)	2.51E+03	2.9	3980.9
Declared duplicate reaction...			
696. C3H6+H<=>IC3H7	1.00E+00	1.0	1.0
Rate coefficients at P=1.30E-03(atm)	1.35E+44	-10.7	8196.4
Rate coefficients at P=4.00E-02(atm)	2.11E+57	-14.2	15147.0
Rate coefficients at P=1.00E+00(atm)	3.26E+61	-14.9	20161.0

Rate coefficients at P=1.00E+01(atm)	5.30E+56	-13.1	20667.0
Rate coefficients at P=1.00E+02(atm)	1.11E+50	-10.8	20202.0
Declared duplicate reaction...			
697. C3H6+H<=>IC3H7	1.00E+00	1.0	1.0
Rate coefficients at P=1.30E-03(atm)	2.17+130	-32.6	136140.0
Rate coefficients at P=4.00E-02(atm)	2.25E+29	-5.8	4241.9
Rate coefficients at P=1.00E+00(atm)	1.06E+30	-5.6	5613.4
Rate coefficients at P=1.00E+01(atm)	6.11E+26	-4.4	5182.3
Rate coefficients at P=1.00E+02(atm)	2.73E+23	-3.3	4597.0
Declared duplicate reaction...			
698. C2H4+CH3<=>NC3H7	1.00E+00	1.0	1.0
Rate coefficients at P=1.30E-03(atm)	8.67E+48	-12.5	18206.0
Rate coefficients at P=4.00E-02(atm)	1.06E+49	-12.0	20001.0
Rate coefficients at P=1.00E+00(atm)	7.67E+47	-11.2	22366.0
Rate coefficients at P=1.00E+01(atm)	1.81E+45	-10.0	23769.0
Rate coefficients at P=1.00E+02(atm)	2.04E+40	-8.2	24214.0
Declared duplicate reaction...			
699. C2H4+CH3<=>NC3H7	1.00E+00	1.0	1.0
Rate coefficients at P=1.30E-03(atm)	1.12E+43	-11.3	13080.0
Rate coefficients at P=4.00E-02(atm)	7.28E+39	-9.9	13164.0
Rate coefficients at P=1.00E+00(atm)	2.60E+33	-7.5	12416.0
Rate coefficients at P=1.00E+01(atm)	3.85E+27	-5.4	11455.0
Rate coefficients at P=1.00E+02(atm)	1.66E+21	-3.2	10241.0
Declared duplicate reaction...			
700. C3H6+HO2<=>C3H6OOH2-1	4.85E-21	2.6	11201.0
Rate coefficients at P=1.30E-02(atm)	1.31E+13	-1.8	8561.0
Rate coefficients at P=9.87E-01(atm)	5.93E+17	-2.6	11533.0
Rate coefficients at P=9.87E+00(atm)	8.34E+24	-4.4	16440.0
Rate coefficients at P=9.87E+01(atm)	3.75E+23	-3.7	17965.0
701. C3H6+HO2<=>C3H6O1-2+OH	1.13E+19	-1.7	23587.0
Rate coefficients at P=1.30E-02(atm)	3.73E+03	2.6	11173.0
Rate coefficients at P=9.87E-01(atm)	1.78E+12	0.1	16137.0
Rate coefficients at P=9.87E+00(atm)	3.90E+17	-1.4	20077.0
Rate coefficients at P=9.87E+01(atm)	1.13E+19	-1.7	23587.0
702. C3H6+HO2<=>IC3H7+O2	8.87E+22	-3.1	26586.0
Rate coefficients at P=1.30E-02(atm)	1.02E+07	1.2	10273.0
Rate coefficients at P=9.87E-01(atm)	1.31E+20	-2.6	19078.0
Rate coefficients at P=9.87E+00(atm)	4.14E+28	-4.9	26212.0
Rate coefficients at P=9.87E+01(atm)	8.87E+22	-3.1	26586.0
703. C3H6OOH2-1<=>C3H6O1-2+OH	6.91E+07	1.4	13373.0
Rate coefficients at P=1.30E-02(atm)	2.66E+35	-8.4	18056.0
Rate coefficients at P=9.87E-01(atm)	1.96E+35	-7.7	20595.0
Rate coefficients at P=9.87E+00(atm)	2.24E+33	-6.8	21619.0
Rate coefficients at P=9.87E+01(atm)	8.48E+26	-4.6	20278.0
704. C3H5-A+H<=>C3H4-A+H2	1.23E+03	3.0	2582.0
705. C3H5-A+OH<=>C3H4-A+H2O	6.00E+12	0.0	0.0
706. C3H5-A+CH3<=>C3H4-A+CH4	3.00E+12	-0.3	-131.0
707. C3H5-A+C2H5<=>C3H4-A+C2H6	4.00E+11	0.0	0.0
708. C3H5-A+C2H3<=>C3H4-A+C2H4	1.00E+12	0.0	0.0
709. C3H4-A+C3H4-A<=>C3H5-A+C3H3	5.00E+14	0.0	64746.7
710. C3H5-S+H<=>C3H4-A+H2	3.33E+12	0.0	0.0
711. C3H5-S+CH3<=>C3H4-A+CH4	1.00E+11	0.0	0.0
712. C3H5-S+H<=>C3H4-P+H2	3.34E+12	0.0	0.0
713. C3H5-S+CH3<=>C3H4-P+CH4	1.00E+11	0.0	0.0
714. C3H5-T+H<=>C3H4-P+H2	3.34E+12	0.0	0.0
715. C3H5-T+CH3<=>C3H4-P+CH4	1.00E+11	0.0	0.0
716. C3H5-A+C3H5-A<=>C3H4-A+C3H6	9.55E+40	-9.3	12470.0
Rate coefficients at P=1.00E+00(atm)	4.77E+40	-9.3	12470.0
Rate coefficients at P=4.00E+00(atm)	3.97E+32	-6.8	9180.0
Rate coefficients at P=1.00E+01(atm)	1.46E+28	-5.5	7410.0
717. C3H5-A+C2H5<=>C2H4+C3H6	4.00E+11	0.0	0.0
718. C3H5-A+HCO<=>C3H6+CO	6.00E+13	0.0	0.0
719. C3H5-S+HCO<=>C3H6+CO	9.00E+13	0.0	0.0
720. C3H5-T+HCO<=>C3H6+CO	9.00E+13	0.0	0.0
721. C3H5-S+O<=>C2H4+HCO	6.00E+13	0.0	0.0
722. C3H5-S+OH=>C2H4+HCO+H	5.00E+12	0.0	0.0
723. C3H5-S+HO2=>C2H4+HCO+OH	2.00E+13	0.0	0.0
724. C3H5-T+O<=>CH3+CH2CO	6.00E+13	0.0	0.0
725. C3H5-T+OH=>CH3+CH2CO+H	5.00E+12	0.0	0.0
726. C3H5-T+HO2=>CH3+CH2CO+OH	2.00E+13	0.0	0.0
727. C3H5-A+O<=>C2H3CHO+H	6.00E+13	0.0	0.0
728. C3H5-A+OH=>C2H3CHO+H+H	5.30E+37	-6.7	29306.0
Rate coefficients at P=1.00E-01(atm)	5.30E+37	-6.7	29306.0
Rate coefficients at P=1.00E+00(atm)	4.20E+32	-5.2	30126.0
Rate coefficients at P=1.00E+01(atm)	1.60E+20	-1.6	26330.0
729. C3H5-A+O2<=>C3H4-A+HO2	4.99E+15	-1.4	22428.0
Rate coefficients at P=1.00E+00(atm)	4.99E+15	-1.4	22428.0
Rate coefficients at P=1.00E+01(atm)	2.18E+21	-2.9	30755.0
730. C3H5-A+O2<=>CH3CO+CH2O	1.19E+15	-1.0	20128.0
Rate coefficients at P=1.00E+00(atm)	1.19E+15	-1.0	20128.0
Rate coefficients at P=1.00E+01(atm)	7.14E+15	-1.2	21046.0
731. C3H5-A+O2<=>C2H3CHO+OH	1.82E+13	-0.4	22859.0
Rate coefficients at P=1.00E+00(atm)	1.82E+13	-0.4	22859.0
Rate coefficients at P=1.00E+01(atm)	2.47E+13	-0.5	23017.0
732. C3H5-S+O2<=>CH3CHO+HCO	3.10E+31	-5.9	5748.4
733. C3H5-S+O2<=>CH3CHCHO+O	5.38E+18	-2.1	5142.9
734. C3H5-S+O2<=>C2H3CHO+OH	2.70E+19	-2.1	5142.9
735. C3H5-T+O2<=>CH3COCH2+O	9.86E+25	-3.8	11255.4
736. C3H5-T+O2<=>CH3CO+CH2O	2.55E+20	-2.6	1565.7
737. C3H5-T+O2<=>C3H4-A+HO2	3.59E+10	-0.3	-413.6
738. C3H5-A+HO2<=>C3H5O+OH	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	1.02E+13	-0.2	-1417.0
Rate coefficients at P=1.00E-01(atm)	4.98E+14	-0.6	-349.1
Rate coefficients at P=1.00E+00(atm)	7.77E+17	-1.5	2379.2

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     Rate coefficients at P=1.00E+01(atm)          2.93E+15   -0.7     3615.3
     Rate coefficients at P=1.00E+02(atm)          1.64E+04    2.7     1144.4
739. C3H5-A+HO2<=>AC3H5OOH                          1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-02(atm)          1.91E+31   -7.2     1336.2
     Rate coefficients at P=1.00E-01(atm)          6.31E+42  -10.3     5568.9
     Rate coefficients at P=1.00E+00(atm)          1.03E+45  -10.6     7851.5
     Rate coefficients at P=1.00E+01(atm)          2.79E+37   -7.9     6497.9
     Rate coefficients at P=1.00E+02(atm)          1.44E+32   -6.0     6053.6
740. C3H5-A+HO2<=>C2H3CHO+H2O                       1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-02(atm)          1.09E+00    3.0    -3421.1
     Rate coefficients at P=1.00E-01(atm)          6.35E+01    2.5    -2341.4
     Rate coefficients at P=1.00E+00(atm)          6.05E+05    1.4      595.1
     Rate coefficients at P=1.00E+01(atm)          3.10E+05    1.6     2677.6
     Rate coefficients at P=1.00E+02(atm)          5.07E-05    4.6      927.5
741. AC3H5OOH<=>C2H3CHO+H2O                         1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-02(atm)          1.99E+50  -12.7    53531.9
     Rate coefficients at P=1.00E-01(atm)          4.72E+47  -11.5    54360.9
     Rate coefficients at P=1.00E+00(atm)          1.50E+40   -8.8    53179.2
     Rate coefficients at P=1.00E+01(atm)          2.54E+28   -5.0    49919.4
     Rate coefficients at P=1.00E+02(atm)          1.48E+16   -1.1    45949.3
742. AC3H5OOH<=>C3H5O+OH                            1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-02(atm)          1.49E+58  -13.9    54266.9
     Rate coefficients at P=1.00E-01(atm)          1.80E+54  -12.4    54193.8
     Rate coefficients at P=1.00E+00(atm)          3.36E+46   -9.8    52468.5
     Rate coefficients at P=1.00E+01(atm)          2.39E+36   -6.5    49429.0
     Rate coefficients at P=1.00E+02(atm)          1.28E+27   -3.6    46333.1
743. C3H5O<=>C2H3+CH2O                              1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-03(atm)          7.26E+06    0.2    17815.5
     Rate coefficients at P=1.00E-02(atm)          6.97E+16   -2.5    20878.7
     Rate coefficients at P=1.00E-01(atm)          6.64E+23   -4.2    23565.0
     Rate coefficients at P=1.00E+00(atm)          1.07E+26   -4.6    24622.9
     Rate coefficients at P=1.00E+01(atm)          6.50E+29   -5.4    26645.0
     Rate coefficients at P=1.00E+02(atm)          4.63E+31   -5.6    28915.3
     Rate coefficients at P=1.00E+03(atm)          8.52E+25   -3.6    27863.4
744. C3H5O<=>CH2CHOCH2                              1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-03(atm)          3.17E+20   -4.2    12121.3
     Rate coefficients at P=1.00E-02(atm)          4.79E+24   -5.0    14606.1
     Rate coefficients at P=1.00E-01(atm)          1.90E+26   -5.2    16124.4
     Rate coefficients at P=1.00E+00(atm)          1.51E+28   -5.4    18165.4
     Rate coefficients at P=1.00E+01(atm)          2.42E+28   -5.2    19691.2
     Rate coefficients at P=1.00E+02(atm)          5.57E+24   -3.9    19395.2
     Rate coefficients at P=1.00E+03(atm)          1.35E+18   -1.7    17386.5
745. C3H5O<=>CH2CH2CHO                              1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-03(atm)          5.25E-49   15.5   -15639.9
     Rate coefficients at P=1.00E-02(atm)          1.46E-88   27.6   -35995.0
     Rate coefficients at P=1.00E-01(atm)          4.44E-22    8.4    -3819.0
     Rate coefficients at P=1.00E+00(atm)          6.23E+12   -1.4    10829.2
     Rate coefficients at P=1.00E+01(atm)          3.48E+42   -9.9    25297.9
     Rate coefficients at P=1.00E+02(atm)          1.88E+38   -8.2    25974.5
     Rate coefficients at P=1.00E+03(atm)          1.67E+21   -2.7    20337.7
746. C3H5O<=>C2H3CHO+H                              1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-03(atm)          3.00E+15   -2.3    14667.9
     Rate coefficients at P=1.00E-02(atm)          1.50E+22   -4.0    18283.0
     Rate coefficients at P=1.00E-01(atm)          1.95E+23   -4.0    19143.3
     Rate coefficients at P=1.00E+00(atm)          1.15E+25   -4.2    20311.2
     Rate coefficients at P=1.00E+01(atm)          1.76E+28   -4.9    22765.2
     Rate coefficients at P=1.00E+02(atm)          1.41E+27   -4.3    23770.6
     Rate coefficients at P=1.00E+03(atm)          2.57E+20   -2.1    22040.1
747. C3H5O<=>C2H4+HCO                               1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-03(atm)          6.62E+16   -2.8    13197.0
     Rate coefficients at P=1.00E-02(atm)          1.26E+20   -3.5    15469.2
     Rate coefficients at P=1.00E-01(atm)          2.13E+21   -3.6    16584.5
     Rate coefficients at P=1.00E+00(atm)          1.07E+24   -4.2    18985.0
     Rate coefficients at P=1.00E+01(atm)          8.42E+25   -4.4    22382.6
     Rate coefficients at P=1.00E+02(atm)          1.86E+21   -2.7    23658.8
     Rate coefficients at P=1.00E+03(atm)          4.75E+08    1.1    20922.5
748. CH2CHOCH2<=>C2H3+CH2O                          1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-03(atm)          3.30E+09   -0.6    19747.8
     Rate coefficients at P=1.00E-02(atm)          3.36E+21   -3.9    23945.2
     Rate coefficients at P=1.00E-01(atm)          2.91E+29   -5.9    27249.7
     Rate coefficients at P=1.00E+00(atm)          1.83E+34   -6.9    30690.4
     Rate coefficients at P=1.00E+01(atm)          9.72E+33   -6.5    33002.5
     Rate coefficients at P=1.00E+02(atm)          2.68E+27   -4.3    33305.6
     Rate coefficients at P=1.00E+03(atm)          8.81E+14   -0.3    31553.1
749. CH2CHOCH2<=>CH2CH2CHO                          1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-03(atm)          8.01E-92   27.8   -37321.2
     Rate coefficients at P=1.00E-02(atm)          7.78E-11    3.7    -2766.9
     Rate coefficients at P=1.00E-01(atm)          5.11E+15   -2.8    15937.6
     Rate coefficients at P=1.00E+00(atm)          4.48E+25   -5.2    21532.2
     Rate coefficients at P=1.00E+01(atm)          3.97E+34   -7.4    28116.9
     Rate coefficients at P=1.00E+02(atm)          5.62E+22   -3.6    25806.7
     Rate coefficients at P=1.00E+03(atm)          2.51E+20   -2.6    29288.4
750. CH2CHOCH2<=>C2H3CHO+H                          1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-03(atm)          4.93E+24   -5.0    20108.4
     Rate coefficients at P=1.00E-02(atm)          2.14E+28   -5.8    22219.4
     Rate coefficients at P=1.00E-01(atm)          1.93E+32   -6.6    25108.2
     Rate coefficients at P=1.00E+00(atm)          8.60E+34   -7.1    28209.1
     Rate coefficients at P=1.00E+01(atm)          2.17E+34   -6.6    30647.6
     Rate coefficients at P=1.00E+02(atm)          4.17E+28   -4.7    31231.9
     Rate coefficients at P=1.00E+03(atm)          3.98E+18   -1.6    30129.8
751. CH2CHOCH2<=>C2H4+HCO                           1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-03(atm)          8.23E+26   -5.8    19356.9
     Rate coefficients at P=1.00E-02(atm)          1.32E+29   -6.2    21293.6
     Rate coefficients at P=1.00E-01(atm)          3.47E+32   -7.0    24197.3
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     Rate coefficients at P=1.00E+00(atm)          1.44E+36   -7.8    28007.8
     Rate coefficients at P=1.00E+01(atm)          9.72E+37   -8.0    32394.6
     Rate coefficients at P=1.00E+02(atm)          2.43E+31   -5.8    34295.8
     Rate coefficients at P=1.00E+03(atm)          3.73E+14   -0.7    32008.3
752. CH2CH2CHO<=>C2H3+CH2O                          1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-03(atm)          6.89E-69   21.5     2638.0
     Rate coefficients at P=1.00E-02(atm)          5.34E-33   11.1    16749.1
     Rate coefficients at P=1.00E-01(atm)          6.11E+26   -6.0    44116.7
     Rate coefficients at P=1.00E+00(atm)          8.04E+35   -8.3    46919.7
     Rate coefficients at P=1.00E+01(atm)          5.52E+40   -9.2    50508.7
     Rate coefficients at P=1.00E+02(atm)          5.85E+35   -7.2    52038.4
     Rate coefficients at P=1.00E+03(atm)          1.93E+19   -1.9    48440.0
753. CH2CH2CHO<=>C2H3CHO+H                          1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-03(atm)          1.61E+10   -1.2    32371.3
     Rate coefficients at P=1.00E-02(atm)          5.84E+15   -2.6    32878.4
     Rate coefficients at P=1.00E-01(atm)          3.64E+23   -4.6    34275.3
     Rate coefficients at P=1.00E+00(atm)          7.58E+31   -6.6    37895.4
     Rate coefficients at P=1.00E+01(atm)          2.86E+32   -6.3    39990.7
     Rate coefficients at P=1.00E+02(atm)          1.57E+23   -3.1    38011.7
     Rate coefficients at P=1.00E+03(atm)          4.52E+12    0.2    34570.5
754. CH2CH2CHO<=>C2H4+HCO                           1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-03(atm)          2.90E+32   -7.2    25687.5
     Rate coefficients at P=1.00E-02(atm)          5.30E+33   -7.3    27100.6
     Rate coefficients at P=1.00E-01(atm)          2.00E+35   -7.4    29027.3
     Rate coefficients at P=1.00E+00(atm)          1.01E+34   -6.7    30018.1
     Rate coefficients at P=1.00E+01(atm)          9.76E+27   -4.6    28923.9
     Rate coefficients at P=1.00E+02(atm)          2.11E+19   -1.9    26239.8
     Rate coefficients at P=1.00E+03(atm)          1.59E+13    0.1    24086.3
755. C2H3+CH2O<=>C2H3CHO+H                          1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-03(atm)          2.60E+04    2.3     1510.3
     Rate coefficients at P=1.00E-02(atm)          5.13E+04    2.2     1675.5
     Rate coefficients at P=1.00E-01(atm)          3.99E+05    1.9     2218.3
     Rate coefficients at P=1.00E+00(atm)          1.75E+07    1.4     3428.0
     Rate coefficients at P=1.00E+01(atm)          1.35E+09    0.9     5173.0
     Rate coefficients at P=1.00E+02(atm)          2.24E+11    0.4     8001.3
     Rate coefficients at P=1.00E+03(atm)          6.01E+05    2.1     7895.6
756. C2H3+CH2O<=>C2H4+HCO                           1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-03(atm)          1.11E+07    1.1     1807.2
     Rate coefficients at P=1.00E-02(atm)          2.47E+07    1.0     1994.9
     Rate coefficients at P=1.00E-01(atm)          2.47E+08    0.7     2596.2
     Rate coefficients at P=1.00E+00(atm)          1.42E+10    0.2     3934.2
     Rate coefficients at P=1.00E+01(atm)          3.45E+13   -0.7     6944.3
     Rate coefficients at P=1.00E+02(atm)          3.31E+14   -0.9    10965.7
     Rate coefficients at P=1.00E+03(atm)          1.65E+01    3.2     9399.8
757. C3H5-A+CH3O2<=>C3H5O+CH3O                      1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-02(atm)          3.33E+12   -0.2    -1417.0
     Rate coefficients at P=1.00E-01(atm)          1.66E+14   -0.6     -349.1
     Rate coefficients at P=1.00E+00(atm)          2.60E+17   -1.5     2379.2
     Rate coefficients at P=1.00E+01(atm)          9.78E+14   -0.7     3615.3
     Rate coefficients at P=1.00E+02(atm)          5.47E+03    2.7     1144.4
758. C3H5-A+CH3O2<=>AC4H7OOH                        1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-02(atm)          1.91E+31   -7.2     1336.2
     Rate coefficients at P=1.00E-01(atm)          6.31E+42  -10.3     5568.9
     Rate coefficients at P=1.00E+00(atm)          1.03E+45  -10.6     7851.5
     Rate coefficients at P=1.00E+01(atm)          2.79E+37   -7.9     6497.9
     Rate coefficients at P=1.00E+02(atm)          3.40E+29   -5.3     4539.8
759. AC4H7OOH<=>C3H5O+CH3O                          1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-02(atm)          1.49E+58  -13.9    54266.9
     Rate coefficients at P=1.00E-01(atm)          1.80E+54  -12.4    54193.8
     Rate coefficients at P=1.00E+00(atm)          3.36E+46   -9.8    52468.5
     Rate coefficients at P=1.00E+01(atm)          2.39E+36   -6.5    49429.0
     Rate coefficients at P=1.00E+02(atm)          2.56E+27   -3.6    46333.1
760. C3H6+OH<=>C3H5OH+H                             2.29E+13    0.1    10580.0
     Rate coefficients at P=1.30E-03(atm)          2.67E+13    0.1    10611.0
     Rate coefficients at P=1.00E-02(atm)          2.75E+13    0.1    10623.0
     Rate coefficients at P=1.30E-02(atm)          2.87E+13    0.0    10634.0
     Rate coefficients at P=2.50E-02(atm)          1.59E+14   -0.2    11125.0
     Rate coefficients at P=1.00E-01(atm)          3.10E+14   -0.2    11407.0
     Rate coefficients at P=1.32E-01(atm)          3.78E+14   -0.2    11458.0
     Rate coefficients at P=1.00E+00(atm)          9.15E+07    1.4    10087.0
     Rate coefficients at P=1.00E+01(atm)          3.66E+05    2.1    10410.0
     Rate coefficients at P=1.00E+02(atm)          8.19E+02    2.8    10481.0
761. C3H6+OH<=>C2H3OH+CH3                           1.29E+06    1.6     1233.0
     Rate coefficients at P=1.30E-03(atm)          1.29E+06    1.6     1233.0
     Rate coefficients at P=1.00E-02(atm)          1.82E+04    2.1     1162.0
     Rate coefficients at P=1.30E-02(atm)          2.04E+03    2.5     1128.0
     Rate coefficients at P=2.50E-02(atm)          2.88E+02    2.8     1152.0
     Rate coefficients at P=1.00E-01(atm)          1.40E+01    3.2     1208.0
     Rate coefficients at P=1.32E-01(atm)          7.71E+00    3.3     1216.0
     Rate coefficients at P=1.00E+00(atm)          1.13E+04    2.5     3238.0
     Rate coefficients at P=1.00E+01(atm)          2.41E+19   -1.7    13107.0
     Rate coefficients at P=1.00E+02(atm)          3.30E-01    3.7     3665.0
762. C3H6+OH<=>IC3H5OH+H                            2.87E+00    2.9      625.0
     Rate coefficients at P=1.30E-03(atm)          2.87E+00    2.9      625.0
     Rate coefficients at P=1.00E-02(atm)          4.84E-01    3.0      704.0
     Rate coefficients at P=1.30E-02(atm)          3.13E-01    3.0      721.0
     Rate coefficients at P=2.50E-02(atm)          9.33E-03    3.6      677.0
     Rate coefficients at P=1.00E-01(atm)          4.64E-05    4.5      687.0
     Rate coefficients at P=1.32E-01(atm)          2.71E-05    4.6      707.0
     Rate coefficients at P=1.00E+00(atm)          7.65E-07    5.0      874.0
     Rate coefficients at P=1.00E+01(atm)          2.64E+15   -0.8    12728.0
     Rate coefficients at P=1.00E+02(atm)          4.87E-04    4.3     4020.0
763. C3H6+OH<=>SC3H5OH+H                            2.87E+00    2.9      625.0
     Rate coefficients at P=1.30E-03(atm)          3.47E+06    1.5     4288.0
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     Rate coefficients at P=1.00E-02(atm)          1.08E+07    1.3     4576.0
     Rate coefficients at P=1.30E-02(atm)          9.76E+06    1.3     4589.0
     Rate coefficients at P=2.50E-02(atm)          5.14E+06    1.4     4594.0
     Rate coefficients at P=1.00E-01(atm)          3.13E+05    1.7     4603.0
     Rate coefficients at P=1.32E-01(atm)          1.39E+05    1.8     4603.0
     Rate coefficients at P=1.00E+00(atm)          1.03E+02    2.8     4530.0
     Rate coefficients at P=1.00E+01(atm)          3.40E-02    3.9     4390.0
     Rate coefficients at P=1.00E+02(atm)          4.46E-06    5.0     4132.0
764. C3H6+OH<=>CH3CHO+CH3                           6.93E+05    1.5     -536.0
     Rate coefficients at P=1.30E-03(atm)          6.93E+05    1.5     -536.0
     Rate coefficients at P=1.00E-02(atm)          5.94E+03    2.0     -560.0
     Rate coefficients at P=1.30E-02(atm)          1.10E+03    2.2     -680.0
     Rate coefficients at P=2.50E-02(atm)          1.07E+02    2.5     -759.0
     Rate coefficients at P=1.00E-01(atm)          7.83E-01    3.1     -919.0
     Rate coefficients at P=1.32E-01(atm)          3.07E-01    3.2     -946.0
     Rate coefficients at P=1.00E+00(atm)          3.16E-04    4.0    -1144.0
     Rate coefficients at P=1.00E+01(atm)          7.59E-06    4.5     -680.0
     Rate coefficients at P=1.00E+02(atm)          5.45E-05    4.2     1141.0
765. C3H6+OH<=>C3H6OH1-2                            5.10E+54  -20.7    32402.0
     Rate coefficients at P=1.30E-03(atm)          2.30E+78  -20.7    32402.0
     Rate coefficients at P=1.00E-02(atm)          2.74E+77  -20.0    33874.0
     Rate coefficients at P=1.30E-02(atm)          1.07E+76  -19.6    32874.0
     Rate coefficients at P=2.50E-02(atm)          3.68E+73  -18.8    31361.0
     Rate coefficients at P=1.00E-01(atm)          1.04E+68  -17.0    27909.0
     Rate coefficients at P=1.32E-01(atm)          7.23E+66  -16.6    27162.0
     Rate coefficients at P=1.00E+00(atm)          1.95E+59  -14.2    23079.0
     Rate coefficients at P=1.00E+01(atm)          7.58E+53  -12.2    22976.0
     Rate coefficients at P=1.00E+02(atm)          1.43E+48  -10.2    23772.0
     Declared duplicate reaction...
766. C3H6+OH<=>C3H6OH1-2                            1.42E+36  -15.8    11594.0
     Rate coefficients at P=1.30E-03(atm)          6.41E+59  -15.8    11594.0
     Rate coefficients at P=1.00E-02(atm)          7.28E+59  -15.5    12898.0
     Rate coefficients at P=1.30E-02(atm)          2.79E+59  -15.3    12913.0
     Rate coefficients at P=2.50E-02(atm)          2.65E+58  -14.9    12936.0
     Rate coefficients at P=1.00E-01(atm)          1.35E+56  -14.0    12945.0
     Rate coefficients at P=1.32E-01(atm)          3.98E+55  -13.8    12887.0
     Rate coefficients at P=1.00E+00(atm)          1.55E+50  -12.0    11493.0
     Rate coefficients at P=1.00E+01(atm)          6.41E+41   -9.3     8921.0
     Rate coefficients at P=1.00E+02(atm)          2.30E+32   -6.3     6088.0
     Declared duplicate reaction...
767. C3H6+OH<=>C3H6OH2-1                            5.10E+54  -20.7    32402.0
     Rate coefficients at P=1.30E-03(atm)          2.14E+59  -15.8    11594.0
     Rate coefficients at P=1.00E-02(atm)          2.43E+59  -15.5    12898.0
     Rate coefficients at P=1.30E-02(atm)          9.30E+58  -15.3    12913.0
     Rate coefficients at P=2.50E-02(atm)          8.83E+57  -14.9    12936.0
     Rate coefficients at P=1.00E-01(atm)          4.50E+55  -14.0    12945.0
     Rate coefficients at P=1.32E-01(atm)          1.33E+55  -13.8    12887.0
     Rate coefficients at P=1.00E+00(atm)          5.18E+49  -12.0    11493.0
     Rate coefficients at P=1.00E+01(atm)          2.14E+41   -9.3     8921.0
     Rate coefficients at P=1.00E+02(atm)          7.65E+31   -6.3     6088.0
     Declared duplicate reaction...
768. C3H6+OH<=>C3H6OH2-1                            1.42E+36  -15.8    11594.0
     Rate coefficients at P=1.30E-03(atm)          7.68E+77  -20.7    32402.0
     Rate coefficients at P=1.00E-02(atm)          9.13E+76  -20.0    33874.0
     Rate coefficients at P=1.30E-02(atm)          3.55E+75  -19.6    32874.0
     Rate coefficients at P=2.50E-02(atm)          1.23E+73  -18.8    31361.0
     Rate coefficients at P=1.00E-01(atm)          3.45E+67  -17.0    27909.0
     Rate coefficients at P=1.32E-01(atm)          2.41E+66  -16.6    27162.0
     Rate coefficients at P=1.00E+00(atm)          6.50E+58  -14.2    23079.0
     Rate coefficients at P=1.00E+01(atm)          2.53E+53  -12.2    22976.0
     Rate coefficients at P=1.00E+02(atm)          4.78E+47  -10.2    23772.0
     Declared duplicate reaction...
769. CH2CCH2OH+H<=>C3H5OH                           1.00E+14    0.0        0.0
770. C3H5OH+H<=>CH2CCH2OH+H2                        3.90E+05    2.5     5821.0
771. C3H5OH+O2<=>CH2CCH2OH+HO2                      4.00E+13    0.0    60690.0
772. C3H5OH+OH<=>CH2CCH2OH+H2O                      5.06E+12    0.0     5960.0
773. C3H5OH+CH3<=>CH2CCH2OH+CH4                     2.40E+11    0.0     8030.0
774. CH2CCH2OH+H2O2<=>C3H5OH+HO2                    3.01E+09    0.0     2583.0
775. CH2CCH2OH<=>C2H2+CH2OH                         2.16E+40   -8.3    45110.0
776. CH2CCH2OH<=>CH2O+C2H3                          9.24E+10    0.9    30460.0
777. CH2CCH2OH<=>C2H3CHO+H                          1.11E+11    0.5    36770.0
778. CH2CCH2OH<=>HCO+C2H4                           9.24E+10    0.9    30460.0
779. CH2CCH2OH+O2=>CH2OH+CO+CH2O                    4.34E+12    0.0        0.0
780. C3H5O+O2<=>C2H3CHO+HO2                         1.00E+12    0.0     6000.0
781. CH3COCH3+H<=>C3H6OH2-1                         8.00E+12    0.0     9500.0
782. IC3H5OH+H<=>C3H6OH2-1                          6.25E+11    0.5     4020.0
783. C2H5CHO+H<=>C3H6OH1-2                          8.00E+12    0.0     9500.0
784. C3H5-T+OH<=>IC3H5OH                            5.00E+13    0.0        0.0
785. C3H6OH2-1+O2<=>CH3COCH3+HO2                    1.50E+12    0.0     5000.0
786. C3H6OH1-2+O2<=>C2H5CHO+HO2                     1.50E+12    0.0     5000.0
787. C3H6OH1-2+O2<=>HOC3H6O2                        1.20E+11    0.0    -1100.0
788. C3H6OH2-1+O2<=>HOC3H6O2                        1.20E+11    0.0    -1100.0
789. HOC3H6O2=>CH3CHO+CH2O+OH                       1.25E+10    0.0    18900.0
790. SC3H5OH<=>C2H5CHO                              8.59E+11    0.3    55900.0
791. SC3H5OH+O2=>C2H3CHO+H+HO2                      3.00E+13    0.0    39100.0
792. SC3H5OH+OH=>C2H3CHO+H+H2O                      3.10E+06    2.0     -298.0
793. SC3H5OH+H=>C2H3CHO+H+H2                        1.73E+05    2.5     2492.0
794. SC3H5OH+O=>C2H3CHO+H+OH                        1.75E+12    0.7     5884.0
795. SC3H5OH+HO2=>C2H3CHO+H+H2O2                    9.60E+03    2.6    13900.0
796. SC3H5OH+CH3=>C2H3CHO+H+CH4                     2.21E+00    3.5     5675.0
797. SC3H5OH+CH3O2=>C2H3CHO+H+CH3O2H                9.60E+03    2.6    13900.0
798. SC3H5OH+CH3O=>C2H3CHO+H+CH3OH                  8.30E+10    0.0     2600.0
799. SC3H5OH+HO2<=>C2H5CHO+HO2                      1.49E+05    1.7     6810.0
800. SC3H5OH+HOCHO<=>C2H5CHO+HOCHO                  2.81E-02    3.3    -4509.0
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801. C3H5-A+C2H2<=>CVCCVCCJ                        1.00E+12    0.0     6883.4
802. C3H5-A+C2H3=>C5H6+H+H                         1.60E+35  -14.0    61137.7
803. C2H+CH3<=>C3H4-P                              8.00E+13    0.0        0.0
804. C3H4-A<=>C3H4-P                               4.79E+48  -10.0    88685.0
     Rate coefficients at P=1.00E+00(atm)         7.76E+39   -7.8    78446.0
     Rate coefficients at P=1.00E+01(atm)         4.79E+48  -10.0    88685.0
805. CC3H4<=>C3H4-P                                1.66E+37   -7.2    48013.0
     Rate coefficients at P=3.95E-02(atm)         2.51E+50  -11.8    50914.0
     Rate coefficients at P=1.00E+00(atm)         1.23E+37   -7.5    45551.0
     Rate coefficients at P=1.00E+01(atm)         1.66E+37   -7.2    48013.0
806. CC3H4<=>C3H4-A                                5.01E+35   -6.9    51298.0
     Rate coefficients at P=3.95E-02(atm)         9.77E+43  -10.0    56007.0
     Rate coefficients at P=1.00E+00(atm)         2.51E+26   -4.6    43922.0
     Rate coefficients at P=1.00E+01(atm)         5.01E+35   -6.9    51298.0
807. C3H3+H=C3H4-P                                 3.63E+36   -7.4     6039.0
     Rate coefficients at P=3.95E-02(atm)         3.63E+36   -7.4     6039.0
     Rate coefficients at P=1.00E+00(atm)         7.94E+29   -5.1     4861.0
     Rate coefficients at P=1.00E+01(atm)         1.07E+24   -3.1     3261.0
808. C3H3+H=C3H4-A                                 3.39E+36   -7.4     6337.0
     Rate coefficients at P=3.95E-02(atm)         3.39E+36   -7.4     6337.0
     Rate coefficients at P=1.00E+00(atm)         3.16E+29   -5.0     4711.0
     Rate coefficients at P=1.00E+01(atm)         8.71E+23   -3.2     3255.0
809. C3H3+H=CC3H4                                  8.91+112  -28.3    83611.0
     Rate coefficients at P=3.95E-02(atm)         8.91+112  -28.3    83611.0
     Rate coefficients at P=1.00E+00(atm)         1.07E+21   -3.0     2687.0
     Rate coefficients at P=1.00E+01(atm)         3.24E+18   -2.0     2053.0
810. C3H4-P+C3H3<=>C3H4-A+C3H3                     6.14E+06    1.7    10450.0
811. C3H4-P+O2<=>C3H3+HO2                          3.00E+13    0.0    42630.0
812. C3H4-P+O<=>C3H3+OH                            7.65E+08    1.5     8600.0
813. C3H4-P+H<=>C3H3+H2                            3.57E+04    2.8     4821.0
814. C3H4-P+OH<=>C3H3+H2O                          4.94E+06    2.0     1059.6
815. C3H4-P+HO2<=>C3H3+H2O2                        9.55E-02    4.2     9632.8
816. C3H4-P+CH3<=>C3H3+CH4                         1.80E+12    0.0     7700.0
817. C3H4-P+CH3O2<=>C3H3+CH3O2H                    9.55E-02    4.2     9632.8
818. C3H4-P+C2H<=>C2H2+C3H3                        1.00E+13    0.0        0.0
819. C3H4-P+C2H3<=>C3H3+C2H4                       1.00E+12    0.0     7700.0
820. C3H4-P+C3H5-A<=>C3H3+C3H6                     3.00E+12    0.0     7700.0
821. C3H4-A+H<=>C3H3+H2                            6.62E+03    3.1     5522.0
822. C3H4-A+O2<=>C3H3+HO2                          4.00E+13    0.0    41320.0
823. C3H4-A+OH<=>C3H3+H2O                          1.48E+05    2.5     1807.2
824. C3H4-A+CH3<=>C3H3+CH4                         1.30E+12    0.0     7700.0
825. C3H4-A+HO2<=>C3H3+H2O2                        3.58E-02    4.2     9632.8
826. C3H4-A+CH3O2<=>C3H3+CH3O2H                    7.16E-02    4.2     9632.8
827. C3H4-A+C3H5-A<=>C3H3+C3H6                     2.00E+11    0.0     7700.0
828. C3H4-A+H<=>C3H4-P+H                           2.44E+10    1.0     2159.0
     Rate coefficients at P=1.00E-03(atm)         8.49E+10    0.9     2503.0
     Rate coefficients at P=3.90E-02(atm)         1.48E+13    0.3     4103.0
     Rate coefficients at P=1.00E+00(atm)         2.48E+15   -0.3     6436.0
     Rate coefficients at P=1.00E+01(atm)         2.35E+25   -3.2    13165.0
     Rate coefficients at P=1.00E+02(atm)         1.02E+24   -2.7    15552.0
     Declared duplicate reaction...
829. C3H4-A+H<=>C3H4-P+H                           2.44E+10    1.0     2159.0
     Rate coefficients at P=1.00E-03(atm)         1.00E-10    0.0        0.0
     Rate coefficients at P=3.90E-02(atm)         1.00E-10    0.0        0.0
     Rate coefficients at P=1.00E+00(atm)         1.00E-10    0.0        0.0
     Rate coefficients at P=1.00E+01(atm)         1.79E+07    2.0     4521.0
     Rate coefficients at P=1.00E+02(atm)         4.63E+04    2.6     4466.0
     Declared duplicate reaction...
830. C3H4-A+H<=>C3H5-A                             2.21E+61  -15.2    20076.0
     Rate coefficients at P=1.00E-03(atm)         2.21E+61  -15.2    20076.0
     Rate coefficients at P=3.90E-02(atm)         1.24E+52  -12.0    17839.0
     Rate coefficients at P=1.00E+00(atm)         4.67E+51  -11.4    21340.0
     Rate coefficients at P=1.00E+01(atm)         3.75E+48  -10.3    22511.0
     Rate coefficients at P=1.00E+02(atm)         4.23E+43   -8.6    22522.0
     Declared duplicate reaction...
831. C3H4-A+H<=>C3H5-A                             2.21E+61  -15.2    20076.0
     Rate coefficients at P=1.00E-03(atm)         2.80E+38   -8.7     8035.0
     Rate coefficients at P=3.90E-02(atm)         9.33E+36   -8.2     7462.0
     Rate coefficients at P=1.00E+00(atm)         3.32E+30   -5.8     6913.0
     Rate coefficients at P=1.00E+01(atm)         2.29E+26   -4.3     6163.0
     Rate coefficients at P=1.00E+02(atm)         4.38E+21   -2.7     5187.0
     Declared duplicate reaction...
832. C3H4-A+H<=>C3H5-S                             1.10E+30   -6.5    15200.0
     Rate coefficients at P=1.00E-01(atm)         1.10E+30   -6.5    15200.0
     Rate coefficients at P=1.00E+00(atm)         5.40E+29   -6.1    16300.0
     Rate coefficients at P=1.00E+01(atm)         2.60E+31   -6.2    18700.0
     Rate coefficients at P=1.00E+02(atm)         3.20E+31   -5.9    21500.0
833. C3H4-A+H<=>C3H5-T                             6.44+102  -27.5    51768.0
     Rate coefficients at P=1.00E-03(atm)         6.44+102  -27.5    51768.0
     Rate coefficients at P=3.90E-02(atm)         1.55E+53  -13.1    14472.0
     Rate coefficients at P=1.00E+00(atm)         1.90E+53  -12.6    16726.0
     Rate coefficients at P=1.00E+01(atm)         7.95E+51  -11.8    18286.0
     Rate coefficients at P=1.00E+02(atm)         4.21E+52  -11.6    22262.0
     Declared duplicate reaction...
834. C3H4-A+H<=>C3H5-T                             6.44+102  -27.5    51768.0
     Rate coefficients at P=1.00E-03(atm)         1.10E+54  -14.3    10809.0
     Rate coefficients at P=3.90E-02(atm)         9.88E+44  -11.2     8212.0
     Rate coefficients at P=1.00E+00(atm)         2.81E+40   -9.4     7850.0
     Rate coefficients at P=1.00E+01(atm)         2.60E+35   -7.6     7147.0
     Rate coefficients at P=1.00E+02(atm)         9.88E+29   -5.5     6581.0
     Declared duplicate reaction...
835. C3H4-A+H<=>CH3+C2H2                           3.74E+01    3.4       57.8
     Rate coefficients at P=1.00E-03(atm)         1.23E+08    1.5     4737.0
     Rate coefficients at P=3.90E-02(atm)         2.72E+09    1.2     6834.0
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     Rate coefficients at P=1.00E+00(atm)          1.26E+20   -1.8    15003.0
     Rate coefficients at P=1.00E+01(atm)          1.68E+16   -0.6    14754.0
     Rate coefficients at P=1.00E+02(atm)          1.37E+17   -0.8    17603.0
     Declared duplicate reaction...
836. C3H4-A+H<=>CH3+C2H2                            3.74E+01    3.4       57.8
     Rate coefficients at P=1.00E-03(atm)          1.00E-10    0.0        0.0
     Rate coefficients at P=3.90E-02(atm)          1.00E-10    0.0        0.0
     Rate coefficients at P=1.00E+00(atm)          1.23E+04    2.7     6335.0
     Rate coefficients at P=1.00E+01(atm)          3.31E+08    1.1     8886.0
     Rate coefficients at P=1.00E+02(atm)          1.28E+06    1.7     9774.0
     Declared duplicate reaction...
837. C3H4-P+H<=>C3H5-T                              8.85E+51  -13.0    12325.0
     Rate coefficients at P=1.00E-03(atm)          8.85E+51  -13.0    12325.0
     Rate coefficients at P=3.90E-02(atm)          3.17E+52  -12.7    14226.0
     Rate coefficients at P=1.00E+00(atm)          2.87E+53  -12.5    16853.0
     Rate coefficients at P=1.00E+01(atm)          9.51E+51  -11.7    18331.0
     Rate coefficients at P=1.00E+02(atm)          4.51E+52  -11.6    22207.0
     Declared duplicate reaction...
838. C3H4-P+H<=>C3H5-T                              8.85E+51  -13.0    12325.0
     Rate coefficients at P=1.00E-03(atm)          1.97E+46  -11.9     7456.0
     Rate coefficients at P=3.90E-02(atm)          2.59E+45  -11.2     8046.0
     Rate coefficients at P=1.00E+00(atm)          6.93E+39   -9.1     7458.0
     Rate coefficients at P=1.00E+01(atm)          6.80E+34   -7.3     6722.0
     Rate coefficients at P=1.00E+02(atm)          5.65E+29   -5.4     6150.0
     Declared duplicate reaction...
839. C3H4-P+H<=>C3H5-S                              3.38E+49  -12.8    14072.0
     Rate coefficients at P=1.00E-03(atm)          1.00E-10    0.0        0.0
     Rate coefficients at P=3.90E-02(atm)          3.38E+49  -12.8    14072.0
     Rate coefficients at P=1.00E+00(atm)          1.37E+51  -12.6    15428.0
     Rate coefficients at P=1.00E+01(atm)          3.88E+50  -11.9    16915.0
     Rate coefficients at P=1.00E+02(atm)          2.17E+49  -11.1    18746.0
     Declared duplicate reaction...
840. C3H4-P+H<=>C3H5-S                              3.38E+49  -12.8    14072.0
     Rate coefficients at P=1.00E-03(atm)          1.49E+38  -10.1     7458.0
     Rate coefficients at P=3.90E-02(atm)          2.98E+43  -11.4     8736.0
     Rate coefficients at P=1.00E+00(atm)          5.75E+39   -9.5     8772.0
     Rate coefficients at P=1.00E+01(atm)          4.33E+40   -9.6     9401.0
     Rate coefficients at P=1.00E+02(atm)          3.44E+34   -7.4     8558.0
     Declared duplicate reaction...
841. C3H4-P+H<=>CH3+C2H2                            2.12E+10    1.1     3945.0
     Rate coefficients at P=1.00E-03(atm)          2.44E+10    1.0     3980.0
     Rate coefficients at P=3.90E-02(atm)          3.89E+10    1.0     4114.0
     Rate coefficients at P=1.00E+00(atm)          3.46E+12    0.4     5463.0
     Rate coefficients at P=1.00E+01(atm)          1.72E+14    0.0     7134.0
     Rate coefficients at P=1.00E+02(atm)          1.90E+15   -0.3     8306.0
842. C3H4-P+H<=>C3H5-A                              1.10E+60  -14.6    28100.0
     Rate coefficients at P=1.00E-01(atm)          1.10E+60  -14.6    28100.0
     Rate coefficients at P=1.00E+00(atm)          4.91E+60  -14.4    31644.0
     Rate coefficients at P=2.00E+00(atm)          3.04E+60  -14.2    32642.0
     Rate coefficients at P=5.00E+00(atm)          9.02E+59  -13.9    33953.0
     Rate coefficients at P=1.00E+01(atm)          2.20E+59  -13.6    34900.0
     Rate coefficients at P=1.00E+02(atm)          1.60E+55  -12.1    37500.0
843. C3H5-A<=>C3H5-T                                3.90E+59  -15.4    75400.0
     Rate coefficients at P=1.00E-01(atm)          3.90E+59  -15.4    75400.0
     Rate coefficients at P=1.00E+00(atm)          7.06E+56  -14.1    75868.0
     Rate coefficients at P=2.00E+00(atm)          4.80E+55  -13.6    75949.0
     Rate coefficients at P=5.00E+00(atm)          4.86E+53  -12.8    75883.0
     Rate coefficients at P=1.00E+01(atm)          6.40E+51  -12.1    75700.0
     Rate coefficients at P=1.00E+02(atm)          2.80E+43   -9.3    74000.0
844. C3H5-A<=>C3H5-S                                1.30E+55  -14.5    73800.0
     Rate coefficients at P=1.00E-01(atm)          1.30E+55  -14.5    73800.0
     Rate coefficients at P=1.00E+00(atm)          5.00E+51  -13.0    73300.0
     Rate coefficients at P=1.00E+01(atm)          9.70E+48  -11.7    73700.0
     Rate coefficients at P=1.00E+02(atm)          4.86E+44   -9.8    73400.0
845. C2H2+CH3<=>C3H5-T                              6.80E+20   -4.2    18000.0
     Rate coefficients at P=1.00E-01(atm)          6.80E+20   -4.2    18000.0
     Rate coefficients at P=1.00E+00(atm)          4.99E+22   -4.4    18850.0
     Rate coefficients at P=2.00E+00(atm)          6.00E+23   -4.6    19571.0
     Rate coefficients at P=5.00E+00(atm)          7.31E+25   -5.1    21150.0
     Rate coefficients at P=1.00E+01(atm)          9.30E+27   -5.5    22900.0
     Rate coefficients at P=1.00E+02(atm)          3.80E+36   -7.6    31300.0
846. C3H5-T<=>C3H5-S                                1.60E+44  -12.2    52200.0
     Rate coefficients at P=1.00E-01(atm)          1.60E+44  -12.2    52200.0
     Rate coefficients at P=1.00E+00(atm)          1.50E+48  -12.7    53900.0
     Rate coefficients at P=1.00E+01(atm)          5.10E+52  -13.4    57200.0
     Rate coefficients at P=1.00E+02(atm)          5.80E+51  -12.4    59200.0
847. C2H2+CH3<=>C3H5-A                              8.20E+53  -13.3    33200.0
     Rate coefficients at P=1.00E-01(atm)          8.20E+53  -13.3    33200.0
     Rate coefficients at P=1.00E+00(atm)          2.68E+53  -12.8    35730.0
     Rate coefficients at P=2.00E+00(atm)          3.64E+52  -12.5    36127.0
     Rate coefficients at P=5.00E+00(atm)          1.04E+51  -11.9    36476.0
     Rate coefficients at P=1.00E+01(atm)          4.40E+49  -11.4    36700.0
     Rate coefficients at P=1.00E+02(atm)          3.80E+44   -9.6    37600.0
848. CH3+C2H2<=>C3H5-S                              1.78E+42  -10.4    13647.0
     Rate coefficients at P=1.00E-03(atm)          1.78E+42  -10.4    13647.0
     Rate coefficients at P=3.90E-02(atm)          1.52E+44  -10.7    15256.0
     Rate coefficients at P=1.00E+00(atm)          1.19E+44  -10.2    18728.0
     Rate coefficients at P=1.00E+01(atm)          6.02E+43   -9.7    20561.0
     Rate coefficients at P=1.00E+02(atm)          1.42E+42   -8.9    22235.0
     Declared duplicate reaction...
849. CH3+C2H2<=>C3H5-S                              1.78E+42  -10.4    13647.0
     Rate coefficients at P=1.00E-03(atm)          1.00E-10    0.0        0.0
     Rate coefficients at P=3.90E-02(atm)          1.00E-10    0.0        0.0
     Rate coefficients at P=1.00E+00(atm)          8.49E+35   -8.4    12356.0
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     Rate coefficients at P=1.00E+01(atm)          3.04E+32   -7.0    12357.0
     Rate coefficients at P=1.00E+02(atm)          1.69E+27   -5.1    11690.0
     Declared duplicate reaction...
850. C3H4-P+O<=>HCCO+CH3                            7.30E+12    0.0     2250.0
851. C3H4-P+O<=>C2H4+CO                             1.00E+13    0.0     2250.0
852. C3H4-P+O<=>C2H3+HCO                            3.20E+12    0.0     2010.0
853. C3H4-A+O<=>C2H4+CO                             2.00E+07    1.8     1000.0
854. C3H4-A+O<=>C2H2+CH2O                           3.00E-03    4.6    -4243.0
855. C3H4-A+OH<=>CH2CCH2OH                          1.11E+12    0.0     -304.0
856. C3H4-A+OH<=>SC3H4OH                            2.22E+12    0.0     -304.0
857. SC3H4OH<=>CH2CO+CH3                            9.24E+10    0.9    30460.0
858. C3H4-P+OH<=>PC3H4OH-2                          3.93E+11    0.0        0.0
859. C3H4-P+OH<=>SC3H4OH                            2.36E+12    0.0        0.0
860. PC3H4OH-2<=>CH3CHCHO                           3.56E+10    0.9    23238.0
861. CH3CHCHO<=>C2H3CHO+H                           1.00E+00    1.0        1.0
     Rate coefficients at P=1.00E-02(atm)          1.74E+50  -11.7    52870.0
     Rate coefficients at P=1.00E-01(atm)          1.13E+47  -10.6    50479.0
     Rate coefficients at P=1.00E+00(atm)          2.94E+43   -9.3    48810.0
     Rate coefficients at P=2.50E+00(atm)          1.16E+42   -8.8    48382.0
     Rate coefficients at P=5.00E+00(atm)          9.48E+40   -8.4    48095.0
     Rate coefficients at P=1.00E+01(atm)          7.19E+39   -8.0    47818.0
     Rate coefficients at P=2.50E+01(atm)          2.13E+38   -7.5    47438.0
     Rate coefficients at P=5.00E+01(atm)          1.42E+37   -7.1    47128.0
862. CH3CHCHO<=>CH3CHCO+H                           8.33E+12    0.0    32410.0
863. CH3CHCHO+H2<=>C2H5CHO+H                        2.16E+05    2.4    18990.0
864. C3H4-P+HO2=>C2H4+CO+OH                         3.00E+12    0.0    19000.0
865. C3H4-A+HO2=>C2H4+CO+OH                         1.00E+11    0.0    14000.0
866. C3H4-A+HO2=>CH2CO+CH2+OH                       4.00E+12    0.0    19000.0
867. C3H4-A+C2H<=>C2H2+C3H3                         1.00E+13    0.0        0.0
868. C3H3+O<=>CH2O+C2H                              2.00E+13    0.0        0.0
869. C3H3+HO2=>OH+CO+C2H3                           8.00E+11    0.0        0.0
870. C3H3+HCO<=>C3H4-A+CO                           2.50E+13    0.0        0.0
871. C3H3+HCO<=>C3H4-P+CO                           2.50E+13    0.0        0.0
872. C2H5+C2H<=>C3H3+CH3                            1.81E+13    0.0        0.0
873. C3H3+O2<=>CH2CO+HCO                            1.70E+05    1.7     1500.0
874. C3H3+CH<=>C4H3-N+H                             7.00E+13    0.0        0.0
875. C3H3+HO2<=>C3H3O+OH                            1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-02(atm)          1.02E+13   -0.2    -1417.0
     Rate coefficients at P=1.00E-01(atm)          4.98E+14   -0.6     -349.1
     Rate coefficients at P=1.00E+00(atm)          7.77E+17   -1.5     2379.2
     Rate coefficients at P=1.00E+01(atm)          2.93E+15   -0.7     3615.3
     Rate coefficients at P=1.00E+02(atm)          1.64E+04    2.7     1144.4
876. C3H3+HO2<=>C3H3O2H                             1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-02(atm)          1.91E+31   -7.2     1336.2
     Rate coefficients at P=1.00E-01(atm)          6.31E+42  -10.3     5568.9
     Rate coefficients at P=1.00E+00(atm)          1.03E+45  -10.6     7851.5
     Rate coefficients at P=1.00E+01(atm)          2.79E+37   -7.9     6497.9
     Rate coefficients at P=1.00E+02(atm)          4.73E+25   -4.1     2923.8
877. C3H3+HO2<=>C2HCHO+H2O                          1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-02(atm)          1.09E+00    3.0    -3421.1
     Rate coefficients at P=1.00E-01(atm)          6.35E+01    2.5    -2341.4
     Rate coefficients at P=1.00E+00(atm)          6.05E+05    1.4      595.1
     Rate coefficients at P=1.00E+01(atm)          3.10E+05    1.6     2677.6
     Rate coefficients at P=1.00E+02(atm)          5.07E-05    4.6      927.5
878. C3H3O2H<=>C2HCHO+H2O                           1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-02(atm)          1.99E+50  -12.7    53531.9
     Rate coefficients at P=1.00E-01(atm)          4.72E+47  -11.5    54360.9
     Rate coefficients at P=1.00E+00(atm)          1.50E+40   -8.8    53179.2
     Rate coefficients at P=1.00E+01(atm)          2.54E+28   -5.0    49919.4
     Rate coefficients at P=1.00E+02(atm)          1.48E+16   -1.1    45949.3
879. C2H+CH2O<=>C3H3O                               1.00E+11    0.0        0.0
     Rate coefficients at P=1.00E-03(atm)          5.93E-04    2.6    -4297.3
     Rate coefficients at P=1.00E-02(atm)          5.69E+06   -0.1    -1234.1
     Rate coefficients at P=1.00E-01(atm)          5.39E+13   -1.8     1452.2
     Rate coefficients at P=1.00E+00(atm)          8.73E+15   -2.1     2510.1
     Rate coefficients at P=1.00E+01(atm)          5.30E+19   -2.9     4532.2
     Rate coefficients at P=1.00E+02(atm)          3.78E+21   -3.2     6802.5
880. C2HCHO<=>C2H2+CO                               2.51E+14    0.0    68000.0
881. C2H+HCO<=>C2HCHO                               1.00E+13    0.0        0.0
882. C3H3+H<=>C3H2+H2                               2.14E+05    2.5     7453.0
883. C3H3+H<=>C3H2(S)+H2                            3.31E+13    0.2    17579.0
     Rate coefficients at P=3.95E-02(atm)          2.95E+09    1.3    13474.0
     Rate coefficients at P=1.00E+00(atm)          1.10E+10    1.1    13929.0
     Rate coefficients at P=1.00E+01(atm)          3.31E+13    0.2    17579.0
884. C3H3+H<=>H2CCC(S)+H2                           1.00E+18   -1.2    15111.0
     Rate coefficients at P=3.95E-02(atm)          2.69E+09    1.1     5371.0
     Rate coefficients at P=1.00E+00(atm)          2.88E+13    0.0     9448.0
     Rate coefficients at P=1.00E+01(atm)          1.00E+18   -1.2    15111.0
885. C3H3+H<=>C3H2C+H2                              7.24E+09    0.6    18356.0
     Rate coefficients at P=3.95E-02(atm)          1.07E+07    1.4    15557.0
     Rate coefficients at P=1.00E+00(atm)          1.35E+07    1.3    15560.0
     Rate coefficients at P=1.00E+01(atm)          7.24E+09    0.6    18356.0
886. C3H2C+O2<=>C2H2+CO2                            1.00E+13    0.0        0.0
887. C3H3+OH<=>C3H2+H2O                             2.00E+13    0.0     8000.0
888. C3H3+OH<=>CH2O+C2H2                            2.00E+12    0.0        0.0
889. C3H3+OH<=>C2H3+HCO                             1.00E+13    0.0        0.0
890. C3H3+OH<=>C2H4+CO                              1.00E+13    0.0        0.0
891. C3H3+OH<=>C3H2(S)+H2O                          1.00E+12    0.0        0.0
892. C3H3+OH<=>H2CCC(S)+H2O                         1.00E+12    0.0        0.0
893. C3H2(S)+M<=>C3H2+M                             1.00E+13    0.0        0.0
894. C3H2(S)+H<=>H2CCC(S)+H                         1.00E+13    0.0        0.0
895. H2CCC(S)+O2<=>CO2+C2H2                         1.00E+13    0.0        0.0
896. C3H3+C3H3<=>C6H5+H                             1.05E+54  -11.9    28757.0
     Rate coefficients at P=3.95E-02(atm)          1.05E+54  -11.9    28757.0
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     Rate coefficients at P=1.00E+00(atm)          1.70E+48  -10.0    36755.0
     Rate coefficients at P=1.00E+01(atm)          3.67E+26   -3.9    28963.0
897. C3H3+C3H3<=>C6H6                               1.82E+74  -18.1    31896.0
     Rate coefficients at P=3.95E-02(atm)          1.64E+66  -15.9    27529.0
     Rate coefficients at P=1.00E+00(atm)          3.16E+55  -12.6    22264.0
     Rate coefficients at P=1.00E+01(atm)          3.89E+50  -11.0    20320.0
898. C3H3+C3H3<=>FULVENE                            6.31E+76  -19.1    31542.0
     Rate coefficients at P=3.95E-02(atm)          7.25E+65  -16.0    25035.0
     Rate coefficients at P=1.00E+00(atm)          1.38E+66  -15.7    28260.0
     Rate coefficients at P=1.00E+01(atm)          1.26E+56  -12.6    23515.0
899. C3H3+C3H5-A=>FULVENE+H+H                       3.26E+29   -5.4     3390.0
900. C3H3+C3H4-A<=>C6H6+H                           1.40E+12    0.0     9990.4
901. CH3CHCO+OH<=>C2H5+CO2                          1.73E+12    0.0    -1010.0
902. CH3CHCO+OH<=>SC2H4OH+CO                        2.00E+12    0.0    -1010.0
903. CH3CHCO+H<=>C2H5+CO                            4.40E+12    0.0     1459.0
904. CH3CHCO+O<=>CH3CHO+CO                          3.20E+12    0.0     -437.0
905. CH3COCH3<=>CH3CO+CH3                           2.05E+58  -12.8   100030.1
     Rate coefficients at P=1.00E-02(atm)          2.05E+58  -12.8   100030.1
     Rate coefficients at P=1.00E-01(atm)          3.30E+51  -10.6    98221.2
     Rate coefficients at P=1.00E+00(atm)          1.31E+42   -7.7    94660.6
     Rate coefficients at P=1.00E+01(atm)          2.16E+33   -5.0    90916.5
     Rate coefficients at P=1.00E+02(atm)          9.40E+28   -3.7    89022.8
906. CH3COCH2+H<=>CH3COCH3                          1.00E+13    0.0        0.0
907. CH3COCH3+OH<=>CH3COCH2+H2O                     1.25E+05    2.5      445.0
908. CH3COCH3+H<=>CH3COCH2+H2                       9.80E+05    2.4     5160.0
909. CH3COCH3+O<=>CH3COCH2+OH                       5.13E+11    0.2     4890.0
910. CH3COCH3+CH3<=>CH3COCH2+CH4                    3.96E+11    0.0     9784.0
911. CH3COCH3+CH3O<=>CH3COCH2+CH3OH                 4.34E+11    0.0     6460.0
912. CH3COCH3+O2<=>CH3COCH2+HO2                     6.03E+13    0.0    48500.0
913. CH3COCH3+HO2<=>CH3COCH2+H2O2                   1.70E+13    0.0    20460.0
914. CH3COCH3+CH3O2<=>CH3COCH2+CH3O2H               1.70E+13    0.0    20460.0
915. CH3COCH3+CH3COCH2O2<=>CH3COCH2+C3KET21         1.00E+11    0.0     5000.0
916. CH3COCH2+HO2<=>CH3COCH2O+OH                    2.41E+13    0.0        0.0
917. CH3COCH2+CH3O2<=>CH3COCH2O+CH3O                1.20E+13    0.0        0.0
918. CH3COCH2O<=>CH3CO+CH2O                         5.87E+20   -2.4    10535.8
919. CH3COCH2+O2<=>CH3COCH2O2                       1.20E+11    0.0    -1100.0
920. CH2CO+CH3<=>CH3COCH2                           1.76E+04    2.5     6130.0
921. CH2O+CH3COCH2O2<=>HCO+C3KET21                  1.29E+11    0.0     9000.0
922. HO2+CH3COCH2O2<=>C3KET21+O2                    1.00E+12    0.0        0.0
923. C2H3+HCO<=>C2H3CHO                             1.81E+13    0.0        0.0
924. C2H3CHO+H<=>C2H3CO+H2                          1.34E+13    0.0     3300.0
925. C2H3CHO+O<=>C2H3CO+OH                          5.94E+12    0.0     1868.0
926. C2H3CHO+OH<=>C2H3CO+H2O                        9.24E+06    1.5     -962.0
927. C2H3CHO+O2<=>C2H3CO+HO2                        1.00E+13    0.0    40700.0
928. C2H3CHO+HO2<=>C2H3CO+H2O2                      3.01E+12    0.0    11920.0
929. C2H3CHO+CH3<=>C2H3CO+CH4                       2.61E+06    1.8     5911.0
930. C2H3CHO+C2H3<=>C2H3CO+C2H4                     1.74E+12    0.0     8440.0
931. C2H3CHO+CH3O<=>C2H3CO+CH3OH                    1.00E+12    0.0     3300.0
932. C2H3CHO+CH3O2<=>C2H3CO+CH3O2H                  3.01E+12    0.0    11920.0
933. C2H3+CO<=>C2H3CO                               1.51E+11    0.0     4810.0
934. C2H5+HCO<=>C2H5CHO                             1.81E+13    0.0        0.0
935. C2H5CHO+H<=>C2H5CO+H2                          4.00E+13    0.0     4200.0
936. C2H5CHO+O<=>C2H5CO+OH                          5.00E+12    0.0     1790.0
937. C2H5CHO+OH<=>C2H5CO+H2O                        2.69E+10    0.8     -340.0
938. C2H5CHO+CH3<=>C2H5CO+CH4                       2.61E+06    1.8     5911.0
939. C2H5CHO+HO2<=>C2H5CO+H2O2                      2.80E+12    0.0    13600.0
940. C2H5CHO+CH3O<=>C2H5CO+CH3OH                    1.00E+12    0.0     3300.0
941. C2H5CHO+CH3O2<=>C2H5CO+CH3O2H                  3.01E+12    0.0    11920.0
942. C2H5CHO+C2H5<=>C2H5CO+C2H6                     1.00E+12    0.0     8000.0
943. C2H5CHO+C2H5O<=>C2H5CO+C2H5OH                  6.03E+11    0.0     3300.0
944. C2H5CHO+C2H5O2<=>C2H5CO+C2H5O2H                3.01E+12    0.0    11920.0
945. C2H5CHO+O2<=>C2H5CO+HO2                        1.00E+13    0.0    40700.0
946. C2H5CHO+CH3CO3<=>C2H5CO+CH3CO3H                3.01E+12    0.0    11920.0
947. C2H5CHO+C2H3<=>C2H5CO+C2H4                     1.70E+12    0.0     8440.0
948. C2H5CHO+NC3H7<=>C2H5CO+C3H8                    1.70E+12    0.0     8440.0
949. C2H5CHO+IC3H7<=>C2H5CO+C3H8                    1.70E+12    0.0     8440.0
950. C2H5CHO+C3H5-A<=>C2H5CO+C3H6                   1.70E+12    0.0     8440.0
951. C2H5+CO<=>C2H5CO                               1.51E+11    0.0     4810.0
952. C4H10(+M)<=>C2H5+C2H5(+M)                      1.36E+37   -6.0    92929.0
     Low pressure limit:  0.47200E+19  0.00000E+00  0.49578E+05
     TROE centering:      0.79980E-01  0.10000E-19  0.32430E+05  0.48580E+04
953. C4H10(+M)<=>NC3H7+CH3(+M)                      6.60E+52  -10.6   100330.0
     Low pressure limit:  0.53400E+18  0.00000E+00  0.42959E+05
     TROE centering:      0.95020E-01  0.10000E-19  0.53480E+04  0.43260E+04
954. C4H10<=>PC4H9+H                                4.80E+40   -7.1   115302.0
     Rate coefficients at P=1.00E-02(atm)          4.45E+90  -21.9   140564.0
     Rate coefficients at P=1.00E-01(atm)          4.63E+76  -17.6   134669.0
     Rate coefficients at P=1.00E+00(atm)          4.94E+58  -12.3   125435.0
     Rate coefficients at P=1.00E+01(atm)          4.80E+40   -7.1   115302.0
     Rate coefficients at P=1.00E+02(atm)          1.49E+27   -3.1   107323.0
955. C4H10<=>SC4H9+H                                8.52E+38   -6.6   110556.0
     Rate coefficients at P=1.00E-02(atm)          3.10E+88  -21.2   136355.0
     Rate coefficients at P=1.00E-01(atm)          4.34E+73  -16.8   129590.0
     Rate coefficients at P=1.00E+00(atm)          7.39E+55  -11.5   120199.0
     Rate coefficients at P=1.00E+01(atm)          8.52E+38   -6.6   110556.0
     Rate coefficients at P=1.00E+02(atm)          5.40E+26   -3.0   103313.0
956. C4H10+H<=>PC4H9+H2                             3.49E+05    2.7     6450.0
957. C4H10+O2<=>PC4H9+HO2                           6.00E+13    0.0    52340.0
958. C4H10+O<=>PC4H9+OH                             1.13E+14    0.0     7850.0
959. C4H10+OH<=>PC4H9+H2O                           1.05E+10    1.0     1586.0
960. C4H10+HO2<=>PC4H9+H2O2                         4.08E+01    3.6    17160.0
961. C4H10+CH3<=>PC4H9+CH4                          9.04E-01    3.6     7154.0
962. C4H10+CH3O<=>PC4H9+CH3OH                       3.00E+11    0.0     7000.0
963. C4H10+CH3O2<=>PC4H9+CH3O2H                     1.39E+00    4.0    18280.0
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964.	C4H10+O2CHO<=>PC4H9+HO2CHO	1.68E+13	0.0	20440.0
965.	C4H10+C2H5<=>PC4H9+C2H6	1.58E+11	0.0	12300.0
966.	C4H10+C2H3<=>PC4H9+C2H4	1.00E+12	0.0	18000.0
967.	C4H10+C2H5O<=>PC4H9+C2H5OH	3.00E+11	0.0	7000.0
968.	C4H10+C2H5O2<=>PC4H9+C2H5O2H	4.08E+01	3.6	17160.0
969.	C4H10+CH3CO3<=>PC4H9+CH3CO3H	1.70E+13	0.0	20460.0
970.	C4H10+C3H5-A<=>PC4H9+C3H6	7.94E+11	0.0	20500.0
971.	C4H10+NC3H7O2<=>PC4H9+NC3H7O2H	1.70E+13	0.0	20460.0
972.	C4H10+IC3H7O2<=>PC4H9+IC3H7O2H	1.70E+13	0.0	20460.0
973.	C4H10+PC4H9<=>SC4H9+C4H10	1.00E+11	0.0	10400.0
974.	C4H10+PC4H9O2<=>PC4H9+PC4H9O2H	1.70E+13	0.0	20460.0
975.	C4H10+SC4H9O2<=>PC4H9+SC4H9O2H	1.70E+13	0.0	20460.0
976.	C4H10+IC4H9O2<=>PC4H9+IC4H9O2H	1.70E+13	0.0	20460.0
977.	C4H10+TC4H9O2<=>PC4H9+TC4H9O2H	1.70E+13	0.0	20460.0
978.	C4H10+H<=>SC4H9+H2	2.60E+06	2.4	4471.0
979.	C4H10+O2<=>SC4H9+HO2	4.00E+13	0.0	49800.0
980.	C4H10+O<=>SC4H9+OH	5.62E+13	0.0	5200.0
981.	C4H10+OH<=>SC4H9+H2O	9.34E+07	1.6	-35.0
982.	C4H10+HO2<=>SC4H9+H2O2	1.26E+02	3.4	13720.0
983.	C4H10+CH3<=>SC4H9+CH4	3.02E+00	3.5	5481.0
984.	C4H10+CH3O<=>SC4H9+CH3OH	6.00E+11	0.0	7000.0
985.	C4H10+CH3O2<=>SC4H9+CH3O2H	2.04E+01	3.6	14810.0
986.	C4H10+O2CHO<=>SC4H9+HO2CHO	1.12E+13	0.0	17690.0
987.	C4H10+C2H5<=>SC4H9+C2H6	1.00E+11	0.0	10400.0
988.	C4H10+C2H3<=>SC4H9+C2H4	8.00E+11	0.0	16800.0
989.	C4H10+C2H5O<=>SC4H9+C2H5OH	6.00E+11	0.0	7000.0
990.	C4H10+C2H5O2<=>SC4H9+C2H5O2H	1.26E+02	3.4	13720.0
991.	C4H10+CH3CO3<=>SC4H9+CH3CO3H	1.12E+13	0.0	17700.0
992.	C4H10+C3H5-A<=>SC4H9+C3H6	3.16E+11	0.0	16400.0
993.	C4H10+NC3H7O2<=>SC4H9+NC3H7O2H	1.12E+13	0.0	17700.0
994.	C4H10+IC3H7O2<=>SC4H9+IC3H7O2H	1.12E+13	0.0	17700.0
995.	C4H10+PC4H9O2<=>SC4H9+PC4H9O2H	1.12E+13	0.0	17700.0
996.	C4H10+SC4H9O2<=>SC4H9+SC4H9O2H	1.12E+13	0.0	17700.0
997.	C4H10+IC4H9O2<=>SC4H9+IC4H9O2H	1.12E+13	0.0	17700.0
998.	C4H10+TC4H9O2<=>SC4H9+TC4H9O2H	1.12E+13	0.0	17700.0
999.	PC4H9+HO2<=>PC4H9O+OH	7.00E+12	0.0	-1000.0
1000.	CH3O2+PC4H9<=>CH3O+PC4H9O	7.00E+12	0.0	-1000.0
1001.	SC4H9+HO2<=>SC4H9O+OH	7.00E+12	0.0	-1000.0
1002.	SC4H9+CH3O2<=>CH3O+SC4H9O	7.00E+12	0.0	-1000.0
1003.	C2H5+CH3CHO<=>SC4H9O	3.33E+10	0.0	6397.0
1004.	PC4H9+O2<=>C4H8-1+HO2	8.37E-01	3.6	11960.0
1005.	PC4H9+O2<=>PC4H9O2	6.86E+16	-1.6	198.7
1006.	SC4H9+O2<=>C4H8-1+HO2	5.35E-01	3.7	9322.0
1007.	SC4H9+O2<=>C4H8-2+HO2	1.07E+00	3.7	9322.0
1008.	SC4H9+O2<=>SC4H9O2	3.49E+14	-0.8	-536.5
1009.	PC4H9O2+H2<=>PC4H9O2H+H	3.01E+13	0.0	26030.0
1010.	PC4H9O2+HO2<=>PC4H9O2H+O2	1.75E+10	0.0	-3275.0
1011.	PC4H9O2+H2O2<=>PC4H9O2H+HO2	2.40E+12	0.0	10000.0
1012.	PC4H9O2+CH4<=>PC4H9O2H+CH3	1.12E+13	0.0	24640.0
1013.	PC4H9O2+CH3OH<=>PC4H9O2H+CH2OH	6.30E+12	0.0	19360.0
1014.	PC4H9O2+CH2O<=>PC4H9O2H+HCO	5.60E+12	0.0	13600.0
1015.	PC4H9O2+C2H6<=>PC4H9O2H+C2H5	1.70E+13	0.0	20460.0
1016.	PC4H9O2+CH3CHO<=>PC4H9O2H+CH3CO	2.80E+12	0.0	13600.0
1017.	PC4H9O2+C2H4<=>PC4H9O2H+C2H3	1.13E+13	0.0	30430.0
1018.	PC4H9O2+C3H6<=>PC4H9O2H+C3H5-A	5.35E-02	4.2	13288.1
1019.	PC4H9O2+C2H5CHO<=>PC4H9O2H+C2H5CO	2.00E+11	0.0	9500.0
1020.	PC4H9O2+C2H3CHO<=>PC4H9O2H+C2H3CO	2.80E+12	0.0	13600.0
1021.	PC4H9O2+C3H8<=>PC4H9O2H+NC3H7	1.70E+13	0.0	20460.0
1022.	PC4H9O2+C3H8<=>PC4H9O2H+IC3H7	2.00E+12	0.0	17000.0
1023.	PC4H9O2+CH3<=>PC4H9O+CH3O	7.00E+12	0.0	-1000.0
1024.	PC4H9O2+C2H5<=>PC4H9O+C2H5O	7.00E+12	0.0	-1000.0
1025.	PC4H9O2+IC3H7<=>PC4H9O+IC3H7O	7.00E+12	0.0	-1000.0
1026.	PC4H9O2+NC3H7<=>PC4H9O+NC3H7O	7.00E+12	0.0	-1000.0
1027.	PC4H9O2+C3H5-A<=>PC4H9O+C3H5O	7.00E+12	0.0	-1000.0
1028.	PC4H9O2+PC4H9<=>PC4H9O+PC4H9O	7.00E+12	0.0	-1000.0
1029.	PC4H9O2+SC4H9<=>PC4H9O+SC4H9O	7.00E+12	0.0	-1000.0
1030.	PC4H9O2+C4H71-3<=>PC4H9O+C4H71-O	7.00E+12	0.0	-1000.0
1031.	PC4H9O2H<=>PC4H9O+OH	1.50E+16	0.0	42500.0
1032.	PC4H9O2+CH3O2=>PC4H9O+CH3O+O2	1.40E+16	-1.6	1860.0
1033.	PC4H9O2+CH3CO3=>PC4H9O+CH3CO2+O2	1.40E+16	-1.6	1860.0
1034.	PC4H9O2+C2H5O2=>PC4H9O+C2H5O+O2	1.40E+16	-1.6	1860.0
1035.	PC4H9O2+NC3H7O2=>PC4H9O+NC3H7O+O2	1.40E+16	-1.6	1860.0
1036.	PC4H9O2+IC3H7O2=>PC4H9O+IC3H7O+O2	1.40E+16	-1.6	1860.0
1037.	PC4H9O2+PC4H9O2=>PC4H9O+PC4H9O+O2	1.40E+16	-1.6	1860.0
1038.	PC4H9O2+SC4H9O2=>PC4H9O+SC4H9O+O2	1.40E+16	-1.6	1860.0
1039.	PC4H9O2<=>C4H8OOH1-2	4.01E+08	1.1	30100.0
1040.	PC4H9O2<=>C4H8OOH1-3	1.36E+07	1.3	18200.0
1041.	PC4H9O2<=>C4H8OOH1-4	1.23E+06	1.5	20000.0
1042.	PC4H9O2<=>C4H8-1+HO2	1.26E+08	1.4	28900.0
1043.	IC3H7O2+PC4H9<=>IC3H7O+PC4H9O	7.00E+12	0.0	-1000.0
1044.	NC3H7O2+PC4H9<=>NC3H7O+PC4H9O	7.00E+12	0.0	-1000.0
1045.	SC4H9O2+PC4H9<=>SC4H9O+PC4H9O	7.00E+12	0.0	-1000.0
1046.	IC3H7O2+SC4H9<=>IC3H7O+SC4H9O	7.00E+12	0.0	-1000.0
1047.	NC3H7O2+SC4H9<=>NC3H7O+SC4H9O	7.00E+12	0.0	-1000.0
1048.	SC4H9O2+H2<=>SC4H9O2H+H	3.01E+13	0.0	26030.0
1049.	SC4H9O2+HO2<=>SC4H9O2H+O2	1.75E+10	0.0	-3275.0
1050.	SC4H9O2+CH2O<=>SC4H9O2H+HCO	5.60E+12	0.0	13600.0
1051.	SC4H9O2+CH3CHO<=>SC4H9O2H+CH3CO	2.80E+12	0.0	13600.0
1052.	SC4H9O2+C2H6<=>SC4H9O2H+C2H5	1.70E+13	0.0	20460.0
1053.	SC4H9O2+C2H5CHO<=>SC4H9O2H+C2H5CO	2.00E+11	0.0	9500.0
1054.	SC4H9O2+C3H6<=>SC4H9O2H+C3H5-A	5.35E-02	4.2	13288.1
1055.	SC4H9O2+C2H4<=>SC4H9O2H+C2H3	1.13E+13	0.0	30430.0
1056.	SC4H9O2+CH3OH<=>SC4H9O2H+CH2OH	6.30E+12	0.0	19360.0
1057.	SC4H9O2+C2H3CHO<=>SC4H9O2H+C2H3CO	2.80E+12	0.0	13600.0

1058.	SC4H9O2+CH4<=>SC4H9O2H+CH3	1.12E+13	0.0	24640.0
1059.	SC4H9O2+H2O2<=>SC4H9O2H+HO2	2.40E+12	0.0	10000.0
1060.	SC4H9O2+C3H8<=>SC4H9O2H+NC3H7	1.70E+13	0.0	20460.0
1061.	SC4H9O2+C3H8<=>SC4H9O2H+IC3H7	2.00E+12	0.0	17000.0
1062.	SC4H9O2+CH3O2=>SC4H9O+CH3O+O2	1.40E+16	-1.6	1860.0
1063.	SC4H9O2+CH3CO3=>SC4H9O+CH3CO2+O2	1.40E+16	-1.6	1860.0
1064.	SC4H9O2+NC3H7O2=>SC4H9O+NC3H7O+O2	1.40E+16	-1.6	1860.0
1065.	SC4H9O2+IC3H7O2=>SC4H9O+IC3H7O+O2	1.40E+16	-1.6	1860.0
1066.	SC4H9O2+SC4H9O2=>SC4H9O+SC4H9O+O2	1.40E+16	-1.6	1860.0
1067.	SC4H9O2+C2H5O2=>SC4H9O+C2H5O+O2	1.40E+16	-1.6	1860.0
1068.	SC4H9O2+CH3<=>SC4H9O+CH3O	7.00E+12	0.0	-1000.0
1069.	SC4H9O2+C2H5<=>SC4H9O+C2H5O	7.00E+12	0.0	-1000.0
1070.	SC4H9O2+IC3H7<=>SC4H9O+IC3H7O	7.00E+12	0.0	-1000.0
1071.	SC4H9O2+NC3H7<=>SC4H9O+NC3H7O	7.00E+12	0.0	-1000.0
1072.	SC4H9O2+SC4H9<=>SC4H9O+SC4H9O	7.00E+12	0.0	-1000.0
1073.	SC4H9O2+C3H5-A<=>SC4H9O+C3H5O	7.00E+12	0.0	-1000.0
1074.	SC4H9O2+C4H71-3<=>SC4H9O+C4H71-O	7.00E+12	0.0	-1000.0
1075.	SC4H9O+OH<=>SC4H9O2H	1.00E+15	-0.8	0.0
1076.	SC4H9O2<=>C4H8OOH2-1	1.46E+09	1.1	33500.0
1077.	SC4H9O2<=>C4H8OOH2-3	1.72E+09	0.9	29500.0
1078.	SC4H9O2<=>C4H8OOH2-4	1.44E+07	1.4	20800.0
1079.	SC4H9O2<=>C4H8-1+HO2	5.13E+09	1.0	30400.0
1080.	C4H8OOH1-2<=>C4H8O1-2+OH	1.71E+09	1.1	10900.0
1081.	C4H8OOH1-3<=>C4H8O1-3+OH	2.59E+09	0.7	16000.0
1082.	C4H8OOH1-4<=>C4H8O1-4+OH	1.72E+08	0.8	11100.0
1083.	C4H8OOH2-4<=>C4H8O1-3+OH	2.44E+09	0.8	18000.0
1084.	C4H8O1-2+H=>CH2O+C3H5-A+H2	5.00E+12	0.0	0.0
1085.	C4H8O1-2+O=>CH2O+C3H5-A+OH	5.00E+12	0.0	0.0
1086.	C4H8O1-2+OH=>CH2O+C3H5-A+H2O	5.00E+12	0.0	0.0
1087.	C4H8O1-2+HO2=>CH2O+C3H5-A+H2O2	1.00E+13	0.0	15000.0
1088.	C4H8O1-2+CH3=>CH2O+C3H5-A+CH4	2.00E+11	0.0	10000.0
1089.	C4H8O1-2+CH3O2=>CH2O+C3H5-A+CH3O2H	1.00E+13	0.0	19000.0
1090.	C4H8O1-3+H=>CH2O+C3H5-A+H2	5.00E+12	0.0	0.0
1091.	C4H8O1-3+O=>CH2O+C3H5-A+OH	5.00E+12	0.0	0.0
1092.	C4H8O1-3+OH=>CH2O+C3H5-A+H2O	5.00E+12	0.0	0.0
1093.	C4H8O1-3+HO2=>CH2O+C3H5-A+H2O2	1.00E+13	0.0	15000.0
1094.	C4H8O1-3+CH3=>CH2O+C3H5-A+CH4	2.00E+11	0.0	10000.0
1095.	C4H8O1-3+CH3O2=>CH2O+C3H5-A+CH3O2H	1.00E+13	0.0	19000.0
1096.	C4H8O1-4+H=>CH2O+C3H5-A+H2	5.00E+12	0.0	0.0
1097.	C4H8O1-4+O=>CH2O+C3H5-A+OH	5.00E+12	0.0	0.0
1098.	C4H8O1-4+OH=>CH2O+C3H5-A+H2O	5.00E+12	0.0	0.0
1099.	C4H8O1-4+HO2=>CH2O+C3H5-A+H2O2	1.00E+13	0.0	15000.0
1100.	C4H8O1-4+CH3=>CH2O+C3H5-A+CH4	2.00E+11	0.0	10000.0
1101.	C4H8O1-4+CH3O2=>CH2O+C3H5-A+CH3O2H	1.00E+13	0.0	19000.0
1102.	C4H8O2-3+H=>CH2O+C3H5-A+H2	5.00E+12	0.0	0.0
1103.	C4H8O2-3+OH=>CH2O+C3H5-A+H2O	5.00E+12	0.0	0.0
1104.	C4H8O2-3+O=>CH2O+C3H5-A+OH	5.00E+12	0.0	0.0
1105.	C4H8O2-3+HO2=>CH2O+C3H5-A+H2O2	1.00E+13	0.0	15000.0
1106.	C4H8O2-3+CH3O2=>CH2O+C3H5-A+CH3O2H	1.00E+13	0.0	19000.0
1107.	C4H8O2-3+CH3=>CH2O+C3H5-A+CH4	2.00E+11	0.0	10000.0
1108.	C4H8OOH1-3=>OH+CH2O+C3H6	1.23E+09	1.3	24900.0
1109.	C4H8OOH2-4=>OH+CH3CHO+C2H4	3.08E+08	1.5	23500.0
1110.	C4H8OOH1-2+O2<=>C4H8OOH1-2O2	1.74E+14	-0.8	-536.5
1111.	C4H8OOH1-3+O2<=>C4H8OOH1-3O2	1.74E+14	-0.8	-536.5
1112.	C4H8OOH1-4+O2<=>C4H8OOH1-4O2	3.43E+16	-1.6	198.7
1113.	C4H8OOH2-1+O2<=>C4H8OOH2-1O2	3.43E+16	-1.6	198.7
1114.	C4H8OOH2-3+O2<=>C4H8OOH2-3O2	1.74E+14	-0.8	-536.5
1115.	C4H8OOH2-4+O2<=>C4H8OOH2-4O2	3.43E+16	-1.6	198.7
1116.	C4H8OOH1-2O2<=>C4H72-1OOH+HO2	2.54E+10	0.8	30098.5
1117.	C4H8OOH1-3O2<=>C4H71-4OOH+HO2	5.13E+09	1.0	30400.0
1118.	C4H8OOH1-3O2<=>C4H72-1OOH+HO2	2.54E+10	0.8	30098.5
1119.	C4H8OOH1-4O2<=>C4H71-4OOH+HO2	1.44E+07	1.4	28900.0
1120.	C4H8OOH2-3O2<=>C4H71-3OOH+HO2	5.13E+09	1.0	30400.0
1121.	C4H8OOH2-4O2<=>C4H71-3OOH+HO2	1.44E+07	1.4	28900.0
1122.	C4H8OOH1-2O2<=>C4H71-3,4OOH	1.44E+07	1.4	20800.0
1123.	C4H8OOH1-2O2<=>C4H72-3,4OOH	1.72E+09	0.9	29500.0
1124.	C4H8OOH1-2O2<=>NC4KET12+OH	2.44E+07	1.6	27900.0
1125.	C4H8OOH1-3O2<=>C4H71-2,4OOH	1.46E+09	1.1	33500.0
1126.	C4H8OOH1-3O2<=>C4H72-1,3OOH	1.72E+09	0.9	29500.0
1127.	C4H8OOH1-3O2<=>NC4KET13+OH	1.09E+04	2.4	19900.0
1128.	C4H8OOH1-4O2<=>C4H72-1,4OOH	1.36E+07	1.3	18200.0
	Declared duplicate reaction...			
1129.	C4H8OOH1-4O2<=>C4H72-1,4OOH	4.01E+08	1.1	30100.0
	Declared duplicate reaction...			
1130.	C4H8OOH1-4O2<=>NC4KET14+OH	4.80E+03	1.7	16600.0
1131.	C4H8OOH2-1O2<=>C4H72-3,4OOH	1.72E+09	0.9	29500.0
1132.	C4H8OOH2-1O2<=>C4H71-3,4OOH	1.23E+06	1.5	20000.0
1133.	C4H8OOH2-1O2<=>NC4KET21+OH	2.76E+08	1.2	25700.0
1134.	C4H8OOH2-3O2<=>C4H71-2,3OOH	1.46E+09	1.1	33500.0
	Declared duplicate reaction...			
1135.	C4H8OOH2-3O2<=>C4H71-2,3OOH	1.44E+07	1.4	20800.0
	Declared duplicate reaction...			
1136.	C4H8OOH2-3O2<=>NC4KET23+OH	1.75E+06	1.7	26000.0
1137.	C4H8OOH2-4O2<=>C4H71-2,4OOH	1.23E+06	1.5	20000.0
1138.	C4H8OOH2-4O2<=>C4H72-1,3OOH	4.01E+08	1.1	30100.0
1139.	C4H8OOH2-4O2<=>NC4KET24+OH	5.79E+01	2.9	17000.0
1140.	C4H71-3,4OOH<=>C4H7O1-3OOH-4+OH	2.44E+09	0.8	18000.0
1141.	C4H71-3,4OOH<=>C4H7O1-4OOH-2+OH	1.72E+09	0.8	11100.0
1142.	C4H72-3,4OOH<=>C4H7O2-3OOH-1+OH	6.99E+09	0.8	9788.3
1143.	C4H72-3,4OOH<=>C4H7O1-3OOH-2+OH	2.59E+09	0.7	16000.0
1144.	C4H71-2,4OOH<=>C4H7O1-2OOH-4+OH	2.35E+10	0.7	10800.0
1145.	C4H71-2,4OOH<=>C4H7O1-4OOH-2+OH	1.72E+09	0.8	11100.0
1146.	C4H72-1,3OOH<=>C4H7O1-2OOH-3+OH	1.71E+09	1.1	10900.0
1147.	C4H72-1,3OOH<=>C4H7O2-3OOH-1+OH	6.99E+09	0.8	9788.3

1148.	C4H72-1,4OOH<=>C4H7O1-2OOH-4+OH	1.71E+09	1.1	10900.0
1149.	C4H72-1,4OOH<=>C4H7O1-3OOH-4+OH	2.59E+09	0.7	16000.0
1150.	C4H71-2,3OOH<=>C4H7O1-2OOH-3+OH	2.35E+10	0.7	10800.0
1151.	C4H71-2,3OOH<=>C4H7O1-3OOH-2+OH	2.44E+09	0.8	18000.0
1152.	C4H71-3,4OOH=>C2H4+OH+HO2CH2CHO	1.23E+09	1.3	24900.0
1153.	C4H72-3,4OOH<=>C4H72-1OOH+HO2	2.57E+11	0.5	15324.7
1154.	C4H71-2,4OOH<=>C4H71-4OOH+HO2	2.67E+11	0.5	15800.0
1155.	C4H72-1,3OOH<=>C4H72-1OOH+HO2	2.57E+11	0.5	15324.7
1156.	C4H72-1,3OOH<=>C4H71-3OOH+HO2	6.03E+09	0.9	15200.0
1157.	C4H72-1,4OOH<=>C4H71-4OOH+HO2	2.57E+11	0.5	15324.7
1158.	C4H71-2,3OOH<=>C4H71-3OOH+HO2	6.03E+09	0.9	15200.0
1159.	C4H72-1,4OOH<=>C4H72-1OOH+HO2	2.67E+11	0.5	15800.0
1160.	C4H72-1OOH=>CH2O+C3H5-S+OH	1.50E+16	0.0	42000.0
1161.	C4H71-3OOH=>C2H3CHO+CH3+OH	1.05E+16	0.0	41600.0
1162.	C4H71-3OOH=>CH3CHO+C2H3+OH	1.05E+16	0.0	41600.0
1163.	NC4KET12=>C2H5CHO+HCO+OH	1.05E+16	0.0	41600.0
1164.	NC4KET13=>CH3CHO+CH2CHO+OH	1.05E+16	0.0	43000.0
1165.	NC4KET14=>CH2CH2CHO+CH2O+OH	1.50E+16	0.0	42000.0
1166.	NC4KET21=>CH2O+C2H5CO+OH	1.50E+16	0.0	42000.0
1167.	NC4KET23=>CH3CHO+CH3CO+OH	1.05E+16	0.0	41600.0
1168.	NC4KET24=>CH2O+CH3COCH2+OH	1.50E+16	0.0	43000.0
1169.	HO2CH2CHO=>CH2O+HCO+OH	1.50E+16	0.0	42000.0
1170.	IC4H10(+M)<=>CH3+IC3H7(+M)	2.52E+31	-4.1	91495.0
	Low pressure limit: 0.24100E+20 0.00000E+00	0.52576E+05		
	TROE centering: 0.36620E+00 0.81530E+03	0.60790E+02	0.10000E+21	
1171.	IC4H10<=>TC4H9+H	2.51E+98	-23.8	145300.0
1172.	IC4H10<=>IC4H9+H	9.85E+95	-23.1	147600.0
1173.	IC4H10+CH3<=>IC4H9+CH4	1.36E+00	3.6	7154.0
1174.	IC4H10+H<=>IC4H9+H2	1.81E+06	2.5	6756.0
1175.	IC4H10+OH<=>IC4H9+H2O	6.65E+04	2.7	-168.9
1176.	IC4H10+C2H5<=>IC4H9+C2H6	1.51E+12	0.0	10400.0
1177.	IC4H10+HO2<=>IC4H9+H2O2	6.12E+01	3.6	17160.0
1178.	IC4H10+O<=>IC4H9+OH	4.05E+07	2.0	5136.0
1179.	IC4H10+CH3O<=>IC4H9+CH3OH	4.80E+11	0.0	7000.0
1180.	IC4H10+O2<=>IC4H9+HO2	9.00E+13	0.0	52290.0
1181.	IC4H10+CH3O2<=>IC4H9+CH3O2H	2.08E+00	4.0	18280.0
1182.	IC4H10+C2H5O2<=>IC4H9+C2H5O2H	2.55E+13	0.0	20460.0
1183.	IC4H10+CH3CO3<=>IC4H9+CH3CO3H	2.55E+13	0.0	20460.0
1184.	IC4H10+NC3H7O2<=>IC4H9+NC3H7O2H	2.55E+13	0.0	20460.0
1185.	IC4H10+IC3H7O2<=>IC4H9+IC3H7O2H	2.55E+13	0.0	20460.0
1186.	IC4H10+IC4H9O2<=>IC4H9+IC4H9O2H	2.55E+13	0.0	20460.0
1187.	IC4H10+TC4H9O2<=>IC4H9+TC4H9O2H	2.55E+13	0.0	20460.0
1188.	IC4H10+O2CHO<=>IC4H9+HO2CHO	2.52E+13	0.0	20440.0
1189.	IC4H10+SC4H9O2<=>IC4H9+SC4H9O2H	2.25E+13	0.0	20460.0
1190.	IC4H10+SC4H9O2<=>TC4H9+SC4H9O2H	2.80E+12	0.0	16000.0
1191.	IC4H10+PC4H9O2<=>IC4H9+PC4H9O2H	2.25E+13	0.0	20460.0
1192.	IC4H10+H<=>TC4H9+H2	6.02E+05	2.4	2583.0
1193.	IC4H10+CH3<=>TC4H9+CH4	9.04E-01	3.5	4598.0
1194.	IC4H10+OH<=>TC4H9+H2O	2.92E+04	2.5	-1659.0
1195.	IC4H10+C2H5<=>TC4H9+C2H6	1.00E+11	0.0	7900.0
1196.	IC4H10+HO2<=>TC4H9+H2O2	4.33E+02	3.0	12090.0
1197.	IC4H10+O<=>TC4H9+OH	1.97E+05	2.4	1150.0
1198.	IC4H10+CH3O<=>TC4H9+CH3OH	1.90E+10	0.0	2800.0
1199.	IC4H10+O2<=>TC4H9+HO2	1.00E+13	0.0	48200.0
1200.	IC4H10+O2CHO<=>TC4H9+HO2CHO	2.80E+12	0.0	16010.0
1201.	IC4H10+PC4H9O2<=>TC4H9+PC4H9O2H	2.80E+12	0.0	16000.0
1202.	IC4H10+CH3O2<=>TC4H9+CH3O2H	1.37E+02	3.1	13190.0
1203.	IC4H10+C2H5O2<=>TC4H9+C2H5O2H	2.80E+12	0.0	16000.0
1204.	IC4H10+CH3CO3<=>TC4H9+CH3CO3H	2.80E+12	0.0	16000.0
1205.	IC4H10+NC3H7O2<=>TC4H9+NC3H7O2H	2.80E+12	0.0	16000.0
1206.	IC4H10+IC3H7O2<=>TC4H9+IC3H7O2H	2.80E+12	0.0	16000.0
1207.	IC4H10+IC4H9O2<=>TC4H9+IC4H9O2H	2.80E+12	0.0	16000.0
1208.	IC4H10+TC4H9O2<=>TC4H9+TC4H9O2H	2.80E+12	0.0	16000.0
1209.	IC4H10+IC4H9<=>TC4H9+IC4H10	2.50E+10	0.0	7900.0
1210.	IC4H9<=>TC4H9	3.56E+10	0.9	34600.0
1211.	IC4H9<=>C3H6+CH3	1.00E+00	1.0	1.0
	Rate coefficients at P=1.00E-01(atm)	3.15E+41	-9.5	33486.0
	Rate coefficients at P=1.00E+00(atm)	6.75E+44	-10.1	37209.0
	Rate coefficients at P=1.00E+01(atm)	7.79E+44	-9.7	39751.0
	Rate coefficients at P=1.00E+02(atm)	3.61E+39	-7.8	39583.0
1212.	TC4H9+HO2<=>TC4H9O+OH	7.00E+12	0.0	-1000.0
1213.	TC4H9+CH3O2<=>TC4H9O+CH3O	7.00E+12	0.0	-1000.0
1214.	TC4H9+NC3H7O2<=>TC4H9O+NC3H7O	7.00E+12	0.0	-1000.0
1215.	TC4H9+SC4H9O2<=>TC4H9O+SC4H9O	7.00E+12	0.0	-1000.0
1216.	TC4H9+PC4H9O2<=>TC4H9O+PC4H9O	7.00E+12	0.0	-1000.0
1217.	TC4H9+IC3H7O2<=>TC4H9O+IC3H7O	7.00E+12	0.0	-1000.0
1218.	IC4H9+HO2<=>IC4H9O+OH	7.00E+12	0.0	-1000.0
1219.	IC4H9+CH3O2<=>IC4H9O+CH3O	7.00E+12	0.0	-1000.0
1220.	IC4H9+NC3H7O2<=>IC4H9O+NC3H7O	7.00E+12	0.0	-1000.0
1221.	IC4H9+SC4H9O2<=>IC4H9O+SC4H9O	7.00E+12	0.0	-1000.0
1222.	IC4H9+PC4H9O2<=>IC4H9O+PC4H9O	7.00E+12	0.0	-1000.0
1223.	IC4H9+IC3H7O2<=>IC4H9O+IC3H7O	7.00E+12	0.0	-1000.0
1224.	CH3COCH3+CH3<=>TC4H9O	1.50E+11	0.0	11900.0
1225.	TC4H9O+O2<=>IC4H8O+HO2	8.10E+11	0.0	4700.0
1226.	IC4H9O+H<=>IC3H7CHO+H2	1.99E+13	0.0	0.0
1227.	IC4H9O+O2<=>IC3H7CHO+HO2	1.93E+11	0.0	1660.0
1228.	IC4H9O+O<=>IC3H7CHO+OH	6.00E+12	0.0	0.0
1229.	IC4H9O+OH<=>IC3H7CHO+H2O	1.81E+13	0.0	0.0
1230.	IC4H9O+HO2<=>IC3H7CHO+H2O2	1.00E+12	0.0	0.0
1231.	IC4H9O+CH3<=>IC3H7CHO+CH4	2.40E+13	0.0	0.0
1232.	IC3H7CHO+H<=>IC4H9O	1.00E+12	0.0	5860.0
1233.	CH2O+IC3H7<=>IC4H9O	5.00E+10	0.0	2330.0
1234.	TC3H6CHO+H<=>IC3H7CHO	2.00E+14	0.0	0.0
1235.	SC4H7OH-I<=>IC3H7CHO	8.59E+11	0.3	55900.0

1236. IC3H7+HCO<=>IC3H7CHO	1.81E+13	0.0	0.0
1237. IC4H8O<=>IC3H7CHO	4.18E+13	0.0	52720.0
1238. IC3H7CHO+HO2<=>IC3H7CO+H2O2	3.00E+12	0.0	11920.0
1239. IC3H7CHO+CH3<=>IC3H7CO+CH4	3.98E+12	0.0	8700.0
1240. IC3H7CHO+O<=>IC3H7CO+OH	7.18E+12	0.0	1389.0
1241. IC3H7CHO+O2<=>IC3H7CO+HO2	4.00E+13	0.0	37600.0
1242. IC3H7CHO+OH<=>IC3H7CO+H2O	2.69E+10	0.8	-340.0
1243. IC3H7CHO+H<=>IC3H7CO+H2	2.60E+12	0.0	2600.0
1244. IC3H7CHO+OH<=>IC3H6CHO+H2O	3.12E+06	2.0	-298.0
1245. IC3H7CHO+HO2<=>IC3H6CHO+H2O2	2.74E+04	2.5	15500.0
1246. IC3H7CHO+CH3O2<=>IC3H6CHO+CH3O2H	4.76E+04	2.5	16490.0
1247. TC3H6CHO+H2<=>IC3H7CHO+H	2.16E+05	2.4	18990.0
1248. IC3H7CHO+HO2<=>TC3H6CHO+H2O2	8.00E+10	0.0	11920.0
1249. IC3H7CHO+OH<=>TC3H6CHO+H2O	1.68E+12	0.0	-781.0
1250. IC4H8O+OH<=>IC3H6CHO+H2O	7.52E+04	2.5	-1474.1
1251. IC4H8O+H<=>IC3H6CHO+H2	8.79E+04	2.7	2910.0
1252. IC4H8O+HO2<=>IC3H6CHO+H2O2	2.45E-05	5.3	7475.1
1253. IC4H8O+CH3O2<=>IC3H6CHO+CH3O2H	1.22E-05	5.3	7475.1
1254. IC4H8O+CH3<=>IC3H6CHO+CH4	1.99E+01	3.4	7634.0
1255. IC4H8O+O<=>IC3H6CHO+OH	1.45E+05	2.5	876.0
1256. IC4H8O+O2<=>IC3H6CHO+HO2	1.50E+13	0.0	50150.0
1257. IC3H5CHO+H<=>TC3H6CHO	1.30E+13	0.0	1200.0
1258. IC3H6CO+H<=>TC3H6CHO	1.30E+13	0.0	4800.0
1259. IC3H6CO+OH<=>IC3H7+CO2	1.73E+12	0.0	-1010.0
1260. IC3H6CO+OH<=>C3H6OH2-1+CO	2.00E+12	0.0	-1010.0
1261. TC3H6CHO+HO2<=>IC3H7CHO+O2	3.68E+12	0.0	1310.0
1262. TC3H6CHO+CH3<=>IC3H5CHO+CH4	3.01E+12	-0.3	-131.0
1263. TC3H6CHO+CH2O<=>IC3H7CHO+HCO	2.52E+08	1.9	18190.0
1264. TC3H6CHO+IC4H8<=>IC3H7CHO+IC4H7	4.70E+02	3.3	19840.0
1265. TC3H6CHO+O2<=>TC3H6O2CHO	1.99E+17	-2.1	0.0
1266. TC3H6O2CHO<=>IC3H5O2HCHO	6.00E+11	0.0	29880.0
1267. TC3H6O2CHO<=>TC3H6O2HCO	1.00E+11	0.0	25750.0
1268. IC3H5CHO+HO2<=>IC3H5O2HCHO	2.23E+11	0.0	10600.0
1269. TC3H6OCHO+OH<=>TC3H6CHO+HO2	2.02E+17	-1.2	21010.0
1270. TC3H6OCHO<=>CH3COCH3+HCO	3.98E+13	0.0	9700.0
1271. TC3H6CHO+OH<=>IC3H6OHCHO	5.00E+13	0.0	0.0
1272. C3H6OH2-1+HCO<=>IC3H6OHCHO	1.81E+13	0.0	0.0
1273. IC3H5CHO+H<=>IC3H5CO+H2	7.15E+05	2.4	1577.2
1274. IC3H5CHO+O2<=>IC3H5CO+HO2	2.00E+13	0.0	40700.0
1275. IC3H5CHO+O<=>IC3H5CO+OH	7.18E+12	0.0	1389.0
1276. IC3H5CHO+OH<=>IC3H5CO+H2O	6.13E+04	2.6	-4586.4
1277. IC3H5CHO+HO2<=>IC3H5CO+H2O2	1.18E-04	4.9	3684.3
1278. IC3H5CHO+CH3<=>IC3H5CO+CH4	1.25E+00	3.6	4328.9
1279. IC3H5CHO+H<=>IC3H4CHO-A+H2	3.64E+05	2.5	4361.2
1280. IC3H5CHO+O2<=>IC3H4CHO-A+HO2	5.96E+19	-1.7	46192.1
1281. IC3H5CHO+OH<=>IC3H4CHO-A+H2O	4.46E+06	2.1	1050.8
1282. IC3H5CHO+O<=>IC3H4CHO-A+OH	5.24E+11	0.7	5884.0
1283. IC3H5CHO+HO2<=>IC3H4CHO-A+H2O2	3.07E-02	4.4	13547.2
1284. IC3H5CHO+CH3<=>IC3H4CHO-A+CH4	2.21E+00	3.5	5675.0
1285. IC3H5CO<=>C3H5-T+CO	1.28E+20	-1.9	34460.0
1286. C3H4-A+HCO<=>IC3H4CHO-A	4.02E+04	2.5	8847.5
1287. IC3H7+CO<=>IC3H7CO	1.50E+11	0.0	4810.0
1288. C2H3CHO+CH3<=>IC3H6CHO	1.00E+11	0.0	7800.0
1289. SC4H7OH-I+HO2<=>IC3H7CHO+HO2	1.49E+05	1.7	6810.0
1290. SC4H7OH-I+HOCHO<=>IC3H7CHO+HOCHO	2.81E-02	3.3	-4509.0
1291. SC4H7OH-I+H<=>IC4H6OH+H2	7.29E+05	2.5	4361.2
1292. SC4H7OH-I+O<=>IC4H6OH+OH	1.05E+12	0.7	5884.0
1293. SC4H7OH-I+OH<=>IC4H6OH+H2O	4.40E+04	2.7	-827.1
1294. SC4H7OH-I+HO2<=>IC4H6OH+H2O2	2.92E-01	4.1	12802.0
1295. SC4H7OH-I+CH3<=>IC4H6OH+CH4	4.42E+00	3.5	5675.0
1296. SC4H7OH-I+CH3O<=>IC4H6OH+CH3OH	1.68E+11	0.0	2600.0
1297. SC4H7OH-I+CH3O2<=>IC4H6OH+CH3O2H	1.93E+04	2.6	13910.0
1298. IC4H6OH+H=>CH3+C3H4-A+OH	4.02E+04	2.5	8847.5
1299. TC4H9+O2<=>IC4H8+HO2	8.37E-01	3.6	11960.0
1300. IC4H9+O2<=>IC4H8+HO2	1.07E+00	3.7	9322.0
1301. IC4H9+O2<=>IC4H9O2	6.69E+13	-0.3	-187.2
1302. TC4H9+O2<=>TC4H9O2	6.69E+13	-0.3	-187.2
1303. IC4H9O2<=>IC4H8+HO2	1.94E+08	1.3	29600.0
1304. IC4H9O2<=>IC4H8O2H-I	9.82E+07	1.3	21500.0
1305. IC4H9O2<=>IC4H8O2H-T	2.31E+09	0.8	27100.0
1306. TC4H9O2<=>TC4H8O2H-I	4.52E+09	1.2	33500.0
1307. IC4H8O2H-I<=>CC4H8O+OH	4.47E+11	0.0	21900.0
1308. IC4H8O2H-I=>OH+CH2O+C3H6	8.45E+15	-0.7	29170.0
1309. CC4H8O+OH=>CH2O+C3H5-A+H2O	5.00E+12	0.0	0.0
1310. CC4H8O+H=>CH2O+C3H5-A+H2	3.51E+07	2.0	5000.0
1311. CC4H8O+O=>CH2O+C3H5-A+OH	1.12E+14	0.0	5200.0
1312. CC4H8O+HO2=>CH2O+C3H5-A+H2O2	1.00E+13	0.0	15000.0
1313. CC4H8O+CH3O2=>CH2O+C3H5-A+CH3O2H	1.00E+13	0.0	19000.0
1314. CC4H8O+CH3=>CH2O+C3H5-A+CH4	2.00E+11	0.0	10000.0
1315. IC4H8O2H-I+O2<=>IC4H8OOH-IO2	9.35E+11	0.1	-1010.9
1316. IC4H8O2H-T+O2<=>IC4H8OOH-TO2	5.04E+12	-0.1	-655.2
1317. TC4H8O2H-I+O2<=>TC4H8OOH-IO2	2.28E+10	0.5	-786.2
1318. IC4H8OOH-IO2<=>IC4KETII+OH	5.00E+10	0.0	21400.0
1319. IC4H8OOH-TO2<=>IC4KETIT+OH	4.00E+11	0.0	31500.0
1320. IC4H8OOH-TO2<=>TIC4H7Q2-I	6.00E+11	0.0	34500.0
1321. IC4H8OOH-IO2<=>IIC4H7Q2-I	3.75E+10	0.0	24400.0
1322. IC4H8OOH-IO2<=>IIC4H7Q2-T	1.00E+11	0.0	29200.0
1323. TC4H8OOH-IO2<=>TIC4H7Q2-I	9.82E+07	1.3	21500.0
1324. IC4H8O2H-T<=>IC4H8O+OH	1.55E+12	0.0	13400.0
1325. AC3H5OOH+CH2O2H<=>IIC4H7Q2-I	8.50E+10	0.0	10600.0
1326. IC4H7OOH+HO2<=>IIC4H7Q2-T	1.00E+11	0.0	7800.0
1327. TIC4H7Q2-I<=>IC4H7OOH+HO2	1.60E+12	0.2	15200.0
1328. IC4KETII=>CH2O+C2H5CO+OH	1.50E+16	0.0	42000.0
1329. IC4H9O2+CH3O2=>IC4H9O+CH3O+O2	1.40E+16	-1.6	1860.0

1330. IC4H9O2+C2H5O2=>IC4H9O+C2H5O+O2	1.40E+16	-1.6	1860.0
1331. IC4H9O2+CH3CO3=>IC4H9O+CH3CO2+O2	1.40E+16	-1.6	1860.0
1332. IC4H9O2+IC4H9O2=>O2+IC4H9O+IC4H9O	1.40E+16	-1.6	1860.0
1333. IC4H9O2+TC4H9O2=>IC4H9O+TC4H9O+O2	1.40E+16	-1.6	1860.0
1334. IC4H9O2+PC4H9O2=>IC4H9O+PC4H9O+O2	1.40E+16	-1.6	1860.0
1335. IC4H9O2+SC4H9O2=>IC4H9O+SC4H9O+O2	1.40E+16	-1.6	1860.0
1336. IC4H9O2+NC3H7O2=>IC4H9O+NC3H7O+O2	1.40E+16	-1.6	1860.0
1337. IC4H9O2+IC3H7O2=>IC4H9O+IC3H7O+O2	1.40E+16	-1.6	1860.0
1338. IC4H9O2+HO2=>IC4H9O+OH+O2	1.40E+16	-1.6	1860.0
1339. TC4H9O2+CH3O2=>TC4H9O+CH3O+O2	1.40E+16	-1.6	1860.0
1340. TC4H9O2+C2H5O2=>TC4H9O+C2H5O+O2	1.40E+16	-1.6	1860.0
1341. TC4H9O2+CH3CO3=>TC4H9O+CH3CO2+O2	1.40E+16	-1.6	1860.0
1342. TC4H9O2+TC4H9O2=>O2+TC4H9O+TC4H9O	1.40E+16	-1.6	1860.0
1343. TC4H9O2+PC4H9O2=>TC4H9O+PC4H9O+O2	1.40E+16	-1.6	1860.0
1344. TC4H9O2+SC4H9O2=>TC4H9O+SC4H9O+O2	1.40E+16	-1.6	1860.0
1345. TC4H9O2+NC3H7O2=>TC4H9O+NC3H7O+O2	1.40E+16	-1.6	1860.0
1346. TC4H9O2+IC3H7O2=>TC4H9O+IC3H7O+O2	1.40E+16	-1.6	1860.0
1347. TC4H9O2+HO2=>TC4H9O+OH+O2	1.40E+16	-1.6	1860.0
1348. IC4H9O2+CH3<=>IC4H9O+CH3O	7.00E+12	0.0	-1000.0
1349. IC4H9O2+C2H5<=>IC4H9O+C2H5O	7.00E+12	0.0	-1000.0
1350. IC4H9O2+IC3H7<=>IC4H9O+IC3H7O	7.00E+12	0.0	-1000.0
1351. IC4H9O2+NC3H7<=>IC4H9O+NC3H7O	7.00E+12	0.0	-1000.0
1352. IC4H9O2+PC4H9<=>IC4H9O+PC4H9O	7.00E+12	0.0	-1000.0
1353. IC4H9O2+SC4H9<=>IC4H9O+SC4H9O	7.00E+12	0.0	-1000.0
1354. IC4H9O2+IC4H9<=>IC4H9O+IC4H9O	7.00E+12	0.0	-1000.0
1355. IC4H9O2+TC4H9<=>IC4H9O+TC4H9O	7.00E+12	0.0	-1000.0
1356. IC4H9O2+C3H5-A<=>IC4H9O+C3H5O	7.00E+12	0.0	-1000.0
1357. IC4H9O2+C4H71-3<=>IC4H9O+C4H71-O	7.00E+12	0.0	-1000.0
1358. IC4H9O2+IC4H7<=>IC4H9O+IC4H7O	7.00E+12	0.0	-1000.0
1359. TC4H9O2+CH3<=>TC4H9O+CH3O	7.00E+12	0.0	-1000.0
1360. TC4H9O2+C2H5<=>TC4H9O+C2H5O	7.00E+12	0.0	-1000.0
1361. TC4H9O2+IC3H7<=>TC4H9O+IC3H7O	7.00E+12	0.0	-1000.0
1362. TC4H9O2+NC3H7<=>TC4H9O+NC3H7O	7.00E+12	0.0	-1000.0
1363. TC4H9O2+PC4H9<=>TC4H9O+PC4H9O	7.00E+12	0.0	-1000.0
1364. TC4H9O2+SC4H9<=>TC4H9O+SC4H9O	7.00E+12	0.0	-1000.0
1365. TC4H9O2+IC4H9<=>TC4H9O+IC4H9O	7.00E+12	0.0	-1000.0
1366. TC4H9O2+TC4H9<=>TC4H9O+TC4H9O	7.00E+12	0.0	-1000.0
1367. TC4H9O2+C3H5-A<=>TC4H9O+C3H5O	7.00E+12	0.0	-1000.0
1368. TC4H9O2+C4H71-3<=>TC4H9O+C4H71-O	7.00E+12	0.0	-1000.0
1369. IC4H9O2+HO2<=>IC4H9O2H+O2	1.75E+10	0.0	-3275.0
1370. IC4H9O2+H2O2<=>IC4H9O2H+HO2	2.40E+12	0.0	10000.0
1371. IC4H9O2+H2<=>IC4H9O2H+H	3.01E+13	0.0	26030.0
1372. IC4H9O2+CH4<=>IC4H9O2H+CH3	1.13E+13	0.0	20460.0
1373. IC4H9O2+CH3OH<=>IC4H9O2H+CH2OH	6.30E+12	0.0	19360.0
1374. IC4H9O2+CH2O<=>IC4H9O2H+HCO	1.30E+11	0.0	9000.0
1375. IC4H9O2+C2H6<=>IC4H9O2H+C2H5	1.70E+13	0.0	20460.0
1376. IC4H9O2+C2H4<=>IC4H9O2H+C2H3	8.59E+00	3.8	27132.0
1377. IC4H9O2+C2H5OH<=>IC4H9O2H+PC2H4OH	6.30E+12	0.0	19360.0
1378. IC4H9O2+C2H5OH<=>IC4H9O2H+SC2H4OH	4.20E+12	0.0	15000.0
1379. IC4H9O2+CH3CHO<=>IC4H9O2H+CH3CO	2.80E+12	0.0	13600.0
1380. IC4H9O2+C3H8<=>IC4H9O2H+IC3H7	2.00E+12	0.0	17000.0
1381. IC4H9O2+C3H8<=>IC4H9O2H+NC3H7	1.70E+13	0.0	20460.0
1382. IC4H9O2+C2H3CHO<=>IC4H9O2H+C2H3CO	2.80E+12	0.0	13600.0
1383. IC4H9O2+C2H5CHO<=>IC4H9O2H+C2H5CO	2.80E+12	0.0	13600.0
1384. IC4H9O2+C3H6<=>IC4H9O2H+C3H5-A	5.35E-02	4.2	13288.1
1385. TC4H9O2H<=>TC4H9O+OH	5.95E+15	0.0	42540.0
1386. TC4H9O2+CH4<=>TC4H9O2H+CH3	1.13E+13	0.0	20460.0
1387. TC4H9O2+C2H6<=>TC4H9O2H+C2H5	1.70E+13	0.0	20460.0
1388. TC4H9O2+C3H8<=>TC4H9O2H+IC3H7	2.00E+12	0.0	17000.0
1389. TC4H9O2+C3H8<=>TC4H9O2H+NC3H7	1.70E+13	0.0	20460.0
1390. TC4H9O2+CH3OH<=>TC4H9O2H+CH2OH	6.30E+12	0.0	19360.0
1391. TC4H9O2+C2H5OH<=>TC4H9O2H+PC2H4OH	6.30E+12	0.0	19360.0
1392. TC4H9O2+C2H5OH<=>TC4H9O2H+SC2H4OH	4.20E+12	0.0	15000.0
1393. TC4H9O2+CH3CHO<=>TC4H9O2H+CH3CO	2.80E+12	0.0	13600.0
1394. TC4H9O2+C2H3CHO<=>TC4H9O2H+C2H3CO	2.80E+12	0.0	13600.0
1395. TC4H9O2+C2H5CHO<=>TC4H9O2H+C2H5CO	2.80E+12	0.0	13600.0
1396. TC4H9O2+HO2<=>TC4H9O2H+O2	1.75E+10	0.0	-3275.0
1397. TC4H9O2+H2O2<=>TC4H9O2H+HO2	2.40E+12	0.0	10000.0
1398. TC4H9O2+CH2O<=>TC4H9O2H+HCO	1.30E+11	0.0	9000.0
1399. TC4H9O2+C2H4<=>TC4H9O2H+C2H3	8.59E+00	3.8	27132.0
1400. TC4H9O2+H2<=>TC4H9O2H+H	3.01E+13	0.0	26030.0
1401. TC4H9O2+C3H6<=>TC4H9O2H+C3H5-A	5.35E-02	4.2	13288.1
1402. IC4H8<=>IC4H7-I1+H	7.71E+69	-16.1	140000.0
1403. IC4H8<=>C3H5-T+CH3	1.42E+93	-22.8	133825.0
Rate coefficients at P=1.00E-01(atm)	1.26E+94	-23.0	134024.0
Rate coefficients at P=1.00E+00(atm)	6.76E+93	-22.5	137933.0
Rate coefficients at P=3.50E+00(atm)	3.14E+90	-21.4	137866.0
Rate coefficients at P=1.00E+01(atm)	9.20E+85	-19.9	136498.0
Rate coefficients at P=3.50E+01(atm)	6.05E+78	-17.8	133437.0
Rate coefficients at P=1.00E+02(atm)	4.87E+71	-15.7	129919.0
1404. IC4H8<=>IC4H7+H	4.66E+92	-22.4	129059.0
Rate coefficients at P=1.00E-01(atm)	7.51E+95	-23.4	129214.0
Rate coefficients at P=1.00E+00(atm)	3.59E+88	-21.0	127813.0
Rate coefficients at P=3.50E+00(atm)	2.96E+82	-19.1	125456.0
Rate coefficients at P=1.00E+01(atm)	2.13E+76	-17.3	122629.0
Rate coefficients at P=3.50E+01(atm)	1.13E+68	-14.8	118416.0
Rate coefficients at P=1.00E+02(atm)	4.73E+60	-12.7	114404.0
1405. IC4H8+OH<=>IC4H7+H2O	4.40E+04	2.7	-827.1
1406. IC4H8+OH<=>IC4H7-I1+H2O	1.09E+04	2.8	1114.2
1407. IC4H8+O2<=>IC4H7+HO2	3.12E+13	0.0	37450.0
1408. IC4H8+O2<=>IC4H7-I1+HO2	2.00E+13	0.0	62270.0
1409. IC4H8+H<=>IC4H7+H2	7.29E+05	2.5	4361.2
1410. IC4H8+H<=>IC4H7-I1+H2	8.62E+02	3.2	12167.0
1411. IC4H8+O<=>IC4H7+OH	1.05E+12	0.7	5884.0

1412. IC4H8+O<=>IC4H7-I1+OH	1.20E+11	0.7	8959.1
1413. IC4H8+HO2<=>IC4H7+H2O2	2.92E-01	4.1	12802.0
1414. IC4H8+HO2<=>IC4H7-I1+H2O2	9.70E+04	2.5	24733.2
1415. IC4H8+CH3<=>IC4H7+CH4	3.20E+12	0.0	10000.0
1416. IC4H8+CH3<=>IC4H7-I1+CH4	2.00E+12	0.0	15000.0
1417. IC4H8+CH3O<=>IC4H7+CH3OH	1.68E+11	0.0	2600.0
1418. IC4H8+C3H5-A<=>IC4H7+C3H6	7.94E+11	0.0	20500.0
1419. IC4H8+C3H5-S<=>IC4H7+C3H6	7.94E+11	0.0	20500.0
1420. IC4H8+C3H5-T<=>IC4H7+C3H6	7.94E+11	0.0	20500.0
1421. IC4H8+CH3O2<=>IC4H7+CH3O2H	1.54E-01	4.4	13547.2
1422. IC4H8+CH3CO3<=>IC4H7+CH3CO3H	1.54E-01	4.4	13547.2
1423. IC4H8+O2CHO<=>IC4H7+HO2CHO	1.93E+04	2.6	13910.0
1424. IC4H9O2+IC4H8<=>IC4H9O2H+IC4H7	1.40E+12	0.0	14900.0
1425. TC4H9O2+IC4H8<=>TC4H9O2H+IC4H7	1.40E+12	0.0	14900.0
1426. PC4H9O2+IC4H8<=>PC4H9O2H+IC4H7	1.40E+12	0.0	14900.0
1427. SC4H9O2+IC4H8<=>SC4H9O2H+IC4H7	1.40E+12	0.0	14900.0
1428. IC3H7O2+IC4H8<=>IC3H7O2H+IC4H7	1.40E+12	0.0	14900.0
1429. NC3H7O2+IC4H8<=>NC3H7O2H+IC4H7	1.40E+12	0.0	14900.0
1430. IC4H7O+IC4H8<=>IC4H7OH+IC4H7	2.70E+11	0.0	4000.0
1431. IC4H8+CH2CCH2OH<=>IC4H7+C3H5OH	7.94E+11	0.0	20500.0
1432. IC4H7<=>IC4H7-I1	1.30E+55	-14.5	73800.0
Rate coefficients at P=1.00E-01(atm)	1.30E+55	-14.5	73800.0
Rate coefficients at P=1.00E+00(atm)	5.00E+51	-13.0	73300.0
Rate coefficients at P=1.00E+01(atm)	9.70E+48	-11.7	73700.0
Rate coefficients at P=1.00E+02(atm)	4.86E+44	-9.8	73400.0
1433. C3H4-A+CH3<=>IC4H7	4.02E+04	2.5	8847.5
1434. IC4H7+HO2<=>IC4H7O+OH	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	1.02E+13	-0.2	-1417.0
Rate coefficients at P=1.00E-01(atm)	4.98E+14	-0.6	-349.1
Rate coefficients at P=1.00E+00(atm)	7.77E+17	-1.5	2379.2
Rate coefficients at P=1.00E+01(atm)	2.93E+15	-0.7	3615.3
Rate coefficients at P=1.00E+02(atm)	1.64E+04	2.7	1144.4
1435. IC4H7+HO2<=>IC4H7OOH	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	1.91E+31	-7.2	1336.2
Rate coefficients at P=1.00E-01(atm)	6.31E+42	-10.3	5568.9
Rate coefficients at P=1.00E+00(atm)	1.03E+45	-10.6	7851.5
Rate coefficients at P=1.00E+01(atm)	2.79E+37	-7.9	6497.9
Rate coefficients at P=1.00E+02(atm)	1.44E+32	-6.0	6053.6
1436. IC4H7+HO2<=>IC3H5CHO+H2O	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	1.09E+00	3.0	-3421.1
Rate coefficients at P=1.00E-01(atm)	6.35E+01	2.5	-2341.4
Rate coefficients at P=1.00E+00(atm)	6.05E+05	1.4	595.1
Rate coefficients at P=1.00E+01(atm)	3.10E+05	1.6	2677.6
Rate coefficients at P=1.00E+02(atm)	5.07E-05	4.6	927.5
1437. IC4H7OOH<=>IC3H5CHO+H2O	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	1.99E+50	-12.7	53531.9
Rate coefficients at P=1.00E-01(atm)	4.72E+47	-11.5	54360.9
Rate coefficients at P=1.00E+00(atm)	1.50E+40	-8.8	53179.2
Rate coefficients at P=1.00E+01(atm)	2.54E+28	-5.0	49919.4
Rate coefficients at P=1.00E+02(atm)	1.48E+16	-1.1	45949.3
1438. IC4H7OOH<=>IC4H7O+OH	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	1.49E+58	-13.9	54266.9
Rate coefficients at P=1.00E-01(atm)	1.80E+54	-12.4	54193.8
Rate coefficients at P=1.00E+00(atm)	3.36E+46	-9.8	52468.5
Rate coefficients at P=1.00E+01(atm)	2.39E+36	-6.5	49429.0
Rate coefficients at P=1.00E+02(atm)	1.28E+27	-3.6	46333.1
1439. IC4H7O<=>C3H5-T+CH2O	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	7.26E+06	0.2	17815.5
Rate coefficients at P=1.00E-02(atm)	6.97E+16	-2.5	20878.7
Rate coefficients at P=1.00E-01(atm)	6.64E+23	-4.2	23565.0
Rate coefficients at P=1.00E+00(atm)	1.07E+26	-4.6	24622.9
Rate coefficients at P=1.00E+01(atm)	6.50E+29	-5.4	26645.0
Rate coefficients at P=1.00E+02(atm)	4.63E+31	-5.6	28915.3
Rate coefficients at P=1.00E+03(atm)	8.52E+25	-3.6	27863.4
1440. IC4H7O<=>IC3H5OCH2	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	3.17E+20	-4.2	12121.3
Rate coefficients at P=1.00E-02(atm)	4.79E+24	-5.0	14606.1
Rate coefficients at P=1.00E-01(atm)	1.90E+26	-5.2	16124.4
Rate coefficients at P=1.00E+00(atm)	1.51E+28	-5.4	18165.4
Rate coefficients at P=1.00E+01(atm)	2.42E+28	-5.2	19691.2
Rate coefficients at P=1.00E+02(atm)	5.57E+24	-3.9	19395.2
Rate coefficients at P=1.00E+03(atm)	1.35E+18	-1.7	17386.5
1441. IC4H7O<=>IC3H6CHO	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	5.25E-49	15.5	-15639.9
Rate coefficients at P=1.00E-02(atm)	1.46E-88	27.6	-35995.0
Rate coefficients at P=1.00E-01(atm)	4.44E-22	8.4	-3819.0
Rate coefficients at P=1.00E+00(atm)	6.23E+12	-1.4	10829.2
Rate coefficients at P=1.00E+01(atm)	3.48E+42	-9.9	25297.9
Rate coefficients at P=1.00E+02(atm)	1.88E+38	-8.2	25974.5
Rate coefficients at P=1.00E+03(atm)	1.67E+21	-2.7	20337.7
1442. IC4H7O<=>IC3H5CHO+H	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	3.00E+15	-2.3	14667.9
Rate coefficients at P=1.00E-02(atm)	1.50E+22	-4.0	18283.0
Rate coefficients at P=1.00E-01(atm)	1.95E+23	-4.0	19143.3
Rate coefficients at P=1.00E+00(atm)	1.15E+25	-4.2	20311.2
Rate coefficients at P=1.00E+01(atm)	1.76E+28	-4.9	22765.2
Rate coefficients at P=1.00E+02(atm)	1.41E+27	-4.3	23770.6
Rate coefficients at P=1.00E+03(atm)	2.57E+20	-2.1	22040.1
1443. IC4H7O<=>C3H6+HCO	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	6.62E+16	-2.8	13197.0
Rate coefficients at P=1.00E-02(atm)	1.26E+20	-3.5	15469.2
Rate coefficients at P=1.00E-01(atm)	2.13E+21	-3.6	16584.5
Rate coefficients at P=1.00E+00(atm)	1.07E+24	-4.2	18985.0
Rate coefficients at P=1.00E+01(atm)	8.42E+25	-4.4	22382.6

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      Rate coefficients at P=1.00E+02(atm)          1.86E+21   -2.7    23658.8
      Rate coefficients at P=1.00E+03(atm)          4.75E+08    1.1    20922.5
1444. IC3H5OCH2<=>C3H5-T+CH2O                        1.00E+11    0.0        0.0
      Rate coefficients at P=1.00E-03(atm)          3.30E+09   -0.6    19747.8
      Rate coefficients at P=1.00E-02(atm)          3.36E+21   -3.9    23945.2
      Rate coefficients at P=1.00E-01(atm)          2.91E+29   -5.9    27249.7
      Rate coefficients at P=1.00E+00(atm)          1.83E+34   -6.9    30690.4
      Rate coefficients at P=1.00E+01(atm)          9.72E+33   -6.5    33002.5
      Rate coefficients at P=1.00E+02(atm)          2.68E+27   -4.3    33305.6
      Rate coefficients at P=1.00E+03(atm)          8.81E+14   -0.3    31553.1
1445. IC3H5OCH2<=>IC3H6CHO                           1.00E+11    0.0        0.0
      Rate coefficients at P=1.00E-03(atm)          8.01E-92   27.8   -37321.2
      Rate coefficients at P=1.00E-02(atm)          7.78E-11    3.7    -2766.9
      Rate coefficients at P=1.00E-01(atm)          5.11E+15   -2.8    15937.6
      Rate coefficients at P=1.00E+00(atm)          4.48E+25   -5.2    21532.2
      Rate coefficients at P=1.00E+01(atm)          3.97E+34   -7.4    28116.9
      Rate coefficients at P=1.00E+02(atm)          5.62E+22   -3.6    25806.7
      Rate coefficients at P=1.00E+03(atm)          2.51E+20   -2.6    29288.4
1446. IC3H5OCH2<=>IC3H5CHO+H                         1.00E+11    0.0        0.0
      Rate coefficients at P=1.00E-03(atm)          4.93E+24   -5.0    20108.4
      Rate coefficients at P=1.00E-02(atm)          2.14E+28   -5.8    22219.4
      Rate coefficients at P=1.00E-01(atm)          1.93E+32   -6.6    25108.2
      Rate coefficients at P=1.00E+00(atm)          8.60E+34   -7.1    28209.1
      Rate coefficients at P=1.00E+01(atm)          2.17E+34   -6.6    30647.6
      Rate coefficients at P=1.00E+02(atm)          4.17E+28   -4.7    31231.9
      Rate coefficients at P=1.00E+03(atm)          3.98E+18   -1.6    30129.8
1447. IC3H5OCH2<=>C3H6+HCO                           1.00E+11    0.0        0.0
      Rate coefficients at P=1.00E-03(atm)          8.23E+26   -5.8    19356.9
      Rate coefficients at P=1.00E-02(atm)          1.32E+29   -6.2    21293.6
      Rate coefficients at P=1.00E-01(atm)          3.47E+32   -7.0    24197.3
      Rate coefficients at P=1.00E+00(atm)          1.44E+36   -7.8    28007.8
      Rate coefficients at P=1.00E+01(atm)          9.72E+37   -8.0    32394.6
      Rate coefficients at P=1.00E+02(atm)          2.43E+31   -5.8    34295.8
      Rate coefficients at P=1.00E+03(atm)          3.73E+14   -0.7    32008.3
1448. IC3H6CHO<=>C3H5-T+CH2O                         1.00E+11    0.0        0.0
      Rate coefficients at P=1.00E-03(atm)          6.89E-69   21.5     2638.0
      Rate coefficients at P=1.00E-02(atm)          5.34E-33   11.1    16749.1
      Rate coefficients at P=1.00E-01(atm)          6.11E+26   -6.0    44116.7
      Rate coefficients at P=1.00E+00(atm)          8.04E+35   -8.3    46919.7
      Rate coefficients at P=1.00E+01(atm)          5.52E+40   -9.2    50508.7
      Rate coefficients at P=1.00E+02(atm)          5.85E+35   -7.2    52038.4
      Rate coefficients at P=1.00E+03(atm)          1.93E+19   -1.9    48440.0
1449. IC3H6CHO<=>IC3H5CHO+H                          1.00E+11    0.0        0.0
      Rate coefficients at P=1.00E-03(atm)          1.61E+10   -1.2    32371.3
      Rate coefficients at P=1.00E-02(atm)          5.84E+15   -2.6    32878.4
      Rate coefficients at P=1.00E-01(atm)          3.64E+23   -4.6    34275.3
      Rate coefficients at P=1.00E+00(atm)          7.58E+31   -6.6    37895.4
      Rate coefficients at P=1.00E+01(atm)          2.86E+32   -6.3    39990.7
      Rate coefficients at P=1.00E+02(atm)          1.57E+23   -3.1    38011.7
      Rate coefficients at P=1.00E+03(atm)          4.52E+12    0.2    34570.5
1450. IC3H6CHO<=>C3H6+HCO                            1.00E+11    0.0        0.0
      Rate coefficients at P=1.00E-03(atm)          2.90E+32   -7.2    25687.5
      Rate coefficients at P=1.00E-02(atm)          5.30E+33   -7.3    27100.6
      Rate coefficients at P=1.00E-01(atm)          2.00E+35   -7.4    29027.3
      Rate coefficients at P=1.00E+00(atm)          1.01E+34   -6.7    30018.1
      Rate coefficients at P=1.00E+01(atm)          9.76E+27   -4.6    28923.9
      Rate coefficients at P=1.00E+02(atm)          2.11E+19   -1.9    26239.8
      Rate coefficients at P=1.00E+03(atm)          1.59E+13    0.1    24086.3
1451. C3H5-T+CH2O<=>IC3H5CHO+H                       1.00E+11    0.0        0.0
      Rate coefficients at P=1.00E-03(atm)          2.60E+04    2.3     1510.3
      Rate coefficients at P=1.00E-02(atm)          5.13E+04    2.2     1675.5
      Rate coefficients at P=1.00E-01(atm)          3.99E+05    1.9     2218.3
      Rate coefficients at P=1.00E+00(atm)          1.75E+07    1.4     3428.0
      Rate coefficients at P=1.00E+01(atm)          1.35E+09    0.9     5173.0
      Rate coefficients at P=1.00E+02(atm)          2.24E+11    0.4     8001.3
      Rate coefficients at P=1.00E+03(atm)          6.01E+05    2.1     7895.6
1452. C3H5-T+CH2O<=>C3H6+HCO                         1.00E+11    0.0        0.0
      Rate coefficients at P=1.00E-03(atm)          1.11E+07    1.1     1807.2
      Rate coefficients at P=1.00E-02(atm)          2.47E+07    1.0     1994.9
      Rate coefficients at P=1.00E-01(atm)          2.47E+08    0.7     2596.2
      Rate coefficients at P=1.00E+00(atm)          1.42E+10    0.2     3934.2
      Rate coefficients at P=1.00E+01(atm)          3.45E+13   -0.7     6944.3
      Rate coefficients at P=1.00E+02(atm)          3.31E+14   -0.9    10965.7
      Rate coefficients at P=1.00E+03(atm)          1.65E+01    3.2     9399.8
1453. IC4H7+CH3O2<=>IC4H7O+CH3O                      1.00E+11    0.0        0.0
      Rate coefficients at P=1.00E-02(atm)          3.33E+12   -0.2    -1417.0
      Rate coefficients at P=1.00E-01(atm)          1.66E+14   -0.6     -349.1
      Rate coefficients at P=1.00E+00(atm)          2.60E+17   -1.5     2379.2
      Rate coefficients at P=1.00E+01(atm)          9.78E+14   -0.7     3615.3
      Rate coefficients at P=1.00E+02(atm)          5.47E+03    2.7     1144.4
1454. IC4H7+CH3O2<=>IC4H7OOCH3                       1.00E+11    0.0        0.0
      Rate coefficients at P=1.00E-02(atm)          1.91E+31   -7.2     1336.2
      Rate coefficients at P=1.00E-01(atm)          6.31E+42  -10.3     5568.9
      Rate coefficients at P=1.00E+00(atm)          1.03E+45  -10.6     7851.5
      Rate coefficients at P=1.00E+01(atm)          2.79E+37   -7.9     6497.9
      Rate coefficients at P=1.00E+02(atm)          3.40E+29   -5.3     4539.8
1455. IC4H7OOCH3<=>IC4H7O+CH3O                       1.00E+11    0.0        0.0
      Rate coefficients at P=1.00E-02(atm)          1.49E+58  -13.9    54266.9
      Rate coefficients at P=1.00E-01(atm)          1.80E+54  -12.4    54193.8
      Rate coefficients at P=1.00E+00(atm)          3.36E+46   -9.8    52468.5
      Rate coefficients at P=1.00E+01(atm)          2.39E+36   -6.5    49429.0
      Rate coefficients at P=1.00E+02(atm)          2.56E+27   -3.6    46333.1
1456. IC4H7O2+IC4H7<=>IC4H7O+IC4H7O                  1.00E+11    0.0        0.0
      Rate coefficients at P=1.00E-02(atm)          2.55E+12   -0.2    -1417.0
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	Rate coefficients at P=1.00E-01(atm)	1.25E+14	-0.6	-349.1
	Rate coefficients at P=1.00E+00(atm)	1.94E+17	-1.5	2379.2
	Rate coefficients at P=1.00E+01(atm)	7.33E+14	-0.7	3615.3
	Rate coefficients at P=1.00E+02(atm)	4.10E+03	2.7	1144.4
1457.	IC4H7O2+IC4H7<=>IC4H7OOIC4H7	1.00E+11	0.0	0.0
	Rate coefficients at P=1.00E-02(atm)	4.78E+30	-7.2	1336.2
	Rate coefficients at P=1.00E-01(atm)	1.58E+42	-10.3	5568.9
	Rate coefficients at P=1.00E+00(atm)	2.58E+44	-10.6	7851.5
	Rate coefficients at P=1.00E+01(atm)	6.98E+36	-7.9	6497.9
	Rate coefficients at P=1.00E+02(atm)	3.60E+31	-6.0	6053.6
1458.	IC4H7OOIC4H7<=>IC4H7O+IC4H7O	1.00E+11	0.0	0.0
	Rate coefficients at P=1.00E-02(atm)	3.73E+57	-13.9	54266.9
	Rate coefficients at P=1.00E-01(atm)	4.50E+53	-12.4	54193.8
	Rate coefficients at P=1.00E+00(atm)	8.40E+45	-9.8	52468.5
	Rate coefficients at P=1.00E+01(atm)	5.98E+35	-6.5	49429.0
	Rate coefficients at P=1.00E+02(atm)	3.20E+26	-3.6	46333.1
1459.	IC4H7+NC3H7O2<=>IC4H7O+NC3H7O	7.00E+12	0.0	-1000.0
1460.	IC4H7+PC4H9O2<=>IC4H7O+PC4H9O	7.00E+12	0.0	-1000.0
1461.	IC4H7+SC4H9O2<=>IC4H7O+SC4H9O	7.00E+12	0.0	-1000.0
1462.	IC4H7+IC3H7O2<=>IC4H7O+IC3H7O	7.00E+12	0.0	-1000.0
1463.	IC4H7+TC4H9O2<=>IC4H7O+TC4H9O	7.00E+12	0.0	-1000.0
1464.	IC4H7+IC4H7<=>C3H4-A+AC5H10	9.55E+40	-9.3	12470.0
	Rate coefficients at P=1.00E+00(atm)	4.10E+40	-9.3	12470.0
	Rate coefficients at P=4.00E+00(atm)	3.41E+32	-6.8	9180.0
	Rate coefficients at P=1.00E+01(atm)	1.26E+28	-5.5	7410.0
1465.	IC4H7+IC4H7<=>H15DE25DM	1.00E+11	0.0	0.0
	Rate coefficients at P=3.90E-02(atm)	3.27E+64	-15.9	20230.0
	Rate coefficients at P=7.80E-02(atm)	7.50E+59	-14.5	18600.0
	Rate coefficients at P=1.56E-01(atm)	1.14E+55	-13.0	16700.0
1466.	H15DE25DM+H<=>H15DE25DM-S+H2	1.42E+06	2.3	2076.0
1467.	H15DE25DM+O2<=>H15DE25DM-S+HO2	4.00E+14	0.0	38890.0
1468.	H15DE25DM+O<=>H15DE25DM-S+OH	1.59E+11	0.7	13.0
1469.	H15DE25DM+OH<=>H15DE25DM-S+H2O	8.95E+04	2.6	-6.0
1470.	H15DE25DM+HO2<=>H15DE25DM-S+H2O2	1.00E+00	3.9	9386.4
1471.	H15DE25DM+CH3<=>H15DE25DM-S+CH4	1.00E+00	3.6	3374.1
1472.	H15DE25DM+H<=>H15DE25DM-A+H2	7.29E+05	2.5	4361.2
1473.	H15DE25DM+O2<=>H15DE25DM-A+HO2	1.86E+09	1.3	40939.0
1474.	H15DE25DM+O<=>H15DE25DM-A+OH	1.05E+12	0.7	5884.0
1475.	H15DE25DM+OH<=>H15DE25DM-A+H2O	2.53E+05	2.5	729.4
1476.	H15DE25DM+HO2<=>H15DE25DM-A+H2O2	2.92E-01	4.1	12802.0
1477.	H15DE25DM+CH3<=>H15DE25DM-A+CH4	4.42E+00	3.5	5675.0
1478.	C3H5-T+B13DE2M<=>H15DE25DM-S	7.07E+03	2.5	6130.0
1479.	C3H4-A+AC5H9-D<=>H15DE25DM-A	2.84E+04	2.5	8847.5
1480.	H15DE25DM-S+HO2<=>H15DE25DM-SO+OH	7.00E+12	0.0	-1000.0
1481.	IC3H5CHO+IC4H7<=>H15DE25DM-SO	2.50E+10	0.0	6329.7
1482.	C3H5-T+IC4H7CHO<=>H15DE25DM-SO	2.50E+10	0.0	15526.4
1483.	H15DE25DM-A+HO2<=>H15DE25DM-AO+OH	7.00E+12	0.0	-1000.0
1484.	H15DE2M-T+CH2O<=>H15DE25DM-AO	2.50E+10	0.0	4786.6
1485.	IC4H7+C3H4-A<=>H15DE2M-T	8.80E+03	2.5	6130.0
1486.	IC4H7-I1+H<=>C3H4-A+CH4	3.33E+12	0.0	0.0
1487.	IC4H7-I1+H<=>C3H4-P+CH4	3.34E+12	0.0	0.0
1488.	IC4H7-I1+O<=>C3H6+HCO	6.00E+13	0.0	0.0
1489.	IC4H7-I1+OH=>C3H6+HCO+H	5.00E+12	0.0	0.0
1490.	IC4H7-I1+HO2=>C3H6+HCO+OH	2.00E+13	0.0	0.0
1491.	IC4H7-I1+HCO<=>IC4H8+CO	9.00E+13	0.0	0.0
1492.	IC4H7-I1+CH3<=>C3H4-P+C2H6	1.00E+11	0.0	0.0
1493.	IC4H7-I1+O2<=>CH3COCH3+HCO	3.10E+31	-5.9	5748.4
1494.	IC4H7-I1+O2<=>TC3H6CHO+O	5.38E+18	-2.1	5142.9
1495.	IC4H7-I1+O2<=>IC3H5CHO+OH	2.70E+19	-2.1	5142.9
1496.	IC4H7+O2<=>IC4H7O2	1.09E+10	0.6	2290.0
1497.	IC4H7+O<=>IC3H5CHO+H	6.03E+13	0.0	0.0
1498.	IC4H7O2<=>IC4H6OOH-I	1.41E+05	1.8	19820.0
1499.	IC4H7O2<=>CCYCCOOC-T1	1.19E+08	0.8	28020.0
1500.	IC4H7O2<=>C2CYCOOC-I1	1.07E+08	0.9	29720.0
1501.	IC4H7O2<=>IC4H7O+O	1.82E+14	0.0	60620.0
1502.	IC4H7O2<=>IC3H5CHO+OH	1.52E+09	1.0	39460.0
1503.	IC4H6OOH-I<=>CVCYCCOC+OH	6.82E+12	-0.3	42140.0
1504.	IC4H6OOH-I<=>C3H4-A+CH2O2H	1.18E+12	0.9	51390.0
1505.	IC4H6OOH-I<=>IC3H5CHO+OH	2.42E+09	0.9	54090.0
1506.	CCYCCOOC-T1<=>CCYC2OCO	4.56E+11	0.9	17470.0
1507.	CCYCCOOC-T1<=>CCYCCOOC-I2	3.56E+13	0.0	38820.0
1508.	CCYCCOOC-I2<=>CHOIC3H6O	3.19E+14	0.0	3000.0
1509.	C2CYCOOC-I1<=>IC3H5OOCH2	4.41E+13	-0.2	18500.0
1510.	IC3H5OOCH2<=>CH3COCH2+CH2O	1.41E+10	0.0	1000.0
1511.	CHOIC3H6O<=>CH3CHCHO+CH2O	4.30E+12	0.0	9780.0
1512.	CCYC2OCO<=>CCYCCO-T1+CH2O	1.74E+13	0.0	18150.0
1513.	C2CYCOOC-I1<=>CCYC2OCO	1.21E+13	0.1	20320.0
1514.	IC4H7O2+IC4H7O2=>IC4H7O+IC4H7O+O2	1.40E+16	-1.6	1860.0
1515.	IC4H7O2+IC4H8<=>IC4H7+IC4H7OOH	1.46E-01	4.1	12802.0
1516.	IC4H8+H<=>IC4H9	1.00E+00	1.0	0.0
	Rate coefficients at P=1.30E-03(atm)	7.99E+81	-23.2	22239.0
	Rate coefficients at P=4.00E-02(atm)	4.24E+68	-18.4	19665.0
	Rate coefficients at P=1.00E+00(atm)	1.04E+49	-11.5	15359.0
	Rate coefficients at P=1.00E+01(atm)	6.20E+41	-8.9	14637.0
	Declared duplicate reaction...			
1517.	IC4H8+H<=>IC4H9	1.00E+00	1.0	0.0
	Rate coefficients at P=1.30E-03(atm)	1.85E+26	-5.8	3865.8
	Rate coefficients at P=4.00E-02(atm)	2.82E+30	-6.5	5470.8
	Rate coefficients at P=1.00E+00(atm)	3.78E+28	-5.6	5625.1
	Rate coefficients at P=1.00E+01(atm)	1.46E+25	-4.3	5247.8
	Rate coefficients at P=1.00E+02(atm)	4.22E+27	-4.4	9345.8
	Declared duplicate reaction...			
1518.	IC4H8+H<=>TC4H9	1.00E+00	1.0	1.0
	Rate coefficients at P=1.30E-03(atm)	1.35E+44	-10.7	8196.4

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      Rate coefficients at P=4.00E-02(atm)          2.11E+57  -14.2    15147.0
      Rate coefficients at P=1.00E+00(atm)          3.26E+61  -14.9    20161.0
      Rate coefficients at P=1.00E+01(atm)          5.30E+56  -13.1    20667.0
      Rate coefficients at P=1.00E+02(atm)          1.11E+50  -10.8    20202.0
      Declared duplicate reaction...
1519. IC4H8+H<=>TC4H9                                1.00E+00    1.0        1.0
      Rate coefficients at P=1.30E-03(atm)          2.17+130  -32.6   136140.0
      Rate coefficients at P=4.00E-02(atm)          2.25E+29   -5.8     4241.9
      Rate coefficients at P=1.00E+00(atm)          1.06E+30   -5.6     5613.4
      Rate coefficients at P=1.00E+01(atm)          6.11E+26   -4.4     5182.3
      Rate coefficients at P=1.00E+02(atm)          2.73E+23   -3.3     4597.0
      Declared duplicate reaction...
1520. IC4H8+H<=>C3H6+CH3                             1.00E+00    1.0        1.0
      Rate coefficients at P=1.30E-03(atm)          5.13E+08    1.4     2542.0
      Rate coefficients at P=4.00E-02(atm)          2.63E+10    0.9     3599.6
      Rate coefficients at P=1.00E+00(atm)          8.90E+11    0.5     5431.1
      Rate coefficients at P=1.00E+01(atm)          3.08E+22   -2.6    12898.0
      Rate coefficients at P=1.00E+02(atm)          4.40E+22   -2.4    16500.0
      Declared duplicate reaction...
1521. IC4H8+H<=>C3H6+CH3                             1.00E+00    1.0        1.0
      Rate coefficients at P=1.30E-03(atm)          7.70E+02    1.4     2542.0
      Rate coefficients at P=4.00E-02(atm)          3.94E+04    0.9     3599.6
      Rate coefficients at P=1.00E+00(atm)          1.34E+06    0.5     5431.1
      Rate coefficients at P=1.00E+01(atm)          4.13E+04    2.5     3679.1
      Rate coefficients at P=1.00E+02(atm)          8.37E+02    2.9     3980.9
      Declared duplicate reaction...
1522. IC4H8+HO2<=>TC4H9O2                            1.04E-01    3.5     4338.0
1523. IC4H8+HO2<=>IC4H8O2H-T                         1.64E+04    2.4     8300.0
1524. IC4H8+HO2<=>TC4H8O2H-I                         1.00E+11    0.0        0.0
      Rate coefficients at P=1.30E-02(atm)          6.67E+14   -2.1    14188.0
      Rate coefficients at P=9.87E-01(atm)          6.25E+06    0.6     9073.0
      Rate coefficients at P=9.87E+00(atm)          7.96E+06    0.8     8771.0
      Rate coefficients at P=9.87E+01(atm)          2.05E+13   -0.8    12919.0
1525. IC4H8+HO2<=>IC4H8O+OH                          1.00E+11    0.0        0.0
      Rate coefficients at P=1.30E-02(atm)          1.18E+04    2.3    11321.0
      Rate coefficients at P=9.87E-01(atm)          5.30E+04    2.1    11797.0
      Rate coefficients at P=9.87E+00(atm)          1.47E+09    0.8    14808.0
      Rate coefficients at P=9.87E+01(atm)          1.96E+17   -1.4    21195.0
1526. TC4H8O2H-I<=>IC4H8O+OH                         1.00E+11    0.0        0.0
      Rate coefficients at P=1.30E-02(atm)          5.23E+17   -3.0     8215.0
      Rate coefficients at P=9.87E-01(atm)          4.39E+22   -3.9    11424.0
      Rate coefficients at P=9.87E+00(atm)          4.00E+25   -4.5    13952.0
      Rate coefficients at P=9.87E+01(atm)          1.21E+27   -4.7    16324.0
1527. IC4H8+O<=>IC3H7+HCO                            7.45E+06    1.9      183.0
1528. IC4H8+O=>CH2CO+CH3+CH3                         3.05E+06    1.9      183.0
1529. IC4H8+O=>IC3H6CO+H+H                           3.05E+06    1.9      183.0
1530. IC4H8+OH<=>IC4H7OH+H                           2.29E+13    0.1    10580.0
      Rate coefficients at P=1.30E-03(atm)          2.67E+13    0.1    10611.0
      Rate coefficients at P=1.00E-02(atm)          2.75E+13    0.1    10623.0
      Rate coefficients at P=1.30E-02(atm)          2.87E+13    0.0    10634.0
      Rate coefficients at P=2.50E-02(atm)          1.59E+14   -0.2    11125.0
      Rate coefficients at P=1.00E-01(atm)          3.10E+14   -0.2    11407.0
      Rate coefficients at P=1.32E-01(atm)          3.78E+14   -0.2    11458.0
      Rate coefficients at P=1.00E+00(atm)          9.15E+07    1.4    10087.0
      Rate coefficients at P=1.00E+01(atm)          3.66E+05    2.1    10410.0
      Rate coefficients at P=1.00E+02(atm)          8.19E+02    2.8    10481.0
1531. IC4H8+OH<=>SC3H5OH+CH3                         1.29E+06    1.6     1233.0
      Rate coefficients at P=1.30E-03(atm)          5.16E+05    1.6     1233.0
      Rate coefficients at P=1.00E-02(atm)          7.28E+03    2.1     1162.0
      Rate coefficients at P=1.30E-02(atm)          8.16E+02    2.5     1128.0
      Rate coefficients at P=2.50E-02(atm)          1.15E+02    2.8     1152.0
      Rate coefficients at P=1.00E-01(atm)          5.60E+00    3.2     1208.0
      Rate coefficients at P=1.32E-01(atm)          3.08E+00    3.3     1216.0
      Rate coefficients at P=1.00E+00(atm)          4.52E+03    2.5     3238.0
      Rate coefficients at P=1.00E+01(atm)          9.64E+18   -1.7    13107.0
      Rate coefficients at P=1.00E+02(atm)          1.32E-01    3.7     3665.0
1532. IC4H8+OH<=>IC3H5OH+CH3                         1.29E+06    1.6     1233.0
      Rate coefficients at P=1.30E-03(atm)          2.06E+06    1.6     1233.0
      Rate coefficients at P=1.00E-02(atm)          2.91E+04    2.1     1162.0
      Rate coefficients at P=1.30E-02(atm)          3.26E+03    2.5     1128.0
      Rate coefficients at P=2.50E-02(atm)          4.61E+02    2.8     1152.0
      Rate coefficients at P=1.00E-01(atm)          2.24E+01    3.2     1208.0
      Rate coefficients at P=1.32E-01(atm)          1.23E+01    3.3     1216.0
      Rate coefficients at P=1.00E+00(atm)          1.81E+04    2.5     3238.0
      Rate coefficients at P=1.00E+01(atm)          3.86E+19   -1.7    13107.0
      Rate coefficients at P=1.00E+02(atm)          5.28E-01    3.7     3665.0
1533. IC4H8+OH<=>SC4H7OH-I+H                         2.87E+00    2.9      625.0
      Rate coefficients at P=1.30E-03(atm)          2.87E+00    2.9      625.0
      Rate coefficients at P=1.00E-02(atm)          4.84E-01    3.0      704.0
      Rate coefficients at P=1.30E-02(atm)          3.13E-01    3.0      721.0
      Rate coefficients at P=2.50E-02(atm)          9.33E-03    3.6      677.0
      Rate coefficients at P=1.00E-01(atm)          4.64E-05    4.5      687.0
      Rate coefficients at P=1.32E-01(atm)          2.71E-05    4.6      707.0
      Rate coefficients at P=1.00E+00(atm)          7.65E-07    5.0      874.0
      Rate coefficients at P=1.00E+01(atm)          2.64E+15   -0.8    12728.0
      Rate coefficients at P=1.00E+02(atm)          4.87E-04    4.3     4020.0
1534. IC4H8+OH<=>CH3COCH3+CH3                        6.93E+05    1.5     -536.0
      Rate coefficients at P=1.30E-03(atm)          6.93E+05    1.5     -536.0
      Rate coefficients at P=1.00E-02(atm)          5.94E+03    2.0     -560.0
      Rate coefficients at P=1.30E-02(atm)          1.10E+03    2.2     -680.0
      Rate coefficients at P=2.50E-02(atm)          1.07E+02    2.5     -759.0
      Rate coefficients at P=1.00E-01(atm)          7.83E-01    3.1     -919.0
      Rate coefficients at P=1.32E-01(atm)          3.07E-01    3.2     -946.0
      Rate coefficients at P=1.00E+00(atm)          3.16E-04    4.0    -1144.0
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      Rate coefficients at P=1.00E+01(atm)          7.59E-06    4.5     -680.0
      Rate coefficients at P=1.00E+02(atm)          5.45E-05    4.2     1141.0
1535. IC4H8+OH<=>IC4H8OH-IT                          5.10E+54  -20.7    32402.0
      Rate coefficients at P=1.30E-03(atm)          2.30E+78  -20.7    32402.0
      Rate coefficients at P=1.00E-02(atm)          2.74E+77  -20.0    33874.0
      Rate coefficients at P=1.30E-02(atm)          1.07E+76  -19.6    32874.0
      Rate coefficients at P=2.50E-02(atm)          3.68E+73  -18.8    31361.0
      Rate coefficients at P=1.00E-01(atm)          1.04E+68  -17.0    27909.0
      Rate coefficients at P=1.32E-01(atm)          7.23E+66  -16.6    27162.0
      Rate coefficients at P=1.00E+00(atm)          1.95E+59  -14.2    23079.0
      Rate coefficients at P=1.00E+01(atm)          7.58E+53  -12.2    22976.0
      Rate coefficients at P=1.00E+02(atm)          1.43E+48  -10.2    23772.0
      Declared duplicate reaction...
1536. IC4H8+OH<=>IC4H8OH-IT                          1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.30E-03(atm)          6.41E+59  -15.8    11594.0
      Rate coefficients at P=1.00E-02(atm)          7.28E+59  -15.5    12898.0
      Rate coefficients at P=1.30E-02(atm)          2.79E+59  -15.3    12913.0
      Rate coefficients at P=2.50E-02(atm)          2.65E+58  -14.9    12936.0
      Rate coefficients at P=1.00E-01(atm)          1.35E+56  -14.0    12945.0
      Rate coefficients at P=1.32E-01(atm)          3.98E+55  -13.8    12887.0
      Rate coefficients at P=1.00E+00(atm)          1.55E+50  -12.0    11493.0
      Rate coefficients at P=1.00E+01(atm)          6.41E+41   -9.3     8921.0
      Rate coefficients at P=1.00E+02(atm)          2.30E+32   -6.3     6088.0
      Declared duplicate reaction...
1537. IC4H8+OH<=>IC4H8OH-TI                          5.10E+54  -20.7    32402.0
      Rate coefficients at P=1.30E-03(atm)          2.14E+59  -15.8    11594.0
      Rate coefficients at P=1.00E-02(atm)          2.43E+59  -15.5    12898.0
      Rate coefficients at P=1.30E-02(atm)          9.30E+58  -15.3    12913.0
      Rate coefficients at P=2.50E-02(atm)          8.83E+57  -14.9    12936.0
      Rate coefficients at P=1.00E-01(atm)          4.50E+55  -14.0    12945.0
      Rate coefficients at P=1.32E-01(atm)          1.33E+55  -13.8    12887.0
      Rate coefficients at P=1.00E+00(atm)          5.18E+49  -12.0    11493.0
      Rate coefficients at P=1.00E+01(atm)          2.14E+41   -9.3     8921.0
      Rate coefficients at P=1.00E+02(atm)          7.65E+31   -6.3     6088.0
      Declared duplicate reaction...
1538. IC4H8+OH<=>IC4H8OH-TI                          1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.30E-03(atm)          7.68E+77  -20.7    32402.0
      Rate coefficients at P=1.00E-02(atm)          9.13E+76  -20.0    33874.0
      Rate coefficients at P=1.30E-02(atm)          3.55E+75  -19.6    32874.0
      Rate coefficients at P=2.50E-02(atm)          1.23E+73  -18.8    31361.0
      Rate coefficients at P=1.00E-01(atm)          3.45E+67  -17.0    27909.0
      Rate coefficients at P=1.32E-01(atm)          2.41E+66  -16.6    27162.0
      Rate coefficients at P=1.00E+00(atm)          6.50E+58  -14.2    23079.0
      Rate coefficients at P=1.00E+01(atm)          2.53E+53  -12.2    22976.0
      Rate coefficients at P=1.00E+02(atm)          4.78E+47  -10.2    23772.0
      Declared duplicate reaction...
1539. IC4H8OH-IT+O2<=>TQJC4H8OH                      1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          1.05+114  -33.8    24741.0
      Rate coefficients at P=1.00E-02(atm)          2.13+114  -33.4    26448.0
      Rate coefficients at P=1.00E-01(atm)          1.62+110  -31.8    26612.0
      Rate coefficients at P=1.00E+00(atm)          6.00+101  -28.8    25197.0
      Rate coefficients at P=1.00E+01(atm)          5.36E+89  -24.8    22402.0
      Rate coefficients at P=4.00E+01(atm)          1.55E+81  -21.9    20197.0
      Rate coefficients at P=1.00E+02(atm)          1.51E+75  -20.0    18578.0
      Rate coefficients at P=2.00E+02(atm)          3.16E+70  -18.5    17287.0
1540. IC4H8OH-IT+O2<=>IC4H7OH+HO2                    1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          1.21E+26   -5.1     5755.0
      Rate coefficients at P=1.00E-02(atm)          1.41E+31   -6.5     8781.0
      Rate coefficients at P=1.00E-01(atm)          5.08E+34   -7.5    11702.0
      Rate coefficients at P=1.00E+00(atm)          1.67E+34   -7.3    13418.0
      Rate coefficients at P=1.00E+01(atm)          2.82E+28   -5.4    13318.0
      Rate coefficients at P=4.00E+01(atm)          2.50E+22   -3.5    12314.0
      Rate coefficients at P=1.00E+02(atm)          2.82E+17   -2.0    11286.0
      Rate coefficients at P=2.00E+02(atm)          1.93E+13   -0.7    10340.0
      Declared duplicate reaction...
1541. IC4H8OH-IT+O2<=>IC4H7OH+HO2                    1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          2.45E+21   -4.2     6837.0
      Rate coefficients at P=1.00E-02(atm)          1.40E+30   -6.8    11554.0
      Rate coefficients at P=1.00E-01(atm)          9.11E+39   -9.6    17834.0
      Rate coefficients at P=1.00E+00(atm)          5.16E+42  -10.2    22412.0
      Rate coefficients at P=1.00E+01(atm)          6.07E+32   -6.9    22738.0
      Rate coefficients at P=4.00E+01(atm)          3.88E+20   -3.1    20677.0
      Rate coefficients at P=1.00E+02(atm)          3.32E+10    0.0    18552.0
      Rate coefficients at P=2.00E+02(atm)          1.22E+02    2.6    16623.0
      Declared duplicate reaction...
1542. IC4H8OH-IT+O2<=>SC4H7OH-I+HO2                  1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          1.26E+25   -4.7     5755.0
      Rate coefficients at P=1.00E-02(atm)          1.44E+30   -6.2     8785.0
      Rate coefficients at P=1.00E-01(atm)          4.78E+33   -7.1    11695.0
      Rate coefficients at P=1.00E+00(atm)          1.40E+33   -6.8    13395.0
      Rate coefficients at P=1.00E+01(atm)          2.12E+27   -5.0    13277.0
      Rate coefficients at P=4.00E+01(atm)          1.78E+21   -3.1    12265.0
      Rate coefficients at P=1.00E+02(atm)          1.97E+16   -1.5    11234.0
      Rate coefficients at P=2.00E+02(atm)          1.32E+12   -0.2    10285.0
      Declared duplicate reaction...
1543. IC4H8OH-IT+O2<=>SC4H7OH-I+HO2                  1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          3.22E+23   -4.7     5341.0
      Rate coefficients at P=1.00E-02(atm)          4.80E+28   -6.2     8461.0
      Rate coefficients at P=1.00E-01(atm)          1.71E+32   -7.2    11410.0
      Rate coefficients at P=1.00E+00(atm)          1.53E+32   -7.0    13378.0
      Rate coefficients at P=1.00E+01(atm)          5.55E+29   -6.1    15100.0
      Rate coefficients at P=4.00E+01(atm)          1.72E+26   -5.0    15849.0
      Rate coefficients at P=1.00E+02(atm)          4.46E+21   -3.5    15644.0
      Rate coefficients at P=2.00E+02(atm)          5.06E+16   -2.0    14979.0
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     Declared duplicate reaction...
1544. IC4H8OH-IT+O2<=>TQC4H8OI                    1.42E+36  -15.8    11594.0
     Rate coefficients at P=1.00E-03(atm)         6.36+104  -33.7    22390.0
     Rate coefficients at P=1.00E-02(atm)         7.96+103  -33.0    22966.0
     Rate coefficients at P=1.00E-01(atm)         6.99E+96  -30.5    20584.0
     Rate coefficients at P=1.00E+00(atm)         1.04E+88  -27.5    16629.0
     Rate coefficients at P=1.00E+01(atm)         3.13E+96  -29.6    20346.0
     Rate coefficients at P=4.00E+01(atm)         2.79+105  -32.0    24971.0
     Rate coefficients at P=1.00E+02(atm)         4.64+109  -33.1    27657.0
     Rate coefficients at P=2.00E+02(atm)         2.06+111  -33.5    29197.0
1545. IC4H8OH-IT+O2=>CH3COCH3+CH2O+OH             1.42E+36  -15.8    11594.0
     Rate coefficients at P=1.00E-03(atm)         3.03E+37   -8.3     6940.0
     Rate coefficients at P=1.00E-02(atm)         1.07E+42   -9.6     9965.0
     Rate coefficients at P=1.00E-01(atm)         9.22E+43  -10.1    12427.0
     Rate coefficients at P=1.00E+00(atm)         1.14E+42   -9.4    13806.0
     Rate coefficients at P=1.00E+01(atm)         1.80E+38   -8.1    15131.0
     Rate coefficients at P=4.00E+01(atm)         1.61E+34   -6.8    15691.0
     Rate coefficients at P=1.00E+02(atm)         7.00E+29   -5.4    15552.0
     Rate coefficients at P=2.00E+02(atm)         3.74E+25   -4.1    15118.0
1546. IC4H8OH-IT+O2<=>QC4H7OHP                    1.42E+36  -15.8    11594.0
     Rate coefficients at P=1.00E-03(atm)         1.18+118  -37.6    26229.0
     Rate coefficients at P=1.00E-02(atm)         1.91+131  -40.7    34079.0
     Rate coefficients at P=1.00E-01(atm)         5.81+138  -42.2    40750.0
     Rate coefficients at P=1.00E+00(atm)         5.05+134  -40.2    43580.0
     Rate coefficients at P=1.00E+01(atm)         2.07+117  -34.3    41516.0
     Rate coefficients at P=4.00E+01(atm)         1.71+101  -29.0    38094.0
     Rate coefficients at P=1.00E+02(atm)         1.25E+89  -25.1    35203.0
     Rate coefficients at P=2.00E+02(atm)         2.98E+79  -22.1    32802.0
1547. IC4H8OH-IT+O2<=>CCY(CCO)COH+OH              1.42E+36  -15.8    11594.0
     Rate coefficients at P=1.00E-03(atm)         2.11E+18   -2.9     6870.0
     Rate coefficients at P=1.00E-02(atm)         3.02E+27   -5.5    11842.0
     Rate coefficients at P=1.00E-01(atm)         1.36E+37   -8.3    18165.0
     Rate coefficients at P=1.00E+00(atm)         1.21E+39   -8.7    22517.0
     Rate coefficients at P=1.00E+01(atm)         1.53E+28   -5.1    22530.0
     Rate coefficients at P=4.00E+01(atm)         2.72E+15   -1.2    20283.0
     Rate coefficients at P=1.00E+02(atm)         1.06E+05    2.1    18044.0
     Rate coefficients at P=2.00E+02(atm)         2.30E-04    4.7    16037.0
1548. IC4H8OH-IT+O2<=>TQC4H7OHI                   1.42E+36  -15.8    11594.0
     Rate coefficients at P=1.00E-03(atm)         1.76E+53  -19.9     9019.0
     Rate coefficients at P=1.00E-02(atm)         4.68E+67  -23.9    11892.0
     Rate coefficients at P=1.00E-01(atm)         2.07E+91  -30.6    17347.0
     Rate coefficients at P=1.00E+00(atm)         2.84+100  -32.4    20041.0
     Rate coefficients at P=1.00E+01(atm)         1.16+115  -35.8    27656.0
     Rate coefficients at P=4.00E+01(atm)         4.87+123  -37.8    33314.0
     Rate coefficients at P=1.00E+02(atm)         7.95+124  -37.8    35683.0
     Rate coefficients at P=2.00E+02(atm)         4.58+122  -36.9    36374.0
1549. IC4H8OH-IT+O2<=>C2CY(COC)OH+OH              1.42E+36  -15.8    11594.0
     Rate coefficients at P=1.00E-03(atm)         1.42E+32   -7.0     6210.0
     Rate coefficients at P=1.00E-02(atm)         5.19E+36   -8.2     9233.0
     Rate coefficients at P=1.00E-01(atm)         5.77E+38   -8.8    11715.0
     Rate coefficients at P=1.00E+00(atm)         2.86E+36   -8.0    12823.0
     Rate coefficients at P=1.00E+01(atm)         1.37E+32   -6.5    13646.0
     Rate coefficients at P=4.00E+01(atm)         2.15E+29   -5.6    14541.0
     Rate coefficients at P=1.00E+02(atm)         1.20E+26   -4.5    14778.0
     Rate coefficients at P=2.00E+02(atm)         3.31E+22   -3.4    14606.0
1550. TQJC4H8OH<=>IC4H7OH+HO2                     1.42E+36  -15.8    11594.0
     Rate coefficients at P=1.00E-03(atm)         9.73E+65  -18.5    42975.0
     Rate coefficients at P=1.00E-02(atm)         1.04E+64  -17.2    44419.0
     Rate coefficients at P=1.00E-01(atm)         7.90E+59  -15.6    44504.0
     Rate coefficients at P=1.00E+00(atm)         9.35E+53  -13.5    43566.0
     Rate coefficients at P=1.00E+01(atm)         4.13E+44  -10.4    41279.0
     Rate coefficients at P=4.00E+01(atm)         6.57E+38   -8.5    39745.0
     Rate coefficients at P=1.00E+02(atm)         8.32E+34   -7.2    38675.0
     Rate coefficients at P=2.00E+02(atm)         9.46E+31   -6.3    37849.0
     Declared duplicate reaction...
1551. TQJC4H8OH<=>IC4H7OH+HO2                     1.42E+36  -15.8    11594.0
     Rate coefficients at P=1.00E-03(atm)         5.27E+64  -18.0    42872.0
     Rate coefficients at P=1.00E-02(atm)         4.82E+62  -16.7    44284.0
     Rate coefficients at P=1.00E-01(atm)         3.42E+58  -15.1    44348.0
     Rate coefficients at P=1.00E+00(atm)         4.05E+52  -13.0    43402.0
     Rate coefficients at P=1.00E+01(atm)         1.93E+43   -9.9    41120.0
     Rate coefficients at P=4.00E+01(atm)         3.28E+37   -8.0    39593.0
     Rate coefficients at P=1.00E+02(atm)         4.35E+33   -6.7    38527.0
     Rate coefficients at P=2.00E+02(atm)         5.13E+30   -5.8    37706.0
     Declared duplicate reaction...
1552. TQJC4H8OH<=>TQC4H8OI                        1.42E+36  -15.8    11594.0
     Rate coefficients at P=1.00E-03(atm)         3.78E+50  -12.9    31539.0
     Rate coefficients at P=1.00E-02(atm)         1.42E+45  -10.9    30864.0
     Rate coefficients at P=1.00E-01(atm)         1.50E+40   -9.2    29932.0
     Rate coefficients at P=1.00E+00(atm)         3.12E+35   -7.6    28864.0
     Rate coefficients at P=1.00E+01(atm)         2.73E+29   -5.7    27243.0
     Rate coefficients at P=4.00E+01(atm)         8.88E+25   -4.5    26272.0
     Rate coefficients at P=1.00E+02(atm)         4.60E+23   -3.8    25622.0
     Rate coefficients at P=2.00E+02(atm)         9.08E+21   -3.2    25131.0
1553. TQJC4H8OH<=>QC4H7OHP                        1.42E+36  -15.8    11594.0
     Rate coefficients at P=1.00E-03(atm)         9.16E+62  -18.0    45297.0
     Rate coefficients at P=1.00E-02(atm)         2.56E+62  -17.1    47393.0
     Rate coefficients at P=1.00E-01(atm)         1.25E+59  -15.6    47984.0
     Rate coefficients at P=1.00E+00(atm)         1.97E+53  -13.5    47281.0
     Rate coefficients at P=1.00E+01(atm)         1.91E+43  -10.2    44926.0
     Rate coefficients at P=4.00E+01(atm)         7.68E+36   -8.1    43267.0
     Rate coefficients at P=1.00E+02(atm)         3.49E+32   -6.6    42089.0
     Rate coefficients at P=2.00E+02(atm)         1.77E+29   -5.6    41173.0
1554. TQJC4H8OH<=>TQC4H7OHI                       1.42E+36  -15.8    11594.0
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      Rate coefficients at P=1.00E-03(atm)          9.57E+58  -16.0    38293.0
      Rate coefficients at P=1.00E-02(atm)          7.27E+54  -14.2    38593.0
      Rate coefficients at P=1.00E-01(atm)          8.30E+49  -12.4    38031.0
      Rate coefficients at P=1.00E+00(atm)          1.90E+44  -10.5    36905.0
      Rate coefficients at P=1.00E+01(atm)          2.18E+36   -7.9    34865.0
      Rate coefficients at P=4.00E+01(atm)          4.10E+31   -6.4    33581.0
      Rate coefficients at P=1.00E+02(atm)          3.00E+28   -5.3    32704.0
      Rate coefficients at P=2.00E+02(atm)          1.34E+26   -4.6    32035.0
1555. TQC4H8OI=>CH3COCH3+CH2O+OH                     1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          8.09E+38   -9.9    19096.0
      Rate coefficients at P=1.00E-02(atm)          9.09E+39   -9.9    19135.0
      Rate coefficients at P=1.00E-01(atm)          1.89E+41  -10.0    19407.0
      Rate coefficients at P=1.00E+00(atm)          7.47E+23   -4.1    14658.0
      Rate coefficients at P=1.00E+01(atm)          2.95E+33   -6.8    18685.0
      Rate coefficients at P=4.00E+01(atm)          4.24E+36   -7.6    20307.0
      Rate coefficients at P=1.00E+02(atm)          7.83E+36   -7.5    20747.0
      Rate coefficients at P=2.00E+02(atm)          7.63E+35   -7.2    20641.0
1556. QC4H7OHP<=>IC4H7OH+HO2                         1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          3.29E+57  -15.6    28576.0
      Rate coefficients at P=1.00E-02(atm)          9.65E+58  -15.8    29927.0
      Rate coefficients at P=1.00E-01(atm)          2.19E+50  -12.7    28547.0
      Rate coefficients at P=1.00E+00(atm)          1.67E+49  -12.1    29204.0
      Rate coefficients at P=1.00E+01(atm)          7.08E+40   -9.3    27188.0
      Rate coefficients at P=4.00E+01(atm)          1.32E+30   -5.8    24071.0
      Rate coefficients at P=1.00E+02(atm)          1.15E+30   -5.8    24053.0
      Rate coefficients at P=2.00E+02(atm)          1.12E+30   -5.8    24050.0
1557. QC4H7OHP<=>CCY(CCO)COH+OH                      1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          1.11E+51  -13.0    28497.0
      Rate coefficients at P=1.00E-02(atm)          5.58E+51  -12.9    29529.0
      Rate coefficients at P=1.00E-01(atm)          3.03E+44  -10.3    28326.0
      Rate coefficients at P=1.00E+00(atm)          1.42E+44  -10.0    28986.0
      Rate coefficients at P=1.00E+01(atm)          9.69E+37   -7.9    27491.0
      Rate coefficients at P=4.00E+01(atm)          5.90E+29   -5.3    25095.0
      Rate coefficients at P=1.00E+02(atm)          5.27E+29   -5.3    25081.0
      Rate coefficients at P=2.00E+02(atm)          5.15E+29   -5.3    25078.0
1558. TQC4H7OHI<=>C2CY(COC)OH+OH                     1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          1.10E+31   -7.2    14640.0
      Rate coefficients at P=1.00E-02(atm)          1.37E+32   -7.2    14716.0
      Rate coefficients at P=1.00E-01(atm)          3.34E+33   -7.3    15127.0
      Rate coefficients at P=1.00E+00(atm)          1.86E+23   -3.7    12864.0
      Rate coefficients at P=1.00E+01(atm)          9.88E+31   -6.2    16040.0
      Rate coefficients at P=4.00E+01(atm)          1.25E+34   -6.8    17056.0
      Rate coefficients at P=1.00E+02(atm)          7.73E+33   -6.7    17176.0
      Rate coefficients at P=2.00E+02(atm)          2.13E+33   -6.5    17170.0
1559. TQC4H7OHI<=>SC4H7OH-I+HO2                      1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          6.01E+27   -7.3    14658.0
      Rate coefficients at P=1.00E-02(atm)          7.78E+28   -7.3    14733.0
      Rate coefficients at P=1.00E-01(atm)          3.27E+30   -7.5    15191.0
      Rate coefficients at P=1.00E+00(atm)          2.81E+17   -2.8    12336.0
      Rate coefficients at P=1.00E+01(atm)          1.92E+26   -5.2    16146.0
      Rate coefficients at P=4.00E+01(atm)          7.61E+27   -5.5    17483.0
      Rate coefficients at P=1.00E+02(atm)          1.91E+26   -4.9    17429.0
      Rate coefficients at P=2.00E+02(atm)          2.94E+24   -4.2    17285.0
1560. IC4H8OH-TI+O2<=>IQJC4H8OH                      1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          3.34+111  -32.7    25143.0
      Rate coefficients at P=1.00E-02(atm)          4.84+107  -31.1    25460.0
      Rate coefficients at P=1.00E-01(atm)          2.41+100  -28.4    24474.0
      Rate coefficients at P=1.00E+00(atm)          4.55E+89  -24.8    22176.0
      Rate coefficients at P=1.00E+01(atm)          1.14E+76  -20.3    18721.0
      Rate coefficients at P=4.00E+01(atm)          9.25E+66  -17.4    16238.0
      Rate coefficients at P=1.00E+02(atm)          6.20E+60  -15.4    14499.0
      Rate coefficients at P=2.00E+02(atm)          1.30E+56  -13.9    13159.0
1561. IC4H8OH-TI+O2<=>IC3H6OHCHO+OH                  1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          1.59E+15   -1.6     8947.0
      Rate coefficients at P=1.00E-02(atm)          5.07E+20   -3.2    11938.0
      Rate coefficients at P=1.00E-01(atm)          5.00E+25   -4.7    15251.0
      Rate coefficients at P=1.00E+00(atm)          3.18E+26   -4.8    17388.0
      Rate coefficients at P=1.00E+01(atm)          6.00E+20   -3.0    17297.0
      Rate coefficients at P=4.00E+01(atm)          1.70E+14   -0.9    16099.0
      Rate coefficients at P=1.00E+02(atm)          7.91E+08    0.7    14913.0
      Rate coefficients at P=2.00E+02(atm)          3.03E+04    2.1    13854.0
1562. IC4H8OH-TI+O2<=>IQC4H8OT                       1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          1.12+102  -32.4    23496.0
      Rate coefficients at P=1.00E-02(atm)          4.23E+95  -30.0    22067.0
      Rate coefficients at P=1.00E-01(atm)          3.45E+83  -26.1    17114.0
      Rate coefficients at P=1.00E+00(atm)          8.16E+82  -25.6    16198.0
      Rate coefficients at P=1.00E+01(atm)          1.04E+97  -29.5    22648.0
      Rate coefficients at P=4.00E+01(atm)          7.25+103  -31.4    26487.0
      Rate coefficients at P=1.00E+02(atm)          2.48+106  -32.1    28397.0
      Rate coefficients at P=2.00E+02(atm)          1.39+107  -32.2    29446.0
1563. IC4H8OH-TI+O2=>CH3COCH3+CH2O+OH                1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          4.39E+48  -11.9    11603.0
      Rate coefficients at P=1.00E-02(atm)          9.82E+50  -12.5    14143.0
      Rate coefficients at P=1.00E-01(atm)          3.43E+49  -11.9    15561.0
      Rate coefficients at P=1.00E+00(atm)          2.43E+45  -10.6    16415.0
      Rate coefficients at P=1.00E+01(atm)          4.98E+39   -8.7    17473.0
      Rate coefficients at P=4.00E+01(atm)          7.99E+33   -6.8    17502.0
      Rate coefficients at P=1.00E+02(atm)          1.02E+29   -5.3    17165.0
      Rate coefficients at P=2.00E+02(atm)          7.18E+24   -4.0    16747.0
1564. IC4H8OH-TI+O2<=>CH3+C3KET21                    1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          2.91E+40   -9.2    10830.0
      Rate coefficients at P=1.00E-02(atm)          9.66E+43  -10.2    13698.0
      Rate coefficients at P=1.00E-01(atm)          1.34E+44  -10.1    15661.0
      Rate coefficients at P=1.00E+00(atm)          2.57E+41   -9.2    17047.0
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Rate coefficients at P=1.00E+01(atm)	1.82E+36	-7.5	18330.0
Rate coefficients at P=4.00E+01(atm)	8.82E+29	-5.4	18205.0
Rate coefficients at P=1.00E+02(atm)	1.74E+24	-3.6	17600.0
Rate coefficients at P=2.00E+02(atm)	2.16E+19	-2.1	16925.0
1565. IC4H8OH-TI+O2<=>IQC4H7OHT	1.42E+36	-15.8	11594.0
Rate coefficients at P=1.00E-03(atm)	1.03+115	-35.1	25407.0
Rate coefficients at P=1.00E-02(atm)	1.10+129	-38.9	32891.0
Rate coefficients at P=1.00E-01(atm)	5.15+135	-40.4	38573.0
Rate coefficients at P=1.00E+00(atm)	7.27+129	-38.1	39933.0
Rate coefficients at P=1.00E+01(atm)	4.50+112	-32.5	37045.0
Rate coefficients at P=4.00E+01(atm)	7.72E+97	-27.8	33612.0
Rate coefficients at P=1.00E+02(atm)	5.17E+86	-24.3	30799.0
Rate coefficients at P=2.00E+02(atm)	4.70E+77	-21.4	28440.0
1566. IC4H8OH-TI+O2=>IC3H5OH+CH2O+OH	1.42E+36	-15.8	11594.0
Rate coefficients at P=1.00E-03(atm)	5.10E+24	-4.3	13009.0
Rate coefficients at P=1.00E-02(atm)	6.91E+33	-7.0	17935.0
Rate coefficients at P=1.00E-01(atm)	1.74E+41	-9.0	23613.0
Rate coefficients at P=1.00E+00(atm)	2.26E+36	-7.3	25633.0
Rate coefficients at P=1.00E+01(atm)	3.15E+17	-1.4	22782.0
Rate coefficients at P=4.00E+01(atm)	9.35E+00	3.7	19114.0
Rate coefficients at P=1.00E+02(atm)	5.59E-12	7.5	16156.0
Rate coefficients at P=2.00E+02(atm)	1.27E-21	10.4	13733.0
1567. IC4H8OH-TI+O2<=>CCY(CCOC)OH+OH	1.42E+36	-15.8	11594.0
Rate coefficients at P=1.00E-03(atm)	3.06E+33	-7.2	11476.0
Rate coefficients at P=1.00E-02(atm)	6.56E+42	-9.9	17197.0
Rate coefficients at P=1.00E-01(atm)	8.24E+46	-10.9	22090.0
Rate coefficients at P=1.00E+00(atm)	4.48E+38	-8.2	23019.0
Rate coefficients at P=1.00E+01(atm)	1.01E+18	-1.8	19496.0
Rate coefficients at P=4.00E+01(atm)	1.16E+01	3.4	15637.0
Rate coefficients at P=1.00E+02(atm)	4.85E-12	7.2	12599.0
Rate coefficients at P=2.00E+02(atm)	8.64E-22	10.2	10126.0
1568. IQJC4H8OH<=>IC3H6OHCHO+OH	1.42E+36	-15.8	11594.0
Rate coefficients at P=1.00E-03(atm)	3.58E+71	-20.6	52656.0
Rate coefficients at P=1.00E-02(atm)	9.67E+71	-20.1	54935.0
Rate coefficients at P=1.00E-01(atm)	3.39E+67	-18.2	55330.0
Rate coefficients at P=1.00E+00(atm)	7.26E+58	-15.1	54016.0
Rate coefficients at P=1.00E+01(atm)	4.57E+46	-11.0	51172.0
Rate coefficients at P=4.00E+01(atm)	4.31E+38	-8.4	49054.0
Rate coefficients at P=1.00E+02(atm)	2.12E+33	-6.7	47587.0
Rate coefficients at P=2.00E+02(atm)	2.72E+29	-5.4	46486.0
1569. IQJC4H8OH<=>IQC4H8OT	1.42E+36	-15.8	11594.0
Rate coefficients at P=1.00E-03(atm)	1.04E+45	-11.2	31755.0
Rate coefficients at P=1.00E-02(atm)	2.90E+40	-9.6	30945.0
Rate coefficients at P=1.00E-01(atm)	4.85E+35	-8.0	29850.0
Rate coefficients at P=1.00E+00(atm)	2.62E+30	-6.3	28498.0
Rate coefficients at P=1.00E+01(atm)	3.37E+24	-4.4	26873.0
Rate coefficients at P=4.00E+01(atm)	9.75E+20	-3.2	25861.0
Rate coefficients at P=1.00E+02(atm)	5.61E+18	-2.5	25208.0
Rate coefficients at P=2.00E+02(atm)	1.44E+17	-2.0	24740.0
1570. IQJC4H8OH<=>IQC4H7OHT	1.42E+36	-15.8	11594.0
Rate coefficients at P=1.00E-03(atm)	1.36E+50	-12.9	36743.0
Rate coefficients at P=1.00E-02(atm)	3.36E+45	-11.3	36143.0
Rate coefficients at P=1.00E-01(atm)	1.13E+40	-9.4	34990.0
Rate coefficients at P=1.00E+00(atm)	5.93E+33	-7.3	33438.0
Rate coefficients at P=1.00E+01(atm)	4.24E+26	-5.0	31502.0
Rate coefficients at P=4.00E+01(atm)	1.97E+22	-3.6	30275.0
Rate coefficients at P=1.00E+02(atm)	3.43E+19	-2.7	29477.0
Rate coefficients at P=2.00E+02(atm)	3.69E+17	-2.1	28900.0
1571. IQC4H7OHT=>IC3H5OH+CH2O+OH	1.42E+36	-15.8	11594.0
Rate coefficients at P=1.00E-03(atm)	4.25E+16	-3.7	19364.0
Rate coefficients at P=1.00E-02(atm)	2.98E+33	-8.0	27106.0
Rate coefficients at P=1.00E-01(atm)	3.46E+38	-8.8	31412.0
Rate coefficients at P=1.00E+00(atm)	7.07E+28	-5.5	29633.0
Rate coefficients at P=1.00E+01(atm)	2.01E+13	-0.4	25278.0
Rate coefficients at P=4.00E+01(atm)	1.43E+13	-0.4	25238.0
Rate coefficients at P=1.00E+02(atm)	1.38E+13	-0.4	25234.0
Rate coefficients at P=2.00E+02(atm)	1.37E+13	-0.4	25233.0
1572. IQC4H7OHT<=>CCY(CCOC)OH+OH	1.42E+36	-15.8	11594.0
Rate coefficients at P=1.00E-03(atm)	1.12E+25	-5.6	19349.0
Rate coefficients at P=1.00E-02(atm)	7.20E+32	-7.6	23093.0
Rate coefficients at P=1.00E-01(atm)	2.22E+34	-7.7	25130.0
Rate coefficients at P=1.00E+00(atm)	2.40E+27	-5.3	23663.0
Rate coefficients at P=1.00E+01(atm)	2.24E+17	-2.0	20810.0
Rate coefficients at P=4.00E+01(atm)	1.82E+17	-2.0	20786.0
Rate coefficients at P=1.00E+02(atm)	1.78E+17	-2.0	20783.0
Rate coefficients at P=2.00E+02(atm)	1.77E+17	-2.0	20782.0
1573. IQC4H7OHT<=>IC4H7OOH+OH	1.42E+36	-15.8	11594.0
Rate coefficients at P=1.00E-03(atm)	6.07E+13	-4.2	22478.0
Rate coefficients at P=1.00E-02(atm)	9.74E+39	-10.9	33616.0
Rate coefficients at P=1.00E-01(atm)	2.18E+49	-12.7	40359.0
Rate coefficients at P=1.00E+00(atm)	3.32E+37	-8.4	38539.0
Rate coefficients at P=1.00E+01(atm)	2.34E+16	-1.6	32712.0
Rate coefficients at P=4.00E+01(atm)	1.44E+16	-1.5	32656.0
Rate coefficients at P=1.00E+02(atm)	1.38E+16	-1.5	32651.0
Rate coefficients at P=2.00E+02(atm)	1.37E+16	-1.5	32649.0
1574. IQC4H8OT=>CH3COCH3+CH2O+OH	3.64E+09	1.3	23700.0
1575. IQC4H8OT<=>CH3+C3KET21	4.95E+10	0.8	27900.0
1576. IQC4H7OHT<=>CH2COHCH2OOH+CH3	4.95E+10	0.8	27900.0
1577. TQC4H7OHIO2<=>TQC4H7OHIQ-I	2.56E+12	-0.1	34360.0
1578. TQC4H7OHIQ-I=>HO2CHO+CH3COCH3+OH	5.82E+05	2.4	22790.0
1579. TQC4H7OHIQ-I<=>IC4KETIT+HO2	1.83E+10	0.8	15100.0
1580. IC4KETIT=>CH3COCH3+HCO+OH	9.50E+15	0.0	42540.0
1581. IC4KETIT+OH<=>TC3H6O2HCO+H2O	6.13E+04	2.7	-4586.4
1582. IC4KETIT+HO2<=>TC3H6O2HCO+H2O2	1.18E-04	4.9	3684.3

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1583. TC3H6O2HCO=>CH3COCH3+CO+OH                    1.28E+20   -1.9    34460.0
1584. TQC4H7OHIO2<=>TQC4H7OHIQ-P                    5.69E+08    0.8    21850.0
1585. TQC4H7OHIQ-P<=>IC3H5COHQ+HO2                  1.83E+10    0.8    15100.0
1586. TQC4H7OHIQ-P<=>CH2CQCOHQ+CH3                  5.38E+11    0.1    24800.0
1587. TQC4H7OHIQ-P=>IC3H5Q+HOCHO+OH                 5.38E+11    0.1    24800.0
1588. TQC4H7OHIQ-P<=>COHQCYC(COC)+OH                2.28E+08    1.3     9890.0
1589. TQC4H7OHIQ-P<=>QCYC(CCOC)OH+OH                4.58E+15   -1.1    18440.0
1590. IC3H5COHQ=>HOCHO+C3H5-T+OH                    1.59E+20   -1.5    42879.5
1591. CH2CQCOHQ=>HOCHO+CH2CO+2OH                    1.59E+20   -1.5    42879.5
1592. CH2CQCOHQ=>HCO+CH2CO+3OH                      1.59E+20   -1.5    42879.5
1593. IC3H5Q=>CH2CO+CH3+OH                          1.59E+20   -1.5    42879.5
1594. COHQCYC(COC)=>HOCHO+CH2O+C2H3+OH              1.59E+20   -1.5    42879.5
1595. QCYC(CCOC)OH=>HOCHO+CH2CO+CH3+OH              1.59E+20   -1.5    42879.5
1596. TQC4H7OHIO2<=>TQC4H7OHTO2                     2.96E+09    0.0    16350.0
1597. TQC4H7OHTO2<=>HOCOCQ(CH3)2+OH                 1.75E+08    1.7    26000.0
1598. HOCOCQ(CH3)2=>CO+CH3COCH3+2OH                 1.59E+20   -1.5    42879.5
1599. IQC4H7OHTO2<=>IQC4H7OHTQ-P                    2.06E+07    1.0    21070.0
1600. IQC4H7OHTQ-P=>OH+CH2O+CH2COHCH2OOH            1.20E+10    0.3    15700.0
1601. CH2COHCH2OOH=>OH+CH2O+CH2CO+H                 1.59E+20   -1.5    42879.5
1602. IC4H6Q2-II=>OH+CH2O+HO2+C3H4-A                1.59E+20   -1.5    42879.5
1603. IQC4H7OHTO2<=>IQC4H8OTQ-I                     4.13E+07    1.0    21070.0
1604. IQC4H8OTQ-I=>OH+CH2O+C3KET21                  1.20E+10    0.3    15700.0
1605. IQC4H8OTQ-I<=>CH3+CO(CH2OOH)2                 2.74E+13    0.2    29830.0
1606. CO(CH2OOH)2=>2OH+2CH2O+CO                     1.59E+20   -1.5    42879.5
1607. IQC4H7OHTO2<=>CHOC(CH3)OHCH2Q+OH              1.20E+10    0.3    15700.0
1608. CHOC(CH3)OHCH2Q=>OH+CH2O+H+CH3COCHO           1.59E+20   -1.5    42879.5
1609. CH3COCHO+OH=>2CO+CH3+H2O                      6.13E+04    2.7    -4586.4
1610. TQC4H7OHI+O2<=>TQC4H7OHIO2                    3.49E+14   -0.8     -536.5
1611. IQC4H7OHT+O2<=>IQC4H7OHTO2                    6.87E+16   -1.6      198.7
1612. C2CY(COC)OH+OH=>IC3H6CO+OH+H2O                2.26E+03    2.7    -4688.0
1613. C2CY(COC)OH+HO2=>IC3H6CO+OH+H2O2              8.60E+00    3.5     9732.3
1614. CCY(CCO)COH+OH=>IC3H5CHO+OH+H2O               5.66E+02    2.9    -4039.4
1615. CCY(CCO)COH+HO2=>IC3H5CHO+OH+H2O2             1.81E-01    4.0     9056.7
1616. CCY(CCO)COH+OH=>PC3H4OH-2+CH2O+H2O            1.26E+03    3.0    -2660.6
1617. CCY(CCO)COH+HO2=>PC3H4OH-2+CH2O+H2O2          1.40E-05    5.3     8267.9
1618. CCY(CCOC)OH+OH=>CH2O+SC3H4OH+H2O              5.66E+02    2.9    -4039.4
1619. CCY(CCOC)OH+HO2=>CH2O+SC3H4OH+H2O2            1.81E-01    4.0     9056.7
1620. IC4H7+OH<=>IC4H7OH                            3.00E+13    0.0        0.0
1621. IC4H7O+H<=>IC4H7OH                            4.00E+13    0.0        0.0
1622. IC4H6OH+H<=>IC4H7OH                           1.00E+14    0.0        0.0
1623. CH2CCH2OH+CH3<=>IC4H7OH                       3.00E+13    0.0        0.0
1624. IC4H7OH+O2<=>IC4H6OH+HO2                      6.00E+13    0.0    39900.0
1625. IC4H7OH+OH<=>IC4H6OH+H2O                      1.26E+03    3.0    -2660.6
1626. IC4H7OH+HO2<=>IC4H6OH+H2O2                    1.45E-05    5.3     8267.9
1627. IC4H6OH+H2<=>IC4H7OH+H                        2.16E+04    2.4    18990.0
1628. IC4H6OH+CH2O<=>IC4H7OH+HCO                    6.30E+08    1.9    18190.0
1629. IC4H6OH+IC4H8<=>IC4H7OH+IC4H7                 4.70E+02    3.3    19840.0
1630. IC4H7O+H2<=>IC4H7OH+H                         9.05E+06    2.0    17830.0
1631. IC4H7OH+HCO<=>IC4H7O+CH2O                     3.02E+11    0.0    18160.0
1632. C3H4-A+CH2OH<=>IC4H6OH                        1.00E+11    0.0     9200.0
1633. IC4H7O<=>IC4H6OH                              1.39E+11    0.0    15600.0
1634. IC4H6OH+HO2=>CH2CCH2OH+CH2O+OH                1.45E+13    0.0        0.0
1635. IC4H7OH+H<=>IC4H8OH                           1.00E+13    0.0     1200.0
1636. IC4H7O+O2<=>IC3H5CHO+HO2                      3.00E+10    0.0     1649.0
1637. IC4H7O+HO2<=>IC3H5CHO+H2O2                    3.00E+11    0.0        0.0
1638. IC4H7O+CH3<=>IC3H5CHO+CH4                     2.40E+13    0.0        0.0
1639. IC4H7O+O<=>IC3H5CHO+OH                        6.00E+12    0.0        0.0
1640. IC4H7O+OH<=>IC3H5CHO+H2O                      1.81E+13    0.0        0.0
1641. IC4H7O+H<=>IC3H5CHO+H2                        1.99E+13    0.0        0.0
1642. IC3H6OHCHO+OH=>TC3H6OH+CO+H2O                 6.13E+04    2.6    -4586.4
1643. IC3H6OHCHO+H=>TC3H6OH+CO+H2                   8.66E+05    2.3     1426.0
1644. IC3H6OHCHO+HO2=>TC3H6OH+CO+H2O2               1.01E-04    5.0     3429.0
1645. IC3H6OHCHO+CH3=>TC3H6OH+CO+CH4                3.94E+00    3.6     4223.0
1646. TC3H6OH<=>CH3COCH3+H                          8.98E+11    0.3    32990.0
1647. TC3H6OH<=>IC3H5OH+H                           4.21E+10    1.0    40900.0
1648. TC3H6OH+O2<=>CH3COCH3+HO2                     2.23E+13    0.0        0.0
1649. C3H5-A+CH3(+M)<=>C4H8-1(+M)                   1.00E+14   -0.3     -262.3
      Low pressure limit:  0.39100E+61 -0.12810E+02  0.62500E+04
      TROE centering:      0.10400E+00  0.16060E+04  0.60000E+05  0.61184E+04
      H2              Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      CH4             Enhanced by    2.000E+00
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      C2H6            Enhanced by    3.000E+00
      AR              Enhanced by    7.000E-01
1650. C2H5+C2H3(+M)<=>C4H8-1(+M)                    1.50E+13    0.0        0.0
      Low pressure limit:  0.15500E+57 -0.11790E+02  0.89845E+04
      TROE centering:      0.19800E+00  0.22779E+04  0.60000E+05  0.57232E+04
      H2              Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      CH4             Enhanced by    2.000E+00
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      C2H6            Enhanced by    3.000E+00
      AR              Enhanced by    7.000E-01
1651. C4H71-4+H(+M)<=>C4H8-1(+M)                    3.60E+13    0.0        0.0
      Low pressure limit:  0.30100E+49 -0.93200E+01  0.58336E+04
      TROE centering:      0.49800E+00  0.13140E+04  0.13140E+04  0.50000E+05
      H2              Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      CH4             Enhanced by    2.000E+00
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
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      C2H6            Enhanced by    3.000E+00
      AR              Enhanced by    7.000E-01
1652. C4H71-3+H<=>C4H8-1                          5.00E+13    0.0     5000.0
1653. C3H5-S+CH3(+M)<=>C4H8-2(+M)                 5.00E+13    0.0        0.0
      Low pressure limit:  0.85400E+59 -0.11940E+02  0.97698E+04
      TROE centering:      0.17500E+00  0.13406E+04  0.60000E+05  0.10140E+05
      H2              Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      CH4             Enhanced by    2.000E+00
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      C2H6            Enhanced by    3.000E+00
      AR              Enhanced by    7.000E-01
      C2H2            Enhanced by    3.000E+00
      C2H4            Enhanced by    3.000E+00
1654. C4H8-2<=>C3H5-A+CH3                         7.50E+65  -15.6    97300.0
1655. C4H8-2<=>H+C4H71-3                          4.60E+84  -20.0   132787.0
1656. C4H8-1+OH<=>C4H71-3+H2O                     7.77E+05    2.2     -437.2
1657. C4H8-1+OH<=>C4H71-4+H2O                     8.60E+06    2.0     2623.1
1658. C4H8-1+OH<=>C4H71-2+H2O                     3.00E+06    2.0     2847.7
1659. C4H8-1+OH<=>C4H71-1+H2O                     6.93E+06    1.9     4962.0
1660. C4H8-2+OH<=>C4H71-3+H2O                     4.46E+06    2.1     1050.8
1661. C4H8-2+OH<=>C4H72-2+H2O                     6.00E+06    2.0     2845.9
1662. C4H8-1+HO2<=>C4H71-3+H2O2                   7.82E-01    4.0    11702.0
1663. C4H8-2+HO2<=>C4H71-3+H2O2                   6.90E-01    4.0    12103.0
1664. C4H8-1+HO2<=>C4H71-4+H2O2                   4.08E+01    3.6    17160.0
1665. C4H8-1+HO2<=>C4H71-1+H2O2                   9.57E+02    3.1    20798.6
1666. C4H8-1+HO2<=>C4H71-2+H2O2                   1.56E+04    2.8    24427.9
1667. C4H8-2+HO2<=>C4H72-2+H2O2                   3.12E+04    2.8    24427.9
1668. C4H8-1+H<=>C4H71-4+H2                       3.84E+04    2.9     6611.0
1669. C4H8-1+H<=>C4H71-3+H2                       2.42E+03    3.0     1995.0
1670. C4H8-1+H<=>C4H71-2+H2                       2.37E+04    2.9     8917.0
1671. C4H8-1+H<=>C4H71-1+H2                       2.63E+04    2.8    12050.0
      Declared duplicate reaction...
1672. C4H8-1+H<=>C4H71-1+H2                       2.23E+04    2.9    11710.0
      Declared duplicate reaction...
1673. C4H8-2+H<=>C4H71-3+H2                       5.62E+02    3.5     1627.0
1674. C4H8-2+H<=>C4H72-2+H2                       8.47E+04    2.8     9304.0
1675. C4H8-1+O<=>C4H71-3+OH                       1.75E+11    0.7     5884.0
1676. C4H8-2+O<=>C4H71-3+OH                       2.19E+11    0.8     7550.0
1677. C4H8-1+O<=>C4H71-1+OH                       1.20E+11    0.7     8959.1
1678. C4H8-1+O<=>C4H71-2+OH                       6.03E+10    0.7     7632.0
1679. C4H8-2+O<=>C4H72-2+OH                       1.21E+11    0.7     7632.0
1680. C4H8-1+O<=>C4H71-4+OH                       1.13E+14    0.0     7850.0
1681. C4H8-1+O2<=>C4H71-3+HO2                     1.00E+14    0.0    37190.0
1682. C4H8-2+O2<=>C4H71-3+HO2                     2.00E+14    0.0    39390.0
1683. C4H8-1+O2<=>C4H71-1+HO2                     2.00E+13    0.0    62270.0
1684. C4H8-1+O2<=>C4H71-2+HO2                     1.00E+13    0.0    58770.0
1685. C4H8-2+O2<=>C4H72-2+HO2                     2.00E+13    0.0    58770.0
1686. C4H8-1+O2<=>C4H71-4+HO2                     6.00E+13    0.0    52340.0
1687. C4H8-1+CH3<=>C4H71-3+CH4                    2.21E+00    3.5     5675.0
1688. C4H8-1+CH3<=>C4H71-4+CH4                    4.52E-01    3.6     7154.0
1689. C4H8-2+CH3<=>C4H71-3+CH4                    7.14E+00    3.6     7642.0
1690. C4H8-1+CH3<=>C4H71-1+CH4                    1.35E+00    3.5    12850.0
1691. C4H8-1+CH3<=>C4H71-2+CH4                    8.40E-01    3.5    11660.0
1692. C4H8-2+CH3<=>C4H72-2+CH4                    1.68E+00    3.5    11660.0
1693. C4H8-1+CH3O2<=>C4H71-3+CH3O2H               2.70E+04    0.7     5884.0
1694. C4H8-1+CH3O2<=>C4H71-4+CH3O2H               2.38E+03    2.5    16490.0
1695. C4H8-1+CH3O<=>C4H71-3+CH3OH                 4.00E+01    2.9     8609.0
1696. C4H8-1+CH3O<=>C4H71-4+CH3OH                 2.17E+11    0.0     6458.0
1697. C4H8-2+CH3O<=>C4H71-3+CH3OH                 1.80E+01    3.0    11990.0
1698. C4H8-1+CH3CO3<=>C4H71-3+CH3CO3H             1.00E+11    0.0     8000.0
1699. C4H8-1+C3H5-A<=>C4H71-3+C3H6                7.90E+10    0.0    12400.0
1700. C4H8-1+C2H5O2<=>C4H71-3+C2H5O2H             1.40E+12    0.0    14900.0
1701. C4H8-1+NC3H7O2<=>C4H71-3+NC3H7O2H           1.40E+12    0.0    14900.0
1702. C4H8-1+IC3H7O2<=>C4H71-3+IC3H7O2H           1.40E+12    0.0    14900.0
1703. C4H8-1+PC4H9O2<=>C4H71-3+PC4H9O2H           1.40E+12    0.0    14900.0
1704. C4H8-1+SC4H9O2<=>C4H71-3+SC4H9O2H           1.40E+12    0.0    14900.0
1705. C4H8-2+NC3H7O2<=>C4H71-3+NC3H7O2H           3.20E+12    0.0    14900.0
1706. C4H8-2+IC3H7O2<=>C4H71-3+IC3H7O2H           3.20E+12    0.0    14900.0
1707. C4H8-2+PC4H9O2<=>C4H71-3+PC4H9O2H           3.20E+12    0.0    14900.0
1708. C4H8-2+SC4H9O2<=>C4H71-3+SC4H9O2H           3.20E+12    0.0    14900.0
1709. C4H71-3+C2H5<=>C4H8-1+C2H4                  2.59E+12    0.0     -131.0
1710. C4H71-3+CH3O<=>C4H8-1+CH2O                  2.41E+13    0.0        0.0
1711. IC4H9O2+C4H8-1<=>IC4H9O2H+C4H71-3           1.40E+12    0.0    14900.0
1712. TC4H9O2+C4H8-1<=>TC4H9O2H+C4H71-3           1.40E+12    0.0    14900.0
1713. IC4H9O2+C4H8-2<=>IC4H9O2H+C4H71-3           1.40E+12    0.0    14900.0
1714. TC4H9O2+C4H8-2<=>TC4H9O2H+C4H71-3           1.40E+12    0.0    14900.0
1715. C4H71-1<=>C4H6-1+H                          8.95E+08    1.1    35636.5
1716. C4H71-1<=>C2H5+C2H2                         2.85E+12    0.7    33178.3
1717. C4H71-2<=>C4H6-1+H                          9.79E+08    1.2    38080.7
1718. C4H71-2<=>C4H612+H                          1.99E+08    1.6    37683.3
1719. C4H71-2<=>C3H4-A+CH3                        1.23E+10    1.2    32916.0
1720. C4H71-3<=>C4H612+H                          3.95E+11    0.9    61611.1
1721. C4H71-3<=>C4H6+H                            8.53E+07    1.9    47490.1
1722. C4H71-4<=>C2H4+C2H3                         2.84E+10    1.0    38998.8
1723. C4H71-4<=>C4H6+H                            1.32E+05    2.3    33245.9
1724. C4H72-2<=>C4H6-2+H                          7.87E+09    1.2    36173.0
1725. C4H72-2<=>C4H612+H                          9.54E+07    1.8    38992.8
1726. C4H72-2<=>C3H4-P+CH3                        6.30E+11    0.9    34754.1
1727. C4H71-3<=>C4H71-4                           5.62E-12    7.2    36200.8
1728. C4H71-3<=>C4H72-2                           6.76E-23   10.2    41574.2
1729. C4H71-3+HO2<=>C4H71-3OOH                    1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-02(atm)        2.05E+01    1.2   -22589.0
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Rate coefficients at P=1.00E-01(atm)	3.69E+06	0.1	-18331.0
Rate coefficients at P=1.00E+00(atm)	2.02E+13	-1.4	-11709.0
Rate coefficients at P=2.00E+00(atm)	1.49E+15	-1.9	-9604.0
Rate coefficients at P=5.00E+00(atm)	1.85E+17	-2.3	-6991.0
Rate coefficients at P=1.00E+01(atm)	2.88E+18	-2.5	-5260.0
Rate coefficients at P=3.00E+01(atm)	3.45E+19	-2.7	-3140.0
Rate coefficients at P=5.00E+01(atm)	5.33E+19	-2.7	-2438.0
1730. C4H71-3+HO2<=>C4H71-O+OH	1.00E+00	1.0	1.0
Rate coefficients at P=1.00E-02(atm)	6.90E+20	-2.7	229.0
Rate coefficients at P=1.00E-01(atm)	4.50E+22	-3.2	1760.0
Rate coefficients at P=1.00E+00(atm)	8.61E+27	-4.6	6415.0
Rate coefficients at P=2.00E+00(atm)	1.92E+30	-5.3	8578.0
Rate coefficients at P=5.00E+00(atm)	5.46E+33	-6.2	11879.0
Rate coefficients at P=1.00E+01(atm)	2.98E+36	-7.0	14600.0
Rate coefficients at P=3.00E+01(atm)	5.58E+40	-8.1	19040.0
Rate coefficients at P=5.00E+01(atm)	4.44E+42	-8.7	21071.0
1731. C4H71-3+HO2<=>C2H3COCH3+H2O	1.00E+00	1.0	1.0
Rate coefficients at P=1.00E-02(atm)	5.16E+14	-1.7	1910.0
Rate coefficients at P=1.00E-01(atm)	1.62E+16	-2.2	3167.0
Rate coefficients at P=1.00E+00(atm)	9.73E+20	-3.5	7339.0
Rate coefficients at P=2.00E+00(atm)	1.70E+23	-4.1	9378.0
Rate coefficients at P=5.00E+00(atm)	4.33E+26	-5.0	12574.0
Rate coefficients at P=1.00E+01(atm)	2.59E+29	-5.8	15275.0
Rate coefficients at P=3.00E+01(atm)	7.85E+33	-7.0	19801.0
Rate coefficients at P=5.00E+01(atm)	8.84E+35	-7.6	21918.0
1732. C4H71-3OOH<=>C4H71-O+OH	1.00E+00	1.0	1.0
Rate coefficients at P=1.00E-02(atm)	4.41E+35	-7.4	39745.0
Rate coefficients at P=1.00E-01(atm)	6.64E+37	-7.6	44224.0
Rate coefficients at P=1.00E+00(atm)	7.09E+37	-7.2	47692.0
Rate coefficients at P=2.00E+00(atm)	1.92E+37	-7.0	48350.0
Rate coefficients at P=5.00E+00(atm)	1.20E+36	-6.5	48849.0
Rate coefficients at P=1.00E+01(atm)	7.17E+34	-6.1	48933.0
Rate coefficients at P=3.00E+01(atm)	3.69E+32	-5.3	48614.0
Rate coefficients at P=5.00E+01(atm)	3.04E+31	-5.0	48341.0
1733. C4H71-3OOH<=>C2H3COCH3+H2O	1.00E+00	1.0	1.0
Rate coefficients at P=1.00E-02(atm)	3.58E+23	-4.6	38121.0
Rate coefficients at P=1.00E-01(atm)	2.85E+27	-5.4	43407.0
Rate coefficients at P=1.00E+00(atm)	2.63E+29	-5.5	48042.0
Rate coefficients at P=2.00E+00(atm)	2.83E+29	-5.4	49101.0
Rate coefficients at P=5.00E+00(atm)	1.04E+29	-5.2	50137.0
Rate coefficients at P=1.00E+01(atm)	2.12E+28	-4.9	50610.0
Rate coefficients at P=3.00E+01(atm)	5.39E+26	-4.3	50818.0
Rate coefficients at P=5.00E+01(atm)	7.76E+25	-4.0	50737.0
1734. C4H71-O<=>C2H3+CH3CHO	8.52E+25	-3.6	27863.4
1735. C4H71-O<=>AC3H5OCH2	1.35E+18	-1.7	17386.5
1736. C4H71-O<=>CH2CH2COCH3	1.67E+21	-2.7	20337.7
1737. C4H71-O<=>C2H3COCH3+H	2.57E+20	-2.1	22040.1
1738. C4H71-O<=>C2H4+CH3CO	4.75E+08	1.1	20922.5
1739. AC3H5OCH2<=>C3H5-A+CH2O	8.81E+14	-0.3	31553.1
1740. AC3H5OCH2<=>CH2CH2COCH3	2.51E+20	-2.6	29288.4
1741. AC3H5OCH2<=>C2H3COCH3+H	3.98E+18	-1.6	30129.8
1742. AC3H5OCH2<=>C3H6+HCO	3.73E+14	-0.7	32008.3
1743. CH2CH2COCH3<=>C2H3+CH3CHO	1.93E+19	-1.9	48440.0
1744. CH2CH2COCH3<=>C2H3COCH3+H	4.52E+12	0.2	34570.5
1745. CH2CH2COCH3<=>C2H4+CH3CO	1.59E+13	0.1	24086.3
1746. C2H3+CH3CHO<=>C2H4+CH3CO	1.65E+01	3.2	9399.8
1747. C4H71-3+HO2<=>C4H72-1OOH	1.00E+00	1.0	1.0
Rate coefficients at P=1.00E-02(atm)	1.00E+07	-0.3	-17896.0
Rate coefficients at P=1.00E-01(atm)	1.15E+11	-1.2	-14831.0
Rate coefficients at P=1.00E+00(atm)	2.95E+16	-2.3	-9451.0
Rate coefficients at P=2.00E+00(atm)	7.68E+17	-2.6	-7705.0
Rate coefficients at P=5.00E+00(atm)	2.21E+19	-2.9	-5556.0
Rate coefficients at P=1.00E+01(atm)	1.14E+20	-3.0	-4159.0
Rate coefficients at P=3.00E+01(atm)	2.80E+20	-3.0	-2503.0
Rate coefficients at P=5.00E+01(atm)	2.40E+20	-2.9	-1971.0
1748. C4H71-3+HO2<=>C4H7O2-1+OH	1.00E+00	1.0	1.0
Rate coefficients at P=1.00E-02(atm)	6.81E+20	-2.7	217.0
Rate coefficients at P=1.00E-01(atm)	2.25E+22	-3.1	1516.0
Rate coefficients at P=1.00E+00(atm)	2.75E+27	-4.5	6067.0
Rate coefficients at P=2.00E+00(atm)	6.27E+29	-5.1	8273.0
Rate coefficients at P=5.00E+00(atm)	1.96E+33	-6.1	11661.0
Rate coefficients at P=1.00E+01(atm)	1.16E+36	-6.8	14456.0
Rate coefficients at P=3.00E+01(atm)	2.51E+40	-8.0	19009.0
Rate coefficients at P=5.00E+01(atm)	2.18E+42	-8.6	21090.0
1749. C4H71-3+HO2<=>SC3H5CHO+H2O	1.00E+00	1.0	1.0
Rate coefficients at P=1.00E-02(atm)	1.62E+14	-1.6	1519.0
Rate coefficients at P=1.00E-01(atm)	3.19E+15	-2.0	2620.0
Rate coefficients at P=1.00E+00(atm)	1.69E+20	-3.3	6800.0
Rate coefficients at P=2.00E+00(atm)	3.39E+22	-3.9	8918.0
Rate coefficients at P=5.00E+00(atm)	1.09E+26	-4.8	12249.0
Rate coefficients at P=1.00E+01(atm)	7.81E+28	-5.6	15058.0
Rate coefficients at P=3.00E+01(atm)	3.14E+33	-6.9	19743.0
Rate coefficients at P=5.00E+01(atm)	4.07E+35	-7.5	21927.0
1750. C4H72-1OOH<=>C4H7O2-1+OH	1.00E+00	1.0	1.0
Rate coefficients at P=1.00E-02(atm)	5.07E+35	-7.4	39733.0
Rate coefficients at P=1.00E-01(atm)	7.69E+37	-7.6	43994.0
Rate coefficients at P=1.00E+00(atm)	2.76E+37	-7.1	47024.0
Rate coefficients at P=2.00E+00(atm)	4.32E+36	-6.8	47507.0
Rate coefficients at P=5.00E+00(atm)	1.21E+35	-6.2	47760.0
Rate coefficients at P=1.00E+01(atm)	3.92E+33	-5.7	47658.0
Rate coefficients at P=3.00E+01(atm)	8.62E+30	-4.9	47084.0
Rate coefficients at P=5.00E+01(atm)	5.29E+29	-4.5	46721.0
1751. C4H72-1OOH<=>SC3H5CHO+H2O	1.00E+00	1.0	1.0
Rate coefficients at P=1.00E-02(atm)	1.15E+24	-4.8	38584.0

	Rate coefficients at P=1.00E-01(atm)	9.65E+27	-5.5	43561.0
	Rate coefficients at P=1.00E+00(atm)	2.33E+29	-5.5	47626.0
	Rate coefficients at P=2.00E+00(atm)	1.29E+29	-5.3	48469.0
	Rate coefficients at P=5.00E+00(atm)	1.81E+28	-5.0	49208.0
	Rate coefficients at P=1.00E+01(atm)	1.76E+27	-4.6	49458.0
	Rate coefficients at P=3.00E+01(atm)	1.59E+25	-3.9	49357.0
	Rate coefficients at P=5.00E+01(atm)	1.58E+24	-3.6	49164.0
1752.	C4H7O2-1<=>C3H5-S+CH2O	8.52E+25	-3.6	27863.4
1753.	C4H7O2-1<=>SC3H5OCH2-1	1.35E+18	-1.7	17386.5
1754.	C4H7O2-1<=>C3H6CHO-2	1.67E+21	-2.7	20337.7
1755.	C4H7O2-1<=>SC3H5CHO+H	2.57E+20	-2.1	22040.1
1756.	C4H7O2-1<=>C3H6+HCO	4.75E+08	1.1	20922.5
1757.	SC3H5OCH2-1<=>C3H5-S+CH2O	8.81E+14	-0.3	31553.1
1758.	SC3H5OCH2-1<=>C3H6CHO-2	2.51E+20	-2.6	29288.4
1759.	SC3H5OCH2-1<=>SC3H5CHO+H	3.98E+18	-1.6	30129.8
1760.	SC3H5OCH2-1<=>C3H6+HCO	3.73E+14	-0.7	32008.3
1761.	C3H6CHO-2<=>C3H5-S+CH2O	1.93E+19	-1.9	48440.0
1762.	C3H6CHO-2<=>SC3H5CHO+H	4.52E+12	0.2	34570.5
1763.	C3H6CHO-2<=>C3H6+HCO	1.59E+13	0.1	24086.3
1764.	C3H5-S+CH2O<=>C3H6+HCO	1.65E+01	3.2	9399.8
1765.	C4H71-3+CH3O2<=>C4H71-3OOCH3	1.00E+00	1.0	1.0
	Rate coefficients at P=1.00E-02(atm)	1.03E+01	1.2	-22589.0
	Rate coefficients at P=1.00E-01(atm)	1.85E+06	0.1	-18331.0
	Rate coefficients at P=1.00E+00(atm)	1.01E+13	-1.4	-11709.0
	Rate coefficients at P=2.00E+00(atm)	7.45E+14	-1.9	-9604.0
	Rate coefficients at P=5.00E+00(atm)	9.25E+16	-2.3	-6991.0
	Rate coefficients at P=1.00E+01(atm)	1.44E+18	-2.5	-5260.0
	Rate coefficients at P=3.00E+01(atm)	1.73E+19	-2.7	-3140.0
	Rate coefficients at P=5.00E+01(atm)	2.67E+19	-2.7	-2438.0
1766.	C4H71-3+CH3O2<=>C4H71-O+CH3O	1.00E+00	1.0	1.0
	Rate coefficients at P=1.00E-02(atm)	3.45E+20	-2.7	229.0
	Rate coefficients at P=1.00E-01(atm)	2.25E+22	-3.2	1760.0
	Rate coefficients at P=1.00E+00(atm)	4.31E+27	-4.6	6415.0
	Rate coefficients at P=2.00E+00(atm)	9.60E+29	-5.3	8578.0
	Rate coefficients at P=5.00E+00(atm)	2.73E+33	-6.2	11879.0
	Rate coefficients at P=1.00E+01(atm)	1.49E+36	-7.0	14600.0
	Rate coefficients at P=3.00E+01(atm)	2.79E+40	-8.1	19040.0
	Rate coefficients at P=5.00E+01(atm)	2.22E+42	-8.7	21071.0
1767.	C4H71-3OOCH3<=>C4H71-O+CH3O	1.00E+00	1.0	1.0
	Rate coefficients at P=1.00E-02(atm)	2.21E+35	-7.4	39745.0
	Rate coefficients at P=1.00E-01(atm)	3.32E+37	-7.6	44224.0
	Rate coefficients at P=1.00E+00(atm)	3.55E+37	-7.2	47692.0
	Rate coefficients at P=2.00E+00(atm)	9.60E+36	-7.0	48350.0
	Rate coefficients at P=5.00E+00(atm)	6.00E+35	-6.5	48849.0
	Rate coefficients at P=1.00E+01(atm)	3.59E+34	-6.1	48933.0
	Rate coefficients at P=3.00E+01(atm)	1.85E+32	-5.3	48614.0
	Rate coefficients at P=5.00E+01(atm)	1.52E+31	-5.0	48341.0
1768.	C4H71-3+CH3O2<=>C4H72-1OOCH3	1.00E+00	1.0	1.0
	Rate coefficients at P=1.00E-02(atm)	5.00E+06	-0.3	-17896.0
	Rate coefficients at P=1.00E-01(atm)	5.75E+10	-1.2	-14831.0
	Rate coefficients at P=1.00E+00(atm)	1.48E+16	-2.3	-9451.0
	Rate coefficients at P=2.00E+00(atm)	3.84E+17	-2.6	-7705.0
	Rate coefficients at P=5.00E+00(atm)	1.11E+19	-2.9	-5556.0
	Rate coefficients at P=1.00E+01(atm)	5.70E+19	-3.0	-4159.0
	Rate coefficients at P=3.00E+01(atm)	1.40E+20	-3.0	-2503.0
	Rate coefficients at P=5.00E+01(atm)	1.20E+20	-2.9	-1971.0
1769.	C4H71-3+CH3O2<=>C4H7O2-1+CH3O	1.00E+00	1.0	1.0
	Rate coefficients at P=1.00E-02(atm)	3.41E+20	-2.7	217.0
	Rate coefficients at P=1.00E-01(atm)	1.13E+22	-3.1	1516.0
	Rate coefficients at P=1.00E+00(atm)	1.38E+27	-4.5	6067.0
	Rate coefficients at P=2.00E+00(atm)	3.14E+29	-5.1	8273.0
	Rate coefficients at P=5.00E+00(atm)	9.80E+32	-6.1	11661.0
	Rate coefficients at P=1.00E+01(atm)	5.80E+35	-6.8	14456.0
	Rate coefficients at P=3.00E+01(atm)	1.26E+40	-8.0	19009.0
	Rate coefficients at P=5.00E+01(atm)	1.09E+42	-8.6	21090.0
1770.	C4H72-1OOCH3<=>C4H7O2-1+CH3O	1.00E+00	1.0	1.0
	Rate coefficients at P=1.00E-02(atm)	2.54E+35	-7.4	39733.0
	Rate coefficients at P=1.00E-01(atm)	3.85E+37	-7.6	43994.0
	Rate coefficients at P=1.00E+00(atm)	1.38E+37	-7.1	47024.0
	Rate coefficients at P=2.00E+00(atm)	2.16E+36	-6.8	47507.0
	Rate coefficients at P=5.00E+00(atm)	6.05E+34	-6.2	47760.0
	Rate coefficients at P=1.00E+01(atm)	1.96E+33	-5.7	47658.0
	Rate coefficients at P=3.00E+01(atm)	4.31E+30	-4.9	47084.0
	Rate coefficients at P=5.00E+01(atm)	2.65E+29	-4.5	46721.0
1771.	C4H71-3+C2H5O2<=>C4H71-O+C2H5O	3.80E+12	0.0	-1200.0
1772.	IC3H7O2+C4H71-3<=>IC3H7O+C4H71-O	3.80E+12	0.0	-1200.0
1773.	NC3H7O2+C4H71-3<=>NC3H7O+C4H71-O	3.80E+12	0.0	-1200.0
1774.	C4H71-O<=>C2H3CHO+CH3	7.94E+14	0.0	19000.0
1775.	C4H71-3+O<=>C2H3CHO+CH3	6.03E+13	0.0	0.0
1776.	C4H71-3+O2<=>C4H6+HO2	1.07E+00	3.7	9322.0
1777.	H+C4H71-3<=>C4H6+H2	3.16E+13	0.0	0.0
1778.	C2H5+C4H71-3<=>C4H6+C2H6	3.98E+12	0.0	0.0
1779.	C2H3+C4H71-3<=>C2H4+C4H6	3.98E+12	0.0	0.0
1780.	C3H5-A+C4H71-3<=>C3H6+C4H6	6.31E+12	0.0	0.0
1781.	C4H71-3+C4H71-3<=>C8H141-5,3-4	4.11E+16	-1.3	1560.6
1782.	C4H71-3+C4H71-3<=>C8H141-5,3	4.11E+16	-1.3	1560.6
1783.	C4H71-3+C4H71-3<=>C8H142-6	4.11E+16	-1.3	1560.6
1784.	C8H141-5,3-4+OH<=>C8H131-5,3-4,TA+H2O	2.50E+06	2.0	-2629.1
1785.	C8H141-5,3+OH<=>C8H131-5,3,TA+H2O	1.30E+06	2.0	-2629.1
1786.	C8H141-5,3+OH<=>C8H131-5,3,SA+H2O	3.20E+06	2.0	-1434.0
1787.	C8H141-5,3+OH<=>C8H131-5,3,PA+H2O	3.00E+06	2.0	-239.0
1788.	C8H142-6+OH<=>C8H132-6,SA+H2O	6.30E+06	2.0	-1434.0
1789.	C8H142-6+OH<=>C8H132-6,PA+H2O	6.00E+06	2.0	-239.0
1790.	C8H141-5,3-4+HO2<=>C8H131-5,3-4,TA+H2O2	3.20E+04	2.6	10755.3

1791.	C8H141-5,3+HO2<=>C8H131-5,3,TA+H2O2	1.60E+04	2.6	10755.3
1792.	C8H141-5,3+HO2<=>C8H131-5,3,SA+H2O2	6.30E+03	2.6	12428.3
1793.	C8H141-5,3+HO2<=>C8H131-5,3,PA+H2O2	9.50E+03	2.6	13862.3
1794.	C8H142-6+HO2<=>C8H132-6,SA+H2O2	1.30E+04	2.6	12428.3
1795.	C8H142-6+HO2<=>C8H132-6,PA+H2O2	1.90E+04	2.6	13862.3
1796.	C8H141-5,3-4+H<=>C8H131-5,3-4,TA+H2	5.00E+04	2.5	-2868.1
1797.	C8H141-5,3+H<=>C8H131-5,3,TA+H2	2.50E+04	2.5	-2868.1
1798.	C8H141-5,3+H<=>C8H131-5,3,SA+H2	5.00E+04	2.5	-1673.0
1799.	C8H141-5,3+H<=>C8H131-5,3,PA+H2	1.90E+05	2.5	2390.1
1800.	C8H142-6+H<=>C8H132-6,SA+H2	1.00E+05	2.5	-1673.0
1801.	C8H142-6+H<=>C8H132-6,PA+H2	3.80E+05	2.5	2390.1
1802.	C8H141-5,3-4+O<=>C8H131-5,3-4,TA+OH	6.30E+10	0.7	1195.0
1803.	C8H141-5,3+O<=>C8H131-5,3,TA+OH	3.20E+10	0.7	1195.0
1804.	C8H141-5,3+O<=>C8H131-5,3,SA+OH	8.00E+10	0.7	3107.1
1805.	C8H141-5,3+O<=>C8H131-5,3,PA+OH	6.30E+10	0.7	5975.1
1806.	C8H142-6+O<=>C8H132-6,SA+OH	1.60E+11	0.7	3107.1
1807.	C8H142-6+O<=>C8H132-6,PA+OH	1.30E+11	0.7	5975.1
1808.	C8H141-5,3-4+CH3<=>C8H131-5,3-4,TA+CH4	1.60E+12	0.0	5258.1
1809.	C8H141-5,3+CH3<=>C8H131-5,3,TA+CH4	7.90E+11	0.0	5258.1
1810.	C8H141-5,3+CH3<=>C8H131-5,3,SA+CH4	1.60E+12	0.0	6931.2
1811.	C8H141-5,3+CH3<=>C8H131-5,3,PA+CH4	1.50E-01	3.5	5736.1
1812.	C8H142-6+CH3<=>C8H132-6,SA+CH4	3.20E+12	0.0	6931.2
1813.	C8H142-6+CH3<=>C8H132-6,PA+CH4	3.00E-01	3.5	5736.1
1814.	C8H141-5,3-4+O2<=>C8H131-5,3-4,TA+HO2	1.60E+13	0.0	35420.0
1815.	C8H141-5,3+O2<=>C8H131-5,3,TA+HO2	8.00E+12	0.0	35420.0
1816.	C8H141-5,3+O2<=>C8H131-5,3,SA+HO2	2.00E+13	0.0	37190.0
1817.	C8H141-5,3+O2<=>C8H131-5,3,PA+HO2	2.00E+13	0.0	39390.0
1818.	C8H142-6+O2<=>C8H132-6,SA+HO2	4.00E+13	0.0	37190.0
1819.	C8H142-6+O2<=>C8H132-6,PA+HO2	4.00E+13	0.0	39390.0
1820.	C6H101-3,3+C2H3<=>C8H131-5,3-4,TA	4.40E+04	2.5	6130.0
1821.	B13DE2M+C3H5-S<=>C8H131-5,3,TA	4.40E+04	2.5	6130.0
1822.	C6H10D24+C2H3<=>C8H131-5,3,SA	8.80E+03	2.5	6130.0
1823.	C4H6+C4H71-3<=>C8H131-5,3,PA	1.30E+03	2.5	8520.0
1824.	C5H81-3+C3H5-S<=>C8H132-6,SA	8.80E+03	2.5	6130.0
1825.	C4H6+C4H71-3<=>C8H132-6,PA	1.30E+03	2.5	8520.0
1826.	C8H131-5,3-4,TA+HO2<=>C8H131-5,3-4,TAO+OH	1.64E+04	2.7	1144.4
1827.	C8H131-5,3,SA+HO2<=>C8H131-5,3,SAO+OH	1.64E+04	2.7	1144.4
1828.	C8H131-5,3,PA+HO2<=>C8H131-5,3,PAO+OH	1.64E+04	2.7	1144.4
1829.	C8H132-6,SA+HO2<=>C8H132-6,SAO+OH	1.64E+04	2.7	1144.4
1830.	C8H132-6,PA+HO2<=>C8H132-6,PAO+OH	1.64E+04	2.7	1144.4
1831.	C4H71-3+C2H3COCH3<=>C8H131-5,3-4,TAO	2.50E+10	0.0	10090.0
1832.	C4H71-3+C2H3COCH3<=>C8H131-5,3,TAO	2.50E+10	0.0	10090.0
1833.	C4H71-3+SC3H5CHO<=>C8H131-5,3,SAO	3.33E+10	0.0	6397.0
1834.	C7H111-5,3,6P+CH2O<=>C8H131-5,3,PAO	1.00E+11	0.0	3496.0
1835.	C4H71-3+SC3H5CHO<=>C8H132-6,SAO	3.33E+10	0.0	6397.0
1836.	C7H111-5,1P+CH2O<=>C8H132-6,PAO	1.00E+11	0.0	3496.0
1837.	CC5H9-A+C2H2<=>C7H111-5,3,6P	1.32E+04	2.5	6130.0
1838.	C5H92-5+C2H2<=>C7H111-5,1P	1.32E+04	2.5	6130.0
1839.	C4H71-4+O2<=>C4H6+HO2	1.00E+11	0.0	0.0
1840.	C4H71-4+O2<=>C4H71-4O2	6.86E+16	-1.6	198.7
1841.	C4H71-4+HO2<=>C4H7O1-4+OH	7.00E+12	0.0	-1000.0
1842.	CH3O2+C4H71-4<=>CH3O+C4H7O1-4	7.00E+12	0.0	-1000.0
1843.	C4H71-4O2+H2<=>C4H71-4OOH+H	3.01E+13	0.0	26030.0
1844.	C4H71-4O2+HO2<=>C4H71-4OOH+O2	1.75E+10	0.0	-3275.0
1845.	C4H71-4O2+H2O2<=>C4H71-4OOH+HO2	2.40E+12	0.0	10000.0
1846.	C4H71-4O2+CH4<=>C4H71-4OOH+CH3	1.12E+13	0.0	24640.0
1847.	C4H71-4O2+CH3OH<=>C4H71-4OOH+CH2OH	6.30E+12	0.0	19360.0
1848.	C4H71-4O2+CH2O<=>C4H71-4OOH+HCO	5.60E+12	0.0	13600.0
1849.	C4H71-4O2+C2H6<=>C4H71-4OOH+C2H5	1.70E+13	0.0	20460.0
1850.	C4H71-4O2+CH3CHO<=>C4H71-4OOH+CH3CO	2.80E+12	0.0	13600.0
1851.	C4H71-4O2+C2H4<=>C4H71-4OOH+C2H3	1.13E+13	0.0	30430.0
1852.	C4H71-4O2+C3H6<=>C4H71-4OOH+C3H5-A	5.35E-02	4.2	13288.1
1853.	C4H71-4O2+C2H5CHO<=>C4H71-4OOH+C2H5CO	2.00E+11	0.0	9500.0
1854.	C4H71-4O2+C2H3CHO<=>C4H71-4OOH+C2H3CO	2.80E+12	0.0	13600.0
1855.	C4H71-4O2+C3H8<=>C4H71-4OOH+NC3H7	1.70E+13	0.0	20460.0
1856.	C4H71-4O2+C3H8<=>C4H71-4OOH+IC3H7	2.00E+12	0.0	17000.0
1857.	C4H71-4O2+CH3<=>C4H7O1-4+CH3O	7.00E+12	0.0	-1000.0
1858.	C4H71-4O2+C2H5<=>C4H7O1-4+C2H5O	7.00E+12	0.0	-1000.0
1859.	C4H71-4O2+IC3H7<=>C4H7O1-4+IC3H7O	7.00E+12	0.0	-1000.0
1860.	C4H71-4O2+NC3H7<=>C4H7O1-4+NC3H7O	7.00E+12	0.0	-1000.0
1861.	C4H71-4O2+C3H5-A<=>C4H7O1-4+C3H5O	7.00E+12	0.0	-1000.0
1862.	C4H71-4O2+PC4H9<=>C4H7O1-4+PC4H9O	7.00E+12	0.0	-1000.0
1863.	C4H71-4O2+SC4H9<=>C4H7O1-4+SC4H9O	7.00E+12	0.0	-1000.0
1864.	C4H71-4O2+C4H71-3<=>C4H7O1-4+C4H71-O	7.00E+12	0.0	-1000.0
1865.	C4H71-4OOH<=>C4H7O1-4+OH	1.50E+16	0.0	42500.0
1866.	C4H71-4O2+CH3O2=>C4H7O1-4+CH3O+O2	1.40E+16	-1.6	1860.0
1867.	C4H71-4O2+CH3CO3=>C4H7O1-4+CH3CO2+O2	1.40E+16	-1.6	1860.0
1868.	C4H71-4O2+C2H5O2=>C4H7O1-4+C2H5O+O2	1.40E+16	-1.6	1860.0
1869.	C4H71-4O2+NC3H7O2=>C4H7O1-4+NC3H7O+O2	1.40E+16	-1.6	1860.0
1870.	C4H71-4O2+IC3H7O2=>C4H7O1-4+IC3H7O+O2	1.40E+16	-1.6	1860.0
1871.	C4H71-4O2+C4H71-4O2=>C4H7O1-4+C4H7O1-4+O2	1.40E+16	-1.6	1860.0
1872.	C4H71-4O2+SC4H9O2=>C4H7O1-4+SC4H9O+O2	1.40E+16	-1.6	1860.0
1873.	C4H71-4O2<=>C4H61-3OOH4	4.01E+08	1.1	30100.0
1874.	C4H61-3OOH4<=>C2H3CHOCH2+OH	1.71E+09	1.1	10900.0
1875.	C4H61-3OOH4<=>C4H6O25+OH	1.72E+08	0.8	11100.0
1876.	C2H3CHOCH2+H=>C2H3+CH2CO+H2	5.00E+12	0.0	0.0
1877.	C2H3CHOCH2+O=>C2H3+CH2CO+OH	5.00E+12	0.0	0.0
1878.	C2H3CHOCH2+OH=>C2H3+CH2CO+H2O	5.00E+12	0.0	0.0
1879.	C2H3CHOCH2+HO2=>C2H3+CH2CO+H2O2	1.00E+13	0.0	15000.0
1880.	C2H3CHOCH2+CH3=>C2H3+CH2CO+CH4	2.00E+11	0.0	10000.0
1881.	C2H3CHOCH2+CH3O2=>C2H3+CH2CO+CH3O2H	1.00E+13	0.0	19000.0
1882.	C4H6O25+H<=>CH2CHCHCHO+H2	5.00E+12	0.0	0.0
1883.	C4H6O25+O<=>CH2CHCHCHO+OH	5.00E+12	0.0	0.0
1884.	C4H6O25+OH<=>CH2CHCHCHO+H2O	5.00E+12	0.0	0.0

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1885. C4H6O25+HO2<=>CH2CHCHCHO+H2O2                1.00E+13   0.0    15000.0
1886. C4H6O25+CH3<=>CH2CHCHCHO+CH4                 2.00E+11   0.0    10000.0
1887. C4H6O25+CH3O2<=>CH2CHCHCHO+CH3O2H            1.00E+13   0.0    19000.0
1888. C4H61-3OOH4+HO2<=>C4H6O1-3OOH4+OH            4.10E+03   2.7     1144.4
1889. C4H61-3OOH4+HO2<=>C4H6O2-1OOH4+OH            4.10E+03   2.7     1144.4
1890. C4H6O1-3OOH4<=>C2H3CHO+CH2O+OH               6.70E+39  -8.4    22782.0
1891. C4H6O1-3OOH4<=>C2H3+HO2CH2CHO                2.67E+34  -6.6    22672.0
1892. C4H71-1+O2<=>C4H71-1O2                       4.07E+27  -4.7     5222.0
1893. C4H71-1O2<=>C3H6CHO-3+O                      1.22E+29  -4.7    42340.0
1894. C4H71-1O2<=>C2H5CHCO+OH                      1.55E+24  -3.9    49850.0
1895. C4H71-2+O2<=>C4H71-2O2                       4.07E+27  -4.7     5222.0
1896. C4H71-2O2<=>C2H5COCH2+O                      1.22E+29  -4.7    42340.0
1897. C4H72-2+O2<=>C4H72-2O2                       4.07E+27  -4.7     5222.0
1898. C4H72-2O2<=>CH3CHCOCH3+O                     1.22E+29  -4.7    42340.0
1899. C4H8-1+H<=>C2H4+C2H5                         1.00E+00   1.0        1.0
      Rate coefficients at P=1.00E-03(atm)         2.55E+06   1.9     5564.0
      Rate coefficients at P=1.00E-02(atm)         5.56E+06   1.8     5802.0
      Rate coefficients at P=1.00E-01(atm)         1.21E+09   1.2     7472.0
      Rate coefficients at P=1.00E+00(atm)         9.47E+16  -1.0    13413.0
      Rate coefficients at P=1.00E+01(atm)         4.50E+28  -4.2    23618.0
      Rate coefficients at P=1.00E+02(atm)         7.02E+32  -5.2    31754.0
      Declared duplicate reaction...
1900. C4H8-1+H<=>C2H4+C2H5                         1.00E+00   1.0        1.0
      Rate coefficients at P=1.00E-03(atm)         3.45E+07   1.8     2263.0
      Rate coefficients at P=1.00E-02(atm)         8.06E+07   1.7     2522.0
      Rate coefficients at P=1.00E-01(atm)         1.18E+10   1.1     4077.0
      Rate coefficients at P=1.00E+00(atm)         6.02E+15  -0.5     8452.0
      Rate coefficients at P=1.00E+01(atm)         7.58E+21  -2.1    14245.0
      Rate coefficients at P=1.00E+02(atm)         2.29E+21  -1.9    17243.0
      Declared duplicate reaction...
1901. C4H8-1+H<=>C3H6+CH3                          1.00E+00   1.0        1.0
      Rate coefficients at P=1.00E-03(atm)         7.83E+09   1.2     1442.0
      Rate coefficients at P=1.00E-02(atm)         3.39E+10   1.0     1895.0
      Rate coefficients at P=1.00E-01(atm)         3.70E+13   0.1     4127.0
      Rate coefficients at P=1.00E+00(atm)         4.57E+19  -1.5     9061.0
      Rate coefficients at P=1.00E+01(atm)         8.57E+23  -2.7    14140.0
      Rate coefficients at P=1.00E+02(atm)         1.32E+20  -1.5    15383.0
      Declared duplicate reaction...
1902. C4H8-1+H<=>C3H6+CH3                          1.00E+00   1.0        1.0
      Rate coefficients at P=1.00E-03(atm)         1.80E+06   1.8     5900.0
      Rate coefficients at P=1.00E-02(atm)         3.46E+06   1.7     6100.0
      Rate coefficients at P=1.00E-01(atm)         4.02E+08   1.1     7574.0
      Rate coefficients at P=1.00E+00(atm)         1.21E+16  -1.0    13175.0
      Rate coefficients at P=1.00E+01(atm)         7.14E+27  -4.2    23319.0
      Rate coefficients at P=1.00E+02(atm)         1.00E+33  -5.5    31922.0
      Declared duplicate reaction...
1903. C4H8-1+H<=>PC4H9                             1.00E+00   1.0        1.0
      Rate coefficients at P=1.00E-03(atm)         1.35E+15  -2.8     1570.0
      Rate coefficients at P=1.00E-02(atm)         5.20E+16  -3.0     1992.0
      Rate coefficients at P=1.00E-01(atm)         1.91E+21  -4.0     4636.0
      Rate coefficients at P=1.00E+00(atm)         1.90E+31  -6.5    11968.0
      Rate coefficients at P=1.00E+01(atm)         2.10E+40  -8.6    21058.0
      Rate coefficients at P=1.00E+02(atm)         1.44E+37  -7.2    24896.0
      Declared duplicate reaction...
1904. C4H8-1+H<=>PC4H9                             1.00E+00   1.0        1.0
      Rate coefficients at P=1.00E-03(atm)         4.33E+20  -4.2     -263.0
      Rate coefficients at P=1.00E-02(atm)         1.78E+22  -4.3      186.0
      Rate coefficients at P=1.00E-01(atm)         1.98E+26  -5.2     2518.0
      Rate coefficients at P=1.00E+00(atm)         3.78E+32  -6.6     7265.0
      Rate coefficients at P=1.00E+01(atm)         8.79E+34  -6.9    10952.0
      Rate coefficients at P=1.00E+02(atm)         7.80E+28  -4.8    10355.0
      Declared duplicate reaction...
1905. C4H8-1+H<=>SC4H9                             1.00E+00   1.0        1.0
      Rate coefficients at P=1.00E-03(atm)         4.07E+22  -4.5     -771.0
      Rate coefficients at P=1.00E-02(atm)         3.90E+24  -4.8      -34.0
      Rate coefficients at P=1.00E-01(atm)         2.03E+29  -5.8     2970.0
      Rate coefficients at P=1.00E+00(atm)         3.53E+34  -7.0     7525.0
      Rate coefficients at P=1.00E+01(atm)         1.19E+34  -6.4     9810.0
      Rate coefficients at P=1.00E+02(atm)         1.37E+26  -3.8     8012.0
      Declared duplicate reaction...
1906. C4H8-1+H<=>SC4H9                             1.00E+00   1.0        1.0
      Rate coefficients at P=1.00E-03(atm)         3.52E+12  -2.1     1466.0
      Rate coefficients at P=1.00E-02(atm)         1.02E+14  -2.3     1799.0
      Rate coefficients at P=1.00E-01(atm)         1.16E+18  -3.1     4049.0
      Rate coefficients at P=1.00E+00(atm)         5.22E+27  -5.5    10963.0
      Rate coefficients at P=1.00E+01(atm)         4.33E+37  -7.9    20354.0
      Rate coefficients at P=1.00E+02(atm)         2.22E+36  -7.1    25203.0
      Declared duplicate reaction...
1907. C4H8-2+H<=>C2H4+C2H5                         1.00E+00   1.0        1.0
      Rate coefficients at P=1.00E-03(atm)         8.96E+06   1.9     6209.0
      Rate coefficients at P=1.00E-02(atm)         1.92E+07   1.8     6443.0
      Rate coefficients at P=1.00E-01(atm)         3.97E+09   1.1     8097.0
      Rate coefficients at P=1.00E+00(atm)         3.01E+17  -1.1    14023.0
      Rate coefficients at P=1.00E+01(atm)         1.88E+29  -4.3    24297.0
      Rate coefficients at P=1.00E+02(atm)         5.15E+33  -5.4    32601.0
1908. C4H8-2+H<=>C3H6+CH3                          1.00E+00   1.0        1.0
      Rate coefficients at P=1.00E-03(atm)         6.39E+09   1.3     1834.0
      Rate coefficients at P=1.00E-02(atm)         2.60E+10   1.1     2267.0
      Rate coefficients at P=1.00E-01(atm)         2.48E+13   0.3     4456.0
      Rate coefficients at P=1.00E+00(atm)         2.91E+19  -1.4     9365.0
      Rate coefficients at P=1.00E+01(atm)         6.13E+23  -2.5    14463.0
      Rate coefficients at P=1.00E+02(atm)         1.23E+20  -1.4    15762.0
1909. C4H8-2+H<=>PC4H9                             1.00E+00   1.0        1.0
      Rate coefficients at P=1.00E-03(atm)         3.90E+14  -2.5     1729.0
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      Rate coefficients at P=1.00E-02(atm)          1.41E+16   -2.7     2133.0
      Rate coefficients at P=1.00E-01(atm)          4.31E+20   -3.7     4719.0
      Rate coefficients at P=1.00E+00(atm)          4.03E+30   -6.2    12020.0
      Rate coefficients at P=1.00E+01(atm)          5.19E+39   -8.3    21137.0
      Rate coefficients at P=1.00E+02(atm)          5.17E+36   -7.0    25063.0
1910. C4H8-2+H<=>SC4H9                               1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)          8.34E+21   -4.2     -602.0
      Rate coefficients at P=1.00E-02(atm)          6.79E+23   -4.5       82.0
      Rate coefficients at P=1.00E-01(atm)          2.85E+28   -5.5     3003.0
      Rate coefficients at P=1.00E+00(atm)          5.45E+33   -6.6     7559.0
      Rate coefficients at P=1.00E+01(atm)          2.33E+33   -6.1     9893.0
      Rate coefficients at P=1.00E+02(atm)          3.27E+25   -3.5     8145.0
1911. C4H8-1+H<=>C4H8-2+H                            1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)          2.98E+07    1.9     3575.0
      Rate coefficients at P=1.00E-02(atm)          6.11E+07    1.8     3794.0
      Rate coefficients at P=1.00E-01(atm)          4.78E+09    1.2     5152.0
      Rate coefficients at P=1.00E+00(atm)          1.02E+15   -0.2     9233.0
      Rate coefficients at P=1.00E+01(atm)          6.51E+20   -1.8    14806.0
      Rate coefficients at P=1.00E+02(atm)          4.44E+19   -1.4    17409.0
      Declared duplicate reaction...
1912. C4H8-1+H<=>C4H8-2+H                            1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)          1.55E+04    2.3     7049.0
      Rate coefficients at P=1.00E-02(atm)          2.36E+04    2.3     7177.0
      Rate coefficients at P=1.00E-01(atm)          6.60E+05    1.9     8201.0
      Rate coefficients at P=1.00E+00(atm)          1.15E+12    0.1    12789.0
      Rate coefficients at P=1.00E+01(atm)          8.80E+23   -3.2    22546.0
      Rate coefficients at P=1.00E+02(atm)          3.72E+31   -5.2    32234.0
      Declared duplicate reaction...
1913. SC4H9<=>PC4H9                                  1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)          9.60E+37  -11.0    38840.0
      Rate coefficients at P=1.00E-02(atm)          6.05E+40  -11.3    39461.0
      Rate coefficients at P=1.00E-01(atm)          1.64E+47  -12.5    43112.0
      Rate coefficients at P=1.00E+00(atm)          6.53E+55  -14.3    50351.0
      Rate coefficients at P=1.00E+01(atm)          2.13E+56  -13.7    54866.0
      Rate coefficients at P=1.00E+02(atm)          6.02E+45  -10.1    53399.0
1914. PC4H9<=>C2H4+C2H5                              1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)          3.44E+34   -8.1    28397.0
      Rate coefficients at P=1.00E-02(atm)          1.11E+39   -9.1    31891.0
      Rate coefficients at P=1.00E-01(atm)          7.74E+42   -9.8    35771.0
      Rate coefficients at P=1.00E+00(atm)          7.47E+43   -9.7    38722.0
      Rate coefficients at P=1.00E+01(atm)          2.06E+39   -8.0    38955.0
      Rate coefficients at P=1.00E+02(atm)          1.48E+29   -4.7    35950.0
1915. PC4H9<=>C3H6+CH3                               1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)          3.71E+25   -5.8    34965.0
      Rate coefficients at P=1.00E-02(atm)          1.85E+27   -6.0    35481.0
      Rate coefficients at P=1.00E-01(atm)          2.46E+32   -7.2    38637.0
      Rate coefficients at P=1.00E+00(atm)          2.05E+42   -9.6    46415.0
      Rate coefficients at P=1.00E+01(atm)          4.98E+48  -11.0    54456.0
      Rate coefficients at P=1.00E+02(atm)          2.23E+42   -8.7    56601.0
1916. SC4H9<=>C2H4+C2H5                              1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)          8.30E+25   -5.8    39343.0
      Rate coefficients at P=1.00E-02(atm)          4.12E+27   -5.9    39859.0
      Rate coefficients at P=1.00E-01(atm)          5.57E+32   -7.1    43029.0
      Rate coefficients at P=1.00E+00(atm)          4.54E+42   -9.5    50839.0
      Rate coefficients at P=1.00E+01(atm)          1.06E+49  -10.9    58899.0
      Rate coefficients at P=1.00E+02(atm)          9.94E+42   -8.7    61203.0
1917. SC4H9<=>C3H6+CH3                               1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)          2.89E+40   -9.8    33601.0
      Rate coefficients at P=1.00E-02(atm)          1.80E+44  -10.5    37007.0
      Rate coefficients at P=1.00E-01(atm)          2.51E+46  -10.7    40237.0
      Rate coefficients at P=1.00E+00(atm)          4.74E+44   -9.8    41841.0
      Rate coefficients at P=1.00E+01(atm)          3.79E+37   -7.4    40604.0
      Rate coefficients at P=1.00E+02(atm)          4.79E+26   -4.0    36898.0
1918. C4H71-1OH+H<=>PC4H8OH-1                        4.27E+12    0.5     4444.6
1919. NC3H7CHO+H<=>PC4H8OH-1                         9.80E+10    1.2     8785.6
1920. C2H3OH+C2H5<=>PC4H8OH-1                        3.00E+06    1.8     7337.9
1921. C4H8-1+OH<=>PC4H8OH-2                          2.10E+06    1.8    -3292.3
1922. C4H71-1OH+H<=>PC4H8OH-2                        1.60E+10    1.1     4389.2
1923. C4H72-1OH+H<=>PC4H8OH-2                        2.70E+11   -0.1     1584.7
1924. C3H6+CH2OH<=>PC4H8OH-3                         7.00E+03    2.4     7063.5
1925. C4H71-4OH+H<=>PC4H8OH-3                        1.50E+11    0.9     2750.6
1926. SC4H8OH-1<=>PC4H8OH-3                          2.90E+08    1.4    37866.0
1927. C3H6+CH2OH<=>PC4H8OH-4                         7.00E+03    2.4     7063.5
1928. C4H71-4OH+H<=>PC4H8OH-4                        1.50E+11    0.9     2750.6
1929. SC4H8OH-1<=>PC4H8OH-4                          2.90E+08    1.4    37866.0
1930. NC3H7CHO+H<=>PC4H9O                            4.70E+09    1.4     4357.9
1931. NC3H7+CH2O<=>PC4H9O                            5.00E+03    2.4     3238.9
1932. C4H71-2OH+H<=>SC4H8OH-2                        1.40E+08    1.5      218.8
1933. C2H5COCH3+H<=>SC4H8OH-2                        7.00E+07    1.8    13223.1
1934. C4H8-1+OH<=>SC4H8OH-1                          7.00E+05    1.8    -3290.2
1935. C2H3OH+C2H5<=>SC4H8OH-1                        6.40E+06    1.7    10270.2
1936. C4H8-2+OH<=>SC4H8OH-3                          1.40E+06    1.8    -3290.2
1937. SC3H5OH+CH3<=>SC4H8OH-3                        6.40E+06    1.7    10270.2
1938. C2H5COCH3+H<=>SC4H9O                           2.70E+07    1.8     6206.2
1939. C2H5CHO+CH3<=>SC4H9O                           1.20E+04    2.3     7978.1
1940. C4H71-4OH+OH<=>C4H64,2-1OH+H2O                 2.02E+06    2.2     -437.2
1941. C4H71-4OH+HO2<=>C4H64,2-1OH+H2O2               3.91E-01    4.0    11702.0
1942. PC4H8OH-2+O2<=>PC4H8OH-2O2                     3.60E+12    0.0        0.0
1943. PC4H8OH-2O2<=>SQC4H8OP                         2.91E+12   -0.2    22300.0
1944. PC4H8OH-2O2<=>C4H72-1OH+HO2                    3.64E+14   -0.7    32710.0
1945. PC4H8OH-2O2<=>C4H71-1OH+HO2                    2.44E+13   -0.3    32590.0
1946. SQC4H8OP=>C2H5CHO+CH2O+OH                      5.36E+12   -0.1    10790.0
1947. PC4H8OH-2O2<=>NC4KET21OH+OH                    1.49E+09    0.1    41390.0
1948. C4H72-1OH+OH<=>C4H64,2-1OH+H2O                 2.02E+06    2.2     -436.9
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1949.	C4H72-1OH+OH<=>C4H63,1-1OH+H2O	2.69E+06	2.2	-436.9
1950.	C4H72-1OH+HO2<=>C4H64,2-1OH+H2O2	1.72E-01	4.0	12103.0
1951.	C4H72-1OH+HO2<=>C4H63,1-1OH+H2O2	2.30E-01	4.0	12103.0
1952.	C4H71-1OH+OH<=>C4H63,1-1OH+H2O	2.02E+06	2.2	-437.2
1953.	C4H71-1OH+HO2<=>C4H63,1-1OH+H2O2	3.91E-01	4.0	11702.0
1954.	C4H63,1-1OH<=>C4H5OH-13+H	7.72E+12	0.5	43940.0
1955.	C4H5OH-13<=>C2H3+CH2CHO	2.82E+24	-2.4	90130.0
1956.	NC4KET21OH+OH<=>C2H4COCH2OH+H2O	8.45E+11	0.0	-228.0
1957.	NC4KET21OH+HO2<=>C2H4COCH2OH+H2O2	2.00E+11	0.0	8698.0
1958.	NC4KET21OH+O<=>C2H4COCH2OH+OH	3.07E+13	0.0	3400.0
1959.	NC4KET21OH+H<=>C2H4COCH2OH+H2	4.46E+06	2.0	3200.0
1960.	NC4KET21OH+O2<=>C2H4COCH2OH+HO2	1.55E+13	0.0	41970.0
1961.	NC4KET21OH+CH3<=>C2H4COCH2OH+CH4	1.74E+00	3.5	3680.0
1962.	NC4KET21OH+CH3O<=>C2H4COCH2OH+CH3OH	1.45E+11	0.0	2771.0
1963.	NC4KET21OH+CH3O2<=>C2H4COCH2OH+CH3O2H	2.00E+12	0.0	15250.0
1964.	NC4KET21OH+C2H3<=>C2H4COCH2OH+C2H4	3.00E+11	0.0	3400.0
1965.	NC4KET21OH+C2H5<=>C2H4COCH2OH+C2H6	3.00E+10	0.0	8600.0
1966.	C2H4COCH2OH<=>CH3CHCO+CH2OH	9.44E+29	-4.9	38330.0
1967.	PC4H8OH-2O2<=>SQC4H7OHP-4	1.44E+07	1.4	20800.0
1968.	SQC4H7OHP-4<=>CY(CCCO)COH+OH	2.44E+09	0.8	18000.0
1969.	SQC4H7OHP-4=>OH+HOCH2CHO+C2H4	3.08E+08	1.5	23500.0
1970.	CY(CCCO)COH+H=>C2H4+HOCH2CO+H2	5.00E+12	0.0	0.0
1971.	CY(CCCO)COH+O=>C2H4+HOCH2CO+OH	5.00E+12	0.0	0.0
1972.	CY(CCCO)COH+OH=>C2H4+HOCH2CO+H2O	5.00E+12	0.0	0.0
1973.	CY(CCCO)COH+HO2=>C2H4+HOCH2CO+H2O2	1.00E+13	0.0	15000.0
1974.	CY(CCCO)COH+CH3=>C2H4+HOCH2CO+CH4	2.00E+11	0.0	10000.0
1975.	CY(CCCO)COH+CH3O2=>C2H4+HOCH2CO+CH3O2H	1.00E+13	0.0	19000.0
1976.	CY(CCCO)COH+H=>CH2O+CH2CCH2OH+H2	5.00E+12	0.0	0.0
1977.	CY(CCCO)COH+O=>CH2O+CH2CCH2OH+OH	5.00E+12	0.0	0.0
1978.	CY(CCCO)COH+OH=>CH2O+CH2CCH2OH+H2O	5.00E+12	0.0	0.0
1979.	CY(CCCO)COH+HO2=>CH2O+CH2CCH2OH+H2O2	1.00E+13	0.0	15000.0
1980.	CY(CCCO)COH+CH3=>CH2O+CH2CCH2OH+CH4	2.00E+11	0.0	10000.0
1981.	CY(CCCO)COH+CH3O2=>CH2O+CH2CCH2OH+CH3O2H	1.00E+13	0.0	19000.0
1982.	HOCH2CO<=>CH2OH+CO	1.07E+12	0.6	16900.0
1983.	SQC4H7OHP-4+O2<=>SQC4H7OHP-4O2	3.43E+16	-1.6	198.7
1984.	SQC4H7OHP-4O2<=>C4H6OHOOH1-4-3+HO2	1.44E+07	1.4	28900.0
1985.	SQC4H7OHP-4O2<=>NC4KET24OH-1+OH	5.79E+01	2.9	17000.0
1986.	C4H6OHOOH1-4-3=>C2H3CHO+CH2OH+OH	1.05E+16	0.0	41600.0
1987.	C4H6OHOOH1-4-3=>HOCH2CHO+C2H3+OH	1.05E+16	0.0	41600.0
1988.	NC4KET24OH-1=>CH2O+HOCH2COCH2+OH	1.50E+16	0.0	43000.0
1989.	HOCH2CHO+O2<=>HOCH2CO+HO2	3.01E+13	0.0	39150.0
1990.	HOCH2CHO+O<=>HOCH2CO+OH	5.94E+12	0.0	1868.0
1991.	HOCH2CHO+H<=>HOCH2CO+H2	1.31E+05	2.6	1220.0
1992.	HOCH2CHO+OH<=>HOCH2CO+H2O	3.37E+12	0.0	-619.0
1993.	HOCH2CHO+HO2<=>HOCH2CO+H2O2	3.01E+12	0.0	11920.0
1994.	HOCH2CHO+CH3<=>HOCH2CO+CH4	7.08E-04	4.6	1966.0
1995.	HOCH2CHO+CH3O2<=>HOCH2CO+CH3O2H	3.01E+12	0.0	11920.0
1996.	HOCH2CHO+CH3CO3<=>HOCH2CO+CH3CO3H	3.01E+12	0.0	11920.0
1997.	SC4H8OH-1+O2<=>SC4H8OH-1O2	3.60E+12	0.0	0.0
1998.	SC4H8OH-1O2<=>PQC4H8OS	9.30E+10	0.0	22890.0
1999.	SC4H8OH-1O2<=>NC4KET12OH+OH	1.49E+09	0.1	41390.0
2000.	PQC4H8OS=>C2H5CHO+CH2O+OH	6.70E+39	-8.4	22782.0
2001.	PQC4H8OS=>C2H5+HO2CH2CHO	2.67E+34	-6.6	22672.0
2002.	SC4H8OH-1O2<=>C4H71-2OH+HO2	2.44E+13	-0.3	32590.0
2003.	SC4H8OH-1O2<=>PQC4H7OHS-3	1.36E+07	1.3	18200.0
2004.	PQC4H7OHS-3<=>CCY(COCC)OH+OH	2.59E+09	0.7	16000.0
2005.	PQC4H7OHS-3=>OH+CH2O+SC3H5OH	1.23E+09	1.3	24900.0
2006.	C4H71-2OH+OH<=>C4H63,1-2OH+H2O	2.02E+06	2.2	-437.2
2007.	C4H71-2OH+HO2<=>C4H63,1-2OH+H2O2	3.91E-01	4.0	11702.0
2008.	NC4KET12OH+H<=>C2H5CHOHCO+H2	1.00E+05	2.6	1220.0
2009.	NC4KET12OH+OH<=>C2H5CHOHCO+H2O	1.70E+12	0.0	-619.0
2010.	NC4KET12OH+O<=>C2H5CHOHCO+OH	5.94E+12	0.0	1868.0
2011.	NC4KET12OH+HO2<=>C2H5CHOHCO+H2O2	9.50E+03	2.7	11520.0
2012.	NC4KET12OH+CH3<=>C2H5CHOHCO+CH4	1.42E-03	4.6	1966.0
2013.	NC4KET12OH+C2H5<=>C2H5CHOHCO+C2H6	7.36E+04	2.0	5917.1
2014.	NC4KET12OH+CH3O<=>C2H5CHOHCO+CH3OH	1.00E+12	0.0	3300.0
2015.	NC4KET12OH+CH3O2<=>C2H5CHOHCO+CH3O2H	3.01E+12	0.0	11920.0
2016.	NC4KET12OH+O2<=>C2H5CHOHCO+HO2	9.03E+13	0.0	43320.0
2017.	NC4KET12OH+C2H3<=>C2H5CHOHCO+C2H4	3.26E+05	2.0	3965.7
2018.	NC4KET12OH+C2H5O<=>C2H5CHOHCO+C2H5OH	6.03E+11	0.0	3300.0
2019.	C2H5CHOHCO<=>C3H6OH1-1+CO	5.78E+14	0.0	16843.5
2020.	C3H6OH1-1<=>C2H5CHO+H	8.98E+11	0.3	32990.0
2021.	C2H3OH+CH3<=>C3H6OH1-1	2.04E+40	-8.2	24214.0
	Declared duplicate reaction...			
2022.	C2H3OH+CH3<=>C3H6OH1-1	1.66E+21	-3.2	10241.0
	Declared duplicate reaction...			
2023.	CCY(COCC)OH+H=>OH+C2H3COCH3+H2	5.00E+12	0.0	0.0
2024.	CCY(COCC)OH+O=>OH+C2H3COCH3+OH	5.00E+12	0.0	0.0
2025.	CCY(COCC)OH+OH=>OH+C2H3COCH3+H2O	5.00E+12	0.0	0.0
2026.	CCY(COCC)OH+HO2=>OH+C2H3COCH3+H2O2	1.00E+13	0.0	15000.0
2027.	CCY(COCC)OH+CH3=>OH+C2H3COCH3+CH4	2.00E+11	0.0	10000.0
2028.	CCY(COCC)OH+CH3O2=>OH+C2H3COCH3+CH3O2H	1.00E+13	0.0	19000.0
2029.	CCY(COCC)OH+H=>OH+SC3H5CHO+H2	5.00E+12	0.0	0.0
2030.	CCY(COCC)OH+O=>OH+SC3H5CHO+OH	5.00E+12	0.0	0.0
2031.	CCY(COCC)OH+OH=>OH+SC3H5CHO+H2O	5.00E+12	0.0	0.0
2032.	CCY(COCC)OH+HO2=>OH+SC3H5CHO+H2O2	1.00E+13	0.0	15000.0
2033.	CCY(COCC)OH+CH3=>OH+SC3H5CHO+CH4	2.00E+11	0.0	10000.0
2034.	CCY(COCC)OH+CH3O2=>OH+SC3H5CHO+CH3O2H	1.00E+13	0.0	19000.0
2035.	CCY(COCC)OH+H=>C2H3OH+CH3CO+H2	5.00E+12	0.0	0.0
2036.	CCY(COCC)OH+O=>C2H3OH+CH3CO+OH	5.00E+12	0.0	0.0
2037.	CCY(COCC)OH+OH=>C2H3OH+CH3CO+H2O	5.00E+12	0.0	0.0
2038.	CCY(COCC)OH+HO2=>C2H3OH+CH3CO+H2O2	1.00E+13	0.0	15000.0
2039.	CCY(COCC)OH+CH3=>C2H3OH+CH3CO+CH4	2.00E+11	0.0	10000.0
2040.	CCY(COCC)OH+CH3O2=>C2H3OH+CH3CO+CH3O2H	1.00E+13	0.0	19000.0

2041.	CCY(COCC)OH+H=>HCO+SC3H5OH+H2	5.00E+12	0.0	0.0
2042.	CCY(COCC)OH+O=>HCO+SC3H5OH+OH	5.00E+12	0.0	0.0
2043.	CCY(COCC)OH+OH=>HCO+SC3H5OH+H2O	5.00E+12	0.0	0.0
2044.	CCY(COCC)OH+HO2=>HCO+SC3H5OH+H2O2	1.00E+13	0.0	15000.0
2045.	CCY(COCC)OH+CH3=>HCO+SC3H5OH+CH4	2.00E+11	0.0	10000.0
2046.	CCY(COCC)OH+CH3O2=>HCO+SC3H5OH+CH3O2H	1.00E+13	0.0	19000.0
2047.	PQC4H7OHS-3+O2<=>PQC4H7OHS-3O2	1.74E+14	-0.8	-536.5
2048.	PQC4H7OHS-3O2<=>NC4KET13OH-2+OH	1.09E+04	2.4	19900.0
2049.	NC4KET13OH-2=>CH3CHO+HOCHCHO+OH	1.05E+16	0.0	43000.0
2050.	PQC4H7OHS-3O2<=>C4H7O2-1,3OOH	2.91E+12	-0.2	22300.0
2051.	PQC4H7OHS-3O2<=>C4H6OHOOH1-3-4+HO2	3.64E+14	-0.7	32710.0
2052.	PQC4H7OHS-3O2<=>C4H6OHOOH2-2-1+HO2	2.44E+13	-0.3	32590.0
2053.	C4H7O2-1,3OOH=>C3KET12+CH2O+OH	5.36E+12	-0.1	10790.0
2054.	C4H7O2-1,3OOH=>HO2CH2CHO+CH3CHO+OH	6.70E+39	-8.4	22782.0
2055.	PQC4H7OHS-3O2<=>NC4KET24OH-3+OH	1.49E+09	0.1	41390.0
2056.	HOCHCHO+O<=>CHOCHO+OH	1.46E-03	4.7	1727.0
2057.	HOCHCHO+OH<=>CHOCHO+H2O	5.81E-03	4.3	-3560.0
2058.	HOCHCHO+H<=>CHOCHO+H2	9.45E+02	3.1	8701.1
2059.	HOCHCHO+HO2<=>CHOCHO+H2O2	6.47E-07	5.3	10533.1
2060.	HOCHCHO+CH3<=>CHOCHO+CH4	2.04E+00	3.6	7721.0
2061.	HOCHCHO+CH3O2<=>CHOCHO+CH3O2H	3.24E-07	5.3	10533.1
2062.	C4H6OHOOH1-3-4=>CH2O+PC3H4OH-3+OH	1.50E+16	0.0	42000.0
2063.	C4H6OHOOH2-2-1=>CH2O+PC3H4OH-1+OH	1.50E+16	0.0	42000.0
2064.	NC4KET24OH-3=>CH2O+CH3COCHOH+OH	1.50E+16	0.0	43000.0
2065.	PC3H4OH-3<=>C2H3CHO+H	5.69E+52	-13.4	45049.0
2066.	PC3H4OH-3<=>C3H5O	5.48E+45	-11.6	44328.0
2067.	PC3H4OH-3<=>CH2CCH2OH	2.65E+36	-8.9	51019.0
2068.	PC3H4OH-3+O2<=>C2H3CHO+HO2	5.26E+17	-1.6	869.0
2069.	PC3H4OH-1<=>CH3CHCO+H	5.69E+52	-13.4	45049.0
2070.	PC3H4OH-1<=>PC3H4OH-2	2.65E+36	-8.9	51019.0
2071.	PC3H4OH-1+O2<=>CH3CHCO+HO2	5.26E+17	-1.6	869.0
2072.	CH3COCHOH<=>CH3COCHO+H	5.69E+52	-13.4	45049.0
2073.	CH3COCHOH<=>CH3COCH2O	5.48E+45	-11.6	44328.0
2074.	CH3COCHOH+O2<=>CH3COCHO+HO2	5.26E+17	-1.6	869.0
2075.	SC4H8OH-3+O2<=>SC4H8OH-3O2	3.60E+12	0.0	0.0
2076.	SC4H8OH-3O2<=>SQC4H8OS	2.91E+12	-0.2	22300.0
2077.	SC4H8OH-3O2<=>C4H71-3OH+HO2	3.64E+14	-0.7	32710.0
2078.	SC4H8OH-3O2<=>C4H72-2OH+HO2	2.44E+13	-0.3	32590.0
2079.	SQC4H8OS=>CH3CHO+CH3CHO+OH	2.68E+13	-0.1	10790.0
2080.	SC4H8OH-3O2<=>NC4KET23OH+OH	1.49E+09	0.1	41390.0
2081.	SC4H8OH-3O2<=>SQC4H7OHS-4	1.44E+07	1.4	20800.0
2082.	SQC4H7OHS-4<=>CCY(COCC)OH+OH	2.44E+09	0.8	18000.0
2083.	SQC4H7OHS-4=>OH+CH3CHO+C2H3OH	3.08E+08	1.5	23500.0
2084.	C4H71-3OH+OH<=>C4H63,1-3OH+H2O	2.02E+06	2.2	-437.2
2085.	C4H71-3OH+HO2<=>C4H63,1-3OH+H2O2	3.91E-01	4.0	11702.0
2086.	C4H72-2OH+OH<=>C4H63,1-3OH+H2O	2.02E+06	2.2	-437.2
2087.	C4H72-2OH+HO2<=>C4H63,1-3OH+H2O2	3.91E-01	4.0	11702.0
2088.	NC4KET23OH+OH<=>CH3COCOHCH3+H2O	8.45E+11	0.0	-228.0
2089.	NC4KET23OH+HO2<=>CH3COCOHCH3+H2O2	2.00E+11	0.0	8698.0
2090.	NC4KET23OH+O<=>CH3COCOHCH3+OH	3.07E+13	0.0	3400.0
2091.	NC4KET23OH+H<=>CH3COCOHCH3+H2	4.46E+06	2.0	3200.0
2092.	NC4KET23OH+O2<=>CH3COCOHCH3+HO2	1.55E+13	0.0	41970.0
2093.	NC4KET23OH+CH3<=>CH3COCOHCH3+CH4	1.74E+00	3.5	3680.0
2094.	NC4KET23OH+CH3O<=>CH3COCOHCH3+CH3OH	1.45E+11	0.0	2771.0
2095.	NC4KET23OH+CH3O2<=>CH3COCOHCH3+CH3O2H	2.00E+12	0.0	15250.0
2096.	NC4KET23OH+C2H3<=>CH3COCOHCH3+C2H4	3.00E+11	0.0	3400.0
2097.	NC4KET23OH+C2H5<=>CH3COCOHCH3+C2H6	3.00E+10	0.0	8600.0
2098.	CH3COHCO+CH3<=>CH3COCOHCH3	1.23E+11	0.0	7800.0
2099.	CH3COHCO+OH<=>SC2H4OH+CO2	1.73E+12	0.0	-1010.0
2100.	CH3COHCO+H<=>SC2H4OH+CO	4.40E+12	0.0	1459.0
2101.	SQC4H7OHS-4+O2<=>SQC4H7OHS-4O2	3.43E+16	-1.6	198.7
2102.	SQC4H7OHS-4O2<=>NC4KET24OH-3+OH	5.79E+01	2.9	17000.0
2103.	SQC4H7OHS-4O2<=>C4H7O2-1,3OOH	9.30E+10	0.0	22890.0
2104.	SQC4H7OHS-4O2<=>C4H6OHOOH1-2-3+HO2	2.44E+13	-0.3	32590.0
2105.	SQC4H7OHS-4O2<=>NC4KET13OH-2+OH	1.49E+09	0.1	41390.0
2106.	C4H6OHOOH1-2-3=>CH2COHCHO+CH3+OH	1.05E+16	0.0	41600.0
2107.	C4H6OHOOH1-2-3=>CH3CHO+SC2H2OH+OH	1.05E+16	0.0	41600.0
2108.	SC2H2OH+HCO<=>CH2COHCHO	1.81E+13	0.0	0.0
2109.	CH2COHCHO+H<=>CH2COHCO+H2	1.34E+13	0.0	3300.0
2110.	CH2COHCHO+O<=>CH2COHCO+OH	5.94E+12	0.0	1868.0
2111.	CH2COHCHO+OH<=>CH2COHCO+H2O	9.24E+06	1.5	-962.0
2112.	CH2COHCHO+O2<=>CH2COHCO+HO2	1.00E+13	0.0	40700.0
2113.	CH2COHCHO+HO2<=>CH2COHCO+H2O2	3.01E+12	0.0	11920.0
2114.	CH2COHCHO+CH3<=>CH2COHCO+CH4	2.61E+06	1.8	5911.0
2115.	CH2COHCHO+C2H3<=>CH2COHCO+C2H4	1.74E+12	0.0	8440.0
2116.	CH2COHCHO+CH3O<=>CH2COHCO+CH3OH	1.00E+12	0.0	3300.0
2117.	CH2COHCHO+CH3O2<=>CH2COHCO+CH3O2H	3.01E+12	0.0	11920.0
2118.	SC2H2OH+CO<=>CH2COHCO	1.51E+11	0.0	4810.0
2119.	SC2H2OH<=>CH2CO+H	5.69E+52	-13.4	45049.0
2120.	SC2H2OH<=>C2H2OH	2.65E+36	-8.9	51019.0
2121.	SC2H2OH+O2<=>CH2CO+HO2	5.26E+17	-1.6	869.0
2122.	SC2H2OH+O2<=>HCCOH+HO2	5.51E+03	2.5	-414.0
2123.	C4H8-1+O<=>NC3H7+HCO	7.45E+06	1.9	183.0
2124.	C4H8-1+O=>CH2CO+C2H5+H	3.05E+06	1.9	183.0
2125.	C4H8-1+O=>C2H5CHCO+H+H	3.05E+06	1.9	183.0
2126.	C4H8-2+O<=>CH3+C2H5CO	7.45E+06	1.9	183.0
2127.	C4H8-2+O=>CH2CO+C2H5+H	3.05E+06	1.9	183.0
2128.	C4H8-2+O=>C2H5CHCO+H+H	3.05E+06	1.9	183.0
2129.	SC4H9O2<=>C4H8-2+HO2	7.25E+09	0.8	29900.0
	Declared duplicate reaction...			
2130.	SC4H9O2<=>C4H8-2+HO2	1.70E+10	0.7	30700.0
	Declared duplicate reaction...			
2131.	C4H8OOH1-2<=>C4H8-1+HO2	1.00E+00	1.0	1.0
	Rate coefficients at P=1.00E-02(atm)	1.09E+13	-1.4	9113.0

Rate coefficients at P=1.00E-01(atm)	2.93E+18	-2.6	13142.0
Rate coefficients at P=1.00E+00(atm)	7.80E+24	-4.0	18999.0
Rate coefficients at P=2.00E+00(atm)	1.76E+26	-4.3	20657.0
Rate coefficients at P=5.00E+00(atm)	7.86E+26	-4.3	22246.0
Rate coefficients at P=1.00E+01(atm)	1.73E+26	-4.1	22736.0
Rate coefficients at P=3.00E+01(atm)	1.39E+23	-3.0	22032.0
Rate coefficients at P=5.00E+01(atm)	1.45E+21	-2.4	21227.0
2132. C4H8-1+HO2<=>C4H8OOH2-1	1.46E-01	3.5	5798.0
Rate coefficients at P=1.33E-02(atm)	9.74E+05	0.4	7570.0
Rate coefficients at P=1.00E+00(atm)	8.43E+14	-1.8	12124.0
Rate coefficients at P=1.00E+01(atm)	1.82E+20	-3.0	16135.0
Rate coefficients at P=1.00E+02(atm)	8.79E+17	-2.0	17111.0
2133. C4H8-1+HO2<=>C4H8O1-2+OH	1.00E+11	0.0	0.0
Rate coefficients at P=1.33E-02(atm)	2.96E+03	2.5	12199.0
Rate coefficients at P=1.00E+00(atm)	1.69E+10	0.5	16606.0
Rate coefficients at P=1.00E+01(atm)	2.19E+17	-1.5	22209.0
Rate coefficients at P=1.00E+02(atm)	2.73E+21	-2.5	27857.0
2134. C4H8OOH2-1<=>C4H8O1-2+OH	3.92E+06	1.6	12124.0
Rate coefficients at P=1.33E-02(atm)	2.75E+22	-4.4	12349.0
Rate coefficients at P=1.00E+00(atm)	2.44E+29	-5.9	17573.0
Rate coefficients at P=1.00E+01(atm)	1.52E+30	-5.8	19702.0
Rate coefficients at P=1.00E+02(atm)	1.93E+20	-2.7	16454.0
2135. C4H8-2+HO2<=>C4H8OOH2-3	9.55E+03	2.6	10347.0
Rate coefficients at P=1.33E-02(atm)	2.53E+12	-1.3	10098.0
Rate coefficients at P=1.00E+00(atm)	1.34E+11	-0.5	8480.0
Rate coefficients at P=1.00E+01(atm)	1.93E+17	-2.0	12122.0
Rate coefficients at P=1.00E+02(atm)	4.45E+19	-2.5	14812.0
2136. C4H8-2+HO2<=>C4H8O2-3+OH	1.00E+11	0.0	0.0
Rate coefficients at P=1.33E-02(atm)	7.65E+05	1.9	10745.0
Rate coefficients at P=1.00E+00(atm)	1.79E+08	1.3	12370.0
Rate coefficients at P=1.00E+01(atm)	1.75E+15	-0.7	17220.0
Rate coefficients at P=1.00E+02(atm)	8.37E+20	-2.3	22838.0
2137. C4H8OOH2-3<=>C4H8O2-3+OH	1.05E+10	0.7	11964.0
Rate coefficients at P=1.33E-02(atm)	3.02E+19	-3.5	9746.0
Rate coefficients at P=1.00E+00(atm)	6.37E+24	-4.5	13480.0
Rate coefficients at P=1.00E+01(atm)	1.39E+28	-5.2	16470.0
Rate coefficients at P=1.00E+02(atm)	1.54E+27	-4.7	17832.0
2138. C4H8-1+CH3O2<=>C4H8O1-2+CH3O	1.00E+12	0.0	14340.0
2139. C4H8-2+CH3O2<=>C4H8O2-3+CH3O	5.62E+11	0.0	12310.0
2140. C4H6<=>C4H5-I+H	5.70E+36	-6.3	112353.0
2141. C4H6<=>C4H5-N+H	5.30E+44	-8.6	123608.0
2142. C4H6<=>C4H4+H2	2.50E+15	0.0	94700.0
2143. H2CC+C2H4<=>C4H6	1.00E+12	0.0	0.0
2144. C4H6+H<=>C4H5-N+H2	1.33E+06	2.5	12240.0
2145. C4H5-N+HO2<=>C4H6+O2	6.00E+11	0.0	0.0
2146. C4H6+O<=>C4H5-N+OH	7.50E+06	1.9	3740.0
2147. C4H6+OH<=>C4H5-N+H2O	6.20E+06	2.0	3430.0
2148. C4H5-N+H2O2<=>C4H6+HO2	1.21E+10	0.0	-596.0
2149. C4H6+CH3<=>C4H5-N+CH4	2.00E+14	0.0	22800.0
2150. C4H6+C2H3<=>C4H5-N+C2H4	5.00E+13	0.0	22800.0
2151. C4H6+C3H3<=>C4H5-N+C3H4-A	1.00E+13	0.0	22500.0
2152. C4H6+C3H5-A<=>C4H5-N+C3H6	1.00E+13	0.0	22500.0
2153. C4H6+H<=>C4H5-I+H2	6.65E+05	2.5	9240.0
2154. C4H5-I+HO2<=>C4H6+O2	6.00E+11	0.0	0.0
2155. C4H6+O<=>C4H5-I+OH	7.50E+06	1.9	3740.0
2156. C4H6+OH<=>C4H5-I+H2O	3.10E+06	2.0	430.0
2157. C4H5-I+H2O2<=>C4H6+HO2	1.21E+10	0.0	-596.0
2158. C4H6+CH3<=>C4H5-I+CH4	1.00E+14	0.0	19800.0
2159. C4H6+C2H3<=>C4H5-I+C2H4	2.50E+13	0.0	19800.0
2160. C4H6+C3H3<=>C4H5-I+C3H4-A	5.00E+12	0.0	19500.0
2161. C4H6+C3H5-A<=>C4H5-I+C3H6	5.00E+12	0.0	19500.0
2162. C4H6+H<=>C2H4+C2H3	1.46E+30	-4.3	21647.0
Rate coefficients at P=1.00E+00(atm)	1.46E+30	-4.3	21647.0
Rate coefficients at P=1.00E+01(atm)	5.45E+30	-4.5	21877.0
2163. C4H6+H<=>C3H4-P+CH3	2.00E+12	0.0	7000.0
2164. C4H6+H<=>C3H4-A+CH3	2.00E+12	0.0	7000.0
2165. C4H6+O<=>C2H2+C2H4O1-2	1.00E+08	1.4	-860.0
2166. C4H6+O<=>SC3H5CO+H	5.00E+07	1.4	-860.0
2167. C4H6+O<=>CH2CHCHCHO+H	4.50E+08	1.4	-860.0
2168. C4H6+OH<=>C2H3CHO+CH3	1.37E+12	0.0	-1040.0
2169. C4H6+OH<=>C3H5-A+CH2O	1.37E+12	0.0	-1040.0
2170. C4H6+HO2<=>C4H6O25+OH	1.20E+12	0.0	14000.0
2171. C4H6+HO2<=>C2H3CHOCH2+OH	4.80E+12	0.0	14000.0
2172. C4H6O25<=>C4H4O+H2	5.30E+12	0.0	48500.0
2173. C2H3CHOCH2<=>C4H6O23	2.00E+14	0.0	50600.0
2174. C4H6O23<=>SC3H5CHO	1.95E+13	0.0	49400.0
2175. C4H6O23<=>C2H4+CH2CO	5.75E+15	0.0	69300.0
2176. C4H6O23<=>C2H2+C2H4O1-2	1.00E+16	0.0	75800.0
2177. C4H4O<=>CO+C3H4-P	1.78E+15	0.0	77500.0
2178. C4H4O<=>C2H2+CH2CO	5.01E+14	0.0	77500.0
2179. C2H3+C2H2<=>C4H4+H	7.20E+13	-0.5	6100.0
Rate coefficients at P=1.32E-02(atm)	7.20E+13	-0.5	6100.0
Rate coefficients at P=2.63E-02(atm)	5.00E+14	-0.7	6700.0
Rate coefficients at P=1.20E-01(atm)	4.60E+16	-1.2	8400.0
Rate coefficients at P=1.00E+00(atm)	2.00E+18	-1.7	10600.0
Rate coefficients at P=1.00E+01(atm)	4.90E+16	-1.1	11800.0
2180. C2H3+C2H2<=>C4H5-N	1.10E+31	-7.1	5600.0
Rate coefficients at P=1.32E-02(atm)	1.10E+31	-7.1	5600.0
Rate coefficients at P=2.63E-02(atm)	1.10E+32	-7.3	6200.0
Rate coefficients at P=1.20E-01(atm)	2.40E+31	-7.0	5600.0
Rate coefficients at P=1.00E+00(atm)	9.30E+38	-8.8	12000.0
Rate coefficients at P=1.00E+01(atm)	8.10E+37	-8.1	13400.0
2181. C2H3+C2H2<=>C4H5-I	5.00E+34	-8.4	7900.0
Rate coefficients at P=1.32E-02(atm)	5.00E+34	-8.4	7900.0

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      Rate coefficients at P=2.63E-02(atm)          2.10E+36   -8.8     9100.0
      Rate coefficients at P=1.20E-01(atm)          1.00E+37   -8.8     9800.0
      Rate coefficients at P=1.00E+00(atm)          1.60E+46  -11.0    18600.0
      Rate coefficients at P=1.00E+01(atm)          5.10E+53  -12.6    28800.0
2182. C2H3+C2H3<=>C4H6                               7.00E+57  -13.8    17629.0
      Rate coefficients at P=2.63E-02(atm)          7.00E+57  -13.8    17629.0
      Rate coefficients at P=1.20E-01(atm)          1.50E+52  -12.0    16056.0
      Rate coefficients at P=1.00E+00(atm)          1.50E+42   -8.8    12483.0
2183. C2H3+C2H3<=>C4H5-I+H                           1.50E+30   -5.0    12958.0
      Rate coefficients at P=2.63E-02(atm)          1.50E+30   -5.0    12958.0
      Rate coefficients at P=1.20E-01(atm)          7.20E+28   -4.5    14273.0
      Rate coefficients at P=1.00E+00(atm)          1.20E+22   -2.4    13654.0
2184. C2H3+C2H3<=>C4H5-N+H                           1.10E+24   -3.3    12395.0
      Rate coefficients at P=2.63E-02(atm)          1.10E+24   -3.3    12395.0
      Rate coefficients at P=1.20E-01(atm)          4.60E+24   -3.4    14650.0
      Rate coefficients at P=1.00E+00(atm)          2.40E+20   -2.0    15361.0
2185. C4H5-N<=>C4H5-I                                2.40E+60  -16.1    47500.0
      Rate coefficients at P=1.32E-02(atm)          2.40E+60  -16.1    47500.0
      Rate coefficients at P=2.63E-02(atm)          1.30E+62  -16.4    49600.0
      Rate coefficients at P=1.20E-01(atm)          4.90E+66  -17.3    55400.0
      Rate coefficients at P=1.00E+00(atm)          1.50E+67  -16.9    59100.0
      Rate coefficients at P=1.00E+01(atm)          2.00E+60  -14.5    58600.0
2186. C4H4+H<=>C4H5-N                                1.20E+51  -12.6    12300.0
      Rate coefficients at P=1.32E-02(atm)          1.20E+51  -12.6    12300.0
      Rate coefficients at P=2.63E-02(atm)          4.20E+50  -12.3    12500.0
      Rate coefficients at P=1.20E-01(atm)          1.10E+50  -11.9    13400.0
      Rate coefficients at P=1.00E+00(atm)          1.30E+51  -11.9    16500.0
      Rate coefficients at P=1.00E+01(atm)          6.20E+45  -10.1    15800.0
2187. C4H4+H<=>C4H5-I                                6.10E+53  -13.2    14200.0
      Rate coefficients at P=1.32E-02(atm)          6.10E+53  -13.2    14200.0
      Rate coefficients at P=2.63E-02(atm)          9.60E+52  -12.8    14300.0
      Rate coefficients at P=1.20E-01(atm)          2.10E+52  -12.4    15500.0
      Rate coefficients at P=1.00E+00(atm)          4.90E+51  -11.9    17700.0
      Rate coefficients at P=1.00E+01(atm)          1.50E+48  -10.6    18800.0
2188. C4H5-N+H<=>C4H5-I+H                            3.10E+26   -3.4    17423.0
2189. C4H5-N+H<=>C4H4+H2                             1.50E+13    0.0        0.0
2190. C4H5-N+OH<=>C4H4+H2O                           2.00E+12    0.0        0.0
2191. C4H5-N+HCO<=>C4H6+CO                           5.00E+12    0.0        0.0
2192. C4H5-N+HO2=>C2H3+CH2CO+OH                      6.60E+12    0.0        0.0
2193. C4H5-N+O2<=>CH2CHCHCHO+O                       3.00E+11    0.3       11.0
2194. C4H5-N+O2<=>HCO+C2H3CHO                        9.20E+16   -1.4     1010.0
2195. C4H5-N+O2=>H+CO+C2H3CHO                        5.19E+15   -1.3     3312.6
2196. C4H5-I+H<=>C4H4+H2                             3.00E+13    0.0        0.0
2197. C4H5-I+H<=>C3H3+CH3                            2.00E+13    0.0     2000.0
2198. C4H5-I+OH<=>C4H4+H2O                           4.00E+12    0.0        0.0
2199. C4H5-I+HCO<=>C4H6+CO                           5.00E+12    0.0        0.0
2200. C4H5-I+HO2=>C2H3+CH2CO+OH                      6.60E+12    0.0        0.0
2201. C4H5-I+O2<=>CH2CO+CH2CHO                       2.16E+10    0.0     2500.0
2202. C4H5-2<=>C4H5-I                                1.50E+67  -16.9    59100.0
2203. C4H5-2+H<=>C4H5-I+H                            3.10E+26   -3.4    17423.0
2204. C4H5-2+HO2=>OH+C2H2+CH3CO                      8.00E+11    0.0        0.0
2205. C4H5-2+O2<=>CH3CO+CH2CO                        2.16E+10    0.0     2500.0
2206. C4H5-2+OH<=>CH2OH+C3H3                         3.00E+12    0.0        0.0
2207. C4H5-2+O<=>CH2O+C3H3                           3.00E+13    0.0        0.0
2208. C4H6+C2H3=>C6H6+H2+H                           5.62E+11    0.0     3240.0
2209. C4H5-I+C2H2<=>FULVENE+H                        9.74E+26   -3.8    21329.0
2210. C4H5-N+C2H2<=>FULVENE+H                        1.74E+19   -1.9    12384.0
2211. C4H5-N+C2H2<=>C6H6+H                           1.60E+16   -1.3     5400.0
2212. C4H5-N+C2H3<=>C6H6+H2                          1.84E-13    7.1    -3611.0
2213. C4H5-2+C2H<=>C3H3+C3H3                         4.00E+12    0.0        0.0
2214. C4H5-2+C2H2<=>C6H6+H                           5.00E+14    0.0    25000.0
2215. C4H5-2+C2H4<=>C5H6+CH3                         5.00E+14    0.0    25000.0
2216. C4H612<=>C4H5-I+H                              4.20E+15    0.0    92600.0
2217. C4H612<=>C4H6                                  3.00E+13    0.0    65000.0
2218. C3H3+CH3(+M)<=>C4H612(+M)                      1.50E+12    0.0        0.0
      Low pressure limit:  0.26000E+58 -0.11940E+02  0.97700E+04
      TROE centering:      0.17500E+00  0.13410E+04  0.60000E+05  0.97700E+04
      H2              Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      CH4             Enhanced by    2.000E+00
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      C2H6            Enhanced by    3.000E+00
      AR              Enhanced by    7.000E-01
2219. C4H612+H<=>C4H5-I+H2                           1.70E+05    2.5     2490.0
2220. C4H612+CH3<=>C4H5-I+CH4                        7.00E+13    0.0    18500.0
2221. C4H612+O<=>C4H5-I+OH                           1.80E+11    0.7     5880.0
2222. C4H612+OH<=>C4H5-I+H2O                         3.10E+06    2.0     -298.0
2223. C4H612+H<=>C4H6+H                              2.00E+13    0.0     4000.0
2224. C4H612+H<=>C3H4-A+CH3                          2.00E+13    0.0     2000.0
2225. C4H612+H<=>C3H4-P+CH3                          2.00E+13    0.0     2000.0
2226. C4H612+O<=>CH2CO+C2H4                          1.20E+08    1.6      327.0
2227. C4H6-2<=>C4H6                                  3.00E+13    0.0    65000.0
2228. C4H6-2<=>C4H612                                3.00E+13    0.0    67000.0
2229. C4H6-2+H<=>C4H612+H                            2.00E+13    0.0     4000.0
2230. C4H6-2+H<=>C4H5-2+H2                           3.40E+05    2.5     2490.0
2231. C4H6-2+H<=>CH3+C3H4-P                          2.60E+05    2.5     1000.0
2232. C4H6-2+CH3<=>C4H5-2+CH4                        1.40E+14    0.0    18500.0
2233. C4H3-I+H<=>C4H4                                3.40E+43   -9.0    12120.0
2234. C4H4+H<=>C4H3-N+H2                             6.65E+05    2.5    12240.0
2235. C4H4+OH<=>C4H3-N+H2O                           3.10E+07    2.0     3430.0
2236. C4H4+H<=>C4H3-I+H2                             3.33E+05    2.5     9240.0
2237. C4H4+OH<=>C4H3-I+H2O                           1.55E+07    2.0      430.0
2238. C4H4+CH3<=>C4H3-I+CH4                          5.00E+13    0.0    19800.0
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2239. C4H4+CH3<=>C4H3-N+CH4                          1.00E+14    0.0    22800.0
2240. C3H3+CH2<=>C4H4+H                              5.00E+13    0.0        0.0
2241. C4H4+O<=>C3H3+HCO                              6.00E+08    1.4     -860.0
2242. C4H4+OH<=>CH2O+C3H3                            5.00E+12    0.0        0.0
2243. C2H2+C2H(+M)<=>C4H3-N(+M)                      8.30E+10    0.9     -363.0
      Low pressure limit:  0.12400E+32 -0.47180E+01  0.18710E+04
      TROE centering:      0.10000E+01  0.10000E+03  0.56130E+04  0.13390E+05
      H2              Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      CH4             Enhanced by    2.000E+00
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      C2H6            Enhanced by    3.000E+00
      C2H2            Enhanced by    2.500E+00
      C2H4            Enhanced by    2.500E+00
2244. C2H2+C2H(+M)<=>C4H3-I(+M)                      8.30E+10    0.9     -363.0
      Low pressure limit:  0.12400E+32 -0.47180E+01  0.18710E+04
      TROE centering:      0.10000E+01  0.10000E+03  0.56130E+04  0.13390E+05
      H2              Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      CH4             Enhanced by    2.000E+00
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      C2H6            Enhanced by    3.000E+00
      C2H2            Enhanced by    2.500E+00
      C2H4            Enhanced by    2.500E+00
2245. C4H2+H<=>C4H3-N                                1.10E+42   -8.7    15300.0
2246. C4H2+H<=>C4H3-I                                1.10E+30   -4.9    10800.0
2247. C4H3-N<=>C4H3-I                                4.10E+43   -9.5    53000.0
2248. C4H3-N+H<=>C4H3-I+H                            2.50E+20   -1.7    10800.0
2249. C4H3-N+H<=>C2H2+H2CC                           6.30E+25   -3.3    10014.0
2250. C4H3-N+H<=>C4H4                                2.00E+47  -10.3    13070.0
2251. C4H3-N+H<=>C4H2+H2                             3.00E+13    0.0        0.0
2252. C4H3-N+OH<=>C4H2+H2O                           2.00E+12    0.0        0.0
2253. C4H3-N+C2H3<=>C3H3+C3H3                        4.00E+12    0.0        0.0
2254. C3H3+CH<=>C4H3-I+H                             5.00E+13    0.0        0.0
2255. C4H3-I+H<=>C2H2+H2CC                           2.80E+23   -2.5    10780.0
2256. C4H3-I+H<=>C4H2+H2                             6.00E+13    0.0        0.0
2257. C4H3-I+OH<=>C4H2+H2O                           4.00E+12    0.0        0.0
2258. C4H3-I+O2<=>HCCO+CH2CO                         7.86E+16   -1.8        0.0
2259. C4H3-I+CH2<=>C3H4-A+C2H                        2.00E+13    0.0        0.0
2260. C4H4+C2H<=>L-C6H4+H                            1.20E+13    0.0        0.0
2261. C4H3-N+C2H2<=>L-C6H4+H                         2.50E+14   -0.6    10600.0
2262. C4H3-N+C2H2<=>C-C6H4+H                         6.90E+46  -10.0    30100.0
2263. C4H3-N+C2H2<=>C6H5                             9.60E+70  -17.8    31300.0
2264. C4H3-I+CH3<=>C5H6                              1.00E+12    0.0        0.0
2265. C3H3+HCCO<=>C4H4+CO                            2.50E+13    0.0        0.0
2266. H2CC+C2H2(+M)<=>C4H4(+M)                       3.50E+05    2.1    -2400.0
      Low pressure limit:  0.14000E+61 -0.12599E+02  0.74170E+04
      TROE centering:      0.98000E+00  0.56000E+02  0.58000E+03  0.41640E+04
      H2              Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      CH4             Enhanced by    2.000E+00
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      C2H6            Enhanced by    3.000E+00
      C2H2            Enhanced by    3.000E+00
      C2H4            Enhanced by    3.000E+00
2267. C2H2+C2H<=>C4H2+H                              9.60E+13    0.0        0.0
2268. C4H2+OH<=>H2C4O+H                              6.60E+12    0.0     -410.0
2269. C4H2+OH<=>CO+C3H3                              2.58E+19   -2.4     3034.0
2270. H2C4O+H<=>C2H2+HCCO                            5.00E+13    0.0     3000.0
2271. H2C4O+OH<=>CH2CO+HCCO                          1.00E+07    2.0     2000.0
2272. C4H2+C2H<=>C6H2+H                              9.60E+13    0.0        0.0
2273. C4H2+C2H<=>C6H3                                4.50E+37   -7.7     7100.0
2274. NC3H7CHO+O2<=>NC3H7CO+HO2                      3.01E+13    0.0    39150.0
2275. NC3H7CHO+O<=>NC3H7CO+OH                        5.94E+12    0.0     1868.0
2276. NC3H7CHO+H<=>NC3H7CO+H2                        1.31E+05    2.6     1220.0
2277. NC3H7CHO+OH<=>NC3H7CO+H2O                      3.37E+12    0.0     -619.0
2278. NC3H7CHO+HO2<=>NC3H7CO+H2O2                    3.01E+12    0.0    11920.0
2279. NC3H7CHO+CH3<=>NC3H7CO+CH4                     7.08E-04    4.6     1966.0
2280. NC3H7CHO+CH3O2<=>NC3H7CO+CH3O2H                3.01E+12    0.0    11920.0
2281. NC3H7CHO+OH<=>C3H6CHO-3+H2O                    5.52E+02    3.1    -1176.0
2282. NC3H7CHO+HO2<=>C3H6CHO-3+H2O2                  3.44E+12    0.1    17880.0
2283. NC3H7CHO+CH3O2<=>C3H6CHO-3+CH3O2H              3.44E+12    0.1    17880.0
2284. NC3H7CHO+OH<=>C3H6CHO-2+H2O                    4.68E+07    1.6      -35.0
2285. NC3H7CHO+HO2<=>C3H6CHO-2+H2O2                  9.64E+03    2.6    13910.0
2286. NC3H7CHO+CH3O2<=>C3H6CHO-2+CH3O2H              9.64E+03    2.6    13910.0
2287. NC3H7CHO+OH<=>C3H6CHO-1+H2O                    5.28E+09    1.0     1586.0
2288. NC3H7CHO+HO2<=>C3H6CHO-1+H2O2                  2.38E+04    2.5    16490.0
2289. NC3H7CHO+CH3O2<=>C3H6CHO-1+CH3O2H              2.38E+04    2.5    16490.0
2290. NC3H7CO<=>NC3H7+CO                             1.00E+11    0.0     9600.0
2291. C2H5CHCO+H<=>C3H6CHO-3                         5.00E+12    0.0     1200.0
2292. C2H3CHO+CH3<=>C3H6CHO-3                        1.23E+11    0.0     7800.0
2293. C3H6CHO-1<=>C2H4+CH2CHO                        7.40E+11    0.0    21970.0
2294. C2H5CHCO+OH<=>NC3H7+CO2                        3.73E+12    0.0    -1010.0
2295. C2H5CHCO+H<=>NC3H7+CO                          4.40E+12    0.0     1459.0
2296. C2H5CHCO+O<=>C3H6+CO2                          3.20E+12    0.0     -437.0
2297. SC3H5CHO<=>C3H6+CO                             3.90E+14    0.0    69000.0
2298. SC3H5CO+H<=>SC3H5CHO                           1.00E+14    0.0        0.0
2299. CH2CHCHCHO+H<=>SC3H5CHO                        1.00E+14    0.0        0.0
2300. SC3H5CHO+OH<=>SC3H5CO+H2O                      3.37E+12    0.0     -619.0
2301. SC3H5CHO+HO2<=>SC3H5CO+H2O2                    1.00E+12    0.0    11920.0
2302. SC3H5CHO+CH3<=>SC3H5CO+CH4                     3.98E+12    0.0     8700.0
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2303.	SC3H5CHO+O<=>SC3H5CO+OH	7.18E+12	0.0	1389.0
2304.	SC3H5CHO+O2<=>SC3H5CO+HO2	4.00E+13	0.0	37600.0
2305.	SC3H5CHO+H<=>SC3H5CO+H2	2.60E+12	0.0	2600.0
2306.	SC3H5CHO+C2H3<=>SC3H5CO+C2H4	1.11E+00	3.5	4682.0
2307.	SC3H5CHO+H<=>CH2CHCHCHO+H2	1.70E+05	2.5	2490.0
2308.	SC3H5CHO+O<=>CH2CHCHCHO+OH	5.24E+11	0.7	5884.0
2309.	SC3H5CHO+OH<=>CH2CHCHCHO+H2O	4.46E+06	2.1	1051.0
2310.	SC3H5CHO+CH3<=>CH2CHCHCHO+CH4	2.10E+00	3.5	5675.0
2311.	SC3H5CHO+C2H3<=>CH2CHCHCHO+C2H4	2.21E+00	3.5	4682.0
2312.	SC3H5CHO+H<=>CH3+C2H3CHO	4.00E+21	-2.4	11180.0
2313.	SC3H5CHO+H<=>C3H6+HCO	4.00E+21	-2.4	11180.0
2314.	C3H5-S+CO<=>SC3H5CO	5.00E+12	0.0	8000.0
2315.	CH2CHCHCHO<=>C3H5-A+CO	6.10E+05	0.9	-1120.0
2316.	CH2CHCHCHO+O2<=>C2H3CHO+HOCO	1.20E+36	-7.2	33600.0
2317.	C2H3COCH3+OH<=>CH3CHO+CH3CO	1.00E+11	0.0	0.0
2318.	C2H3COCH3+OH=>CH2CO+C2H3+H2O	5.10E+11	0.0	1192.0
2319.	C2H3COCH3+HO2=>CH2CHO+CH3CO+OH	6.03E+09	0.0	7949.0
2320.	C2H3COCH3+HO2=>CH2CO+C2H3+H2O2	8.50E+12	0.0	20460.0
2321.	C2H3COCH3+CH3O2=>CH2CHO+CH3CO+CH3O	3.97E+11	0.0	17050.0
2322.	C2H3COCH3+CH3O2=>CH2CO+C2H3+CH3O2H	3.01E+12	0.0	17580.0
2323.	C2H5COCH3+OH<=>CH2CH2COCH3+H2O	7.55E+09	1.0	1586.0
2324.	C2H5COCH3+HO2<=>CH2CH2COCH3+H2O2	2.38E+04	2.5	16490.0
2325.	C2H5COCH3+O<=>CH2CH2COCH3+OH	2.25E+13	0.0	7700.0
2326.	C2H5COCH3+H<=>CH2CH2COCH3+H2	9.16E+06	2.0	7700.0
2327.	C2H5COCH3+O2<=>CH2CH2COCH3+HO2	2.05E+13	0.0	51310.0
2328.	C2H5COCH3+CH3<=>CH2CH2COCH3+CH4	3.19E+01	3.2	7172.0
2329.	C2H5COCH3+CH3O<=>CH2CH2COCH3+CH3OH	2.17E+11	0.0	6460.0
2330.	C2H5COCH3+CH3O2<=>CH2CH2COCH3+CH3O2H	3.01E+12	0.0	19380.0
2331.	C2H5COCH3+C2H3<=>CH2CH2COCH3+C2H4	5.00E+11	0.0	10400.0
2332.	C2H5COCH3+C2H5<=>CH2CH2COCH3+C2H6	5.00E+10	0.0	13400.0
2333.	C2H5COCH3+OH<=>CH3CHCOCH3+H2O	8.45E+11	0.0	-228.0
2334.	C2H5COCH3+HO2<=>CH3CHCOCH3+H2O2	2.00E+11	0.0	8698.0
2335.	C2H5COCH3+O<=>CH3CHCOCH3+OH	3.07E+13	0.0	3400.0
2336.	C2H5COCH3+H<=>CH3CHCOCH3+H2	4.46E+06	2.0	3200.0
2337.	C2H5COCH3+O2<=>CH3CHCOCH3+HO2	1.55E+13	0.0	41970.0
2338.	C2H5COCH3+CH3<=>CH3CHCOCH3+CH4	1.74E+00	3.5	3680.0
2339.	C2H5COCH3+CH3O<=>CH3CHCOCH3+CH3OH	1.45E+11	0.0	2771.0
2340.	C2H5COCH3+CH3O2<=>CH3CHCOCH3+CH3O2H	2.00E+12	0.0	15250.0
2341.	C2H5COCH3+C2H3<=>CH3CHCOCH3+C2H4	3.00E+11	0.0	3400.0
2342.	C2H5COCH3+C2H5<=>CH3CHCOCH3+C2H6	3.00E+10	0.0	8600.0
2343.	C2H5COCH3+OH<=>C2H5COCH2+H2O	5.10E+11	0.0	1192.0
2344.	C2H5COCH3+HO2<=>C2H5COCH2+H2O2	2.38E+04	2.5	14690.0
2345.	C2H5COCH3+O<=>C2H5COCH2+OH	5.00E+12	0.0	5962.0
2346.	C2H5COCH3+H<=>C2H5COCH2+H2	9.30E+12	0.0	6357.0
2347.	C2H5COCH3+O2<=>C2H5COCH2+HO2	2.05E+13	0.0	49150.0
2348.	C2H5COCH3+CH3<=>C2H5COCH2+CH4	1.62E+11	0.0	9630.0
2349.	C2H5COCH3+CH3O<=>C2H5COCH2+CH3OH	2.17E+11	0.0	4660.0
2350.	C2H5COCH3+CH3O2<=>C2H5COCH2+CH3O2H	3.01E+12	0.0	17580.0
2351.	C2H5COCH3+C2H3<=>C2H5COCH2+C2H4	6.15E+10	0.0	4278.0
2352.	C2H5COCH3+C2H5<=>C2H5COCH2+C2H6	5.00E+10	0.0	11600.0
2353.	C2H3COCH3+H<=>CH3CHCOCH3	5.00E+12	0.0	1200.0
2354.	CH3CHCO+CH3<=>CH3CHCOCH3	1.23E+11	0.0	7800.0
2355.	C2H5COCH2<=>CH2CO+C2H5	1.00E+14	0.0	35000.0
2356.	CH3CHCOCH3+O2<=>CH3CHOOCOCH3	1.00E+11	0.0	0.0
2357.	CH3CHOOCOCH3<=>CH2CHOOHCOCH3	8.90E+12	0.0	29700.0
2358.	C2H3COCH3+HO2<=>CH2CHOOHCOCH3	7.00E+10	0.0	7800.0
2359.	C5H81-3+OH<=>CH2O+C4H71-3	1.00E+12	0.0	0.0
2360.	C5H81-3+OH<=>C2H3CHO+C2H5	1.00E+12	0.0	0.0
2361.	C5H81-3+OH<=>CH3CHO+C3H5-S	1.00E+12	0.0	0.0
2362.	C4H7O1-4<=>CH2O+C3H5-A	1.33E+21	-2.3	25084.0
2363.	C5H10-1<=>C2H5+C3H5-A	9.86E+21	-2.1	75060.0
2364.	C4H71-3+CH3(+M)<=>C5H10-2(+M)	1.00E+14	-0.3	-262.3
	Low pressure limit: 0.39100E+61 -0.12810E+02 0.62500E+04			
	TROE centering: 0.10400E+00 0.16060E+04 0.60000E+05 0.61180E+04			
	H2 Enhanced by 2.000E+00			
	H2O Enhanced by 6.000E+00			
	CH4 Enhanced by 2.000E+00			
	CO Enhanced by 1.500E+00			
	CO2 Enhanced by 2.000E+00			
	C2H6 Enhanced by 3.000E+00			
	AR Enhanced by 7.000E-01			
2365.	C5H10-1+O2<=>C5H91-5+HO2	3.00E+13	0.0	52290.0
2366.	C5H10-1+O<=>C5H91-5+OH	9.80E+05	2.4	4750.0
2367.	C5H10-1+H<=>C5H91-5+H2	6.65E+05	2.5	6756.0
2368.	C5H10-1+OH<=>C5H91-5+H2O	5.27E+09	1.0	1586.0
2369.	C5H10-1+HO2<=>C5H91-5+H2O2	2.38E+04	2.5	16490.0
2370.	C5H10-1+CH3<=>C5H91-5+CH4	4.52E-01	3.6	7154.0
2371.	C5H10-1+CH3O<=>C5H91-5+CH3OH	2.17E+11	0.0	6458.0
2372.	C5H10-1+CH3O2<=>C5H91-5+CH3O2H	2.38E+04	2.5	16490.0
2373.	C5H10-2+O2<=>C5H92-5+HO2	3.00E+13	0.0	52290.0
2374.	C5H10-2+O<=>C5H92-5+OH	9.80E+05	2.4	4750.0
2375.	C5H10-2+H<=>C5H92-5+H2	6.65E+05	2.5	6756.0
2376.	C5H10-2+OH<=>C5H92-5+H2O	5.27E+09	1.0	1586.0
2377.	C5H10-2+HO2<=>C5H92-5+H2O2	2.38E+04	2.5	16490.0
2378.	C5H10-2+CH3<=>C5H92-5+CH4	4.52E-01	3.6	7154.0
2379.	C5H10-2+CH3O<=>C5H92-5+CH3OH	2.17E+11	0.0	6458.0
2380.	C5H10-2+CH3O2<=>C5H92-5+CH3O2H	2.38E+04	2.5	16490.0
2381.	C5H10-1+O2<=>C5H91-4+HO2	2.00E+13	0.0	49640.0
2382.	C5H10-1+O<=>C5H91-4+OH	5.51E+05	2.5	2830.0
2383.	C5H10-1+H<=>C5H91-4+H2	1.30E+06	2.4	4471.0
2384.	C5H10-1+OH<=>C5H91-4+H2O	4.67E+07	1.6	-35.0
2385.	C5H10-1+HO2<=>C5H91-4+H2O2	9.64E+03	2.6	13910.0
2386.	C5H10-1+CH3<=>C5H91-4+CH4	1.51E+00	3.5	5481.0
2387.	C5H10-1+CH3O<=>C5H91-4+CH3OH	1.45E+11	0.0	4571.0

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2388. C5H10-1+CH3O2<=>C5H91-4+CH3O2H                9.64E+03    2.6    13910.0
2389. C5H10-2+O2<=>C5H91-3+HO2                      3.30E+12    0.0    39900.0
2390. C5H10-2+O<=>C5H91-3+OH                        4.41E+05    2.4     3150.0
2391. C5H10-2+H<=>C5H91-3+H2                        1.73E+05    2.5     2492.0
2392. C5H10-2+OH<=>C5H91-3+H2O                      3.12E+06    2.0     -298.0
2393. C5H10-2+HO2<=>C5H91-3+H2O2                    9.64E+03    2.6    13910.0
2394. C5H10-2+CH3<=>C5H91-3+CH4                     2.21E+00    3.5     5675.0
2395. C5H10-2+CH3O<=>C5H91-3+CH3OH                  9.00E+01    3.0    11990.0
2396. C5H10-2+CH3O2<=>C5H91-3+CH3O2H                9.64E+03    2.6    13910.0
2397. C5H10-1+O2<=>C5H91-3+HO2                      2.20E+12    0.0    37220.0
2398. C5H10-1+O<=>C5H91-3+OH                        6.60E+05    2.4     1210.0
2399. C5H10-1+H<=>C5H91-3+H2                        3.38E+05    2.4      207.0
2400. C5H10-1+OH<=>C5H91-3+H2O                      2.76E+04    2.6    -1919.0
2401. C5H10-1+HO2<=>C5H91-3+H2O2                    4.82E+03    2.5    10530.0
2402. C5H10-1+CH3<=>C5H91-3+CH4                     3.69E+00    3.3     4002.0
2403. C5H10-1+CH3O<=>C5H91-3+CH3OH                  4.00E+01    2.9     8609.0
2404. C5H10-1+CH3O2<=>C5H91-3+CH3O2H                4.82E+03    2.5    10530.0
2405. C5H10-2+O2<=>C5H92-4+HO2                      2.20E+12    0.0    37220.0
2406. C5H10-2+O<=>C5H92-4+OH                        9.90E+05    2.4     1210.0
2407. C5H10-2+H<=>C5H92-4+H2                        3.38E+05    2.4      207.0
2408. C5H10-2+OH<=>C5H92-4+H2O                      2.76E+04    2.6    -1919.0
2409. C5H10-2+HO2<=>C5H92-4+H2O2                    4.82E+03    2.5    10530.0
2410. C5H10-2+CH3<=>C5H92-4+CH4                     3.69E+00    3.3     4002.0
2411. C5H10-2+CH3O<=>C5H92-4+CH3OH                  4.00E+01    2.9     8609.0
2412. C5H10-2+CH3O2<=>C5H92-4+CH3O2H                4.82E+03    2.5    10530.0
2413. C4H6+CH3<=>C5H91-3                            1.00E+11    0.0     7800.0
2414. C5H81-3+H<=>C5H91-3                           2.50E+11    0.5     2620.0
2415. C3H6+C2H3<=>C5H91-4                           1.00E+11    0.0     7800.0
2416. C2H4+C3H5-A<=>C5H91-5                         1.00E+11    0.0     7800.0
2417. C5H81-3+H<=>C5H92-4                           4.24E+11    0.5     1230.0
2418. C2H4+C3H5-S<=>C5H92-5                         2.00E+11    0.0     7800.0
2419. C5H9O1-3+OH<=>C5H91-3+HO2                     6.09E+15   -1.1    15720.0
2420. C5H9O1-3+CH3O<=>C5H91-3+CH3O2                 5.95E+17   -1.6    20480.0
2421. C5H9O1-3+C2H5O<=>C5H91-3+C2H5O2               3.89E+14   -0.7    18330.0
2422. C5H9O2-4+OH<=>C5H92-4+HO2                     7.03E+15   -1.2    15890.0
2423. C5H9O2-4+CH3O<=>C5H92-4+CH3O2                 6.86E+17   -1.8    20650.0
2424. C5H9O2-4+C2H5O<=>C5H92-4+C2H5O2               4.49E+14   -0.9    18490.0
2425. C5H9O1-3<=>C2H3CHO+C2H5                       3.13E+19   -1.9    10670.0
2426. C5H9O1-3<=>C2H5CHO+C2H3                       1.42E+18   -1.6    23340.0
2427. C5H9O2-4<=>SC3H5CHO+CH3                       5.98E+15   -1.1     9941.0
2428. C5H9O2-4<=>CH3CHO+C3H5-S                      1.07E+22   -2.7    29650.0
2429. BC5H10<=>C4H72-2+CH3                          1.22E+23   -1.9   101400.0
2430. BC5H10<=>IC4H7+CH3                            2.61E+19   -1.0    79020.0
2431. C4H71-3+CH3(+M)<=>CC5H10(+M)                  1.00E+14   -0.3     -262.3
      Low pressure limit:  0.39100E+61 -0.12810E+02  0.62500E+04
      TROE centering:      0.10400E+00  0.16060E+04  0.60000E+05  0.61180E+04
      H2              Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      CH4             Enhanced by    2.000E+00
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      C2H6            Enhanced by    3.000E+00
      AR              Enhanced by    7.000E-01
2432. CC5H10+H<=>CC5H9-A+H2                         3.90E+06    2.4     4471.0
2433. CC5H10+OH<=>CC5H9-A+H2O                       1.40E+08    1.6      -35.0
2434. CC5H10+HO2<=>CC5H9-A+H2O2                     2.89E+04    2.6    13910.0
2435. CC5H10+CH3<=>CC5H9-A+CH4                      4.53E+00    3.5     5481.0
2436. CC5H10+CH3O<=>CC5H9-A+CH3OH                   4.35E+11    0.0     4571.0
2437. CC5H10+CH3O2<=>CC5H9-A+CH3O2H                 2.89E+04    2.6    13910.0
2438. BC5H10+H<=>AC5H9-C+H2                         3.46E+05    2.5     2492.0
2439. BC5H10+H<=>CC5H9-B+H2                         1.73E+05    2.5     2492.0
2440. BC5H10+OH<=>AC5H9-C+H2O                       6.24E+06    2.0     -298.0
2441. BC5H10+OH<=>CC5H9-B+H2O                       3.12E+06    2.0     -298.0
2442. BC5H10+HO2<=>AC5H9-C+H2O2                     1.93E+04    2.6    13910.0
2443. BC5H10+HO2<=>CC5H9-B+H2O2                     9.64E+03    2.6    13910.0
2444. BC5H10+CH3<=>AC5H9-C+CH4                      4.42E+00    3.5     5675.0
2445. BC5H10+CH3<=>CC5H9-B+CH4                      2.21E+00    3.5     5675.0
2446. BC5H10+CH3O<=>AC5H9-C+CH3OH                   1.80E+02    3.0    11990.0
2447. BC5H10+CH3O<=>CC5H9-B+CH3OH                   9.00E+01    3.0    11990.0
2448. BC5H10+CH3O2<=>AC5H9-C+CH3O2H                 1.93E+04    2.6    13910.0
2449. BC5H10+CH3O2<=>CC5H9-B+CH3O2H                 9.64E+03    2.6    13910.0
2450. CC5H10+H<=>CC5H9-B+H2                         2.65E+06    2.2        0.0
2451. CC5H10+OH<=>CC5H9-B+H2O                       6.14E+02    3.2    -3500.0
2452. CC5H10+HO2<=>CC5H9-B+H2O2                     1.81E+03    2.5     7154.0
2453. CC5H10+CH3<=>CC5H9-B+CH4                      4.61E+00    3.1     2330.0
2454. CC5H10+CH3O<=>CC5H9-B+CH3OH                   1.00E+01    2.9     5231.0
2455. CC5H10+CH3O2<=>CC5H9-B+CH3O2H                 1.81E+03    2.5     7154.0
2456. BC5H10+OH<=>IC3H7+CH3CHO                      2.00E+10    0.0     4000.0
2457. CC5H10+OH<=>IC4H9+CH2O                        2.00E+10    0.0     4000.0
2458. CC5H9-B+HO2<=>CC5H9O-B+OH                     7.00E+12    0.0    -1000.0
2459. CC5H9-B+CH3O2<=>CC5H9O-B+CH3O                 7.00E+12    0.0    -1000.0
2460. CC5H9-B+C2H5O2<=>CC5H9O-B+C2H5O               9.64E+12    0.0        0.0
2461. AC5H9-D<=>AC5H9-A2                            1.11E+12    0.0    31700.0
2462. AC5H10<=>C3H5-T+C2H5                          8.92E+24   -2.4   100500.0
2463. IC4H7+CH3(+M)<=>AC5H10(+M)                    1.50E+14   -0.3     -262.3
      Low pressure limit:  0.58650E+61 -0.12810E+02  0.62500E+04
      TROE centering:      0.10400E+00  0.16060E+04  0.60000E+05  0.61180E+04
      H2              Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      CH4             Enhanced by    2.000E+00
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      C2H6            Enhanced by    3.000E+00
      AR              Enhanced by    7.000E-01
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2464.	AC5H10+H<=>AC5H9-A2+H2	1.73E+05	2.5	2492.0
2465.	AC5H10+O<=>AC5H9-A2+OH	3.70E+05	2.6	-1130.0
2466.	AC5H10+OH<=>AC5H9-A2+H2O	3.12E+06	2.0	-298.0
2467.	AC5H10+HO2<=>AC5H9-A2+H2O2	9.64E+03	2.6	13910.0
2468.	AC5H10+CH3<=>AC5H9-A2+CH4	2.21E+00	3.5	5675.0
2469.	AC5H10+CH3O2<=>AC5H9-A2+CH3O2H	9.64E+03	2.6	13910.0
2470.	AC5H10+CH3O<=>AC5H9-A2+CH3OH	9.00E+01	3.0	11990.0
2471.	AC5H10+H<=>AC5H9-C+H2	3.38E+05	2.4	207.0
2472.	AC5H10+OH<=>AC5H9-C+H2O	2.76E+04	2.6	-1919.0
2473.	AC5H10+HO2<=>AC5H9-C+H2O2	4.82E+03	2.5	10530.0
2474.	AC5H10+CH3<=>AC5H9-C+CH4	3.69E+00	3.3	4002.0
2475.	AC5H10+CH3O2<=>AC5H9-C+CH3O2H	4.82E+03	2.5	10530.0
2476.	AC5H10+CH3O<=>AC5H9-C+CH3OH	4.00E+01	2.9	8609.0
2477.	AC5H10+H<=>AC5H9-D+H2	1.95E+06	2.4	4471.0
2478.	AC5H10+OH<=>AC5H9-D+H2O	7.01E+07	1.6	-35.0
2479.	AC5H10+CH3<=>AC5H9-D+CH4	2.27E+00	3.5	5481.0
2480.	AC5H10+HO2<=>AC5H9-D+H2O2	1.45E+04	2.6	13910.0
2481.	AC5H10+CH3O<=>AC5H9-D+CH3OH	2.18E+11	0.0	4571.0
2482.	AC5H10+CH3O2<=>AC5H9-D+CH3O2H	1.45E+04	2.6	13910.0
2483.	AC5H9-A2<=>C3H4-A+C2H5	1.98E+20	-1.6	59240.0
2484.	B13DE2M+H<=>AC5H9-C	4.00E+13	0.0	1300.0
2485.	C4H612+CH3<=>AC5H9-C	1.76E+04	2.5	6130.0
2486.	B13DE2M+H<=>AC5H9-D	2.50E+11	0.5	2620.0
2487.	AC5H9-D<=>C3H5-T+C2H4	1.22E+12	0.6	29370.0
2488.	AC5H10+OH<=>SC4H9+CH2O	2.00E+10	0.0	4000.0
2489.	AC5H10+O<=>SC4H9+HCO	7.23E+05	2.3	-1050.0
2490.	AC5H10+O<=>IC3H7+CH3CO	7.23E+05	2.3	-1050.0
2491.	AC5H10+O<=>IC4H9+HCO	7.23E+05	2.3	-1050.0
2492.	AC5H9-C+HO2<=>AC5H9O-C+OH	7.00E+12	0.0	-1000.0
2493.	AC5H9-C+CH3O2<=>AC5H9O-C+CH3O	7.00E+12	0.0	-1000.0
2494.	AC5H9-C+C2H5O2<=>AC5H9O-C+C2H5O	9.64E+12	0.0	0.0
2495.	CH3CHO+C3H5-T<=>AC5H9O-C	9.45E+02	2.7	6850.0
2496.	AC5H9-C+HO2<=>B2E2M1OJ+OH	7.00E+12	0.0	-1000.0
2497.	AC5H9-C+CH3O2<=>B2E2M1OJ+CH3O	7.00E+12	0.0	-1000.0
2498.	CH2O+C4H72-2<=>B2E2M1OJ	8.80E+03	2.5	6100.0
2499.	C2H3+C3H5-T<=>B13DE2M	8.00E+12	0.0	0.0
2500.	H+B13DE2MJ<=>B13DE2M	1.00E+14	0.0	0.0
2501.	B13DE2M+H<=>B13DE2MJ+H2	3.64E+05	2.5	4361.2
2502.	B13DE2M+O2<=>B13DE2MJ+HO2	5.96E+19	-1.7	46192.1
2503.	B13DE2M+OH<=>B13DE2MJ+H2O	4.46E+06	2.1	1050.8
2504.	B13DE2M+HO2<=>B13DE2MJ+H2O2	3.07E-02	4.4	13547.2
2505.	B13DE2M+CH3<=>B13DE2MJ+CH4	2.21E+00	3.5	5675.0
2506.	B13DE2M+CH3O2<=>B13DE2MJ+CH3O2H	7.68E-02	4.4	13547.2
2507.	C2H3+C3H4-A<=>B13DE2MJ	9.45E+02	2.7	6850.0
2508.	B13DE2M+H<=>CC5H9-B	4.24E+11	0.5	1230.0
2509.	B13DE2M+H<=>CC5H9-A	2.50E+11	0.5	2620.0
2510.	B12DE3M+H<=>CC5H9-B	4.24E+11	0.5	1230.0
2511.	C2H3+C3H6<=>CC5H9-A	9.45E+02	2.7	6850.0
2512.	C2H3+CH3COCH3<=>CC5H9O-B	9.45E+02	2.7	6850.0
2513.	CC5H9-B+HO2<=>B2E3M1OJ+OH	7.00E+12	0.0	-1000.0
2514.	CC5H9-B+CH3O2<=>B2E3M1OJ+CH3O	7.00E+12	0.0	-1000.0
2515.	CH2O+IC4H7-I1<=>B2E3M1OJ	8.80E+03	2.5	6100.0
2516.	TC4H8CHO<=>IC3H5CHO+CH3	1.00E+13	0.0	26290.0
2517.	TC4H8CHO<=>IC4H8+HCO	8.52E+12	0.0	20090.0
2518.	TC4H8CHO+O2<=>O2C4H8CHO	2.00E+12	0.0	0.0
2519.	O2C4H8CHO<=>O2HC4H8CO	2.16E+11	0.0	15360.0
2520.	IC4H8O2H-T+CO<=>O2HC4H8CO	1.50E+11	0.0	4809.0
2521.	C6H101-5<=>C3H5-A+C3H5-A	4.90E+22	-2.1	63355.5
	Rate coefficients at P=1.00E+00(atm)	5.07E+47	-9.7	72680.0
	Rate coefficients at P=4.00E+00(atm)	4.22E+39	-7.3	69390.0
	Rate coefficients at P=1.00E+01(atm)	2.12E+35	-6.0	67620.0
2522.	C6H101-5+H<=>C6H9-A+H2	6.75E+05	2.4	207.0
2523.	C6H101-5+O2<=>C6H9-A+HO2	4.00E+14	0.0	38890.0
2524.	C6H101-5+O<=>C6H9-A+OH	1.32E+06	2.4	1210.0
2525.	C6H101-5+OH<=>C6H9-A+H2O	5.53E+04	2.6	-1919.0
2526.	C6H101-5+CH3<=>C6H9-A+CH4	7.38E+00	3.3	4002.0
2527.	C4H6+C2H3<=>C6H9-A	8.80E+05	2.5	6130.0
2528.	C6H101-5+H=>C3H4-A+C3H5-A+H2	1.00E+12	0.0	0.0
2529.	C6H101-5+H<=>C3H5-A+C3H6	1.00E+13	0.0	0.0
2530.	L-C6H4+H<=>C-C6H4+H	1.40E+54	-11.7	34500.0
2531.	C-C6H4+H<=>C6H5	2.40E+60	-13.7	29500.0
2532.	L-C6H4+H<=>C6H5	1.70E+78	-19.7	31400.0
2533.	C6H3+H<=>L-C6H4	3.40E+43	-9.0	12120.0
2534.	L-C6H4+H<=>C6H3+H2	1.33E+06	2.5	9240.0
2535.	L-C6H4+OH<=>C6H3+H2O	3.10E+06	2.0	430.0
2536.	C6H2+H<=>C6H3	1.10E+30	-4.9	10800.0
2537.	C6H3+H<=>C6H2+H2	3.00E+13	0.0	0.0
2538.	C6H3+OH<=>C6H2+H2O	4.00E+12	0.0	0.0
2539.	C6H3+H<=>C4H2+C2H2	2.80E+23	-2.5	10780.0
2540.	C6H5+H(+M)<=>C6H6(+M)	1.00E+14	0.0	0.0
	Low pressure limit: 0.66000E+76 -0.16300E+02	0.70000E+04		
	TROE centering: 0.10000E+01 0.10000E+00	0.58490E+03	0.61130E+04	
	H2 Enhanced by 2.000E+00			
	H2O Enhanced by 6.000E+00			
	CH4 Enhanced by 2.000E+00			
	CO Enhanced by 1.500E+00			
	CO2 Enhanced by 2.000E+00			
2541.	FULVENE<=>C6H6	2.95E+31	-5.0	88470.0
2542.	FULVENE<=>C6H5+H	8.51E+24	-2.5	113330.0
2543.	C6H6+H<=>FULVENE+H	8.43E+32	-5.0	51244.0
2544.	C6H6+H<=>C6H5+H2	2.50E+14	0.0	16000.0
2545.	C6H6+O2<=>C6H5+HO2	6.30E+13	0.0	60000.0
2546.	C6H6+O<=>C6H5+OH	2.00E+13	0.0	14700.0
2547.	C6H6+OH<=>C6H5+H2O	1.20E+00	4.1	-301.0

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2548. C6H6+HO2<=>C6H5+H2O2                          5.50E+12    0.0    28900.0
2549. C6H6+CH3<=>C6H5+CH4                           7.32E+12    0.0    18920.0
2550. C6H5+CH2O<=>C6H6+HCO                          8.55E+04    2.2       38.0
2551. C6H5+HCO<=>C6H6+CO                            8.55E+04    2.2       38.0
2552. C6H5=>H+C4H2+C2H2                             4.30E+12    0.6    77294.0
2553. C6H6+O<=>C6H5O+H                              2.20E+13    0.0     4530.0
2554. C6H6+OH<=>C6H5OH+H                            1.32E+02    3.2     5590.0
2555. C6H5+HO2<=>C6H5O+OH                           5.00E+12    0.0        0.0
2556. C6H5+O2<=>C6H5O+O                             2.60E+13    0.0     6120.0
2557. C6H5+O2<=>O-C6H4O2+H                          3.00E+13    0.0     8980.0
2558. C6H5+O2<=>C6H5OO                              1.86E+13   -0.2     -711.0
2559. C6H5OO<=>C6H5O+O                              1.27E+15   -0.2    38536.0
2560. C6H5O+OH<=>C6H5OOH                            2.00E+13    0.0        0.0
2561. C6H5O+H(+M)<=>C6H5OH(+M)                      2.00E+14    0.0        0.0
      Low pressure limit:  0.10000E+95 -0.21840E+02  0.13880E+05
      TROE centering:      0.43000E-01  0.30420E+03  0.60000E+05  0.58960E+04
2562. C6H4OH+H<=>C6H5OH                             1.00E+14    0.0        0.0
2563. C6H5OH<=>C5H6+CO                              4.31E+15   -0.6    74115.0
2564. C6H5OH+H<=>C6H5O+H2                           1.20E+14    0.0    12400.0
2565. C6H5OH+O2<=>C6H5O+HO2                         1.00E+13    0.0    38800.0
2566. C6H5OH+O<=>C6H5O+OH                           1.30E+13    0.0     2900.0
2567. C6H5OH+OH<=>C6H5O+H2O                         1.40E+08    1.4     -960.0
2568. C6H5OH+HO2<=>C6H5O+H2O2                       1.00E+12    0.0    10000.0
2569. C6H5OH+CH3<=>C6H5O+CH4                        1.80E+11    0.0     7700.0
2570. C6H5OH+C3H5-A<=>C6H5O+C3H6                    4.90E+11    0.0     9400.0
2571. C6H5OH+C4H5-I<=>C6H5O+C4H6                    4.90E+11    0.0     9400.0
2572. C6H5OH+C6H5<=>C6H5O+C6H6                      4.90E+12    0.0     4400.0
2573. C6H5OH+C6H5OO<=>C6H5O+C6H5OOH                 1.33E+11    0.0    14000.0
2574. C6H5OH+H<=>C6H4OH+H2                          1.70E+14    0.0    16000.0
2575. C6H5OH+O<=>C6H4OH+OH                          2.00E+13    0.0    14700.0
2576. C6H5OH+OH<=>C6H4OH+H2O                        1.40E+13    0.0     4600.0
2577. C6H5OH+HO2<=>C6H4OH+H2O2                      4.00E+11    0.0    28900.0
2578. C6H5OH+CH3<=>C6H4OH+CH4                       2.00E+12    0.0    15000.0
2579. C6H5OH+O<=>OC6H4OH+H                          1.60E+13    0.0     3400.0
2580. C6H5O<=>CO+C5H5                               2.00E+11    0.0    43900.0
2581. C6H5O+H<=>CO+C5H6                             1.00E+13    0.0        0.0
2582. C6H5O+O<=>C5H5+CO2                            1.00E+13    0.0        0.0
2583. C6H5O+O<=>OC6H4OH                             2.60E+10    0.5      800.0
2584. C6H4OH+O2<=>OC6H4OH+O                         2.10E+13    0.0     6100.0
2585. OC6H4OH<=>C5H4OH+CO                           7.40E+11    0.0    43800.0
2586. C6H5O+O<=>P-C6H4O2+H                          4.25E+13    0.0        0.0
2587. C6H5O+O<=>O-C6H4O2+H                          8.50E+13    0.0        0.0
2588. P-C6H4O2+H<=>P-OC6H5OJ                        4.00E+12    0.0     9740.0
2589. O-C6H4O2+H<=>O-OC6H5OJ                        4.00E+12    0.0     6960.0
2590. O-C6H4O2<=>C5H4O+CO                           1.00E+12    0.0    40000.0
2591. P-C6H4O2<=>C5H4O+CO                           3.70E+11    0.0    59000.0
2592. P-C6H3O2+H<=>P-C6H4O2                         1.00E+14    0.0        0.0
2593. P-C6H4O2+H<=>P-C6H3O2+H2                      2.00E+12    0.0     8100.0
2594. P-C6H4O2+O<=>P-C6H3O2+OH                      1.40E+13    0.0    14700.0
2595. P-C6H4O2+OH<=>P-C6H3O2+H2O                    1.00E+06    2.0     4000.0
2596. P-C6H4O2+H<=>C5H5O+CO                         2.50E+13    0.0     4700.0
2597. P-C6H4O2+O=>2CO+C2H2+CH2CO                    3.00E+13    0.0     5000.0
2598. P-C6H3O2+H<=>2C2H2+2CO                        1.00E+14    0.0        0.0
2599. P-C6H3O2+O=>C2H2+HCCO+2CO                     1.00E+14    0.0        0.0
2600. C5H6+C2H3<=>C6H6+CH3                          2.10E+67  -16.1    42460.0
2601. C5H5+H(+M)<=>C5H6(+M)                         2.60E+14    0.0        0.0
      Low pressure limit:  0.44000E+81 -0.18280E+02  0.12994E+05
      TROE centering:      0.68000E-01  0.40070E+03  0.41360E+04  0.55020E+04
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      H2              Enhanced by    2.000E+00
      CH4             Enhanced by    2.000E+00
2602. C5H6(+M)<=>C3H4-A+C2H2(+M)                    3.80E+17    0.0   104000.0
      Low pressure limit:  0.10000E+99 -0.22250E+02  0.12632E+06
      TROE centering:      0.14410E+00  0.53580E+01  0.32840E+04  0.67100E+10
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      H2              Enhanced by    2.000E+00
      CH4             Enhanced by    2.000E+00
2603. C#CCVCCJ+H<=>C5H6                             1.00E+14    0.0        0.0
2604. C5H6+H<=>C5H5+H2                              7.20E+13    0.0     3500.0
2605. C5H6+O2<=>C5H5+HO2                            4.00E+13    0.0    37150.0
2606. C5H6+O<=>C5H5+OH                              4.80E+04    2.7     1100.0
2607. C5H6+OH<=>C5H5+H2O                            3.08E+06    2.0        0.0
2608. C5H6+HO2<=>C5H5+H2O2                          1.10E+04    2.6    12900.0
2609. C5H6+CH3<=>C5H5+CH4                           1.80E-01    4.0        0.0
2610. C5H6+HCO<=>C5H5+CH2O                          1.08E+08    1.9    16000.0
2611. C5H6+C2H3<=>C5H5+C2H4                         1.20E-01    4.0        0.0
2612. C5H6+C3H5-A<=>C5H5+C3H6                       5.50E+10    0.0     5505.0
2613. C5H6+C4H5-I<=>C5H5+C4H6                       6.00E+12    0.0        0.0
2614. C5H6+C4H5-N<=>C5H5+C4H6                       6.00E+12    0.0        0.0
2615. C5H6+C6H5<=>C5H5+C6H6                         1.00E-01    4.0        0.0
2616. C5H6+C6H5O<=>C5H5+C6H5OH                      3.16E+11    0.0     8000.0
2617. C5H6+H<=>C2H2+C3H5-A                          1.55E+37   -6.2    32890.0
2618. C5H6+H<=>C5H7                                 2.40E+73  -17.9    31500.0
2619. C5H6+H<=>CVCCJCVC                             1.10E+14   -0.2     3100.0
2620. C5H6+OH<=>CVCCJCVCOH                          1.10E+13   -0.1      870.0
2621. CVCCJCVCOH+O2<=>HOCVCCVO+CH2CHO               1.20E+36   -7.2    33600.0
2622. C5H7<=>CVCCJCVC                               3.20E+15    0.0    39500.0
2623. CVCCJCVC<=>CVCCVCCJ                           5.40E+11   -0.7       60.0
2624. CVCCVCCJ+H(+M)<=>C5H81-3(+M)                  2.00E+14    0.0        0.0
      Low pressure limit:  0.13300E+61 -0.12000E+02  0.59678E+04
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      TROE centering:      0.20000E-01  0.10966E+04  0.10966E+04  0.68595E+04
      H2              Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      CH4             Enhanced by    2.000E+00
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      C2H6            Enhanced by    3.000E+00
      AR              Enhanced by    7.000E-01
2625. CVCCJCVC+O2<=>C2H3CHO+CH2CHO                    1.20E+36   -7.2    33600.0
2626. CVCCJCVC+O<=>C2H3CHO+C2H3                       2.00E+14    0.0        0.0
2627. CVCCVCCJ+H<=>C4H5-N+CH3                         2.90E+26   -2.2    36770.0
2628. C5H81-3+H<=>CVCCVCCJ+H2                         7.00E+06    2.0     5000.0
2629. C5H81-3+OH<=>CVCCVCCJ+H2O                       7.00E+06    2.0        0.0
2630. C5H81-3+H<=>C4H6+CH3                            5.20E+71  -16.4    51000.0
2631. CVCCVCCJ+OH<=>CVCCVCCOH                         1.50E+13    0.0        0.0
2632. CVCCVCCJ+O2<=>CH2CHCHCHO+CH2O                   8.20E+10    0.2     9140.0
2633. CVCCVCCOH+H<=>C4H6+CH2OH                        2.50E+34   -6.1    16250.0
2634. C5H7+O2<=>OC5H7O                                8.90E+24   -3.8    20000.0
2635. OC5H7O+O2<=>OC4H6O+HOCO                         6.30E+05   -7.2    33600.0
2636. OC4H6O+H<=>OC4H5O+H2                            2.30E+10    1.1     3279.0
2637. OC4H6O+OH<=>OC4H5O+H2O                          3.50E+09    1.2     -447.0
2638. OC4H5O+O2<=>O2CCHOOJ+C2H4                       1.60E+45   -9.9    20670.0
2639. O2CCHOOJ<=>HOCO+CO2                             3.00E+13    0.0     4000.0
2640. C5H7+H<=>C5H6+H2                                3.60E+12    0.0        0.0
2641. C5H7+O<=>C5H6+OH                                1.00E+13    0.0        0.0
2642. C5H7+OH<=>C5H6+H2O                              2.40E+13    0.0        0.0
2643. C5H6+HO2<=>C5H7+O2                              1.30E+15   -1.1     9530.0
2644. HOCVCCVO+OH<=>HOCVCCJVO+H2O                     2.69E+10    0.8     -340.0
2645. HOCVCCVO+HO2<=>HOCVCCJVO+H2O2                   1.00E+12    0.0    11920.0
2646. HOCVCCVO+CH3<=>HOCVCCJVO+CH4                    3.98E+12    0.0     8700.0
2647. HOCVCCVO+O<=>HOCVCCJVO+OH                       7.18E+12    0.0     1389.0
2648. HOCVCCVO+O2<=>HOCVCCJVO+HO2                     2.00E+13    0.0    40700.0
2649. HOCVCCVO+H<=>HOCVCCJVO+H2                       2.60E+12    0.0     2600.0
2650. C2H2OH+CO<=>HOCVCCJVO                           1.51E+11    0.0     4810.0
2651. C5H5<=>C3H3+C2H2                                1.98E+68  -15.0   124900.0
2652. C#CCVCCJ<=>C5H5                                 8.00E+13    0.0    34058.3
2653. C3H3+C2H2<=>C#CCVCCJ                            4.11E+72  -18.2    45400.0
2654. C#CCVCCJ+H<=>C5H6-L                             1.00E+10    0.0        0.0
2655. C5H6-L+O<=>C#CCVCCJ+OH                          1.00E+10    0.0        0.0
2656. C5H6-L+OH<=>C#CCVCCJ+H2O                        1.00E+10    0.0        0.0
2657. C5H5+HO2<=>C5H5O+OH                             6.30E+29   -4.7    11650.0
2658. C5H5+O2<=>C4H4O+HCO                             6.00E+18   -2.5    10970.0
2659. C5H5+O<=>C4H5-N+CO                              3.20E+13   -0.2      440.0
2660. C5H5+O<=>C5H4O+H                                5.80E+13    0.0       20.0
2661. C5H5+OH<=>C5H5OH                                6.50E+14   -0.8    -2730.0
      Declared duplicate reaction...
2662. C5H5+OH<=>C5H5OH                                1.10E+43   -8.8    18730.0
      Declared duplicate reaction...
2663. C5H5+OH<=>C5H5OH                                1.10E+59  -13.1    33450.0
      Declared duplicate reaction...
2664. C5H5+OH<=>C5H4OH+H                              3.50E+57  -12.2    48350.0
2665. C5H5+OH<=>C4H6+CO                               4.00E+14    0.0     4500.0
2666. C5H4OH+H<=>C5H5OH                               1.00E+14    0.0        0.0
2667. C5H5OH+H<=>C5H5O+H2                             4.00E+13    0.0     6094.0
2668. C5H5OH+O<=>C5H5O+OH                             1.00E+13    0.0     4683.0
2669. C5H5OH+OH<=>C5H5O+H2O                           1.00E+13    0.0     1697.0
2670. C5H5OH+HO2<=>C5H5O+H2O2                         1.00E+13    0.0    15800.0
2671. C5H5OH+H<=>C5H4OH+H2                            3.20E+12    0.0        0.0
2672. C5H5OH+O<=>C5H4OH+OH                            4.70E+11    0.0        0.0
2673. C5H5OH+OH<=>C5H4OH+H2O                          5.50E+12    0.0     1731.0
2674. C5H5OH+HO2<=>C5H4OH+H2O2                        3.60E+03    2.5    10531.0
2675. C5H5O<=>C4H5-N+CO                               1.10E+79  -19.6    66250.0
2676. C5H5O<=>CJVCCVCCVO                              2.00E+13    0.0    14338.0
2677. C5H5O+O2<=>C5H4O+HO2                            6.00E+10    0.0     1600.0
2678. CJVCCVCCVO<=>CVCCVCCJVO                         4.30E+11   -1.1     4118.0
2679. C4H5-N+CO<=>CVCCVCCJVO                          1.51E+11    0.0     4810.0
2680. CJVCCVCCVO<=>C2H2+CJVCCVO                       3.00E+13    0.0    43710.0
2681. CJVCCVO<=>C2H3CO                                1.40E+09    1.0    32100.0
2682. C2H2+HCO<=>CJVCCVO                              7.77E+06    1.4     7755.0
2683. C5H4OH+H<=>C5H4O+H2                             2.10E+13    0.0    54000.0
2684. C5H4OH+O2<=>C5H4O+HO2                           3.00E+13    0.0     5000.0
2685. C5H4O=>CO+C2H2+C2H2                             5.70E+32   -6.8    68500.0
      Declared duplicate reaction...
2686. C5H4O=>CO+C2H2+C2H2                             6.20E+41   -7.9    98700.0
      Declared duplicate reaction...
2687. C5H3O+H<=>C5H4O                                 1.00E+14    0.0        0.0
2688. C5H4O+H<=>C5H3O+H2                              2.00E+12    0.0     8100.0
2689. C5H4O+O<=>C5H3O+OH                              1.40E+13    0.0     1470.0
2690. C5H4O+OH<=>C5H3O+H2O                            1.10E+08    1.4     1450.0
2691. C5H3O=>C2H2+CO+C2H                              2.00E+13    0.0    51000.0
2692. C5H3O+O2=>CO2+C2H2+HCCO                         9.70E+58  -13.5    38180.0
2693. C5H4O+H<=>C4H5-N+CO                             2.10E+61  -13.3    40810.0
2694. C5H4O+O<=>C4H4+CO2                              1.00E+13    0.0     2000.0
2695. C4H4O+H<=>C3H5-A+CO                             6.60E+13    0.0     2740.0
      Declared duplicate reaction...
2696. C4H4O+H<=>C3H5-A+CO                             5.90E+06    2.0     1300.0
      Declared duplicate reaction...
2697. C4H4O+O<=>CH2CHO+HCCO                           3.00E+08    1.4     -860.0
2698. C4H4O+OH<=>C3H5-A+CO2                           3.00E+12    0.0        0.0
2699. C4H4O+OH=>C2H2+HCCO+H2O                         2.02E+13    0.0     5933.0
2700. CH3OCH2OCH3=>CH3OH+CH3+HCO                      5.00E+12    0.0    55000.0
2701. CH3OCH2OCH3<=>CH3OCH2+CH3O                      2.55E+19   -0.7    87350.0
2702. CH3OCH2OCH3<=>CH3OCH2O+CH3                      3.93E+18   -0.6    81380.0
2703. CH3OCH2OCH3+H<=>CH3OCH2OCH2+H2                  2.30E+04    2.9     5203.0
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2704. CH3OCH2OCH3+H<=>CH3OCHOCH3+H2	5.21E+07	1.9	5256.0
2705. CH3OCH2OCH3+OH<=>CH3OCH2OCH2+H2O	1.08E+03	3.1	-1725.0
2706. CH3OCH2OCH3+OH<=>CH3OCHOCH3+H2O	5.31E+08	1.4	306.2
2707. CH3OCH2OCH3+O<=>CH3OCH2OCH2+OH	5.43E+06	2.1	3080.8
2708. CH3OCH2OCH3+O<=>CH3OCHOCH3+OH	1.10E+06	2.5	2820.3
2709. CH3OCH2OCH3+O2<=>CH3OCH2OCH2+HO2	1.88E+04	2.8	42590.8
2710. CH3OCH2OCH3+O2<=>CH3OCHOCH3+HO2	1.26E+07	2.0	40344.2
2711. CH3OCH2OCH3+HO2<=>CH3OCH2OCH2+H2O2	1.32E+01	3.6	12691.2
2712. CH3OCH2OCH3+HO2<=>CH3OCHOCH3+H2O2	2.26E+02	3.2	11759.1
2713. CH3OCH2OCH3+CH3O2<=>CH3OCH2OCH2+CH3O2H	1.32E+01	3.6	12691.2
2714. CH3OCH2OCH3+CH3O2<=>CH3OCHOCH3+CH3O2H	2.26E+02	3.2	11759.1
2715. CH3OCH2OCH3+CH3O<=>CH3OCH2OCH2+CH3OH	9.80E+02	2.9	3441.0
2716. CH3OCH2OCH3+CH3O<=>CH3OCHOCH3+CH3OH	3.38E+05	2.1	4493.3
2717. CH3OCH2OCH3+CH3<=>CH3OCH2OCH2+CH4	1.46E-02	4.2	7543.0
2718. CH3OCH2OCH3+CH3<=>CH3OCHOCH3+CH4	1.30E+02	3.1	7985.0
2719. CH3OCH2OCH2<=>CH3OCH2+CH2O	1.12E+55	-13.9	35880.0
Rate coefficients at P=1.00E-02(atm)	1.12E+55	-13.9	35880.0
Rate coefficients at P=1.00E-01(atm)	8.19E+52	-12.8	36800.0
Rate coefficients at P=1.00E+00(atm)	4.75E+48	-11.2	37070.0
Rate coefficients at P=1.00E+01(atm)	2.45E+40	-8.3	35460.0
Rate coefficients at P=1.00E+02(atm)	4.96E+30	-5.2	32610.0
2720. CH3OCH2OCH2<=>CH3OCHO+CH3	3.77E+35	-10.0	31720.0
Rate coefficients at P=1.00E-02(atm)	3.77E+35	-10.0	31720.0
Rate coefficients at P=1.00E-01(atm)	1.25E+35	-9.5	34760.0
Rate coefficients at P=1.00E+00(atm)	9.29E+39	-9.9	40410.0
Rate coefficients at P=1.00E+01(atm)	2.46E+38	-8.8	43230.0
Rate coefficients at P=1.00E+02(atm)	8.42E+30	-6.1	43020.0
2721. CH3OCH2OCH2<=>CH3OCHOCH3	2.76-146	45.4	-35830.0
Rate coefficients at P=1.00E-01(atm)	2.76-146	45.4	-35830.0
Rate coefficients at P=1.00E+00(atm)	1.19-170	53.8	-41950.0
Rate coefficients at P=1.00E+01(atm)	7.10-119	38.1	-22260.0
Rate coefficients at P=1.00E+02(atm)	7.87E-32	11.8	11930.0
2722. CH3OCHOCH3<=>CH3OCH2+CH2O	6.53-242	75.3	-65220.0
Rate coefficients at P=1.00E+00(atm)	6.53-242	75.3	-65220.0
Rate coefficients at P=1.00E+01(atm)	4.80E-24	8.5	19310.0
Rate coefficients at P=1.00E+02(atm)	3.12E-01	2.3	30850.0
2723. CH3OCHOCH3<=>CH3OCHO+CH3	6.04E+31	-6.9	16820.0
Rate coefficients at P=1.00E-01(atm)	6.04E+31	-6.9	16820.0
Rate coefficients at P=1.00E+00(atm)	7.75E+34	-7.5	19050.0
Rate coefficients at P=1.00E+01(atm)	2.38E+35	-7.3	20790.0
Rate coefficients at P=1.00E+02(atm)	5.47E+31	-5.8	21160.0
2724. CH3OCH2OCH2+O2<=>COCOCO2J	4.11E+19	-2.5	1137.0
Rate coefficients at P=1.00E+00(atm)	4.11E+19	-2.5	1137.0
Rate coefficients at P=1.00E+01(atm)	1.12E+14	-0.6	-164.0
2725. CH3OCHOCH3+O2<=>COCO2JOC	4.11E+19	-2.5	1137.0
Rate coefficients at P=1.00E+00(atm)	4.11E+19	-2.5	1137.0
Rate coefficients at P=1.00E+01(atm)	1.12E+14	-0.6	-164.0
2726. COCOCO2J<=>COCJOCO2H	5.37E+08	0.8	14651.1
2727. COCOCO2J<=>CJOCOCO2H	6.70E+07	0.6	14125.2
2728. COCO2JOC<=>COCO2HOCJ	1.85E+06	1.5	17238.0
2729. COCOCO2J<=>COCOC*O+OH	2.82E+06	2.0	34893.0
2730. COCO2JOC<=>COC*OOC+OH	1.67E+07	1.8	34414.0
2731. COCOC*O+H=CJOCOC*O+H2	1.15E+04	2.9	5203.0
2732. COCOC*O+H=COCJOC*O+H2	5.21E+07	1.9	5256.0
2733. COCOC*O+H=COCOCJ*O+H2	6.50E+05	2.4	4471.0
2734. COCOC*O+OH=CJOCOC*O+H2O	6.16E+04	2.8	-939.2
2735. COCOC*O+OH=COCJOC*O+H2O	1.04E+07	2.0	-527.5
2736. COCOC*O+OH=COCOCJ*O+H2O	1.58E+07	1.8	934.0
2737. COCOC*O+O=CJOCOC*O+OH	9.28E-04	5.3	-109.0
2738. COCOC*O+O=COCJOC*O+OH	3.12E+05	2.5	1113.0
2739. COCOC*O+O=COCOCJ*O+OH	2.76E+05	2.5	2830.0
2740. COCOC*O+CH3=CJOCOC*O+CH4	7.29E-03	4.2	7543.0
2741. COCOC*O+CH3=COCJOC*O+CH4	1.30E+02	3.1	7985.0
2742. COCOC*O+CH3=COCOCJ*O+CH4	7.55E-01	3.5	5481.0
2743. COCOC*O+HO2=CJOCOC*O+H2O2	4.66E+09	1.1	14630.0
2744. COCOC*O+HO2=COCJOC*O+H2O2	4.23E+12	0.1	14690.0
2745. COCOC*O+HO2=COCOCJ*O+H2O2	4.82E+03	2.6	13910.0
2746. COCOC*O+O2=CJOCOC*O+HO2	3.00E+13	0.0	47700.0
2747. COCOC*O+O2=COCJOC*O+HO2	2.00E+13	0.0	44200.0
2748. COCOC*O+O2=COCOCJ*O+HO2	1.00E+13	0.0	49700.0
2749. COCOC*O+CH3O=CJOCOC*O+CH3OH	4.66E+09	1.1	14630.0
2750. COCOC*O+CH3O=COCJOC*O+CH3OH	4.23E+12	0.1	14690.0
2751. COCOC*O+CH3O=COCOCJ*O+CH3OH	5.48E+11	0.0	5000.0
2752. COCOC*O+CH3O2=CJOCOC*O+CH3O2H	4.66E+09	1.1	14630.0
2753. COCOC*O+CH3O2=COCJOC*O+CH3O2H	4.23E+12	0.1	14690.0
2754. COCOC*O+CH3O2=COCOCJ*O+CH3O2H	4.82E+03	2.6	13910.0
2755. CJOCOC*O=CH2OCHO+CH2O	2.22E+14	-0.2	27200.0
2756. COCJOC*O=CH3OCHO+HCO	4.44E+14	-0.2	27200.0
2757. COCOCJ*O=CH3OCH2+CO2	8.69E+17	-1.8	13656.7
Rate coefficients at P=5.00E-02(atm)	9.72E+12	-1.3	9416.7
Rate coefficients at P=1.00E+00(atm)	1.25E+16	-1.8	11340.8
Rate coefficients at P=1.00E+01(atm)	1.04E+18	-2.1	12826.9
Rate coefficients at P=1.00E+02(atm)	8.69E+17	-1.8	13656.7
2758. COCOCJ*O=CH3OCH2O+CO	2.83E+22	-3.4	23592.4
Rate coefficients at P=5.00E-02(atm)	1.03E+03	1.3	25401.0
Rate coefficients at P=1.00E+00(atm)	4.09E+05	0.8	21969.1
Rate coefficients at P=1.00E+01(atm)	9.02E+14	-1.7	21767.5
Rate coefficients at P=1.00E+02(atm)	2.83E+22	-3.4	23592.4
2759. COC*OOC=CH3OCH3+CO2	1.49E+43	-8.5	84667.0
2760. COC*OOC=COC*OOJ+CH3	1.29E+64	-13.9	109488.0
2761. COC*OOC+H=COC*OOCJ+H2	8.73E+04	2.8	6751.8
2762. COC*OOC+O=COC*OOCJ+OH	1.13E+04	2.9	4645.6
2763. COC*OOC+O2=COC*OOCJ+HO2	3.07E+13	0.1	51749.8
2764. COC*OOC+OH=COC*OOCJ+H2O	1.77E+13	0.1	3340.5

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2765. COC*OOC+CH3=COC*OOCJ+CH4                    5.82E-01    3.7     6823.8
2766. COC*OOC+HO2=COC*OOCJ+H2O2                   1.13E+05    2.4    16594.3
2767. COC*OOC+CH3O2=COC*OOCJ+CH3O2H               1.13E+05    2.4    16594.3
2768. COC*OOC+CH3O=COC*OOCJ+CH3OH                 9.18E+09    0.5     4823.6
2769. COC*OOC+C2H3=COC*OOCJ+C2H4                  2.00E+11    0.0    10400.0
2770. COC*OOC+C2H5=COC*OOCJ+C2H6                  2.00E+11    0.0    10400.0
2771. COC*OOC+HCO=COC*OOCJ+CH2O                   2.05E+05    2.5    16630.0
2772. COC*OOC+CH3OCO=COC*OOCJ+CH3OCHO             2.00E+11    0.0    10400.0
2773. COC*OOCJ=CH3OCO+CH2O                        5.60E+12    0.6    15140.0
2774. COC*OOJ=CH3O+CO2                            1.61E+14    0.1    16350.0
2775. CJOCOCO2H<=>cy-COCOCO+OH                    2.51E+16   -1.4    15607.1
2776. COCJOCO2H<=>CO-cy-COCO+OH                   9.21E+13   -0.3    15798.3
2777. COCO2HOCJ<=>CO-cy-COCO+OH                   1.18E+13   -0.3    19443.0
2778. COCJOCO2H=>CH3OCHO+CH2O+OH                  5.47E+31   -5.8    21160.0
      Rate coefficients at P=1.00E-01(atm)       6.04E+31   -6.9    16820.0
      Rate coefficients at P=1.00E+00(atm)       7.75E+34   -7.5    19050.0
      Rate coefficients at P=1.00E+01(atm)       2.38E+35   -7.3    20790.0
      Rate coefficients at P=1.00E+02(atm)       5.47E+31   -5.8    21160.0
2779. COCJOCO2H<=>CH3+HO2CH2OCHO                  5.47E+31   -5.8    21160.0
      Rate coefficients at P=1.00E-01(atm)       6.04E+31   -6.9    16820.0
      Rate coefficients at P=1.00E+00(atm)       7.75E+34   -7.5    19050.0
      Rate coefficients at P=1.00E+01(atm)       2.38E+35   -7.3    20790.0
      Rate coefficients at P=1.00E+02(atm)       5.47E+31   -5.8    21160.0
2780. CJOCOCO2H<=>CH2O+CH2OCH2O2H                 4.96E+30   -5.2    32610.0
      Rate coefficients at P=1.00E-02(atm)       1.12E+55  -13.9    35880.0
      Rate coefficients at P=1.00E-01(atm)       8.19E+52  -12.8    36800.0
      Rate coefficients at P=1.00E+00(atm)       4.75E+48  -11.2    37070.0
      Rate coefficients at P=1.00E+01(atm)       2.45E+40   -8.3    35460.0
      Rate coefficients at P=1.00E+02(atm)       4.96E+30   -5.2    32610.0
2781. COCO2HOCJ=>CH3OCHO+CH2O+OH                  4.96E+30   -5.2    32610.0
      Rate coefficients at P=1.00E-02(atm)       1.12E+55  -13.9    35880.0
      Rate coefficients at P=1.00E-01(atm)       8.19E+52  -12.8    36800.0
      Rate coefficients at P=1.00E+00(atm)       4.75E+48  -11.2    37070.0
      Rate coefficients at P=1.00E+01(atm)       2.45E+40   -8.3    35460.0
      Rate coefficients at P=1.00E+02(atm)       4.96E+30   -5.2    32610.0
2782. cy-COCOCO=>CH2O+CH2O+CH2O                   1.90E+15    0.0    47500.0
2783. cy-COCOCO+OH=>H2O+CH2O+CH2O+HCO             8.19E+12    0.0      460.0
2784. cy-COCOCO+H=>H2+CH2O+CH2O+HCO               1.72E+08    1.9     6749.0
2785. cy-COCOCO+O=>OH+CH2O+CH2O+HCO               5.43E+13    0.0     7080.0
2786. cy-COCOCO+HO2=>H2O2+CH2O+CH2O+HCO           1.23E+04    2.5    14210.0
2787. cy-COCOCO+O2=>HO2+CH2O+CH2O+HCO             3.69E+06    3.0    56000.0
2788. cy-COCOCO+CH3=>CH4+CH2O+CH2O+HCO            1.09E-06    5.4     4998.0
2789. CO-cy-COCO=>CH3OCHO+CH2O                    3.92E+12    0.7    39830.0
2790. CO-cy-COCO+H=>H2+CH2O+CH3OCO                7.31E+00    4.0     1840.0
2791. CO-cy-COCO+OH=>H2O+CH2O+CH3OCO              3.39E+06    2.1     -521.0
2792. CO-cy-COCO+O=>OH+CH2O+CH3OCO                1.79E+07    2.0     2629.0
2793. CO-cy-COCO+HO2=>H2O2+CH2O+CH3OCO            1.33E+12    0.0    16500.0
2794. CJOCOCO2H+O2<=>O2JCOCOCO2H                  7.00E+11    0.0        0.0
2795. COCJOCO2H+O2<=>COCO2JOCO2H                  7.00E+11    0.0        0.0
2796. COCO2HOCJ+O2<=>COCO2HOCO2J                  7.00E+11    0.0        0.0
2797. O2JCOCOCO2H<=>HO2COCOC*O+OH                 5.68E+11    0.0    18379.5
      Declared duplicate reaction...
2798. O2JCOCOCO2H<=>HO2COCOC*O+OH                 1.55E+02    3.3    34188.0
      Declared duplicate reaction...
2799. COCO2JOCO2H<=>COCO2HOC*O+OH                 9.48E+07    1.1    18604.0
2800. COCO2HOCO2J<=>COC*OOCO2H+OH                 2.64E+10    0.8    17141.0
2801. HO2COCOC*O<=>OJCOCOC*O+OH                   1.50E+16    0.0    42853.7
2802. COCO2HOC*O<=>COCOJOC*O+OH                   1.50E+16    0.0    42853.7
2803. COC*OOCO2H<=>COC*OOCOJ+OH                   1.50E+16    0.0    42853.7
2804. OJCOCOC*O<=>CH2O+OCH2OCHO                   2.33E+13    0.2    23398.7
2805. COCOJOC*O<=>CH3OCHO+OCHO                    1.53E+11    0.3     7646.0
2806. COCOJOC*O<=>CH3O+OCHOCHO                    2.69E+08    1.6    10568.0
2807. COC*OOCOJ<=>COC*OOJ+CH2O                    4.19E+11    0.8    25884.3
2808. COCOCO2J+CH3OCH2OCH2<=>COCOCOJ+COCOCOJ      7.00E+12    0.0    -1000.0
2809. COCOCO2J+CH3OCHOCH3<=>COCOCOJ+COCOJOC       7.00E+12    0.0    -1000.0
2810. COCO2JOC+CH3OCH2OCH2<=>COCOCOJ+COCOJOC      7.00E+12    0.0    -1000.0
2811. COCO2JOC+CH3OCHOCH3<=>COCOJOC+COCOJOC       7.00E+12    0.0    -1000.0
2812. COCOCO2J+HO2<=>COCOCO2H+O2                  1.75E+10    0.0    -3275.0
2813. COCO2JOC+HO2<=>COCO2HOC+O2                  1.75E+10    0.0    -3275.0
2814. COCOCO2J+H2O2<=>COCOCO2H+HO2                2.40E+12    0.0    10000.0
2815. COCO2JOC+H2O2<=>COCO2HOC+HO2                2.40E+12    0.0    10000.0
2816. COCOCO2J+CH3O2<=>COCOCOJ+CH3O+O2            1.40E+16   -1.6     1860.0
2817. COCO2JOC+CH3O2<=>COCOJOC+CH3O+O2            1.40E+16   -1.6     1860.0
2818. COCOCO2J+COCOCO2J<=>COCOCOJ+COCOCOJ+O2      1.40E+16   -1.6     1860.0
2819. COCO2JOC+COCO2JOC<=>COCOJOC+COCOJOC+O2      1.40E+16   -1.6     1860.0
2820. COCOCO2J+COCO2JOC<=>COCOJOC+COCOJOC+O2      1.40E+16   -1.6     1860.0
2821. COCOCO2H<=>COCOCOJ+OH                       1.26E+16    0.0    42500.0
2822. COCO2HOC<=>COCOJOC+OH                       1.26E+16    0.0    42500.0
2823. COCOCOJ<=>CH3OCH2O+CH2O                     1.12E+55  -13.9    35880.0
      Rate coefficients at P=1.00E-02(atm)       1.12E+55  -13.9    35880.0
      Rate coefficients at P=1.00E-01(atm)       8.19E+52  -12.8    36800.0
      Rate coefficients at P=1.00E+00(atm)       4.75E+48  -11.2    37070.0
      Rate coefficients at P=1.00E+01(atm)       2.45E+40   -8.3    35460.0
      Rate coefficients at P=1.00E+02(atm)       4.96E+30   -5.2    32610.0
2824. COCOJOC<=>CH3OCHO+CH3O                      6.04E+31   -6.9    16820.0
      Rate coefficients at P=1.00E-01(atm)       6.04E+31   -6.9    16820.0
      Rate coefficients at P=1.00E+00(atm)       7.75E+34   -7.5    19050.0
      Rate coefficients at P=1.00E+01(atm)       2.38E+35   -7.3    20790.0
      Rate coefficients at P=1.00E+02(atm)       5.47E+31   -5.8    21160.0

 UNITS for the preceding reactions (unless otherwise noted):
       A units mole-cm-sec-K, E units cal/mole
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Annexe 5 : Mécanisme d'oxydation du 1,2-DME

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Mécanisme d'oxydation du 1,2-DME
                                                    (k = A T**b exp(-E/RT))
   REACTIONS                                          A        b        E

  1. H2+M<=>H+H+M                                  4.58E+19   -1.4   104400.0
     H2              Enhanced by    2.500E+00
     H2O             Enhanced by    1.200E+01
     CO              Enhanced by    1.900E+00
     CO2             Enhanced by    3.800E+00
     HE              Enhanced by    8.300E-01
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
  2. H2+O<=>H+OH                                   5.08E+04    2.7     6292.0
  3. H2+OH<=>H+H2O                                 4.38E+13    0.0     6990.0
  4. O+O+M<=>O2+M                                  6.16E+15   -0.5        0.0
     H2              Enhanced by    2.500E+00
     H2O             Enhanced by    1.200E+01
     AR              Enhanced by    8.300E-01
     CO              Enhanced by    1.900E+00
     CO2             Enhanced by    3.800E+00
     HE              Enhanced by    8.300E-01
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
  5. O2+H<=>O+OH                                   1.04E+14    0.0    15286.0
  6. H+OH+M<=>H2O+M                                3.50E+22   -2.0        0.0
     H2              Enhanced by    7.300E-01
     H2O             Enhanced by    3.650E+00
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
     AR              Enhanced by    3.800E-01
  7. O+H2O<=>OH+OH                                 6.70E+07    1.7    14986.8
  8. O+H+M<=>OH+M                                  4.71E+18   -1.0        0.0
     H2              Enhanced by    2.500E+00
     H2O             Enhanced by    1.200E+01
     AR              Enhanced by    7.500E-01
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     HE              Enhanced by    7.500E-01
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
  9. H+O+M<=>OHV+M                                 1.50E+13    0.0     5975.0
     H2              Enhanced by    1.000E+00
     H2O             Enhanced by    6.500E+00
     O2              Enhanced by    4.000E-01
     N2              Enhanced by    4.000E-01
     AR              Enhanced by    3.500E-01
 10. OHV+H2O<=>OH+H2O                              5.93E+12    0.5     -860.0
 11. OHV+H2<=>OH+H2                                2.95E+12    0.5     -444.0
 12. OHV+N2<=>OH+N2                                1.08E+11    0.5    -1242.0
 13. OHV+OH<=>OH+OH                                6.01E+12    0.5     -764.0
 14. OHV+H<=>OH+H                                  1.31E+12    0.5     -167.0
 15. OHV+AR<=>OH+AR                                1.69E+12    0.0     4135.0
 16. OHV<=>OH                                      1.45E+06    0.0        0.0
 17. OHV+O2<=>OH+O2                                2.10E+12    0.5     -478.0
 18. OHV+CO2<=>OH+CO2                              2.75E+12    0.5     -968.0
 19. OHV+CO<=>OH+CO                                3.23E+12    0.5     -787.0
 20. OHV+CH4<=>OH+CH4                              3.36E+12    0.5     -635.0
 21. H2O2(+M)<=>OH+OH(+M)                          2.00E+12    0.9    48749.0
     Low pressure limit:  0.24900E+25 -0.23000E+01  0.48749E+05
     TROE centering:      0.43000E+00  0.10000E-29  0.10000E+31
     H2O             Enhanced by    7.650E+00
     CO2             Enhanced by    1.600E+00
     N2              Enhanced by    1.500E+00
     O2              Enhanced by    1.200E+00
     HE              Enhanced by    6.500E-01
     H2O2            Enhanced by    7.700E+00
     H2              Enhanced by    3.700E+00
     CO              Enhanced by    2.800E+00
 22. H2O2+H<=>H2O+OH                               2.41E+13    0.0     3970.0
 23. H2O2+H<=>H2+HO2                               2.15E+10    1.0     6000.0
 24. H2O2+O<=>OH+HO2                               9.55E+06    2.0     3970.0
 25. H2O2+OH<=>H2O+HO2                             1.74E+12    0.0      318.0
     Declared duplicate reaction...
 26. H2O2+OH<=>H2O+HO2                             7.59E+13    0.0     7269.0
     Declared duplicate reaction...
 27. HO2+H<=>OH+OH                                 7.08E+13    0.0      295.0
 28. HO2+H<=>H2+O2                                 1.14E+10    1.1      553.8
 29. HO2+O<=>OH+O2                                 3.25E+13    0.0        0.0
 30. OH+HO2<=>H2O+O2                               7.00E+12    0.0    -1093.0
     Declared duplicate reaction...
 31. OH+HO2<=>H2O+O2                               4.50E+14    0.0    10929.6
     Declared duplicate reaction...
 32. HO2+HO2<=>H2O2+O2                             1.00E+14    0.0    11040.9
     Declared duplicate reaction...
 33. HO2+HO2<=>H2O2+O2                             1.90E+11    0.0    -1408.9
     Declared duplicate reaction...
 34. H+O2(+M)<=>HO2(+M)                            4.65E+12    0.4        0.0
     Low pressure limit:  0.17370E+20 -0.12300E+01  0.00000E+00
     TROE centering:      0.67000E+00  0.10000E-29  0.10000E+31  0.10000E+31
     H2              Enhanced by    1.300E+00
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    CO              Enhanced by    1.900E+00
    CO2             Enhanced by    3.800E+00
    HE              Enhanced by    6.400E-01
    H2O             Enhanced by    1.000E+01
    AR              Enhanced by    5.000E-01
    CH4             Enhanced by    2.000E+00
    C2H6            Enhanced by    3.000E+00
35. CO+O(+M)<=>CO2(+M)                            1.36E+10    0.0     2384.0
    Low pressure limit:  0.11730E+25 -0.27900E+01  0.41910E+04
    H2              Enhanced by    2.000E+00
    H2O             Enhanced by    1.200E+01
    CO              Enhanced by    1.750E+00
    CO2             Enhanced by    3.600E+00
    AR              Enhanced by    7.000E-01
    HE              Enhanced by    7.000E-01
36. CO+OH<=>CO2+H                                 7.02E+04    2.1     -355.7
    Declared duplicate reaction...
37. CO+OH<=>CO2+H                                 5.76E+12   -0.7      331.8
    Declared duplicate reaction...
38. CO+HO2<=>CO2+OH                               1.57E+05    2.2    17940.0
39. CO+O2<=>CO2+O                                 1.12E+12    0.0    47700.0
40. H+CO2<=>OCHO                                  7.50E+13    0.0    29000.0
41. HOCO<=>CO+OH                                  6.30E+32   -6.0    32470.0
    Rate coefficients at P=1.00E-03(atm)         1.55E-08    2.9     8768.0
    Rate coefficients at P=3.00E-03(atm)         1.77E+03    0.3    18076.0
    Rate coefficients at P=2.96E-02(atm)         2.02E+13   -1.9    22755.0
    Rate coefficients at P=9.87E-02(atm)         1.68E+18   -3.0    24323.0
    Rate coefficients at P=2.96E-01(atm)         2.50E+24   -4.6    27067.0
    Rate coefficients at P=9.87E-01(atm)         4.54E+26   -5.1    27572.0
    Rate coefficients at P=2.96E+00(atm)         7.12E+28   -5.6    28535.0
    Rate coefficients at P=9.87E+00(atm)         5.48E+29   -5.7    28899.0
    Rate coefficients at P=2.96E+01(atm)         9.89E+31   -6.2    30518.0
    Rate coefficients at P=9.87E+01(atm)         5.74E+33   -6.5    32068.0
    Rate coefficients at P=2.96E+02(atm)         2.61E+33   -6.3    32231.0
    Rate coefficients at P=9.87E+02(atm)         6.30E+32   -6.0    32470.0
42. HOCO<=>CO2+H                                  1.90E+38   -8.0    34240.0
    Rate coefficients at P=1.00E-03(atm)         4.76E+18   -3.8    17676.0
    Rate coefficients at P=3.00E-03(atm)         2.22E+20   -4.1    19037.0
    Rate coefficients at P=9.90E-03(atm)         7.56E+21   -4.4    20325.0
    Rate coefficients at P=2.96E-02(atm)         9.11E+24   -5.2    22419.0
    Rate coefficients at P=9.87E-02(atm)         3.14E+29   -6.4    25233.0
    Rate coefficients at P=2.96E-01(atm)         1.15E+32   -7.0    26662.0
    Rate coefficients at P=9.87E-01(atm)         1.07E+36   -8.1    29064.0
    Rate coefficients at P=2.96E+00(atm)         2.44E+36   -8.2    29336.0
    Rate coefficients at P=9.87E+00(atm)         6.66E+35   -7.9    29217.0
    Rate coefficients at P=2.96E+01(atm)         1.72E+38   -8.5    31273.0
    Rate coefficients at P=9.87E+01(atm)         3.01E+41   -9.3    33966.0
    Rate coefficients at P=2.96E+02(atm)         6.77E+36   -7.8    31613.0
    Rate coefficients at P=9.87E+02(atm)         1.90E+38   -8.0    34240.0
43. CH3+H(+M)<=>CH4(+M)                           1.27E+16   -0.6      383.0
    Low pressure limit:  0.24770E+34 -0.47600E+01  0.24400E+04
    TROE centering:      0.78300E+00  0.74000E+02  0.29410E+04  0.69640E+04
    H2              Enhanced by    2.000E+00
    H2O             Enhanced by    6.000E+00
    AR              Enhanced by    7.000E-01
    CO              Enhanced by    1.500E+00
    CO2             Enhanced by    2.000E+00
    CH4             Enhanced by    2.000E+00
    C2H6            Enhanced by    3.000E+00
    HE              Enhanced by    7.000E-01
44. CH4+H<=>CH3+H2                                6.14E+05    2.5     9587.0
45. CH4+O<=>CH3+OH                                1.02E+09    1.5     8600.0
46. CH4+OH<=>CH3+H2O                              5.83E+04    2.6     2190.0
47. CH4+HO2<=>CH3+H2O2                            1.13E+01    3.7    21010.0
48. CH4+CH3O2<=>CH3+CH3O2H                        9.60E-01    3.8    17810.0
49. CH3+HO2<=>CH4+O2                              1.16E+05    2.2    -3022.0
50. CH4+CH2<=>CH3+CH3                             2.46E+06    2.0     8270.0
51. CH2(S)+N2<=>CH2+N2                            1.50E+13    0.0      600.0
52. CH2(S)+AR<=>CH2+AR                            9.00E+12    0.0      600.0
53. CH2(S)+H2O<=>CH2+H2O                          3.00E+13    0.0        0.0
54. CH2(S)+CO<=>CH2+CO                            9.00E+12    0.0        0.0
55. CH2(S)+CO2<=>CH2+CO2                          7.00E+12    0.0        0.0
56. CH2(S)+O2=>H+OH+CO                            2.80E+13    0.0        0.0
57. CH2(S)+O2<=>CO+H2O                            1.20E+13    0.0        0.0
58. CH2(S)+O<=>CO+H2                              1.50E+13    0.0        0.0
59. CH2(S)+O<=>HCO+H                              1.50E+13    0.0        0.0
60. CH2(S)+H2<=>CH3+H                             7.00E+13    0.0        0.0
61. CH2(S)+H<=>CH+H2                              3.00E+13    0.0        0.0
62. CH2(S)+OH<=>CH2O+H                            3.00E+13    0.0        0.0
63. CH2(S)+CO2<=>CH2O+CO                          1.40E+13    0.0        0.0
64. CH2+H(+M)<=>CH3(+M)                           2.50E+16   -0.8        0.0
    Low pressure limit:  0.32000E+28 -0.31400E+01  0.12300E+04
    TROE centering:      0.68000E+00  0.78000E+02  0.19950E+04  0.55900E+04
    H2              Enhanced by    2.000E+00
    H2O             Enhanced by    6.000E+00
    AR              Enhanced by    7.000E-01
    CO              Enhanced by    1.500E+00
    CO2             Enhanced by    2.000E+00
    CH4             Enhanced by    2.000E+00
    C2H6            Enhanced by    3.000E+00
    HE              Enhanced by    7.000E-01
65. CH2+O2<=>HCO+OH                               1.06E+13    0.0     1500.0
66. CH2+O2=>CO2+H+H                               2.64E+12    0.0     1500.0
67. CH2+O=>CO+H+H                                 5.00E+13    0.0        0.0
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68. CH2+H<=>CH+H2                                  3.00E+13    0.0        0.0
69. CH2+OH<=>CH+H2O                                1.13E+07    2.0     3000.0
70. CHV+AR<=>CH+AR                                 4.00E+11    0.5        0.0
71. CHV+H2O<=>CH+H2O                               5.30E+13    0.0        0.0
72. CHV+CO<=>CH+CO                                 2.44E+12    0.5        0.0
73. CHV+CO2<=>CH+CO2                               2.41E-01    4.3    -1694.0
74. CHV+O2<=>CH+O2                                 2.48E+06    2.1    -1720.0
75. CHV+H2<=>CH+H2                                 1.47E+14    0.0     1361.0
76. CHV+CH4<=>CH+CH4                               1.73E+13    0.0      167.0
77. CHV<=>CH                                       1.86E+06    0.0        0.0
78. CHV+N2<=>CH+N2                                 3.03E+02    3.4     -381.0
79. C+H+M<=>CHV+M                                  6.00E+14    0.0     6940.0
80. CH+O2<=>CO+OHV                                 4.04E+13    0.0        0.0
81. CH+O2<=>HCO+O                                  3.30E+13    0.0        0.0
82. CH+O<=>CO+H                                    5.70E+13    0.0        0.0
83. CH+H<=>C+H2                                    1.10E+14    0.0        0.0
84. CH+OH<=>HCO+H                                  3.00E+13    0.0        0.0
85. CH+H2O<=>H+CH2O                                1.77E+16   -1.2       23.8
86. CH+CO2<=>HCO+CO                                1.70E+12    0.0      685.0
87. C+OH<=>CO+H                                    5.00E+13    0.0        0.0
88. C+O2<=>CO+O                                    5.00E+13    0.0        0.0
89. CH3+O2(+M)<=>CH3O2(+M)                         7.81E+09    0.9        0.0
    Low pressure limit:  0.68500E+25 -0.30000E+01  0.00000E+00
    TROE centering:      0.60000E+00  0.10000E+04  0.70000E+02  0.17000E+04
90. CH3+O2<=>CH3O+O                                7.55E+12    0.0    28320.0
91. CH3+O2<=>CH2O+OH                               2.64E+00    3.3     8105.0
92. CH3+O<=>CH2O+H                                 5.54E+13    0.1     -136.0
93. CH3+OH<=>CH2(S)+H2O                            4.94E+14   -0.7     -445.8
    Rate coefficients at P=1.00E-02(atm)          4.94E+14   -0.7     -445.8
    Rate coefficients at P=1.00E-01(atm)          1.21E+15   -0.8     -175.6
    Rate coefficients at P=1.00E+00(atm)          5.28E+17   -1.5     1772.0
    Rate coefficients at P=1.00E+01(atm)          4.79E+23   -3.2     7003.0
    Rate coefficients at P=1.00E+02(atm)          8.43E+19   -2.0     8244.0
94. CH3+OH<=>CH2O+H2                               3.50E+05    1.4    -3244.0
    Rate coefficients at P=1.00E-02(atm)          3.50E+05    1.4    -3244.0
    Rate coefficients at P=1.00E-01(atm)          8.85E+05    1.3    -2975.0
    Rate coefficients at P=1.00E+00(atm)          1.65E+07    1.0    -2010.0
    Rate coefficients at P=1.00E+01(atm)          5.37E+09    0.3      280.0
    Rate coefficients at P=1.00E+02(atm)          9.49E+18   -2.2     9769.0
95. CH3+OH<=>CH2OH+H                               1.62E+10    1.0     3210.0
    Rate coefficients at P=1.00E-02(atm)          1.62E+10    1.0     3214.0
    Rate coefficients at P=1.00E-01(atm)          1.81E+10    0.9     3247.0
    Rate coefficients at P=1.00E+00(atm)          4.69E+10    0.8     3566.0
    Rate coefficients at P=1.00E+01(atm)          1.52E+13    0.1     5641.0
    Rate coefficients at P=1.00E+02(atm)          3.59E+14   -0.2     8601.0
96. CH3+OH<=>H+CH3O                                1.19E+09    1.0    11940.0
    Rate coefficients at P=1.00E-02(atm)          1.19E+09    1.0    11940.0
    Rate coefficients at P=1.00E-01(atm)          1.19E+09    1.0    11940.0
    Rate coefficients at P=1.00E+00(atm)          1.23E+09    1.0    11950.0
    Rate coefficients at P=1.00E+01(atm)          1.80E+09    1.0    12060.0
    Rate coefficients at P=1.00E+02(atm)          5.24E+10    0.6    13070.0
97. CH3+OH<=>HCOH+H2                               8.67E+08    0.8    -3046.0
    Rate coefficients at P=1.00E-02(atm)          8.67E+08    0.8    -3046.0
    Rate coefficients at P=1.00E-01(atm)          3.12E+09    0.6    -2669.0
    Rate coefficients at P=1.00E+00(atm)          1.56E+11    0.2    -1368.0
    Rate coefficients at P=1.00E+01(atm)          1.70E+21   -2.6     6412.0
    Rate coefficients at P=1.00E+02(atm)          7.25E+20   -2.4     9639.0
98. CH3+OH<=>CH2+H2O                               4.29E+04    2.6     3997.8
99. CH3+HO2<=>CH3O+OH                              1.00E+12    0.3     -687.5
100. CH3O2+O<=>CH3O+O2                             3.60E+13    0.0        0.0
101. CH3O2+H<=>CH3O+OH                             9.60E+13    0.0        0.0
102. CH3O2+OH<=>CH3OH+O2                           6.00E+13    0.0        0.0
103. CH3O2+HO2<=>CH3O2H+O2                         2.47E+11    0.0    -1570.0
104. CH3O2+H2O2<=>CH3O2H+HO2                       2.41E+12    0.0     9936.0
105. CH3O2+CH3<=>CH3O+CH3O                         5.08E+12    0.0    -1411.0
106. CH3O2+CH3O2=>CH2O+CH3OH+O2                    3.11E+14   -1.6    -1051.0
107. CH3O2+CH3O2=>O2+CH3O+CH3O                     1.40E+16   -1.6     1860.0
108. H2+CH3O2<=>H+CH3O2H                           1.50E+14    0.0    26030.0
109. CH3O2H<=>CH3O+OH                              6.31E+14    0.0    42300.0
110. CH2O2H<=>CH2O+OH                              9.00E+14    0.0     1500.0
111. CH3OH(+M)<=>CH3+OH(+M)                        2.08E+18   -0.6    92540.6
    Low pressure limit:  0.15000E+44 -0.69950E+01  0.97992E+05
    TROE centering:     -0.47480E+00  0.35580E+05  0.11160E+04  0.90230E+04
112. CH3OH(+M)<=>CH2(S)+H2O(+M)                    3.12E+18   -1.0    91712.0
    Low pressure limit:  0.14300E+48 -0.82270E+01  0.99417E+05
    TROE centering:      0.25450E+01  0.32900E+04  0.47320E+05  0.47110E+05
113. CH3OH(+M)<=>CH2OH+H(+M)                       7.90E-03    5.0    84467.4
    Low pressure limit:  0.33900E+43 -0.72440E+01  0.10523E+06
    TROE centering:     -0.73910E+02  0.37050E+05  0.41500E+05  0.52200E+04
114. CH3OH+H<=>CH3O+H2                             1.99E+05    2.6    10300.0
115. CH3OH+H<=>CH2OH+H2                            3.07E+05    2.5     5440.0
116. CH3OH+O<=>CH3O+OH                             3.88E+04    2.5     3080.0
117. CH3OH+O<=>CH2OH+OH                            3.88E+05    2.5     3080.0
118. CH3OH+OH<=>CH3O+H2O                           1.50E+02    3.0     -763.0
119. CH3OH+OH<=>CH2OH+H2O                          3.08E+04    2.6     -806.7
120. CH3OH+O2<=>CH3O+HO2                           3.00E+14    0.0    54800.0
121. CH3OH+O2<=>CH2OH+HO2                          3.58E+05    2.3    42764.5
122. CH3OH+HO2<=>CH3O+H2O2                         1.22E+12    0.0    20070.7
123. CH3OH+HO2<=>CH2OH+H2O2                        3.26E+13    0.0    18782.2
124. CH3OH+CH3<=>CH2OH+CH4                         2.13E-01    4.0     7055.1
125. CH3OH+CH3<=>CH3O+CH4                          3.22E+03    2.4     8579.5
126. CH3OH+HCO<=>CH2OH+CH2O                        9.63E+03    2.9    13110.0
127. CH3OH+CH3O<=>CH2OH+CH3OH                      3.00E+11    0.0     4074.0
128. CH3OH+CH3O2<=>CH2OH+CH3O2H                    1.81E+12    0.0    13710.0
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129. CH2OH+O2<=>CH2O+HO2                          1.51E+15   -1.0        0.0
     Declared duplicate reaction...
130. CH2OH+O2<=>CH2O+HO2                          2.41E+14    0.0     5017.0
     Declared duplicate reaction...
131. CH2OH+H<=>CH2O+H2                            6.00E+12    0.0        0.0
132. CH2OH+HO2<=>CH2O+H2O2                        1.20E+13    0.0        0.0
133. CH2OH+HCO<=>CH2O+CH2O                        1.80E+14    0.0        0.0
134. CH2OH+HCO<=>CH3OH+CO                         1.00E+13    0.0        0.0
135. CH2OH+CH3O<=>CH2O+CH3OH                      2.40E+13    0.0        0.0
136. CH2OH+OH<=>H2O+CH2O                          2.40E+13    0.0        0.0
137. CH2OH+O<=>OH+CH2O                            4.20E+13    0.0        0.0
138. CH2OH+CH2OH<=>CH2O+CH3OH                     3.00E+12    0.0        0.0
139. CH2OH+HO2<=>HOCH2O+OH                        1.00E+13    0.0        0.0
140. CH3O+O2<=>CH2O+HO2                           7.30E-20    9.5    -5501.0
141. CH3O+H<=>CH2O+H2                             2.00E+13    0.0        0.0
142. CH3O+HO2<=>CH2O+H2O2                         3.01E+11    0.0        0.0
143. CH3O+CH3<=>CH2O+CH4                          1.20E+13    0.0        0.0
144. CH3O+CH3O<=>CH3OH+CH2O                       6.03E+13    0.0        0.0
145. HCOH+O2=>CO2+H+OH                            5.00E+12    0.0        0.0
146. HCOH+O2<=>CO2+H2O                            3.00E+13    0.0        0.0
147. HCOH+O=>CO2+H+H                              5.00E+13    0.0        0.0
148. HCOH+O=>CO+OH+H                              3.00E+13    0.0        0.0
149. HCOH+H<=>CH2O+H                              2.00E+14    0.0        0.0
150. HCOH+OH<=>HCO+H2O                            2.00E+13    0.0        0.0
151. HCO+H(+M)<=>CH2O(+M)                         1.09E+12    0.5     -260.0
     Low pressure limit:  0.13500E+25 -0.25700E+01  0.14250E+04
     TROE centering:      0.78240E+00  0.27100E+03  0.27550E+04  0.65700E+04
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     AR              Enhanced by    7.000E-01
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
     HE              Enhanced by    7.000E-01
152. CO+H2(+M)<=>CH2O(+M)                         4.30E+07    1.5    79600.0
     Low pressure limit:  0.50700E+28 -0.34200E+01  0.84348E+05
     TROE centering:      0.93200E+00  0.19700E+03  0.15400E+04  0.10300E+05
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     AR              Enhanced by    7.000E-01
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
     HE              Enhanced by    7.000E-01
153. CH2O+O2<=>HCO+HO2                            8.07E+15    0.0    53420.0
154. CH2O+O<=>HCO+OH                              6.26E+09    1.1     2260.0
155. CH2O+H<=>HCO+H2                              2.87E+07    1.9     2740.0
156. CH2O+OH<=>HCO+H2O                            1.94E+06    2.1    -1690.0
157. CH2O+HO2<=>HCO+H2O2                          1.88E+04    2.7    11520.0
158. CH2O+CH3<=>HCO+CH4                           3.83E+01    3.4     4312.0
159. CH2O+O2CHO<=>HCO+HO2CHO                      1.99E+12    0.0    11660.0
160. CH2O+OCHO<=>HCO+HOCHO                        5.60E+12    0.0    13600.0
161. CH2O+CH3O<=>HCO+CH3OH                        6.62E+11    0.0     2294.0
162. CH2O+CH3O2<=>HCO+CH3O2H                      1.99E+12    0.0    11660.0
163. HCO+M<=>H+CO+M                               5.70E+11    0.7    14870.0
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
164. HCO+O2<=>CO+HO2                              7.58E+12    0.0      410.0
165. HCO+O<=>CO+OH                                3.02E+13    0.0        0.0
166. HCO+H<=>CO+H2                                7.34E+13    0.0        0.0
167. HCO+OH<=>CO+H2O                              3.01E+13    0.0        0.0
168. HCO+CH3<=>CH4+CO                             2.65E+13    0.0        0.0
169. HCO+HCO<=>CH2O+CO                            1.80E+13    0.0        0.0
170. HCO+O<=>CO2+H                                3.00E+13    0.0        0.0
171. HCO+HO2=>CO2+H+OH                            3.00E+13    0.0        0.0
172. HCO+HCO=>H2+CO+CO                            3.00E+12    0.0        0.0
173. CH2O+H(+M)<=>CH2OH(+M)                       5.40E+11    0.5     3600.0
     Low pressure limit:  0.12700E+33 -0.48200E+01  0.65300E+04
     TROE centering:      0.71870E+00  0.10300E+03  0.12910E+04  0.41600E+04
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
174. CH3O(+M)<=>CH2O+H(+M)                        3.40E+13    0.0    26170.0
     Low pressure limit:  0.93350E+25 -0.30000E+01  0.24307E+05
     TROE centering:      0.90000E+00  0.25000E+04  0.13000E+04  0.10000+100
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
175. CH2O+OH<=>HOCH2O                             6.31E+06    1.6     4280.0
176. HOCH2O<=>HOCHO+H                             1.00E+14    0.0    14900.0
177. CH2O+HO2<=>OCH2O2H                           7.50E+10    0.0    11900.0
178. OCH2O2H<=>HOCH2O2                            3.00E+11    0.0     8600.0
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179. HOCH2O2+HO2<=>HOCH2O2H+O2                      3.50E+10    0.0    -3275.0
180. HOCH2O+OH<=>HOCH2O2H                           1.00E+13    0.0        0.0
181. HCO+O2<=>O2CHO                                 1.20E+11    0.0    -1100.0
182. HOCHO<=>CO+H2O                                 2.45E+12    0.0    60470.0
183. HOCHO<=>CO2+H2                                 2.95E+09    0.0    48520.0
184. OCHO+HO2<=>HOCHO+O2                            3.50E+10    0.0    -3275.0
185. OCHO+H2O2<=>HOCHO+HO2                          2.40E+12    0.0    10000.0
186. HOCHO+H=>H2+CO2+H                              4.24E+06    2.1     4868.0
187. HOCHO+H=>H2+CO+OH                              6.03E+13   -0.3     2988.0
188. HOCHO+O=>CO+OH+OH                              1.77E+18   -1.9     2975.0
189. HOCHO+OH=>H2O+CO2+H                            2.62E+06    2.1      916.0
190. HOCHO+OH=>H2O+CO+OH                            1.85E+07    1.5     -962.0
191. HOCHO+CH3=>CH4+CO+OH                           3.90E-07    5.8     2200.0
192. HOCHO+HO2=>H2O2+CO+OH                          1.00E+12    0.0    11920.0
193. OCHO+OH<=>HO2CHO                               2.00E+13    0.0        0.0
194. CH3+CH3(+M)<=>C2H6(+M)                         2.28E+15   -0.7      174.9
     Low pressure limit:  0.80540E+32 -0.37500E+01  0.98160E+03
     TROE centering:      0.00000E+00  0.57000E+03  0.10000E+31  0.10000E+31
     H2O             Enhanced by    5.000E+00
     CO              Enhanced by    2.000E+00
     CO2             Enhanced by    3.000E+00
195. C2H5+H(+M)<=>C2H6(+M)                          5.21E+17   -1.0     1580.0
     Low pressure limit:  0.19900E+42 -0.70800E+01  0.66850E+04
     TROE centering:      0.84200E+00  0.12500E+03  0.22190E+04  0.68820E+04
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     AR              Enhanced by    7.000E-01
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
     HE              Enhanced by    7.000E-01
196. C2H6+O2<=>C2H5+HO2                             6.03E+13    0.0    51870.0
197. C2H6+O<=>C2H5+OH                               3.55E+06    2.4     5830.0
198. C2H6+H<=>C2H5+H2                               1.15E+08    1.9     7530.0
199. C2H6+OH<=>C2H5+H2O                             1.48E+07    1.9      950.0
200. C2H6+HO2<=>C2H5+H2O2                           3.46E+01    3.6    16920.0
201. C2H6+CH<=>C2H5+CH2                             1.10E+14    0.0     -260.0
202. C2H6+CH2(S)<=>C2H5+CH3                         1.20E+14    0.0        0.0
203. C2H6+CH3<=>C2H5+CH4                            5.55E-04    4.7     3231.0
204. C2H6+CH3O<=>C2H5+CH3OH                         2.41E+11    0.0     7090.0
205. C2H6+CH3O2<=>C2H5+CH3O2H                       1.94E+01    3.6    17100.0
206. C2H6+C2H5O2<=>C2H5+C2H5O2H                     8.60E+00    3.8    17200.0
207. C2H4+H(+M)<=>C2H5(+M)                          9.57E+08    1.5     1355.0
     Low pressure limit:  0.14190E+40 -0.66420E+01  0.57690E+04
     TROE centering:     -0.56900E+00  0.29900E+03 -0.91470E+04  0.15240E+03
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     CH4             Enhanced by    2.000E+00
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
     AR              Enhanced by    7.000E-01
208. C2H5+H<=>C2H4+H2                               2.00E+12    0.0        0.0
209. C2H4+C2H4<=>C2H5+C2H3                          4.82E+14    0.0    71530.0
210. C2H5+CH3<=>CH4+C2H4                            1.18E+04    2.5    -2921.0
211. C2H5+O<=>CH3CHO+H                              1.10E+14    0.0        0.0
212. C2H5+HO2<=>C2H5O+OH                            1.10E+13    0.0        0.0
213. C2H5+CH3O2<=>C2H5O+CH3O                        8.00E+12    0.0    -1000.0
214. CH3+CH3<=>H+C2H5                               4.74E+12    0.1    10664.3
     Rate coefficients at P=1.00E-02(atm)          4.74E+12    0.1    10664.3
     Rate coefficients at P=1.00E-01(atm)          2.57E+13   -0.1    11406.1
     Rate coefficients at P=1.00E+00(atm)          3.10E+14   -0.4    13372.5
     Rate coefficients at P=1.00E+01(atm)          2.15E+10    0.9    13532.5
     Rate coefficients at P=1.00E+02(atm)          1.03E+02    3.2    11236.1
215. C2H5+O2<=>C2H5O2                               3.40E+53  -13.9     9279.0
     Rate coefficients at P=4.00E-02(atm)          3.40E+53  -13.9     9279.0
     Rate coefficients at P=1.00E+00(atm)          9.36E+59  -15.3    14240.0
     Rate coefficients at P=1.00E+01(atm)          1.26E+60  -14.9    16240.0
216. C2H5+O2<=>C2H4O2H                              2.10E+34   -9.0     5444.0
     Rate coefficients at P=4.00E-02(atm)          2.10E+34   -9.0     5444.0
     Rate coefficients at P=1.00E+00(atm)          4.88E+33   -8.3     7710.0
     Rate coefficients at P=1.00E+01(atm)          1.71E+45  -11.5    14590.0
217. C2H5+O2<=>C2H4+HO2                             2.09E+09    0.5     -391.4
     Rate coefficients at P=4.00E-02(atm)          2.09E+09    0.5     -391.4
     Rate coefficients at P=1.00E+00(atm)          1.84E+07    1.1     -720.6
     Rate coefficients at P=1.00E+01(atm)          7.56E+14   -1.0     4749.0
218. C2H5+O2<=>C2H4O1-2+OH                          1.30E+03    1.9     -502.7
     Rate coefficients at P=4.00E-02(atm)          1.30E+03    1.9     -502.7
     Rate coefficients at P=1.00E+00(atm)          2.44E+02    2.2      -62.5
     Rate coefficients at P=1.00E+01(atm)          4.62E+09    0.1     5409.0
219. C2H5+O2<=>CH3CHO+OH                            4.91E-06    4.8      254.3
     Rate coefficients at P=4.00E-02(atm)          4.91E-06    4.8      254.3
     Rate coefficients at P=1.00E+00(atm)          6.80E-02    3.6     2643.0
     Rate coefficients at P=1.00E+01(atm)          8.26E+02    2.4     5285.0
220. C2H4O2H<=>C2H5O2                               2.65E-16    7.0     2396.0
     Rate coefficients at P=4.00E-02(atm)          2.65E-16    7.0     2396.0
     Rate coefficients at P=1.00E+00(atm)          1.06E+41  -10.1    26030.0
     Rate coefficients at P=1.00E+01(atm)          1.20E+36   -8.1    27020.0
221. C2H5O2<=>CH3CHO+OH                             1.24E+35   -9.4    36360.0
     Rate coefficients at P=4.00E-02(atm)          1.24E+35   -9.4    36360.0
     Rate coefficients at P=1.00E+00(atm)          1.69E+36   -9.2    38700.0
     Rate coefficients at P=1.00E+01(atm)          2.52E+41  -10.2    43710.0
222. C2H5O2<=>C2H4+HO2                              1.78E+32   -7.1    32840.0
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     Rate coefficients at P=4.00E-02(atm)          1.78E+32   -7.1    32840.0
     Rate coefficients at P=1.00E+00(atm)          2.70E+37   -8.5    35840.0
     Rate coefficients at P=1.00E+01(atm)          1.98E+38   -8.5    37900.0
223. C2H5O2<=>C2H4O1-2+OH                           5.78E+45  -11.9     4112.0
     Rate coefficients at P=4.00E-02(atm)          5.78E+45  -11.9     4112.0
     Rate coefficients at P=1.00E+00(atm)          1.92E+43  -10.8    42400.0
     Rate coefficients at P=1.00E+01(atm)          3.96E+43  -10.5    45580.0
224. C2H4O2H<=>C2H4O1-2+OH                          8.96E+38   -9.4    20660.0
     Rate coefficients at P=4.00E-02(atm)          8.96E+38   -9.4    20660.0
     Rate coefficients at P=1.00E+00(atm)          1.22E+37   -8.3    21460.0
     Rate coefficients at P=1.00E+01(atm)          8.85E+30   -6.1    20660.0
225. C2H4O2H<=>C2H4+HO2                             3.92E+40  -10.2    22250.0
     Rate coefficients at P=4.00E-02(atm)          3.92E+40  -10.2    22250.0
     Rate coefficients at P=1.00E+00(atm)          6.82E+40   -9.6    23840.0
     Rate coefficients at P=1.00E+01(atm)          3.98E+34   -7.2    23250.0
226. C2H4O2H<=>CH3CHO+OH                            5.82E+26   -8.0    20860.0
     Rate coefficients at P=4.00E-02(atm)          5.82E+26   -8.0    20860.0
     Rate coefficients at P=1.00E+00(atm)          5.52E+34   -9.9    26230.0
     Rate coefficients at P=1.00E+01(atm)          1.19E+34   -9.0    29210.0
227. H2+C2H5O2<=>H+C2H5O2H                          1.50E+14    0.0    26030.0
228. C2H5O2+HO2<=>C2H5O2H+O2                        1.75E+10    0.0    -3275.0
229. C2H5O2+CH2O<=>C2H5O2H+HCO                      1.99E+12    0.0    11660.0
230. C2H5O2+CH4<=>C2H5O2H+CH3                       1.81E+11    0.0    18480.0
231. C2H5O2+CH3OH<=>C2H5O2H+CH2OH                   1.81E+12    0.0    13710.0
232. C2H5O2H<=>C2H5O+OH                             6.31E+14    0.0    42300.0
233. C2H4O1-2<=>CH3+HCO                             3.63E+13    0.0    57200.0
234. C2H4O1-2<=>CH3CHO                              7.41E+12    0.0    53800.0
235. C2H4O1-2+H<=>C2H3O1-2+H2                       8.00E+13    0.0     9680.0
236. C2H4O1-2+OH<=>C2H3O1-2+H2O                     1.78E+13    0.0     3610.0
237. C2H4O1-2+HO2<=>C2H3O1-2+H2O2                   1.13E+13    0.0    30430.0
238. C2H4O1-2+CH3<=>C2H3O1-2+CH4                    1.07E+12    0.0    11830.0
239. C2H4O1-2+CH3O<=>C2H3O1-2+CH3OH                 1.20E+11    0.0     6750.0
240. C2H4O1-2+CH3O2<=>C2H3O1-2+CH3O2H               1.13E+13    0.0    30430.0
241. C2H4O1-2+C2H5O2<=>C2H3O1-2+C2H5O2H             1.13E+13    0.0    30430.0
242. C2H3O1-2<=>CH3CO                               8.50E+14    0.0    14000.0
243. C2H3O1-2<=>CH2CHO                              1.00E+14    0.0    14000.0
244. C2H3+H(+M)<=>C2H4(+M)                          6.08E+12    0.3      280.0
     Low pressure limit:  0.14000E+31 -0.38600E+01  0.33200E+04
     TROE centering:      0.78200E+00  0.20750E+03  0.26630E+04  0.60950E+04
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     AR              Enhanced by    7.000E-01
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
     HE              Enhanced by    7.000E-01
245. C2H4(+M)<=>H2+H2CC(+M)                         8.00E+12    0.4    88770.0
     Low pressure limit:  0.70000E+51 -0.93100E+01  0.99860E+05
     TROE centering:      0.73450E+00  0.18000E+03  0.10350E+04  0.54170E+04
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     CH4             Enhanced by    2.000E+00
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
     AR              Enhanced by    7.000E-01
246. C2H4+O2<=>C2H3+HO2                             4.22E+13    0.0    57623.1
247. C2H4+H<=>C2H3+H2                               5.07E+07    1.9    12950.0
248. C2H4+OH<=>C2H3+H2O                             4.60E+03    2.7     2215.5
249. C2H4+CH3O<=>C2H3+CH3OH                         1.20E+11    0.0     6750.0
250. C2H4+CH3O2<=>C2H3+CH3O2H                       8.59E+00    3.8    27132.0
251. C2H4+C2H5O2<=>C2H3+C2H5O2H                     8.59E+00    3.8    27132.0
252. C2H4+CH3CO3<=>C2H3+CH3CO3H                     1.13E+13    0.0    30430.0
253. C2H4+CH3<=>C2H3+CH4                            9.76E+02    2.9    15148.0
     Declared duplicate reaction...
254. C2H4+CH3<=>C2H3+CH4                            8.13E-05    4.4     8835.8
     Declared duplicate reaction...
255. C2H4+O<=>CH3+HCO                               7.45E+06    1.9      183.0
256. C2H4+O<=>CH2CHO+H                              6.10E+06    1.9      183.0
257. CH+CH4<=>C2H4+H                                6.00E+13    0.0        0.0
258. CH2(S)+CH3<=>C2H4+H                            2.00E+13    0.0        0.0
259. C2H4+OH<=>CH3+CH2O                             5.35E+00    2.9    -1732.7
     Rate coefficients at P=1.00E-02(atm)          5.35E+00    2.9    -1732.7
     Rate coefficients at P=2.50E-02(atm)          3.19E+01    2.7    -1172.3
     Rate coefficients at P=1.00E-01(atm)          5.55E+02    2.4     -180.8
     Rate coefficients at P=1.00E+00(atm)          1.78E+05    1.7     2060.5
     Rate coefficients at P=1.00E+01(atm)          2.37E+09    0.6     6006.7
     Rate coefficients at P=1.00E+02(atm)          2.76E+13   -0.5    11455.1
260. C2H4+OH<=>CH3CHO+H                             2.37E-07    5.3    -2050.6
     Rate coefficients at P=1.00E-02(atm)          2.37E-07    5.3    -2050.6
     Rate coefficients at P=2.50E-02(atm)          8.73E-05    4.6     -618.0
     Rate coefficients at P=1.00E-01(atm)          4.03E-01    3.5     1881.7
     Rate coefficients at P=1.00E+00(atm)          2.38E-02    3.9     1722.7
     Rate coefficients at P=1.00E+01(atm)          8.25E+08    1.0    10507.3
     Rate coefficients at P=1.00E+02(atm)          6.80E+09    0.8    13867.3
261. C2H4+OH<=>C2H3OH+H                             1.04E+04    2.6     4121.0
     Rate coefficients at P=1.00E-02(atm)          1.04E+04    2.6     4121.0
     Rate coefficients at P=2.50E-02(atm)          1.07E+04    2.6     4129.0
     Rate coefficients at P=1.00E-01(atm)          1.52E+04    2.6     4238.3
     Rate coefficients at P=1.00E+00(atm)          3.19E+05    2.2     5255.6
     Rate coefficients at P=1.00E+01(atm)          1.94E+08    1.4     7828.8
     Rate coefficients at P=1.00E+02(atm)          8.55E+10    0.8    11490.8
262. C2H4+OH<=>PC2H4OH                              1.74E+43  -10.5     7698.7
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     Rate coefficients at P=1.00E-02(atm)          1.74E+43  -10.5     7698.7
     Rate coefficients at P=2.50E-02(atm)          3.25E+37   -8.6     5214.7
     Rate coefficients at P=1.00E-01(atm)          1.84E+35   -7.8     4908.9
     Rate coefficients at P=1.00E+00(atm)          2.56E+36   -7.8     6946.1
     Rate coefficients at P=1.00E+01(atm)          3.70E+33   -6.6     7605.9
     Rate coefficients at P=1.00E+02(atm)          1.12E+26   -4.1     5757.0
263. C2H4+HO2<=>C2H4O1-2+OH                         3.34E+12    0.0    17190.0
264. C2H4+CH3O2<=>C2H4O1-2+CH3O                     2.82E+12    0.0    17110.0
265. C2H4+C2H5O2<=>C2H4O1-2+C2H5O                   2.82E+12    0.0    17110.0
266. C2H2+H(+M)<=>C2H3(+M)                          1.71E+10    1.3     2709.0
     Low pressure limit:  0.63460E+32 -0.46640E+01  0.37800E+04
     TROE centering:      0.78800E+00 -0.10200E+05  0.10000E-29
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     AR              Enhanced by    7.000E-01
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
     HE              Enhanced by    7.000E-01
267. C2H3+O2<=>C2H3OO                               4.07E+27   -4.7     5222.0
     Rate coefficients at P=1.00E-02(atm)          1.55E+24   -5.5     9662.0
     Rate coefficients at P=1.00E-01(atm)          3.48E+56  -15.0    19160.0
     Rate coefficients at P=3.16E-01(atm)          1.25E+64  -17.0    21290.0
     Rate coefficients at P=1.00E+00(atm)          3.34E+61  -15.8    20150.0
     Rate coefficients at P=3.16E+00(atm)          7.34E+53  -13.1    17300.0
     Rate coefficients at P=1.00E+01(atm)          4.16E+48  -11.2    16000.0
     Rate coefficients at P=3.16E+01(atm)          2.33E+43   -9.4    14810.0
     Rate coefficients at P=1.00E+02(atm)          3.41E+39   -8.0    14360.0
     Declared duplicate reaction...
268. C2H3+O2<=>C2H3OO                               4.07E+27   -4.7     5222.0
     Rate coefficients at P=1.00E-02(atm)          1.78E-09    4.2    -4707.0
     Rate coefficients at P=1.00E-01(atm)          2.36E+22   -4.5     2839.0
     Rate coefficients at P=3.16E-01(atm)          2.00E+26   -5.4     2725.0
     Rate coefficients at P=1.00E+00(atm)          6.13E+28   -5.9     3154.0
     Rate coefficients at P=3.16E+00(atm)          2.14E+29   -5.8     3520.0
     Rate coefficients at P=1.00E+01(atm)          3.48E+28   -5.4     3636.0
     Rate coefficients at P=3.16E+01(atm)          3.32E+27   -5.0     3610.0
     Rate coefficients at P=1.00E+02(atm)          1.03E+27   -4.7     3680.0
     Declared duplicate reaction...
269. C2H3+O2<=>CHCHO+OH                             2.84E+14   -0.8     7232.0
     Rate coefficients at P=1.00E-02(atm)          3.91E+11   -0.1     2131.0
     Rate coefficients at P=1.00E-01(atm)          1.13E+09    0.6       46.0
     Rate coefficients at P=3.16E-01(atm)          8.46E+08    0.6        0.7
     Rate coefficients at P=1.00E+00(atm)          2.75E+14   -1.8        4.6
     Rate coefficients at P=3.16E+00(atm)          2.58E+20   -2.8     7530.0
     Rate coefficients at P=1.00E+01(atm)          9.18E+14   -2.3       -0.4
     Rate coefficients at P=3.16E+01(atm)          6.11E+25   -4.2    13050.0
     Rate coefficients at P=1.00E+02(atm)          1.65E+30   -5.3    18430.0
     Declared duplicate reaction...
270. C2H3+O2<=>CHCHO+OH                             2.84E+14   -0.8     7232.0
     Rate coefficients at P=1.00E-02(atm)          9.91E+11   -0.7       -0.6
     Rate coefficients at P=1.00E-01(atm)          6.94E+14   -1.2     4542.0
     Rate coefficients at P=3.16E-01(atm)          2.79E+13   -0.7     3479.0
     Rate coefficients at P=1.00E+00(atm)          4.99E+11   -0.1     1995.0
     Rate coefficients at P=3.16E+00(atm)          2.35E+10    0.2     1573.0
     Rate coefficients at P=1.00E+01(atm)          1.70E+14   -0.8     4450.0
     Rate coefficients at P=3.16E+01(atm)          1.42E+11    0.1     3774.0
     Rate coefficients at P=1.00E+02(atm)          3.17E+11    0.0     5338.0
     Declared duplicate reaction...
271. C2H3+O2<=>CH2CHO+O                             1.76E+12    0.1     4205.0
     Rate coefficients at P=1.00E-02(atm)          7.88E+20   -2.7     6742.0
     Rate coefficients at P=1.00E-01(atm)          7.72E+20   -2.7     6713.0
     Rate coefficients at P=3.16E-01(atm)          9.87E+20   -2.7     6724.0
     Rate coefficients at P=1.00E+00(atm)          7.10E+20   -2.6     6489.0
     Rate coefficients at P=3.16E+00(atm)          4.50E+20   -2.5     6406.0
     Rate coefficients at P=1.00E+01(atm)          1.76E+23   -3.2     8697.0
     Rate coefficients at P=3.16E+01(atm)          3.14E+25   -3.8    11530.0
     Rate coefficients at P=1.00E+02(atm)          1.02E+26   -3.8    13910.0
     Declared duplicate reaction...
272. C2H3+O2<=>CH2CHO+O                             1.76E+12    0.1     4205.0
     Rate coefficients at P=1.00E-02(atm)          1.36E+10    0.6     -277.6
     Rate coefficients at P=1.00E-01(atm)          1.42E+10    0.6     -247.7
     Rate coefficients at P=3.16E-01(atm)          1.66E+10    0.6     -162.5
     Rate coefficients at P=1.00E+00(atm)          2.02E+10    0.6       38.4
     Rate coefficients at P=3.16E+00(atm)          9.75E+09    0.7      248.0
     Rate coefficients at P=1.00E+01(atm)          7.34E+09    0.7      778.1
     Rate coefficients at P=3.16E+01(atm)          1.57E+09    0.9     1219.0
     Rate coefficients at P=1.00E+02(atm)          7.85E+07    1.3     1401.0
     Declared duplicate reaction...
273. C2H3+O2<=>C2H2+HO2                             6.49E+06    1.5     5218.0
     Rate coefficients at P=1.00E-02(atm)          1.08E+07    1.3     3322.0
     Rate coefficients at P=1.00E-01(atm)          7.75E+06    1.3     3216.0
     Rate coefficients at P=3.16E-01(atm)          1.21E+07    1.3     3311.0
     Rate coefficients at P=1.00E+00(atm)          2.15E+07    1.2     3367.0
     Rate coefficients at P=3.16E+00(atm)          1.13E+08    1.0     3695.0
     Rate coefficients at P=1.00E+01(atm)          1.31E+11    0.1     5872.0
     Rate coefficients at P=3.16E+01(atm)          1.19E+09    0.8     5617.0
     Rate coefficients at P=1.00E+02(atm)          1.06E+17   -1.4    12230.0
     Declared duplicate reaction...
274. C2H3+O2<=>C2H2+HO2                             6.49E+06    1.5     5218.0
     Rate coefficients at P=1.00E-02(atm)          4.76E+01    2.8     -796.4
     Rate coefficients at P=1.00E-01(atm)          5.16E+01    2.7     -768.3
     Rate coefficients at P=3.16E-01(atm)          5.55E+01    2.7     -658.5
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     Rate coefficients at P=1.00E+00(atm)          4.60E+01    2.8     -492.8
     Rate coefficients at P=3.16E+00(atm)          3.75E+00    3.1     -601.0
     Rate coefficients at P=1.00E+01(atm)          5.48E+00    3.1       85.7
     Rate coefficients at P=3.16E+01(atm)          4.47E+08    0.0      955.0
     Rate coefficients at P=1.00E+02(atm)          2.02E+01    2.9     1847.0
     Declared duplicate reaction...
275. C2H3+O2<=>CHOCHO+H                             3.08E+12   -0.3     3277.0
     Rate coefficients at P=1.00E-02(atm)          4.79E+14   -1.0      912.0
     Rate coefficients at P=1.00E-01(atm)          5.03E+14   -1.0      922.5
     Rate coefficients at P=3.16E-01(atm)          6.43E+14   -1.1      982.9
     Rate coefficients at P=1.00E+00(atm)          3.73E+15   -1.3     1441.0
     Rate coefficients at P=3.16E+00(atm)          2.44E+18   -2.1     3234.0
     Rate coefficients at P=1.00E+01(atm)          1.30E+15   -1.1     2393.0
     Rate coefficients at P=3.16E+01(atm)          3.57E+33   -6.5    14910.0
     Rate coefficients at P=1.00E+02(atm)          3.28E+31   -5.8    16250.0
     Declared duplicate reaction...
276. C2H3+O2<=>CHOCHO+H                             3.08E+12   -0.3     3277.0
     Rate coefficients at P=1.00E-02(atm)          2.80E-04    4.0    -7019.0
     Rate coefficients at P=1.00E-01(atm)          3.45E-04    4.0    -6978.0
     Rate coefficients at P=3.16E-01(atm)          9.73E-04    3.9    -6768.0
     Rate coefficients at P=1.00E+00(atm)          4.98E-01    3.1    -5496.0
     Rate coefficients at P=3.16E+00(atm)          1.34E+05    1.7    -2931.0
     Rate coefficients at P=1.00E+01(atm)          4.50E+15   -3.1    -4836.0
     Rate coefficients at P=3.16E+01(atm)          3.84E+10    0.2      941.3
     Rate coefficients at P=1.00E+02(atm)          2.75E+08    0.8      857.6
     Declared duplicate reaction...
277. C2H3+O2<=>CH2CO+OH                             1.17E+03    2.4     7074.0
     Rate coefficients at P=1.00E-02(atm)          8.66E+02    2.4     6061.0
     Rate coefficients at P=1.00E-01(atm)          8.91E+02    2.4     6078.0
     Rate coefficients at P=3.16E-01(atm)          9.43E+02    2.4     6112.0
     Rate coefficients at P=1.00E+00(atm)          1.06E+03    2.4     6180.0
     Rate coefficients at P=3.16E+00(atm)          1.09E+03    2.4     6179.0
     Rate coefficients at P=1.00E+01(atm)          1.39E+03    2.4     6074.0
     Rate coefficients at P=3.16E+01(atm)          2.49E+06    1.4     8480.0
     Rate coefficients at P=1.00E+02(atm)          1.66E+10    0.4    12010.0
     Declared duplicate reaction...
278. C2H3+O2<=>CH2CO+OH                             1.17E+03    2.4     7074.0
     Rate coefficients at P=1.00E-02(atm)          1.82E-01    3.1     1331.0
     Rate coefficients at P=1.00E-01(atm)          2.07E-01    3.1     1383.0
     Rate coefficients at P=3.16E-01(atm)          2.71E-01    3.1     1496.0
     Rate coefficients at P=1.00E+00(atm)          5.26E-01    3.0     1777.0
     Rate coefficients at P=3.16E+00(atm)          1.37E+00    2.9     2225.0
     Rate coefficients at P=1.00E+01(atm)          4.19E-01    2.9     2052.0
     Rate coefficients at P=3.16E+01(atm)          1.19E-04    4.2     2043.0
     Rate coefficients at P=1.00E+02(atm)          1.30E-03    4.0     3414.0
     Declared duplicate reaction...
279. C2H3+O2<=>CH2O+HCO                             1.16E+16   -1.1     3791.0
     Rate coefficients at P=1.00E-02(atm)          2.49E+36   -7.6    12640.0
     Rate coefficients at P=1.00E-01(atm)          2.43E+36   -7.6    12610.0
     Rate coefficients at P=3.16E-01(atm)          1.95E+36   -7.6    12490.0
     Rate coefficients at P=1.00E+00(atm)          2.73E+35   -7.3    11820.0
     Rate coefficients at P=3.16E+00(atm)          1.43E+36   -7.5    12460.0
     Rate coefficients at P=1.00E+01(atm)          5.18E+35   -7.2    13430.0
     Rate coefficients at P=3.16E+01(atm)          3.19E+20   -2.6     5578.0
     Rate coefficients at P=1.00E+02(atm)          2.73E+33   -6.3    16000.0
     Declared duplicate reaction...
280. C2H3+O2<=>CH2O+HCO                             1.16E+16   -1.1     3791.0
     Rate coefficients at P=1.00E-02(atm)          4.54E+15   -1.3      515.3
     Rate coefficients at P=1.00E-01(atm)          4.59E+15   -1.3      513.0
     Rate coefficients at P=3.16E-01(atm)          4.81E+15   -1.3      520.6
     Rate coefficients at P=1.00E+00(atm)          6.08E+15   -1.3      645.7
     Rate coefficients at P=3.16E+00(atm)          9.45E+15   -1.4     1066.0
     Rate coefficients at P=1.00E+01(atm)          2.56E+15   -1.2     1429.0
     Rate coefficients at P=3.16E+01(atm)          1.03E+69  -19.2    14760.0
     Rate coefficients at P=1.00E+02(atm)          4.21E+10    0.2      830.6
     Declared duplicate reaction...
281. C2H3+O2=>CH2O+H+CO                             1.16E+16   -1.1     3791.0
     Rate coefficients at P=1.00E-02(atm)          5.82E+36   -7.6    12640.0
     Rate coefficients at P=1.00E-01(atm)          5.66E+36   -7.6    12610.0
     Rate coefficients at P=3.16E-01(atm)          4.55E+36   -7.6    12490.0
     Rate coefficients at P=1.00E+00(atm)          6.36E+35   -7.3    11820.0
     Rate coefficients at P=3.16E+00(atm)          3.35E+36   -7.5    12460.0
     Rate coefficients at P=1.00E+01(atm)          1.21E+36   -7.2    13430.0
     Rate coefficients at P=3.16E+01(atm)          7.43E+20   -2.6     5578.0
     Rate coefficients at P=1.00E+02(atm)          6.36E+33   -6.3    16000.0
     Declared duplicate reaction...
282. C2H3+O2=>CH2O+H+CO                             1.16E+16   -1.1     3791.0
     Rate coefficients at P=1.00E-02(atm)          1.06E+16   -1.3      515.3
     Rate coefficients at P=1.00E-01(atm)          1.07E+16   -1.3      513.0
     Rate coefficients at P=3.16E-01(atm)          1.13E+16   -1.3      520.6
     Rate coefficients at P=1.00E+00(atm)          1.42E+16   -1.3      645.7
     Rate coefficients at P=3.16E+00(atm)          2.20E+16   -1.4     1066.0
     Rate coefficients at P=1.00E+01(atm)          5.98E+15   -1.2     1429.0
     Rate coefficients at P=3.16E+01(atm)          2.39E+69  -19.2    14760.0
     Rate coefficients at P=1.00E+02(atm)          9.81E+10    0.2      830.6
     Declared duplicate reaction...
283. C2H3+O2<=>CO+CH3O                              3.09E+13   -0.9     3682.0
     Rate coefficients at P=1.00E-02(atm)          8.19E+18   -2.7     3201.0
     Rate coefficients at P=1.00E-01(atm)          4.06E+14   -1.3      885.8
     Rate coefficients at P=3.16E-01(atm)          4.34E+14   -1.3      900.6
     Rate coefficients at P=1.00E+00(atm)          1.03E+11   -0.3     -747.8
     Rate coefficients at P=3.16E+00(atm)          1.89E+12   -3.0    -8995.0
     Rate coefficients at P=1.00E+01(atm)          1.93E+24   -5.6        1.8
     Rate coefficients at P=3.16E+01(atm)          1.10E+18   -2.2     5178.0
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     Rate coefficients at P=1.00E+02(atm)          5.79E+32   -6.5    16810.0
     Declared duplicate reaction...
284. C2H3+O2<=>CO+CH3O                              3.09E+13   -0.9     3682.0
     Rate coefficients at P=1.00E-02(atm)          1.29E+09    0.2    -1717.0
     Rate coefficients at P=1.00E-01(atm)          5.99E+11   -2.9    -9564.0
     Rate coefficients at P=3.16E-01(atm)          2.91E+11   -2.9   -10120.0
     Rate coefficients at P=1.00E+00(atm)          5.77E+21   -3.5     4772.0
     Rate coefficients at P=3.16E+00(atm)          4.99E+15   -1.6     1849.0
     Rate coefficients at P=1.00E+01(atm)          9.33E+16   -2.0     3324.0
     Rate coefficients at P=3.16E+01(atm)          1.02E+72  -20.7    15860.0
     Rate coefficients at P=1.00E+02(atm)          1.10E+09    0.3     1024.0
     Declared duplicate reaction...
285. C2H3+O2<=>CO2+CH3                              6.16E+13   -1.1     3743.0
     Rate coefficients at P=1.00E-02(atm)          2.37E+35   -7.8    12630.0
     Rate coefficients at P=1.00E-01(atm)          1.73E+35   -7.7    12520.0
     Rate coefficients at P=3.16E-01(atm)          4.47E+34   -7.5    12140.0
     Rate coefficients at P=1.00E+00(atm)          7.25E+31   -6.7    10440.0
     Rate coefficients at P=3.16E+00(atm)          3.63E+35   -7.8    12830.0
     Rate coefficients at P=1.00E+01(atm)          2.09E+35   -7.5    14050.0
     Rate coefficients at P=3.16E+01(atm)          3.84E+18   -2.4     5408.0
     Rate coefficients at P=1.00E+02(atm)          1.21E+32   -6.3    16190.0
     Declared duplicate reaction...
286. C2H3+O2<=>CO2+CH3                              6.16E+13   -1.1     3743.0
     Rate coefficients at P=1.00E-02(atm)          6.27E+13   -1.2      406.3
     Rate coefficients at P=1.00E-01(atm)          6.24E+13   -1.2      401.4
     Rate coefficients at P=3.16E-01(atm)          6.12E+13   -1.2      397.0
     Rate coefficients at P=1.00E+00(atm)          5.32E+13   -1.1      446.7
     Rate coefficients at P=3.16E+00(atm)          1.45E+14   -1.3      987.7
     Rate coefficients at P=1.00E+01(atm)          5.02E+13   -1.1     1409.0
     Rate coefficients at P=3.16E+01(atm)          1.40E+70  -20.1    15430.0
     Rate coefficients at P=1.00E+02(atm)          9.21E+08    0.2      855.3
     Declared duplicate reaction...
287. C2H3OO<=>CHCHO+OH                              5.89E+36   -7.1    51440.0
     Rate coefficients at P=1.00E-02(atm)          3.64E+49  -12.1    67420.0
     Rate coefficients at P=1.00E-01(atm)          1.44E+36   -9.9    41220.0
     Rate coefficients at P=3.16E-01(atm)          4.18E+40  -10.5    43670.0
     Rate coefficients at P=1.00E+00(atm)          3.79E+46  -10.7    51900.0
     Rate coefficients at P=3.16E+00(atm)          1.60E+49  -11.2    54150.0
     Rate coefficients at P=1.00E+01(atm)          2.38E+51  -11.6    56980.0
     Rate coefficients at P=3.16E+01(atm)          2.00E+54  -12.2    61840.0
     Rate coefficients at P=1.00E+02(atm)          9.54+195  -52.3   163500.0
     Declared duplicate reaction...
288. C2H3OO<=>CHCHO+OH                              5.89E+36   -7.1    51440.0
     Rate coefficients at P=1.00E-02(atm)          1.17E+56  -14.8    60700.0
     Rate coefficients at P=1.00E-01(atm)          2.32E+40   -9.4    50420.0
     Rate coefficients at P=3.16E-01(atm)          1.61E+43  -10.0    50290.0
     Rate coefficients at P=1.00E+00(atm)          2.33+124  -36.8    70100.0
     Rate coefficients at P=3.16E+00(atm)          1.88+103  -29.5    65410.0
     Rate coefficients at P=1.00E+01(atm)          5.96E+86  -23.8    62170.0
     Rate coefficients at P=3.16E+01(atm)          1.51E+57  -13.9    55390.0
     Rate coefficients at P=1.00E+02(atm)          1.79E+34   -6.4    50000.0
     Declared duplicate reaction...
289. C2H3OO<=>CH2CHO+O                              1.22E+29   -4.7    42340.0
     Rate coefficients at P=1.00E-02(atm)          2.70+180  -48.2   169300.0
     Rate coefficients at P=1.00E-01(atm)          3.90E+38   -8.7    42770.0
     Rate coefficients at P=3.16E-01(atm)          4.57E+47  -11.2    47050.0
     Rate coefficients at P=1.00E+00(atm)          7.62E+81  -21.3    65080.0
     Rate coefficients at P=3.16E+00(atm)          1.86E+68  -16.8    60680.0
     Rate coefficients at P=1.00E+01(atm)          2.02E+55  -12.7    55840.0
     Rate coefficients at P=3.16E+01(atm)          1.11E+53  -11.8    56690.0
     Rate coefficients at P=1.00E+02(atm)          4.30E+48  -10.3    56090.0
     Declared duplicate reaction...
290. C2H3OO<=>CH2CHO+O                              1.22E+29   -4.7    42340.0
     Rate coefficients at P=1.00E-02(atm)          1.47E+30   -6.6    41110.0
     Rate coefficients at P=1.00E-01(atm)          9.65E-12    6.0    22890.0
     Rate coefficients at P=3.16E-01(atm)          3.95E+22   -3.7    36270.0
     Rate coefficients at P=1.00E+00(atm)          2.39E+33   -6.6    41280.0
     Rate coefficients at P=3.16E+00(atm)          6.37E+31   -6.0    41260.0
     Rate coefficients at P=1.00E+01(atm)          2.13E+29   -5.1    40710.0
     Rate coefficients at P=3.16E+01(atm)          4.66E+27   -4.5    40530.0
     Rate coefficients at P=1.00E+02(atm)          5.99E+25   -3.9    40120.0
     Declared duplicate reaction...
291. C2H3OO<=>CHOCHO+H                              4.72E+20   -2.7    32320.0
     Rate coefficients at P=1.00E-02(atm)          6.41E+80  -22.2    51750.0
     Rate coefficients at P=1.00E-01(atm)          3.31E+65  -17.0    48090.0
     Rate coefficients at P=3.16E-01(atm)          5.98E+51  -12.6    43000.0
     Rate coefficients at P=1.00E+00(atm)          1.48E+44  -10.1    40790.0
     Rate coefficients at P=3.16E+00(atm)          1.26E+59  -14.3    51390.0
     Rate coefficients at P=1.00E+01(atm)          4.93E+26   -4.7    34320.0
     Rate coefficients at P=3.16E+01(atm)          2.06E+33   -6.4    39520.0
     Rate coefficients at P=1.00E+02(atm)          1.30E+32   -5.9    40660.0
     Declared duplicate reaction...
292. C2H3OO<=>CHOCHO+H                              4.72E+20   -2.7    32320.0
     Rate coefficients at P=1.00E-02(atm)          1.19E+28   -6.0    28740.0
     Rate coefficients at P=1.00E-01(atm)          1.40E+25   -4.8    28940.0
     Rate coefficients at P=3.16E-01(atm)          2.91E+20   -3.3    27550.0
     Rate coefficients at P=1.00E+00(atm)          1.58E+19   -2.8    27620.0
     Rate coefficients at P=3.16E+00(atm)          1.93E+22   -3.5    29980.0
     Rate coefficients at P=1.00E+01(atm)          7.51E+29   -5.8    34490.0
     Rate coefficients at P=3.16E+01(atm)          7.14E+61  -16.2    43280.0
     Rate coefficients at P=1.00E+02(atm)          1.14E+19   -2.6    29670.0
     Declared duplicate reaction...
293. C2H3OO<=>CH2CO+OH                              1.55E+24   -3.9    49850.0
     Rate coefficients at P=1.00E-02(atm)          1.15E+47  -12.3    75330.0
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     Rate coefficients at P=1.00E-01(atm)          8.43E+09   -2.1    33720.0
     Rate coefficients at P=3.16E-01(atm)          6.06E+04    0.2    34220.0
     Rate coefficients at P=1.00E+00(atm)          1.51E+19   -3.6    43060.0
     Rate coefficients at P=3.16E+00(atm)          2.13E+33   -7.4    51610.0
     Rate coefficients at P=1.00E+01(atm)          4.44E+36   -8.0    54680.0
     Rate coefficients at P=3.16E+01(atm)          1.19E+37   -7.8    56460.0
     Rate coefficients at P=1.00E+02(atm)          9.08E+35   -7.2    57550.0
     Declared duplicate reaction...
294. C2H3OO<=>CH2CO+OH                              1.55E+24   -3.9    49850.0
     Rate coefficients at P=1.00E-02(atm)          2.31E+02   -0.7    25710.0
     Rate coefficients at P=1.00E-01(atm)          1.83E-23    7.8    20190.0
     Rate coefficients at P=3.16E-01(atm)          3.82E+63  -20.4    43420.0
     Rate coefficients at P=1.00E+00(atm)          3.18E+27   -7.8    37230.0
     Rate coefficients at P=3.16E+00(atm)          2.32E-05    3.5    31560.0
     Rate coefficients at P=1.00E+01(atm)          1.06E-01    2.6    34160.0
     Rate coefficients at P=3.16E+01(atm)          5.62E+02    1.7    36450.0
     Rate coefficients at P=1.00E+02(atm)          1.11E+07    0.5    38670.0
     Declared duplicate reaction...
295. C2H3OO<=>CH2O+HCO                              1.19E+20   -2.3    30170.0
     Rate coefficients at P=1.00E-02(atm)          1.66+174  -55.5    60320.0
     Rate coefficients at P=1.00E-01(atm)          9.03E+66  -17.2    48120.0
     Rate coefficients at P=3.16E-01(atm)          1.82E+43   -9.9    37960.0
     Rate coefficients at P=1.00E+00(atm)          8.64E+33   -6.9    34370.0
     Rate coefficients at P=3.16E+00(atm)          7.29+171  -43.5   191900.0
     Rate coefficients at P=1.00E+01(atm)          1.03E+32   -6.1    35500.0
     Rate coefficients at P=3.16E+01(atm)          1.85E+34   -6.6    38510.0
     Rate coefficients at P=1.00E+02(atm)          5.70E+29   -5.2    36800.0
     Declared duplicate reaction...
296. C2H3OO<=>CH2O+HCO                              1.19E+20   -2.3    30170.0
     Rate coefficients at P=1.00E-02(atm)          2.27E+35   -8.0    31280.0
     Rate coefficients at P=1.00E-01(atm)          2.08E+26   -5.0    28780.0
     Rate coefficients at P=3.16E-01(atm)          1.45E+20   -3.1    26630.0
     Rate coefficients at P=1.00E+00(atm)          1.06+130  -39.4    54700.0
     Rate coefficients at P=3.16E+00(atm)          2.35E+34   -6.9    35700.0
     Rate coefficients at P=1.00E+01(atm)          2.18+175  -53.8    68500.0
     Rate coefficients at P=3.16E+01(atm)          1.07+185  -54.2    88990.0
     Rate coefficients at P=1.00E+02(atm)          4.68E+02    1.8    18100.0
     Declared duplicate reaction...
297. C2H3OO=>CH2O+H+CO                              1.19E+20   -2.3    30170.0
     Rate coefficients at P=1.00E-02(atm)          3.88+174  -55.5    60320.0
     Rate coefficients at P=1.00E-01(atm)          2.11E+67  -17.2    48120.0
     Rate coefficients at P=3.16E-01(atm)          4.26E+43   -9.9    37960.0
     Rate coefficients at P=1.00E+00(atm)          2.02E+34   -6.9    34370.0
     Rate coefficients at P=3.16E+00(atm)          1.70+172  -43.5   191900.0
     Rate coefficients at P=1.00E+01(atm)          2.40E+32   -6.1    35500.0
     Rate coefficients at P=3.16E+01(atm)          4.32E+34   -6.6    38510.0
     Rate coefficients at P=1.00E+02(atm)          1.33E+30   -5.2    36800.0
     Declared duplicate reaction...
298. C2H3OO=>CH2O+H+CO                              1.19E+20   -2.3    30170.0
     Rate coefficients at P=1.00E-02(atm)          5.29E+35   -8.0    31280.0
     Rate coefficients at P=1.00E-01(atm)          4.85E+26   -5.0    28780.0
     Rate coefficients at P=3.16E-01(atm)          3.37E+20   -3.1    26630.0
     Rate coefficients at P=1.00E+00(atm)          2.46+130  -39.4    54700.0
     Rate coefficients at P=3.16E+00(atm)          5.49E+34   -6.9    35700.0
     Rate coefficients at P=1.00E+01(atm)          5.09+175  -53.8    68500.0
     Rate coefficients at P=3.16E+01(atm)          2.49+185  -54.2    88990.0
     Rate coefficients at P=1.00E+02(atm)          1.09E+03    1.8    18100.0
     Declared duplicate reaction...
299. C2H3OO<=>CO+CH3O                               1.16E-01    3.2    18420.0
     Rate coefficients at P=1.00E-02(atm)          5.20E+33   -7.9    31320.0
     Rate coefficients at P=1.00E-01(atm)          1.26E+98  -27.1    64060.0
     Rate coefficients at P=3.16E-01(atm)          1.80E+33   -7.3    33760.0
     Rate coefficients at P=1.00E+00(atm)          3.83E+33   -7.2    35100.0
     Rate coefficients at P=3.16E+00(atm)          1.28E+79  -19.6    74870.0
     Rate coefficients at P=1.00E+01(atm)          4.07E+32   -6.6    37210.0
     Rate coefficients at P=3.16E+01(atm)          6.86E+44  -10.0    47030.0
     Rate coefficients at P=1.00E+02(atm)          1.00E-10    0.0        0.0
     Declared duplicate reaction...
300. C2H3OO<=>CO+CH3O                               1.16E-01    3.2    18420.0
     Rate coefficients at P=1.00E-02(atm)          2.31+129  -41.9    45850.0
     Rate coefficients at P=1.00E-01(atm)          2.42E+28   -6.0    30540.0
     Rate coefficients at P=3.16E-01(atm)          8.69E-50   16.6    -3900.0
     Rate coefficients at P=1.00E+00(atm)          1.19E-39   13.6    -1317.0
     Rate coefficients at P=3.16E+00(atm)          8.80E+86  -23.1    61010.0
     Rate coefficients at P=1.00E+01(atm)          1.27E+03    1.4    18660.0
     Rate coefficients at P=3.16E+01(atm)          1.97E+17   -2.2    28590.0
     Rate coefficients at P=1.00E+02(atm)          3.25E+04    1.7    23327.6
     Declared duplicate reaction...
301. CHOCHO+OH=>HCO+CO+H2O                          6.13E+04    2.6    -4586.4
302. C2H3+H<=>C2H2+H2                               1.70E+14    0.0        0.0
303. C2H3+H<=>H2CC+H2                               6.00E+13    0.0        0.0
304. C2H3+OH<=>C2H2+H2O                             3.01E+13    0.0        0.0
305. C2H3+CH3<=>CH4+C2H2                            3.92E+11    0.0        0.0
306. C2H3+C2H3<=>C2H2+C2H4                          9.60E+11    0.0        0.0
307. C2H+H(+M)<=>C2H2(+M)                           1.00E+17    0.0        0.0
     Low pressure limit:  0.37500E+34 -0.48000E+01  0.19000E+04
     TROE centering:      0.64600E+00  0.13200E+03  0.13150E+04  0.55660E+04
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     AR              Enhanced by    7.000E-01
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
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     HE              Enhanced by    7.000E-01
308. C2H2(+M)<=>H2CC(+M)                          8.00E+14   -0.5    50750.0
     Low pressure limit:  0.24500E+16 -0.64000E+00  0.49700E+05
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     CH4             Enhanced by    2.000E+00
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
     C2H2            Enhanced by    2.500E+00
     C2H4            Enhanced by    2.500E+00
309. C2H2+O<=>CH2+CO                              7.40E+08    1.3     2472.0
310. C2H2+O<=>HCCO+H                              2.96E+09    1.3     2472.0
311. C2H2+HO2<=>CH2CO+OH                          6.03E+09    0.0     7949.0
312. C2H2+HCO<=>C2H3+CO                           1.00E+07    2.0     6000.0
313. C2H2+CH2<=>C3H3+H                            1.20E+13    0.0     6620.0
314. C2H2+CH2(S)<=>C3H3+H                         2.00E+13    0.0        0.0
315. C2H2+HCCO<=>C3H3+CO                          1.00E+11    0.0     3000.0
316. H2CC+H<=>C2H2+H                              1.00E+14    0.0        0.0
317. H2CC+OH<=>CH2CO+H                            2.00E+13    0.0        0.0
318. H2CC+O2<=>HCO+HCO                            1.00E+13    0.0        0.0
319. C2H2+OH<=>C2H+H2O                            2.63E+06    2.1    17060.0
320. C2H2+OH<=>HCCOH+H                            2.80E+05    2.3    12420.0
     Rate coefficients at P=1.00E-02(atm)         2.80E+05    2.3    12420.0
     Rate coefficients at P=2.50E-02(atm)         7.47E+05    2.2    12550.0
     Rate coefficients at P=1.00E-01(atm)         1.78E+06    2.0    12670.0
     Rate coefficients at P=1.00E+00(atm)         2.42E+06    2.0    12710.0
     Rate coefficients at P=1.00E+01(atm)         3.21E+06    2.0    12810.0
     Rate coefficients at P=1.00E+02(atm)         7.35E+06    1.9    13600.0
321. C2H2+OH<=>CH2CO+H                            1.58E+03    2.6     -844.5
     Rate coefficients at P=1.00E-02(atm)         1.58E+03    2.6     -844.5
     Rate coefficients at P=2.50E-02(atm)         1.52E+04    2.3     -292.1
     Rate coefficients at P=1.00E-01(atm)         3.02E+05    1.9      598.1
     Rate coefficients at P=1.00E+00(atm)         7.53E+06    1.6     2106.0
     Rate coefficients at P=1.00E+01(atm)         5.10E+06    1.6     3400.0
     Rate coefficients at P=1.00E+02(atm)         1.46E+04    2.5     4477.0
322. C2H2+OH<=>CH3+CO                             4.76E+05    1.7     -329.8
     Rate coefficients at P=1.00E-02(atm)         4.76E+05    1.7     -329.8
     Rate coefficients at P=2.50E-02(atm)         4.37E+06    1.4      226.5
     Rate coefficients at P=1.00E-01(atm)         7.65E+07    1.1     1115.0
     Rate coefficients at P=1.00E+00(atm)         1.28E+09    0.7     2579.0
     Rate coefficients at P=1.00E+01(atm)         4.31E+08    0.9     3736.0
     Rate coefficients at P=1.00E+02(atm)         8.25E+05    1.8     4697.0
323. C2H2+OH<=>C2H2OH                             3.91E+32   -7.1     5824.0
     Rate coefficients at P=1.00E-02(atm)         3.91E+32   -7.1     5824.0
     Rate coefficients at P=2.50E-02(atm)         1.07E+32   -6.8     5508.0
     Rate coefficients at P=1.00E-01(atm)         1.65E+32   -6.7     5822.0
     Rate coefficients at P=1.00E+00(atm)         1.39E+31   -6.1     6348.0
     Rate coefficients at P=1.00E+01(atm)         2.89E+29   -5.3     7055.0
     Rate coefficients at P=1.00E+02(atm)         1.37E+25   -3.8     6543.0
324. H+HCCOH<=>H+CH2CO                            1.00E+13    0.0        0.0
325. C2H+O2<=>CO2+CHV                             2.17E+10    0.0        0.0
326. C2H+O2<=>HCO+CO                              5.00E+13    0.0     1500.0
327. C2H+O<=>CO+CHV                               6.20E+12    0.0        0.0
328. C2H+O<=>CO+CH                                5.00E+13    0.0        0.0
329. C2H+H2<=>H+C2H2                              4.90E+05    2.5      560.0
330. C2H+OH<=>H+HCCO                              2.00E+13    0.0        0.0
331. CH3CHO(+M)<=>CH3+HCO(+M)                     2.45E+22   -1.7    86355.0
     Low pressure limit:  0.10300E+60 -0.11300E+02  0.95912E+05
     TROE centering:      0.24900E-02  0.71810E+03  0.60890E+01  0.37800E+04
332. CH3CHO(+M)<=>CH4+CO(+M)                      2.72E+21   -1.7    86355.0
     Low pressure limit:  0.11440E+59 -0.11300E+02  0.95912E+05
     TROE centering:      0.24900E-02  0.71810E+03  0.60890E+01  0.37800E+04
333. CH3CHO+O2<=>CH3CO+HO2                        3.01E+13    0.0    39150.0
334. CH3CHO+O<=>CH3CO+OH                          5.94E+12    0.0     1868.0
335. CH3CHO+H<=>CH3CO+H2                          1.31E+05    2.6     1220.0
336. CH3CHO+OH<=>CH3CO+H2O                        3.37E+12    0.0     -619.0
337. CH3CHO+HO2<=>CH3CO+H2O2                      3.01E+12    0.0    11920.0
338. CH3CHO+CH3<=>CH3CO+CH4                       7.08E-04    4.6     1966.0
339. CH3CHO+CH3O2<=>CH3CO+CH3O2H                  3.01E+12    0.0    11920.0
340. CH3CHO+CH3CO3<=>CH3CO+CH3CO3H                3.01E+12    0.0    11920.0
341. CH3CHO+H<=>CH2CHO+H2                         2.72E+03    3.1     5210.0
342. CH3CHO+OH<=>CH2CHO+H2O                       1.72E+05    2.4      815.0
343. CH3CHO+OH<=>CH3+HOCHO                        3.00E+15   -1.1        0.0
344. CH3CO(+M)<=>CH3+CO(+M)                       1.07E+12    0.6    16900.0
     Low pressure limit:  0.56500E+19 -0.97000E+00  0.14600E+05
     TROE centering:      0.62900E+00  0.87300E+10  0.55200E+01  0.76000E+08
345. CH3CO(+M)<=>CH2CO+H(+M)                      9.41E+07    1.9    44987.2
     Low pressure limit:  0.15160E+52 -0.10270E+02  0.55390E+05
     TROE centering:      0.60090E+00  0.81030E+10  0.66770E+03  0.50000E+10
346. CH3CO+H<=>CH2CO+H2                           2.00E+13    0.0        0.0
347. CH3CO+O<=>CH2CO+OH                           2.00E+13    0.0        0.0
348. CH3CO+CH3<=>CH2CO+CH4                        5.00E+13    0.0        0.0
349. CH3CO+O2<=>CH3CO3                            1.20E+11    0.0    -1100.0
350. CH3CO3+HO2<=>CH3CO3H+O2                      1.75E+10    0.0    -3275.0
351. H2O2+CH3CO3<=>HO2+CH3CO3H                    2.41E+12    0.0     9936.0
352. CH4+CH3CO3<=>CH3+CH3CO3H                     1.81E+11    0.0    18480.0
353. C2H3OH<=>CH3CHO                              7.42E+46  -10.6    67420.0
     Rate coefficients at P=1.00E-01(atm)         7.42E+46  -10.6    67420.0
     Rate coefficients at P=1.00E+00(atm)         4.42E+42   -9.1    67069.2
     Rate coefficients at P=1.00E+02(atm)         2.90E+27   -4.3    61612.9
354. C2H3OH+O2<=>CH2CHO+HO2                       5.31E+11    0.2    39830.0
355. C2H3OH+O<=>CH2CHO+OH                         1.88E+06    1.9     -860.0
356. C2H3OH+H<=>CH2CHO+H2                         1.48E+03    3.1     7220.0
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357. C2H3OH+OH<=>CH2CHO+H2O                          3.33E+09    1.1      540.5
358. C2H3OH+CH3<=>CH2CHO+CH4                         2.03E-08    5.9     1052.0
359. C2H3OH+CH3O2<=>CH2CHO+CH3O2H                    3.40E+03    2.5     8922.0
360. C2H3OH+H<=>C2H2OH+H2                            2.47E+07    2.0    15200.0
361. C2H3OH+H<=>PC2H4OH                              3.01E+08    1.6     3670.0
362. C2H3OH+HO2<=>CH3CHO+HO2                         1.49E+05    1.7     6810.0
363. CH2CHO(+M)<=>CH2CO+H(+M)                        1.43E+15   -0.1    45600.0
     Low pressure limit:  0.60000E+30 -0.38000E+01  0.43424E+05
     TROE centering:      0.98500E+00  0.39300E+03  0.98000E+10  0.50000E+10
364. CH2CHO(+M)<=>CH3+CO(+M)                         2.93E+12    0.3    40300.0
     Low pressure limit:  0.95200E+34 -0.50700E+01  0.41300E+05
     TROE centering:      0.71300E-16  0.11500E+04  0.49900E+10  0.17900E+10
365. CH3CO3H<=>CH3CO2+OH                             5.01E+14    0.0    40150.0
366. CH3CO3+CH2O<=>CH3CO3H+HCO                       1.99E+12    0.0    11660.0
367. CH3CO3+C2H6<=>CH3CO3H+C2H5                      1.70E+13    0.0    20460.0
368. CH3CO2+M<=>CH3+CO2+M                            4.40E+15    0.0    10500.0
369. CH2CHO+O2<=>O2CH2CHO                            1.58E+77  -21.9    19350.0
     Rate coefficients at P=1.00E-02(atm)          1.58E+77  -21.9    19350.0
     Rate coefficients at P=1.00E-01(atm)          3.88E+69  -18.8    19240.0
     Rate coefficients at P=1.00E+00(atm)          7.80E+59  -15.4    17650.0
     Rate coefficients at P=1.00E+01(atm)          3.05E+50  -12.2    15630.0
370. CH2CHO+O2<=>CH2CO+HO2                           1.88E+05    2.4    23730.0
     Rate coefficients at P=1.00E-02(atm)          1.88E+05    2.4    23730.0
     Rate coefficients at P=1.00E-01(atm)          1.88E+05    2.4    27370.0
     Rate coefficients at P=1.00E+00(atm)          2.51E+05    2.3    23800.0
     Rate coefficients at P=1.00E+01(atm)          7.05E+07    1.6    25290.0
371. CH2CHO+O2=>CH2O+CO+OH                           2.68E+17   -1.8     6530.0
     Rate coefficients at P=1.00E-02(atm)          2.68E+17   -1.8     6530.0
     Rate coefficients at P=1.00E-01(atm)          1.52E+20   -2.6     8980.0
     Rate coefficients at P=1.00E+00(atm)          1.65E+19   -2.2    10340.0
     Rate coefficients at P=1.00E+01(atm)          8.95E+13   -0.6    10120.0
372. CH2CHO+O2<=>HO2CH2CO                            4.80E+38  -12.1  *********
     Rate coefficients at P=1.00E-02(atm)          3.64E+65  -21.9    19020.0
     Rate coefficients at P=1.00E-01(atm)          3.64E+58  -19.0    19090.0
     Rate coefficients at P=1.00E+00(atm)          6.65E+48  -15.6    17460.0
     Rate coefficients at P=1.00E+01(atm)          4.80E+38  -12.1    14960.0
373. O2CH2CHO<=>HO2CH2CO                             8.27E+30   -6.7    24500.0
     Rate coefficients at P=1.00E-02(atm)          8.27E+30   -6.7    24500.0
     Rate coefficients at P=1.00E-01(atm)          1.73E+26   -5.0    23760.0
     Rate coefficients at P=1.00E+00(atm)          9.03E+19   -2.9    22170.0
     Rate coefficients at P=1.00E+01(atm)          1.43E+16   -1.7    21210.0
374. O2CH2CHO<=>CH2CO+HO2                            2.05E+40  -13.3    52150.0
     Rate coefficients at P=1.00E-02(atm)          2.05E+40  -13.3    52150.0
     Rate coefficients at P=1.00E-01(atm)          5.72E+45  -14.0    52200.0
     Rate coefficients at P=1.00E+00(atm)          4.16E+55  -15.8    55080.0
     Rate coefficients at P=1.00E+01(atm)          1.12E+61  -16.0    60010.0
375. HO2CH2CO=>CO+CH2O+OH                            2.36E+17   -3.0     8100.0
     Rate coefficients at P=1.00E-02(atm)          2.36E+17   -3.0     8100.0
     Rate coefficients at P=1.00E-01(atm)          2.38E+18   -3.0     8100.0
     Rate coefficients at P=1.00E+00(atm)          2.51E+19   -3.0     8110.0
     Rate coefficients at P=1.00E+01(atm)          4.16E+20   -3.0     8240.0
376. HO2CH2CO<=>CH2CO+HO2                            1.12E+07   -3.8    21680.0
     Rate coefficients at P=1.00E-02(atm)          1.12E+07   -3.8    21680.0
     Rate coefficients at P=1.00E-01(atm)          1.10E+08   -3.8    21680.0
     Rate coefficients at P=1.00E+00(atm)          9.20E+08   -3.7    21630.0
     Rate coefficients at P=1.00E+01(atm)          2.09E+09   -3.5    21220.0
377. CH2+CO(+M)<=>CH2CO(+M)                          8.10E+11    0.0        0.0
     Low pressure limit:  0.26900E+34 -0.51100E+01  0.70950E+04
     TROE centering:      0.59070E+00  0.27500E+03  0.12260E+04  0.51850E+04
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     AR              Enhanced by    7.000E-01
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
     HE              Enhanced by    7.000E-01
378. CH2CO+H<=>HCCO+H2                               1.40E+15   -0.2     8783.2
379. CH2CO+O<=>HCCO+OH                               1.00E+13    0.0     8000.0
380. CH2CO+OH<=>HCCO+H2O                             1.00E+13    0.0     2000.0
381. CH2CO+H<=>CH3+CO                                7.70E+13   -0.2     4183.2
382. CH+CH2O<=>H+CH2CO                               9.46E+13    0.0     -515.0
383. CH2CO+O<=>CH2+CO2                               1.75E+12    0.0     1350.0
384. CH2CO+OH<=>CH2OH+CO                             2.00E+12    0.0    -1010.0
385. CH2CO+CH2(S)<=>C2H4+CO                          1.60E+14    0.0        0.0
386. CH2CO+CH3<=>C2H5+CO                             4.77E+04    2.3     9468.0
387. HCCO+OH=>H2+CO+CO                               1.00E+14    0.0        0.0
388. HCCO+O=>H+CO+CO                                 8.00E+13    0.0        0.0
389. CH+CO+M<=>HCCO+M                                7.57E+22   -1.9        0.0
390. HCCO+H<=>CH2(S)+CO                              1.00E+14    0.0        0.0
391. HCCO+O2=>OH+CO+CO                               1.91E+11    0.0     1020.0
392. HCCO+O2=>CO2+CO+H                               4.78E+12   -0.1     1150.0
393. CH+HCCO<=>CO+C2H2                               5.00E+13    0.0        0.0
394. C2H5OH<=>C2H4+H2O                               3.41E+59  -14.2    83672.6
     Rate coefficients at P=1.00E-03(atm)          3.41E+59  -14.2    83672.6
     Rate coefficients at P=1.00E-02(atm)          2.62E+57  -13.3    85262.2
     Rate coefficients at P=1.00E-01(atm)          1.65E+52  -11.5    84745.6
     Rate coefficients at P=1.00E+00(atm)          5.23E+43   -8.9    81506.7
     Rate coefficients at P=1.00E+01(atm)          4.59E+32   -5.6    76062.4
     Rate coefficients at P=1.00E+02(atm)          3.84E+20   -2.1    69465.5
395. C2H5OH<=>CH3+CH2OH                              1.20E+54  -12.9   100005.7
     Rate coefficients at P=1.00E-03(atm)          1.20E+54  -12.9   100005.7
     Rate coefficients at P=1.00E-02(atm)          5.18E+59  -14.0    99906.4
     Rate coefficients at P=1.00E-01(atm)          1.62E+66  -15.3   105390.5
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     Rate coefficients at P=1.00E+00(atm)          5.55E+64  -14.5   106183.0
     Rate coefficients at P=1.00E+01(atm)          1.55E+58  -12.3   105768.0
     Rate coefficients at P=1.00E+02(atm)          1.78E+47   -9.0   101058.8
396. C2H5OH<=>C2H5+OH                               8.10E+46  -11.3   111053.4
     Rate coefficients at P=1.00E-03(atm)          8.10E+46  -11.3   111053.4
     Rate coefficients at P=1.00E-02(atm)          1.86E+56  -13.5   107238.4
     Rate coefficients at P=1.00E-01(atm)          4.65E+63  -15.0   109622.8
     Rate coefficients at P=1.00E+00(atm)          4.46E+65  -14.9   112345.0
     Rate coefficients at P=1.00E+01(atm)          2.79E+61  -13.4   113080.2
     Rate coefficients at P=1.00E+02(atm)          6.17E+51  -10.3   109940.7
397. C2H5OH+O<=>C2H5O+OH                            1.46E-03    4.7     1727.0
398. C2H5OH+OH<=>C2H5O+H2O                          5.81E-03    4.3    -3560.0
399. C2H5OH+H<=>C2H5O+H2                            9.45E+02    3.1     8701.1
400. C2H5OH+HO2<=>C2H5O+H2O2                        6.47E-07    5.3    10533.1
401. C2H5OH+CH3<=>C2H5O+CH4                         2.04E+00    3.6     7721.0
402. C2H5OH+CH3O2<=>C2H5O+CH3O2H                    3.24E-07    5.3    10533.1
403. C2H5OH+C2H5<=>PC2H4OH+C2H6                     5.00E+10    0.0    13400.0
404. C2H5OH+O2<=>SC2H4OH+HO2                        1.50E+13    0.0    50150.0
405. C2H5OH+O<=>SC2H4OH+OH                          1.45E+05    2.5      876.0
406. C2H5OH+H<=>SC2H4OH+H2                          8.79E+04    2.7     2910.0
407. C2H5OH+OH<=>SC2H4OH+H2O                        7.52E+04    2.5    -1474.1
408. C2H5OH+HO2<=>SC2H4OH+H2O2                      2.45E-05    5.3     7475.1
409. C2H5OH+CH3<=>SC2H4OH+CH4                       1.99E+01    3.4     7634.0
410. C2H5OH+CH3O2<=>SC2H4OH+CH3O2H                  1.22E-05    5.3     7475.1
411. C2H5OH+C2H5<=>SC2H4OH+C2H6                     5.00E+10    0.0    10400.0
412. C2H5OH+O2<=>PC2H4OH+HO2                        2.00E+13    0.0    52800.0
413. C2H5OH+O<=>PC2H4OH+OH                          9.69E+02    3.2     4658.0
414. C2H5OH+H<=>PC2H4OH+H2                          5.31E+04    2.8     7490.0
415. C2H5OH+OH<=>PC2H4OH+H2O                        3.76E+03    2.8    -1810.2
416. C2H5OH+HO2<=>PC2H4OH+H2O2                      3.99E-02    4.3    15333.0
417. C2H5OH+CH3<=>PC2H4OH+CH4                       3.30E+02    3.3    12290.0
418. C2H5OH+CH3O2<=>PC2H4OH+CH3O2H                  1.99E-02    4.3    15333.0
419. SC2H4OH<=>CH3CHO+H                             5.69E+52  -13.4    45049.0
     Rate coefficients at P=1.00E-03(atm)          5.69E+52  -13.4    45049.0
     Rate coefficients at P=1.00E-02(atm)          3.29E+56  -14.1    48129.0
     Rate coefficients at P=1.00E-01(atm)          8.58E+57  -14.2    50743.0
     Rate coefficients at P=1.00E+00(atm)          5.36E+55  -13.2    51886.0
     Rate coefficients at P=1.00E+01(atm)          1.66E+48  -10.6    50297.0
     Rate coefficients at P=2.00E+01(atm)          8.26E+44   -9.6    49218.0
     Rate coefficients at P=5.00E+01(atm)          1.01E+40   -8.1    47439.0
     Rate coefficients at P=1.00E+02(atm)          1.10E+36   -6.8    45899.0
420. SC2H4OH<=>C2H3OH+H                             5.40E+46  -11.6    44323.0
     Rate coefficients at P=1.00E-03(atm)          5.40E+46  -11.6    44323.0
     Rate coefficients at P=1.00E-02(atm)          1.21E+51  -12.6    47240.0
     Rate coefficients at P=1.00E-01(atm)          2.87E+54  -13.2    50702.0
     Rate coefficients at P=1.00E+00(atm)          3.79E+53  -12.5    52560.0
     Rate coefficients at P=1.00E+01(atm)          6.33E+46  -10.2    51441.0
     Rate coefficients at P=2.00E+01(atm)          3.87E+43   -9.2    50440.0
     Rate coefficients at P=5.00E+01(atm)          5.08E+38   -7.7    48713.0
     Rate coefficients at P=1.00E+02(atm)          5.12E+34   -6.4    47182.0
421. SC2H4OH<=>C2H5O                                5.48E+45  -11.6    44328.0
     Rate coefficients at P=1.00E-03(atm)          5.48E+45  -11.6    44328.0
     Rate coefficients at P=1.00E-02(atm)          2.54E+49  -12.4    46445.0
     Rate coefficients at P=1.00E-01(atm)          1.65E+54  -13.4    50330.0
     Rate coefficients at P=1.00E+00(atm)          1.81E+55  -13.3    53132.0
     Rate coefficients at P=1.00E+01(atm)          4.58E+49  -11.3    52714.0
     Rate coefficients at P=2.00E+01(atm)          4.11E+46  -10.3    51834.0
     Rate coefficients at P=5.00E+01(atm)          6.68E+41   -8.8    50202.0
     Rate coefficients at P=1.00E+02(atm)          6.54E+37   -7.6    48697.0
422. SC2H4OH<=>PC2H4OH                              2.65E+36   -8.9    51019.0
     Rate coefficients at P=1.00E-03(atm)          2.65E+36   -8.9    51019.0
     Rate coefficients at P=1.00E-02(atm)          3.56E+37   -8.9    51114.0
     Rate coefficients at P=1.00E-01(atm)          4.14E+39   -9.2    51912.0
     Rate coefficients at P=1.00E+00(atm)          5.82E+44  -10.3    55296.0
     Rate coefficients at P=1.00E+01(atm)          4.26E+48  -11.1    59458.0
     Rate coefficients at P=2.00E+01(atm)          8.84E+47  -10.7    59901.0
     Rate coefficients at P=5.00E+01(atm)          2.23E+45   -9.8    59604.0
     Rate coefficients at P=1.00E+02(atm)          1.70E+42   -8.8    58737.0
423. CH3+CH2O<=>C2H5O                               3.00E+11    0.0     6336.0
424. CH3CHO+H<=>C2H5O                               4.61E+07    1.7     7090.0
425. C2H5O+O2<=>CH3CHO+HO2                          4.28E+10    0.0     1097.0
426. O2C2H4OH<=>PC2H4OH+O2                          3.90E+16   -1.0    30000.0
427. O2C2H4OH=>OH+CH2O+CH2O                         1.25E+11    0.0    18900.0
428. SC2H4OH+O2<=>CH3CHO+HO2                        5.26E+17   -1.6      869.0
     Rate coefficients at P=1.00E-02(atm)          5.26E+17   -1.6      838.0
     Rate coefficients at P=1.00E-01(atm)          5.26E+17   -1.6      838.0
     Rate coefficients at P=1.00E+00(atm)          5.28E+17   -1.6      839.0
     Rate coefficients at P=1.00E+01(atm)          1.54E+18   -1.8     1120.0
     Rate coefficients at P=1.00E+02(atm)          3.78E+20   -2.4     3090.0
429. SC2H4OH+O2<=>C2H3OH+HO2                        5.51E+03    2.5     -414.0
     Rate coefficients at P=1.00E-02(atm)          5.12E+02    2.5     -414.0
     Rate coefficients at P=1.00E-01(atm)          5.33E+02    2.5     -402.0
     Rate coefficients at P=1.00E+00(atm)          7.62E+02    2.4     -296.0
     Rate coefficients at P=1.00E+01(atm)          8.92E+03    2.1      470.0
     Rate coefficients at P=1.00E+02(atm)          4.38E+05    1.7     2330.0
430. CH3OCH3(+M)<=>CH3+CH3O(+M)                     2.33E+19   -0.7    84139.0
     Low pressure limit:  0.17200E+60 -0.11400E+02  0.93296E+05
     TROE centering:      0.10000E+01  0.10000E-29  0.88000E+03
     H2              Enhanced by    3.000E+00
     CO              Enhanced by    2.250E+00
     CO2             Enhanced by    3.000E+00
     N2              Enhanced by    1.500E+00
     H2O             Enhanced by    9.000E+00
     CH3OCH3         Enhanced by    5.000E+00
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     CH4             Enhanced by    3.000E+00
     C2H6            Enhanced by    4.500E+00
431. CH3OCH3+OH<=>CH3OCH2+H2O                      9.35E+05    2.3     -780.7
432. CH3OCH3+H<=>CH3OCH2+H2                        7.72E+06    2.1     3384.0
433. CH3OCH3+O<=>CH3OCH2+OH                        7.75E+08    1.4     2250.0
434. CH3OCH3+HO2<=>CH3OCH2+H2O2                    3.17E-03    4.6    10556.0
435. CH3OCH3+CH3O2<=>CH3OCH2+CH3O2H                1.27E-03    4.6    10556.0
436. CH3OCH3+CH3<=>CH3OCH2+CH4                     7.02E+00    3.8     9687.1
437. CH3OCH3+O2<=>CH3OCH2+HO2                      4.10E+13    0.0    44910.0
438. CH3OCH3+CH3O<=>CH3OCH2+CH3OH                  6.02E+11    0.0     4074.0
439. CH3OCH3+CH3OCH2O2<=>CH3OCH2+CH3OCH2O2H        5.00E+12    0.0    17690.0
440. CH3OCH3+O2CHO<=>CH3OCH2+HO2CHO                4.42E+04    2.6    13910.0
441. CH3OCH3+OCHO<=>CH3OCH2+HOCHO                  1.00E+13    0.0    17690.0
442. CH3OCH2+CH3O<=>CH3OCH3+CH2O                   2.41E+13    0.0        0.0
443. CH3OCH2+CH2O<=>CH3OCH3+HCO                    5.49E+03    2.8     5862.0
444. CH3OCH2+CH3CHO<=>CH3OCH3+CH3CO                1.26E+12    0.0     8499.0
445. CH3OCH2<=>CH3+CH2O                            8.03E+12    0.4    26490.7
     Rate coefficients at P=1.00E-02(atm)         7.49E+23   -4.5    25236.1
     Rate coefficients at P=1.00E-01(atm)         6.92E+28   -5.7    27494.9
     Rate coefficients at P=1.00E+00(atm)         4.23E+29   -5.6    28898.3
     Rate coefficients at P=1.00E+01(atm)         6.61E+27   -4.7    29735.2
     Rate coefficients at P=1.00E+02(atm)         2.66E+29   -4.9    31785.5
446. CH3OCH2+O2<=>CH3OCH2O2                        1.00E+00    1.0        1.0
     Rate coefficients at P=1.00E-03(atm)         1.12E+18   -3.4    -4294.0
     Rate coefficients at P=1.00E-02(atm)         1.33E+21   -4.0    -2615.0
     Rate coefficients at P=1.00E+00(atm)         1.13E+28   -5.2     4088.0
     Rate coefficients at P=2.00E+00(atm)         3.91E+27   -5.0     4512.0
     Rate coefficients at P=1.00E+01(atm)         2.75E+24   -3.9     4290.0
     Rate coefficients at P=2.00E+01(atm)         2.97E+22   -3.2     3781.0
     Rate coefficients at P=5.00E+01(atm)         5.19E+19   -2.4     2908.0
     Rate coefficients at P=1.00E+02(atm)         5.43E+17   -1.7     2210.0
447. CH3OCH2+O2<=>CH2OCH2O2H                       1.00E+00    1.0        1.0
     Rate coefficients at P=1.00E-03(atm)         5.08E+20   -4.4      469.0
     Rate coefficients at P=1.00E-02(atm)         5.47E+23   -5.0     2183.0
     Rate coefficients at P=1.00E+00(atm)         2.81E+28   -5.6     7848.0
     Rate coefficients at P=2.00E+00(atm)         5.19E+27   -5.3     8144.0
     Rate coefficients at P=1.00E+01(atm)         9.67E+24   -4.4     8417.0
     Rate coefficients at P=2.00E+01(atm)         4.08E+23   -3.9     8494.0
     Rate coefficients at P=5.00E+01(atm)         5.08E+21   -3.3     8585.0
     Rate coefficients at P=1.00E+02(atm)         1.62E+20   -2.8     8619.0
448. CH3OCH2+O2=>CH2O+CH2O+OH                      1.00E+00    1.0        1.0
     Rate coefficients at P=1.00E-03(atm)         8.01E+21   -3.2     3067.0
     Rate coefficients at P=1.00E-02(atm)         1.73E+23   -3.5     4050.0
     Rate coefficients at P=1.00E+00(atm)         2.04E+31   -5.8    11594.0
     Rate coefficients at P=2.00E+00(atm)         5.99E+31   -5.9    12710.0
     Rate coefficients at P=1.00E+01(atm)         9.39E+30   -5.6    14517.0
     Rate coefficients at P=2.00E+01(atm)         1.09E+30   -5.3    15051.0
     Rate coefficients at P=5.00E+01(atm)         3.58E+28   -4.9    15664.0
     Rate coefficients at P=1.00E+02(atm)         2.41E+27   -4.5    16107.0
449. CH3OCH2O2<=>CH2OCH2O2H                        1.00E+00    1.0        1.0
     Rate coefficients at P=1.00E-03(atm)         1.94E+29   -7.0    22446.0
     Rate coefficients at P=1.00E-02(atm)         4.07E+27   -6.2    21619.0
     Rate coefficients at P=1.00E+00(atm)         2.52E+25   -4.8    22691.0
     Rate coefficients at P=2.00E+00(atm)         5.97E+24   -4.5    22868.0
     Rate coefficients at P=1.00E+01(atm)         4.44E+21   -3.4    22386.0
     Rate coefficients at P=2.00E+01(atm)         4.52E+19   -2.7    21803.0
     Rate coefficients at P=5.00E+01(atm)         5.72E+16   -1.8    20829.0
     Rate coefficients at P=1.00E+02(atm)         3.70E+14   -1.1    20034.0
450. CH3OCH2O2=>CH2O+CH2O+OH                       1.00E+00    1.0        1.0
     Rate coefficients at P=1.00E-03(atm)         2.06E+36   -8.3    33415.0
     Rate coefficients at P=1.00E-02(atm)         2.07E+39   -8.9    35842.0
     Rate coefficients at P=1.00E+00(atm)         1.12E+40   -8.4    39835.0
     Rate coefficients at P=2.00E+00(atm)         9.72E+38   -8.0    39923.0
     Rate coefficients at P=1.00E+01(atm)         6.28E+35   -7.0    39900.0
     Rate coefficients at P=2.00E+01(atm)         1.60E+34   -6.5    39850.0
     Rate coefficients at P=5.00E+01(atm)         8.32E+31   -5.8    39719.0
     Rate coefficients at P=1.00E+02(atm)         1.22E+30   -5.2    39549.0
451. CH2OCH2O2H=>CH2O+CH2O+OH                      1.00E+00    1.0        1.0
     Rate coefficients at P=1.00E-03(atm)         1.66E+23   -4.5    22243.0
     Rate coefficients at P=1.00E-02(atm)         5.30E+25   -4.9    24158.0
     Rate coefficients at P=1.00E+00(atm)         7.81E+22   -3.5    23156.0
     Rate coefficients at P=2.00E+00(atm)         4.98E+22   -3.4    23062.0
     Rate coefficients at P=1.00E+01(atm)         8.46E+22   -3.2    23559.0
     Rate coefficients at P=2.00E+01(atm)         9.09E+22   -3.1    23899.0
     Rate coefficients at P=5.00E+01(atm)         4.59E+22   -2.9    24262.0
     Rate coefficients at P=1.00E+02(atm)         1.40E+22   -2.7    24407.0
452. CH2OCH2O2H+O2<=>O2CH2OCH2O2H                  2.86E+15   -1.5     1873.0
     Rate coefficients at P=1.00E-03(atm)         9.42E+11   -1.7    -4998.0
     Rate coefficients at P=1.00E-02(atm)         8.16E+15   -2.5    -2753.0
     Rate coefficients at P=1.00E+00(atm)         3.18E+22   -3.3     3389.0
     Rate coefficients at P=2.00E+00(atm)         3.48E+19   -2.8     3131.0
     Rate coefficients at P=1.00E+01(atm)         2.86E+15   -1.5     1873.0
     Rate coefficients at P=2.00E+01(atm)         8.55E+13   -1.0     1312.0
     Rate coefficients at P=5.00E+01(atm)         2.68E+12   -0.5      727.0
     Rate coefficients at P=1.00E+02(atm)         4.87E+11   -0.3      428.0
453. CH2OCH2O2H+O2<=>HO2CH2OCHO+OH                 1.00E+00    1.0        1.0
     Rate coefficients at P=1.00E-03(atm)         5.90E+20   -2.9     3234.0
     Rate coefficients at P=1.00E-02(atm)         2.06E+23   -3.6     5116.0
     Rate coefficients at P=1.00E+00(atm)         4.45E+29   -5.3    12791.0
     Rate coefficients at P=2.00E+00(atm)         2.44E+28   -4.9    12891.0
     Rate coefficients at P=1.00E+01(atm)         9.42E+23   -3.7    12049.0
     Rate coefficients at P=2.00E+01(atm)         1.04E+22   -3.2    11505.0
     Rate coefficients at P=5.00E+01(atm)         6.95E+19   -2.6    10861.0
     Rate coefficients at P=1.00E+02(atm)         3.96E+18   -2.3    10500.0
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454. O2CH2OCH2O2H<=>HO2CH2OCHO+OH                    1.00E+00    1.0        1.0
     Rate coefficients at P=1.00E-03(atm)           9.05E+23   -4.9    18805.0
     Rate coefficients at P=1.00E-02(atm)           6.84E+26   -5.3    22533.0
     Rate coefficients at P=1.00E+00(atm)           5.07E+16   -1.8    21175.0
     Rate coefficients at P=2.00E+00(atm)           2.66E+14   -1.1    20310.0
     Rate coefficients at P=1.00E+01(atm)           1.69E+10    0.2    18604.0
     Rate coefficients at P=2.00E+01(atm)           1.11E+09    0.5    18100.0
     Rate coefficients at P=5.00E+01(atm)           1.07E+08    0.8    17661.0
     Rate coefficients at P=1.00E+02(atm)           3.86E+07    1.0    17467.0
455. CH3OCH2O2+CH3OCH2O2=>O2+CH3OCH2O+CH3OCH2O       4.64E+23   -4.5        0.0
456. CH3OCH2O2+CH2O<=>CH3OCH2O2H+HCO                 1.00E+12    0.0    11660.0
457. CH3OCH2O2+CH3CHO<=>CH3OCH2O2H+CH3CO             2.80E+12    0.0    13600.0
458. CH3OCH2O+OH<=>CH3OCH2O2H                        2.00E+13    0.0        0.0
459. HO2CH2OCHO<=>OCH2OCHO+OH                        5.00E+16    0.0    43000.0
460. CH2O+OCHO<=>OCH2OCHO                            1.25E+11    0.0    11900.0
461. OCH2OCHO<=>HOCH2OCO                             1.00E+11    0.0    14000.0
462. HOCH2OCO<=>CH2OH+CO2                            1.12E+17   -1.5    20771.9
463. HOCH2OCO<=>HOCH2O+CO                            2.92E+18   -2.0    19619.0
464. CH3O+CH2O<=>CH3OCH2O                            1.00E+11    0.0     7960.0
465. CH3OCH2O+O2<=>CH3OCHO+HO2                       4.38E-19    9.5    -5501.0
466. CH3OCH2O<=>CH3OCHO+H                            3.30E+13    0.0    26136.3
467. CH3O+HCO<=>CH3OCHO                              3.00E+13    0.0        0.0
468. CH3O+HCO<=>CH3OH+CO                             9.00E+13    0.0        0.0
469. CH3+OCHO<=>CH3OCHO                              1.00E+13    0.0        0.0
470. CH2OCHO+H<=>CH3OCHO                             1.00E+14    0.0        0.0
471. CH3OCO+H<=>CH3OCHO                              1.00E+14    0.0        0.0
472. CH3OCHO+O2<=>CH3OCO+HO2                         1.00E+13    0.0    49700.0
473. CH3OCHO+O2<=>CH2OCHO+HO2                        2.05E+13    0.0    52000.0
474. CH3OCHO+OH<=>CH3OCO+H2O                         1.58E+07    1.8      934.0
475. CH3OCHO+OH<=>CH2OCHO+H2O                        5.27E+09    1.0     1586.0
476. CH3OCHO+HO2<=>CH3OCO+H2O2                       4.82E+03    2.6    13910.0
477. CH3OCHO+HO2<=>CH2OCHO+H2O2                      2.38E+04    2.5    16490.0
478. CH3OCHO+O<=>CH3OCO+OH                           2.76E+05    2.5     2830.0
479. CH3OCHO+O<=>CH2OCHO+OH                          9.80E+05    2.4     4750.0
480. CH3OCHO+H<=>CH3OCO+H2                           6.50E+05    2.4     4471.0
481. CH3OCHO+H<=>CH2OCHO+H2                          6.65E+05    2.5     6756.0
482. CH3OCHO+CH3<=>CH3OCO+CH4                        7.55E-01    3.5     5481.0
483. CH3OCHO+CH3<=>CH2OCHO+CH4                       4.52E-01    3.6     7154.0
484. CH3OCHO+CH3O<=>CH3OCO+CH3OH                     5.48E+11    0.0     5000.0
485. CH3OCHO+CH3O<=>CH2OCHO+CH3OH                    2.17E+11    0.0     6458.0
486. CH3OCHO+CH3O2<=>CH3OCO+CH3O2H                   4.82E+03    2.6    13910.0
487. CH3OCHO+CH3O2<=>CH2OCHO+CH3O2H                  2.38E+04    2.5    16490.0
488. CH3OCHO+HCO<=>CH3OCO+CH2O                       5.40E+06    1.9    17010.0
489. CH3OCHO+HCO<=>CH2OCHO+CH2O                      1.02E+05    2.5    18430.0
490. CH3OCO<=>CH2OCHO                                1.63E+12   -0.2    40670.0
491. CH2O+HCO<=>CH2OCHO                              1.50E+11    0.0    11900.0
492. C3H8(+M)<=>CH3+C2H5(+M)                         1.29E+37   -5.8    97380.0
     Low pressure limit:  0.56400E+75 -0.15740E+02  0.98714E+05
     TROE centering:      0.31000E+00  0.50000E+02  0.30000E+04  0.90000E+04
     H2              Enhanced by    2.000E+00
     H2O             Enhanced by    6.000E+00
     AR              Enhanced by    7.000E-01
     CO              Enhanced by    1.500E+00
     CO2             Enhanced by    2.000E+00
     CH4             Enhanced by    2.000E+00
     C2H6            Enhanced by    3.000E+00
     HE              Enhanced by    7.000E-01
493. NC3H7+H<=>C3H8                                  1.00E+14    0.0        0.0
494. IC3H7+H<=>C3H8                                  1.00E+14    0.0        0.0
495. C3H8+IC3H7<=>NC3H7+C3H8                         3.00E+10    0.0    12900.0
496. C3H8+O2<=>IC3H7+HO2                             2.00E+13    0.0    49640.0
497. C3H8+H<=>IC3H7+H2                               1.30E+06    2.4     4471.0
498. C3H8+O<=>IC3H7+OH                               5.49E+05    2.5     3140.0
499. C3H8+OH<=>IC3H7+H2O                             4.67E+07    1.6      -35.0
500. C3H8+HO2<=>IC3H7+H2O2                           6.32E+01    3.4    13720.0
501. C3H8+CH3<=>IC3H7+CH4                            6.40E+04    2.2     7520.0
502. C3H8+C2H3<=>IC3H7+C2H4                          1.00E+11    0.0    10400.0
503. C3H8+C2H5<=>IC3H7+C2H6                          1.00E+11    0.0    10400.0
504. C3H8+C3H5-A<=>IC3H7+C3H6                        7.94E+11    0.0    16200.0
505. C3H8+CH3O<=>IC3H7+CH3OH                         3.00E+11    0.0     7000.0
506. C3H8+CH3O2<=>IC3H7+CH3O2H                       1.02E+01    3.6    14810.0
507. C3H8+C2H5O2<=>IC3H7+C2H5O2H                     1.02E+01    3.6    14810.0
508. C3H8+NC3H7O2<=>IC3H7+NC3H7O2H                   2.00E+12    0.0    17000.0
509. C3H8+CH3CO3<=>IC3H7+CH3CO3H                     2.00E+12    0.0    17000.0
510. C3H8+O2CHO<=>IC3H7+HO2CHO                       1.48E+04    2.6    13910.0
511. C3H8+IC3H7O2<=>IC3H7+IC3H7O2H                   2.00E+12    0.0    17000.0
512. C3H8+O2<=>NC3H7+HO2                             6.00E+13    0.0    52290.0
513. C3H8+H<=>NC3H7+H2                               3.49E+05    2.7     6450.0
514. C3H8+O<=>NC3H7+OH                               3.71E+06    2.4     5505.0
515. C3H8+OH<=>NC3H7+H2O                             1.05E+10    1.0     1586.0
516. C3H8+HO2<=>NC3H7+H2O2                           4.08E+01    3.6    17160.0
517. C3H8+CH3<=>NC3H7+CH4                            9.04E-01    3.6     7154.0
518. C3H8+C2H3<=>NC3H7+C2H4                          1.00E+11    0.0    10400.0
519. C3H8+C2H5<=>NC3H7+C2H6                          1.00E+11    0.0    10400.0
520. C3H8+C3H5-A<=>NC3H7+C3H6                        7.94E+11    0.0    20500.0
521. C3H8+CH3O<=>NC3H7+CH3OH                         3.00E+11    0.0     7000.0
522. C3H8+CH3O2<=>NC3H7+CH3O2H                       1.39E+00    4.0    18280.0
523. C3H8+C2H5O2<=>NC3H7+C2H5O2H                     1.39E+00    4.0    18280.0
524. C3H8+NC3H7O2<=>NC3H7+NC3H7O2H                   1.70E+13    0.0    20460.0
525. C3H8+IC3H7O2<=>NC3H7+IC3H7O2H                   1.70E+13    0.0    20460.0
526. C3H8+CH3CO3<=>NC3H7+CH3CO3H                     1.70E+13    0.0    20460.0
527. C3H8+O2CHO<=>NC3H7+HO2CHO                       5.52E+04    2.5    16480.0
528. IC3H7+H<=>C2H5+CH3                              2.00E+13    0.0        0.0
529. IC3H7+OH<=>C3H6+H2O                             2.41E+13    0.0        0.0
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530. IC3H7+O<=>CH3COCH3+H	4.82E+13	0.0	0.0
531. IC3H7+O<=>CH3CHO+CH3	4.82E+13	0.0	0.0
532. NC3H7+HO2<=>NC3H7O+OH	7.00E+12	0.0	-1000.0
533. NC3H7+CH3O2<=>NC3H7O+CH3O	7.00E+12	0.0	-1000.0
534. IC3H7+HO2<=>IC3H7O+OH	7.00E+12	0.0	-1000.0
535. IC3H7+CH3O2<=>IC3H7O+CH3O	7.00E+12	0.0	-1000.0
536. C2H5+CH2O<=>NC3H7O	1.00E+11	0.0	3496.0
537. C2H5CHO+H<=>NC3H7O	4.00E+12	0.0	6260.0
538. CH3+CH3CHO<=>IC3H7O	1.00E+11	0.0	9256.0
539. CH3COCH3+H<=>IC3H7O	2.00E+12	0.0	7270.0
540. IC3H7O+O2<=>CH3COCH3+HO2	9.09E+09	0.0	390.0
541. NC3H7+O2<=>C3H6+HO2	3.00E-19	0.0	3000.0
542. NC3H7+O2<=>NC3H7O2	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	9.20E+08	0.4	-4398.6
Rate coefficients at P=1.00E-01(atm)	1.45E+14	-1.0	-1710.8
Rate coefficients at P=1.00E+00(atm)	2.09E+13	-0.5	-938.4
Rate coefficients at P=1.00E+01(atm)	1.15E+20	-2.4	2451.3
Rate coefficients at P=1.00E+02(atm)	2.07E+16	-1.3	803.4
543. IC3H7+O2<=>IC3H7O2	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	7.33E+05	1.3	-6345.6
Rate coefficients at P=1.00E-01(atm)	2.24E+11	-0.1	-3697.9
Rate coefficients at P=1.00E+00(atm)	1.54E+18	-2.0	-498.6
Rate coefficients at P=1.00E+01(atm)	6.74E+27	-4.8	3779.8
Rate coefficients at P=1.00E+02(atm)	1.67E+29	-5.2	5036.4
544. IC3H7O2<=>C3H6+HO2	1.22E+09	1.3	30000.0
545. NC3H7O2<=>C3H6+HO2	6.24E+08	1.2	29600.0
546. NC3H7O2<=>C3H6OOH1-2	4.09E+08	1.1	30100.0
547. NC3H7O2<=>C3H6OOH1-3	3.57E+06	1.6	21000.0
548. IC3H7O2<=>C3H6OOH2-1	2.92E+09	1.1	33500.0
549. C3H6OOH1-2<=>C3H6O1-2+OH	1.21E+09	1.1	11300.0
550. C3H6OOH1-3<=>C3H6O1-3+OH	2.64E+09	0.7	18500.0
551. C3H6OOH1-2<=>C3H6+HO2	2.34E+10	0.8	15300.0
552. C3H6OOH1-3=>OH+CH2O+C2H4	2.89E+09	1.3	26700.0
553. C3H6OOH2-1<=>C2H3OOH+CH3	8.56E+10	0.8	30700.0
554. C3H6OOH1-2=>C2H4+CH2O+OH	1.31E+33	-7.0	48120.0
555. C3H6OOH1-2+O2<=>C3H6OOH1-2O2	1.74E+14	-0.8	-536.5
556. C3H6OOH1-3+O2<=>C3H6OOH1-3O2	3.43E+16	-1.6	198.7
557. C3H6OOH2-1+O2<=>C3H6OOH2-1O2	3.43E+16	-1.6	198.7
558. C3H6OOH1-2O2<=>C3H51-2,3OOH	2.92E+09	1.1	33500.0
559. C3H6OOH1-3O2<=>C3H52-1,3OOH	4.01E+08	1.1	30100.0
560. C3H6OOH2-1O2<=>C3H51-2,3OOH	3.57E+06	1.6	21000.0
561. C3H51-2,3OOH<=>AC3H5OOH+HO2	2.56E+13	-0.5	17770.0
562. C3H52-1,3OOH<=>AC3H5OOH+HO2	1.15E+14	-0.6	17250.0
563. C3H51-2,3OOH<=>C3H5O1-2OOH-3+OH	4.45E+09	0.9	10800.0
564. C3H51-2,3OOH<=>C3H5O1-3OOH-2+OH	2.64E+09	0.7	18500.0
565. C3H52-1,3OOH<=>C3H5O1-2OOH-3+OH	1.21E+09	1.1	11300.0
566. C3H5O1-2OOH-3=>CH2CHO+CH2O+OH	1.00E+16	0.0	43000.0
567. C3H5O1-3OOH-2=>CH2CHO+CH2O+OH	1.00E+16	0.0	43000.0
568. C3H6OOH1-2O2<=>C3KET12+OH	6.00E+11	0.0	26400.0
569. C3H6OOH1-3O2<=>C3KET13+OH	7.50E+10	0.0	21400.0
570. C3H6OOH2-1O2<=>C3KET21+OH	3.00E+11	0.0	23850.0
571. C3KET12=>CH3CHO+HCO+OH	9.50E+15	0.0	42540.0
572. C3KET13=>CH2O+CH2CHO+OH	1.00E+16	0.0	43000.0
573. C3KET21=>CH2O+CH3CO+OH	1.00E+16	0.0	43000.0
574. C3KET21=>OH+CH2O+CO+CH3	1.59E+20	-1.5	42879.5
575. C2H3OOH<=>CH2CHO+OH	8.40E+14	0.0	43000.0
576. C2H3OOH=>CH2CO+H+OH	1.59E+20	-1.5	42879.5
577. C3KET21<=>CH3COCH2O+OH	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	1.49E+58	-13.9	54266.9
Rate coefficients at P=1.00E-01(atm)	1.80E+54	-12.4	54193.8
Rate coefficients at P=1.00E+00(atm)	3.36E+46	-9.8	52468.5
Rate coefficients at P=1.00E+01(atm)	2.39E+36	-6.5	49429.0
Rate coefficients at P=1.00E+02(atm)	1.28E+27	-3.6	46333.1
578. NC3H7O2H<=>NC3H7O+OH	1.50E+16	0.0	42500.0
579. NC3H7O2+H2<=>NC3H7O2H+H	3.01E+13	0.0	26030.0
580. NC3H7O2+HO2<=>NC3H7O2H+O2	1.75E+10	0.0	-3275.0
581. NC3H7O2+CH2O<=>NC3H7O2H+HCO	5.60E+12	0.0	13600.0
582. NC3H7O2+CH4<=>NC3H7O2H+CH3	1.12E+13	0.0	24640.0
583. NC3H7O2+CH3OH<=>NC3H7O2H+CH2OH	6.30E+12	0.0	19360.0
584. NC3H7O2+CH3CHO<=>NC3H7O2H+CH3CO	2.80E+12	0.0	13600.0
585. NC3H7O2+C2H4<=>NC3H7O2H+C2H3	1.13E+13	0.0	30430.0
586. NC3H7O2+C2H6<=>NC3H7O2H+C2H5	1.70E+13	0.0	20460.0
587. NC3H7O2+C2H3CHO<=>NC3H7O2H+C2H3CO	2.80E+12	0.0	13600.0
588. NC3H7O2+C2H5CHO<=>NC3H7O2H+C2H5CO	2.00E+11	0.0	9500.0
589. NC3H7O2+NC3H7O2=>NC3H7O+NC3H7O+O2	1.40E+16	-1.6	1860.0
590. NC3H7O2+CH3CO3=>NC3H7O+CH3CO2+O2	1.40E+16	-1.6	1860.0
591. NC3H7O2+C2H5O2=>NC3H7O+C2H5O+O2	1.40E+16	-1.6	1860.0
592. NC3H7O2+CH3<=>NC3H7O+CH3O	7.00E+12	0.0	-1000.0
593. NC3H7O2+C2H5<=>NC3H7O+C2H5O	7.00E+12	0.0	-1000.0
594. NC3H7O2+IC3H7<=>NC3H7O+IC3H7O	7.00E+12	0.0	-1000.0
595. NC3H7O2+NC3H7<=>NC3H7O+NC3H7O	7.00E+12	0.0	-1000.0
596. NC3H7O2+C3H5-A<=>NC3H7O+C3H5O	7.00E+12	0.0	-1000.0
597. NC3H7O2+CH3O2=>NC3H7O+CH3O+O2	1.40E+16	-1.6	1860.0
598. IC3H7O+OH<=>IC3H7O2H	1.00E+15	-0.8	0.0
599. IC3H7O2+H2<=>IC3H7O2H+H	3.01E+13	0.0	26030.0
600. IC3H7O2+HO2<=>IC3H7O2H+O2	1.75E+10	0.0	-3275.0
601. IC3H7O2+CH2O<=>IC3H7O2H+HCO	5.60E+12	0.0	13600.0
602. IC3H7O2+CH4<=>IC3H7O2H+CH3	1.12E+13	0.0	24640.0
603. IC3H7O2+CH3CHO<=>IC3H7O2H+CH3CO	2.80E+12	0.0	13600.0
604. IC3H7O2+C2H4<=>IC3H7O2H+C2H3	1.13E+13	0.0	30430.0
605. IC3H7O2+CH3OH<=>IC3H7O2H+CH2OH	6.30E+12	0.0	19360.0
606. IC3H7O2+C2H6<=>IC3H7O2H+C2H5	1.70E+13	0.0	20460.0
607. IC3H7O2+C2H3CHO<=>IC3H7O2H+C2H3CO	2.80E+12	0.0	13600.0
608. IC3H7O2+C2H5CHO<=>IC3H7O2H+C2H5CO	2.00E+11	0.0	9500.0

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609. IC3H7O2+CH3O2=>IC3H7O+CH3O+O2                  1.40E+16   -1.6     1860.0
610. IC3H7O2+CH3CO3=>IC3H7O+CH3CO2+O2               1.40E+16   -1.6     1860.0
611. IC3H7O2+C2H5O2=>IC3H7O+C2H5O+O2                1.40E+16   -1.6     1860.0
612. IC3H7O2+IC3H7O2=>O2+IC3H7O+IC3H7O              1.40E+16   -1.6     1860.0
613. IC3H7O2+NC3H7O2=>IC3H7O+NC3H7O+O2              1.40E+16   -1.6     1860.0
614. IC3H7O2+CH3<=>IC3H7O+CH3O                      7.00E+12    0.0    -1000.0
615. IC3H7O2+C2H5<=>IC3H7O+C2H5O                    7.00E+12    0.0    -1000.0
616. IC3H7O2+IC3H7<=>IC3H7O+IC3H7O                  7.00E+12    0.0    -1000.0
617. IC3H7O2+NC3H7<=>IC3H7O+NC3H7O                  7.00E+12    0.0    -1000.0
618. IC3H7O2+C3H5-A<=>IC3H7O+C3H5O                  7.00E+12    0.0    -1000.0
619. C3H6O1-2<=>C2H4+CH2O                           6.00E+14    0.0    60000.0
620. C3H6O1-2+OH=>CH2O+C2H3+H2O                     5.00E+12    0.0        0.0
621. C3H6O1-2+H=>CH2O+C2H3+H2                       2.63E+07    2.0     5000.0
622. C3H6O1-2+O=>CH2O+C2H3+OH                       8.43E+13    0.0     5200.0
623. C3H6O1-2+HO2=>CH2O+C2H3+H2O2                   1.00E+13    0.0    15000.0
624. C3H6O1-2+CH3O2=>CH2O+C2H3+CH3O2H               1.00E+13    0.0    19000.0
625. C3H6O1-2+CH3=>CH2O+C2H3+CH4                    2.00E+11    0.0    10000.0
626. C3H6O1-3<=>C2H4+CH2O                           6.00E+14    0.0    60000.0
627. C3H6O1-3+OH=>CH2O+C2H3+H2O                     5.00E+12    0.0        0.0
628. C3H6O1-3+O=>CH2O+C2H3+OH                       8.43E+13    0.0     5200.0
629. C3H6O1-3+H=>CH2O+C2H3+H2                       2.63E+07    2.0     5000.0
630. C3H6O1-3+CH3O2=>CH2O+C2H3+CH3O2H               1.00E+13    0.0    19000.0
631. C3H6O1-3+HO2=>CH2O+C2H3+H2O2                   1.00E+13    0.0    15000.0
632. C3H6O1-3+CH3=>CH2O+C2H3+CH4                    2.00E+11    0.0    10000.0
633. C2H3+CH3(+M)<=>C3H6(+M)                        2.50E+13    0.0        0.0
     Low pressure limit:  0.42700E+59 -0.11940E+02  0.97698E+04
     TROE centering:      0.17500E+00  0.13410E+04  0.60000E+05  0.10140E+05
634. CH2(S)+C2H4<=>CC3H6                            1.44E+51  -13.1    14200.0
     Rate coefficients at P=1.00E-02(atm)          1.44E+51  -13.1    14200.0
     Rate coefficients at P=1.00E-01(atm)          3.38E+54  -13.6    16500.0
     Rate coefficients at P=1.00E+00(atm)          1.35E+54  -13.0    18900.0
     Rate coefficients at P=1.00E+01(atm)          2.73E+47  -10.8    14200.0
     Rate coefficients at P=1.00E+02(atm)          2.71E+50  -11.2    16700.0
     Declared duplicate reaction...
635. CH2(S)+C2H4<=>CC3H6                            6.16E+40  -10.5     5428.1
     Rate coefficients at P=1.00E-02(atm)          6.16E+40  -10.5     5428.1
     Rate coefficients at P=1.00E-01(atm)          6.93E+41  -10.3     6188.9
     Rate coefficients at P=1.00E+00(atm)          1.81E+37   -8.6     5521.0
     Rate coefficients at P=1.00E+01(atm)          4.26E+37   -8.3     4770.2
     Rate coefficients at P=1.00E+02(atm)          4.68E+35   -7.4     4689.1
     Declared duplicate reaction...
636. CH2(S)+C2H4<=>C3H6                             4.82E+57  -14.3    17100.0
     Rate coefficients at P=1.00E-02(atm)          4.82E+57  -14.3    17100.0
     Rate coefficients at P=1.00E-01(atm)          3.84E+59  -14.4    18400.0
     Rate coefficients at P=1.00E+00(atm)          2.13E+58  -13.5    20400.0
     Rate coefficients at P=1.00E+01(atm)          8.48E+52  -11.6    20700.0
     Rate coefficients at P=1.00E+02(atm)          6.07E+47   -9.8    22100.0
     Declared duplicate reaction...
637. CH2(S)+C2H4<=>C3H6                             1.15E+45  -11.1     6145.2
     Rate coefficients at P=1.00E-02(atm)          1.15E+45  -11.1     6145.2
     Rate coefficients at P=1.00E-01(atm)          1.83E+45  -10.7     6638.5
     Rate coefficients at P=1.00E+00(atm)          1.30E+40   -8.8     5863.8
     Rate coefficients at P=1.00E+01(atm)          2.27E+32   -6.1     4317.9
     Rate coefficients at P=1.00E+02(atm)          1.28E+24   -3.5     2529.9
     Declared duplicate reaction...
638. CH2(S)+C2H4<=>C3H5-A+H                         8.20E+19   -2.1     1150.0
     Rate coefficients at P=1.00E-02(atm)          8.20E+19   -2.1     1150.0
     Rate coefficients at P=1.00E-01(atm)          2.27E+21   -2.4     2650.0
     Rate coefficients at P=1.00E+00(atm)          4.44E+35   -6.5    13900.0
     Rate coefficients at P=1.00E+01(atm)          1.18E+28   -4.1    14000.0
     Rate coefficients at P=1.00E+02(atm)          6.51E+26   -3.6    18900.0
     Declared duplicate reaction...
639. CH2(S)+C2H4<=>C3H5-A+H                         1.08E+07    1.6    -3174.6
     Rate coefficients at P=1.00E-02(atm)          1.08E+07    1.6    -3174.6
     Rate coefficients at P=1.00E-01(atm)          1.37E+05    2.1    -3799.2
     Rate coefficients at P=1.00E+00(atm)          3.89E+14   -0.4     1237.6
     Rate coefficients at P=1.00E+01(atm)          2.45E+10    0.7      750.9
     Rate coefficients at P=1.00E+02(atm)          1.81E+02    3.0     -746.0
     Declared duplicate reaction...
640. CH2(S)+C2H4<=>C2H3+CH3                         1.77E+19   -1.9     6790.0
     Rate coefficients at P=1.00E-02(atm)          1.77E+19   -1.9     6790.0
     Rate coefficients at P=1.00E-01(atm)          1.68E+19   -1.8     4310.0
     Rate coefficients at P=1.00E+00(atm)          4.16E+24   -3.2     9760.0
     Rate coefficients at P=1.00E+01(atm)          7.89E+24   -3.1    13900.0
     Rate coefficients at P=1.00E+02(atm)          7.36E+29   -4.3    23800.0
     Declared duplicate reaction...
641. CH2(S)+C2H4<=>C2H3+CH3                         4.30E+12    0.2     -110.4
     Rate coefficients at P=1.00E-02(atm)          4.30E+12    0.2     -110.4
     Rate coefficients at P=1.00E-01(atm)          2.26E+11    0.5       47.8
     Rate coefficients at P=1.00E+00(atm)          4.92E+09    1.0      599.8
     Rate coefficients at P=1.00E+01(atm)          1.47E+08    1.3     1228.4
     Rate coefficients at P=1.00E+02(atm)          8.11E+10    0.6     5506.5
     Declared duplicate reaction...
642. C2H3+CH3<=>C3H5-A+H                            4.12E+29   -5.0     8000.0
     Rate coefficients at P=1.00E-02(atm)          4.12E+29   -5.0     8000.0
     Rate coefficients at P=1.00E-01(atm)          4.86E+30   -5.0    11300.0
     Rate coefficients at P=1.00E+00(atm)          5.30E+29   -4.6    14400.0
     Rate coefficients at P=1.00E+01(atm)          1.32E+30   -4.5    19300.0
     Rate coefficients at P=1.00E+02(atm)          5.16E+28   -4.0    23800.0
     Declared duplicate reaction...
643. C2H3+CH3<=>C3H5-A+H                            5.73E+15   -0.8     1195.9
     Rate coefficients at P=1.00E-02(atm)          5.73E+15   -0.8     1195.9
     Rate coefficients at P=1.00E-01(atm)          2.06E+13   -0.1     1428.7
     Rate coefficients at P=1.00E+00(atm)          4.48E+10    0.6     1421.6
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     Rate coefficients at P=1.00E+01(atm)          4.10E+06    1.7     1056.9
     Rate coefficients at P=1.00E+02(atm)          1.37E-01    3.9     -353.6
     Declared duplicate reaction...
644. C3H6<=>C2H3+CH3                                1.88E+78  -18.7   130000.0
     Rate coefficients at P=1.00E-02(atm)          1.88E+78  -18.7   130000.0
     Rate coefficients at P=1.00E-01(atm)          8.73E+76  -17.9   132000.0
     Rate coefficients at P=1.00E+00(atm)          5.80E+75  -17.2   134000.0
     Rate coefficients at P=1.00E+01(atm)          8.12E+71  -15.8   136000.0
     Rate coefficients at P=1.00E+02(atm)          2.15E+64  -13.4   135000.0
     Declared duplicate reaction...
645. C3H6<=>C2H3+CH3                                1.69E+59  -13.6   113290.0
     Rate coefficients at P=1.00E-02(atm)          1.69E+59  -13.6   113290.0
     Rate coefficients at P=1.00E-01(atm)          2.00E+60  -13.7   114890.0
     Rate coefficients at P=1.00E+00(atm)          6.70E+54  -11.8   113840.0
     Rate coefficients at P=1.00E+01(atm)          1.06E+47   -9.3   111510.0
     Rate coefficients at P=1.00E+02(atm)          7.29E+38   -6.7   108740.0
     Declared duplicate reaction...
646. C3H6<=>C3H5-A+H                                9.16E+74  -17.6   120000.0
     Rate coefficients at P=1.00E-02(atm)          9.16E+74  -17.6   120000.0
     Rate coefficients at P=1.00E-01(atm)          1.73E+70  -16.0   120000.0
     Rate coefficients at P=1.00E+00(atm)          1.08E+71  -15.9   124860.0
     Rate coefficients at P=1.00E+01(atm)          6.40E+65  -14.2   125000.0
     Rate coefficients at P=1.00E+02(atm)          8.05E+56  -11.5   122000.0
     Declared duplicate reaction...
647. C3H6<=>C3H5-A+H                                2.98E+54  -12.3   101200.0
     Rate coefficients at P=1.00E-02(atm)          2.98E+54  -12.3   101200.0
     Rate coefficients at P=1.00E-01(atm)          1.37E+43   -8.9    96365.0
     Rate coefficients at P=1.00E+00(atm)          6.28E+42   -8.5    98004.0
     Rate coefficients at P=1.00E+01(atm)          4.73E+35   -6.3    95644.0
     Rate coefficients at P=1.00E+02(atm)          4.34E+28   -4.1    93114.0
     Declared duplicate reaction...
648. C3H6<=>CC3H6                                   1.26E+64  -15.6    95000.0
     Rate coefficients at P=1.00E-02(atm)          1.26E+64  -15.6    95000.0
     Rate coefficients at P=1.00E-01(atm)          3.94E+67  -16.2   101000.0
     Rate coefficients at P=1.00E+00(atm)          6.14E+68  -16.2   106000.0
     Rate coefficients at P=1.00E+01(atm)          9.70E+66  -15.3   109000.0
     Rate coefficients at P=1.00E+02(atm)          1.45E+62  -13.6   110000.0
     Declared duplicate reaction...
649. C3H6<=>CC3H6                                   4.84E+41   -9.6    79528.0
     Rate coefficients at P=1.00E-02(atm)          4.84E+41   -9.6    79528.0
     Rate coefficients at P=1.00E-01(atm)          8.07E+44  -10.2    82671.0
     Rate coefficients at P=1.00E+00(atm)          1.15E+47  -10.6    85502.0
     Rate coefficients at P=1.00E+01(atm)          1.33E+39   -8.0    83303.0
     Rate coefficients at P=1.00E+02(atm)          4.97E+31   -5.6    80987.0
     Declared duplicate reaction...
650. CC3H6<=>C3H5-A+H                               2.33E+63  -14.6   103000.0
     Rate coefficients at P=1.00E-02(atm)          2.33E+63  -14.6   103000.0
     Rate coefficients at P=1.00E-01(atm)          7.03E+63  -14.4   107000.0
     Rate coefficients at P=1.00E+00(atm)          5.07E+64  -14.3   112000.0
     Rate coefficients at P=1.00E+01(atm)          4.92E+61  -13.2   115000.0
     Rate coefficients at P=1.00E+02(atm)          4.82E+57  -11.7   118000.0
     Declared duplicate reaction...
651. CC3H6<=>C3H5-A+H                               1.12E+40   -8.4    85836.0
     Rate coefficients at P=1.00E-02(atm)          1.12E+40   -8.4    85836.0
     Rate coefficients at P=1.00E-01(atm)          1.06E+41   -8.3    88499.0
     Rate coefficients at P=1.00E+00(atm)          8.23E+43   -8.9    92907.0
     Rate coefficients at P=1.00E+01(atm)          1.27E+39   -7.3    93401.0
     Rate coefficients at P=1.00E+02(atm)          1.45E+28   -4.0    90995.0
     Declared duplicate reaction...
652. CC3H6<=>C2H3+CH3                               8.31E+64  -15.1   111000.0
     Rate coefficients at P=1.00E-02(atm)          8.31E+64  -15.1   111000.0
     Rate coefficients at P=1.00E-01(atm)          8.29E+64  -14.7   114000.0
     Rate coefficients at P=1.00E+00(atm)          1.00E+70  -15.7   122000.0
     Rate coefficients at P=1.00E+01(atm)          1.66E+67  -14.6   124000.0
     Rate coefficients at P=1.00E+02(atm)          7.87E+62  -13.1   127000.0
     Declared duplicate reaction...
653. CC3H6<=>C2H3+CH3                               1.51E+49  -11.0    99748.0
     Rate coefficients at P=1.00E-02(atm)          1.51E+49  -11.0    99748.0
     Rate coefficients at P=1.00E-01(atm)          1.05E+45   -9.5    99275.0
     Rate coefficients at P=1.00E+00(atm)          3.39E+50  -10.6   104220.0
     Rate coefficients at P=1.00E+01(atm)          1.76E+47   -9.4   104930.0
     Rate coefficients at P=1.00E+02(atm)          1.88E+39   -6.9   103980.0
     Declared duplicate reaction...
654. C3H5-T+H<=>C3H6                                4.96E+60  -15.2    18000.0
     Rate coefficients at P=1.00E-02(atm)          4.96E+60  -15.2    18000.0
     Rate coefficients at P=1.00E-01(atm)          3.20E+62  -15.1    20100.0
     Rate coefficients at P=1.00E+00(atm)          2.31E+60  -14.0    21900.0
     Rate coefficients at P=1.00E+01(atm)          3.69E+54  -12.0    22100.0
     Rate coefficients at P=1.00E+02(atm)          1.15E+50  -10.4    23300.0
     Declared duplicate reaction...
655. C3H5-T+H<=>C3H6                                1.49E+48  -12.0     7203.3
     Rate coefficients at P=1.00E-02(atm)          1.49E+48  -12.0     7203.3
     Rate coefficients at P=1.00E-01(atm)          6.76E+46  -11.1     7629.9
     Rate coefficients at P=1.00E+00(atm)          1.09E+40   -8.7     6447.8
     Rate coefficients at P=1.00E+01(atm)          2.38E+31   -5.7     4506.0
     Rate coefficients at P=1.00E+02(atm)          5.69E+25   -3.8     3250.4
     Declared duplicate reaction...
656. C3H5-T+H<=>C3H5-A+H                            2.11E+17   -1.1     1290.0
     Rate coefficients at P=1.00E-02(atm)          2.11E+17   -1.1     1290.0
     Rate coefficients at P=1.00E-01(atm)          9.05E+29   -4.9     8540.0
     Rate coefficients at P=1.00E+00(atm)          2.98E+30   -4.8    12000.0
     Rate coefficients at P=1.00E+01(atm)          8.22E+28   -4.1    15400.0
     Rate coefficients at P=1.00E+02(atm)          2.28E+29   -4.1    20900.0
     Declared duplicate reaction...
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657. C3H5-T+H<=>C3H5-A+H	6.41E+03	2.6	-3778.4
Rate coefficients at P=1.00E-02(atm)	6.41E+03	2.6	-3778.4
Rate coefficients at P=1.00E-01(atm)	5.19E+14	-0.3	1090.4
Rate coefficients at P=1.00E+00(atm)	8.17E+11	0.5	1184.6
Rate coefficients at P=1.00E+01(atm)	2.79E+09	1.1	1187.5
Rate coefficients at P=1.00E+02(atm)	6.75E+03	2.7	373.8
Declared duplicate reaction...			
658. C3H5-T+H<=>C2H3+CH3	3.31E+16	-0.7	5200.0
Rate coefficients at P=1.00E-02(atm)	3.31E+16	-0.7	5200.0
Rate coefficients at P=1.00E-01(atm)	9.04E+16	-0.8	4800.0
Rate coefficients at P=1.00E+00(atm)	2.01E+24	-2.9	10900.0
Rate coefficients at P=1.00E+01(atm)	2.75E+26	-3.3	15800.0
Rate coefficients at P=1.00E+02(atm)	3.15E+32	-4.8	26000.0
Declared duplicate reaction...			
659. C3H5-T+H<=>C2H3+CH3	8.04E+13	-0.1	1150.0
Rate coefficients at P=1.00E-02(atm)	8.04E+13	-0.1	1150.0
Rate coefficients at P=1.00E-01(atm)	7.17E+10	0.7	673.8
Rate coefficients at P=1.00E+00(atm)	9.97E+08	1.4	1596.4
Rate coefficients at P=1.00E+01(atm)	7.41E+07	1.6	2108.8
Rate coefficients at P=1.00E+02(atm)	2.70E+12	0.3	6791.8
Declared duplicate reaction...			
660. C3H6<=>C3H5-S+H	7.71E+69	-16.1	140000.0
661. C3H6+H<=>C3H5-A+H2	3.64E+05	2.5	4361.2
662. C3H6+O2<=>C3H5-A+HO2	5.96E+19	-1.7	46192.1
663. C3H6+O<=>C3H5-A+OH	5.24E+11	0.7	5884.0
664. C3H6+OH<=>C3H5-A+H2O	4.46E+06	2.1	1050.8
665. C3H6+HO2<=>C3H5-A+H2O2	3.07E-02	4.4	13547.2
666. C3H6+CH3<=>C3H5-A+CH4	2.21E+00	3.5	5675.0
667. C3H6+CH3O<=>C3H5-A+CH3OH	8.40E+10	0.0	2600.0
668. C3H6+CH3O2<=>C3H5-A+CH3O2H	7.68E-02	4.4	13547.2
669. C3H6+C2H5<=>C3H5-A+C2H6	1.00E+11	0.0	9800.0
670. C3H6+C2H5O2<=>C3H5-A+C2H5O2H	7.68E-02	4.4	13547.2
671. C3H6+CH3CO3<=>C3H5-A+CH3CO3H	7.68E-02	4.4	13547.2
672. C3H6+NC3H7O2<=>C3H5-A+NC3H7O2H	7.68E-02	4.4	13547.2
673. C3H6+IC3H7O2<=>C3H5-A+IC3H7O2H	7.68E-02	4.4	13547.2
674. C3H6+H<=>C3H5-T+H2	1.50E+02	3.4	8909.5
675. C3H6+O<=>C3H5-T+OH	6.03E+10	0.7	7632.0
676. C3H6+OH<=>C3H5-T+H2O	1.80E+06	2.0	2235.2
677. C3H6+HO2<=>C3H5-T+H2O2	1.56E+04	2.8	24427.9
678. C3H6+O2<=>C3H5-T+HO2	1.00E+13	0.0	58770.0
679. C3H6+CH3<=>C3H5-T+CH4	8.40E-01	3.5	11660.0
680. C3H6+H<=>C3H5-S+H2	5.10E+02	3.2	12357.0
Declared duplicate reaction...			
681. C3H6+H<=>C3H5-S+H2	3.97E+02	3.3	12007.0
Declared duplicate reaction...			
682. C3H6+O2<=>C3H5-S+HO2	2.00E+13	0.0	62270.0
683. C3H6+O<=>C3H5-S+OH	1.20E+11	0.7	8959.1
684. C3H6+OH<=>C3H5-S+H2O	1.86E+05	2.4	2502.0
685. C3H6+HO2<=>C3H5-S+H2O2	9.57E+02	3.1	20798.6
686. C3H6+CH3<=>C3H5-S+CH4	1.35E+00	3.5	12850.0
687. C3H6+O<=>C2H5+HCO	7.45E+06	1.9	183.0
688. C3H6+O=>CH2CO+CH3+H	3.05E+06	1.9	183.0
689. C3H6+O=>CH3CHCO+H+H	3.05E+06	1.9	183.0
690. C3H6+H<=>NC3H7	1.00E+00	1.0	0.0
Rate coefficients at P=1.30E-03(atm)	7.99E+81	-23.2	22239.0
Rate coefficients at P=4.00E-02(atm)	4.24E+68	-18.4	19665.0
Rate coefficients at P=1.00E+00(atm)	1.04E+49	-11.5	15359.0
Rate coefficients at P=1.00E+01(atm)	6.20E+41	-8.9	14637.0
Rate coefficients at P=1.00E+02(atm)	1.00E-10	0.0	0.0
Declared duplicate reaction...			
691. C3H6+H<=>NC3H7	1.00E+00	1.0	0.0
Rate coefficients at P=1.30E-03(atm)	1.85E+26	-5.8	3865.8
Rate coefficients at P=4.00E-02(atm)	2.82E+30	-6.5	5470.8
Rate coefficients at P=1.00E+00(atm)	3.78E+28	-5.6	5625.1
Rate coefficients at P=1.00E+01(atm)	1.46E+25	-4.3	5247.8
Rate coefficients at P=1.00E+02(atm)	4.22E+27	-4.4	9345.8
Declared duplicate reaction...			
692. C3H6+H<=>C2H4+CH3	1.00E+00	1.0	1.0
Rate coefficients at P=1.30E-03(atm)	1.54E+09	1.4	2542.0
Rate coefficients at P=4.00E-02(atm)	7.88E+10	0.9	3599.6
Rate coefficients at P=1.00E+00(atm)	2.67E+12	0.5	5431.1
Rate coefficients at P=1.00E+01(atm)	9.25E+22	-2.6	12898.0
Rate coefficients at P=1.00E+02(atm)	1.32E+23	-2.4	16500.0
Declared duplicate reaction...			
693. C3H6+H<=>C2H4+CH3	1.00E+00	1.0	1.0
Rate coefficients at P=1.30E-03(atm)	1.00E-10	0.0	0.0
Rate coefficients at P=4.00E-02(atm)	1.00E-10	0.0	0.0
Rate coefficients at P=1.00E+00(atm)	1.00E-10	0.0	0.0
Rate coefficients at P=1.00E+01(atm)	1.24E+05	2.5	3679.1
Rate coefficients at P=1.00E+02(atm)	2.51E+03	2.9	3980.9
Declared duplicate reaction...			
694. C3H6+H<=>IC3H7	1.00E+00	1.0	1.0
Rate coefficients at P=1.30E-03(atm)	1.35E+44	-10.7	8196.4
Rate coefficients at P=4.00E-02(atm)	2.11E+57	-14.2	15147.0
Rate coefficients at P=1.00E+00(atm)	3.26E+61	-14.9	20161.0
Rate coefficients at P=1.00E+01(atm)	5.30E+56	-13.1	20667.0
Rate coefficients at P=1.00E+02(atm)	1.11E+50	-10.8	20202.0
Declared duplicate reaction...			
695. C3H6+H<=>IC3H7	1.00E+00	1.0	1.0
Rate coefficients at P=1.30E-03(atm)	2.17+130	-32.6	136140.0
Rate coefficients at P=4.00E-02(atm)	2.25E+29	-5.8	4241.9
Rate coefficients at P=1.00E+00(atm)	1.06E+30	-5.6	5613.4
Rate coefficients at P=1.00E+01(atm)	6.11E+26	-4.4	5182.3
Rate coefficients at P=1.00E+02(atm)	2.73E+23	-3.3	4597.0

Declared duplicate reaction...			
696. C2H4+CH3<=>NC3H7	1.00E+00	1.0	1.0
Rate coefficients at P=1.30E-03(atm)	8.67E+48	-12.5	18206.0
Rate coefficients at P=4.00E-02(atm)	1.06E+49	-12.0	20001.0
Rate coefficients at P=1.00E+00(atm)	7.67E+47	-11.2	22366.0
Rate coefficients at P=1.00E+01(atm)	1.81E+45	-10.0	23769.0
Rate coefficients at P=1.00E+02(atm)	2.04E+40	-8.2	24214.0
Declared duplicate reaction...			
697. C2H4+CH3<=>NC3H7	1.00E+00	1.0	1.0
Rate coefficients at P=1.30E-03(atm)	1.12E+43	-11.3	13080.0
Rate coefficients at P=4.00E-02(atm)	7.28E+39	-9.9	13164.0
Rate coefficients at P=1.00E+00(atm)	2.60E+33	-7.5	12416.0
Rate coefficients at P=1.00E+01(atm)	3.85E+27	-5.4	11455.0
Rate coefficients at P=1.00E+02(atm)	1.66E+21	-3.2	10241.0
Declared duplicate reaction...			
698. C3H6+HO2<=>C3H6OOH2-1	4.85E-21	2.6	11201.0
Rate coefficients at P=1.30E-02(atm)	1.31E+13	-1.8	8561.0
Rate coefficients at P=9.87E-01(atm)	5.93E+17	-2.6	11533.0
Rate coefficients at P=9.87E+00(atm)	8.34E+24	-4.4	16440.0
Rate coefficients at P=9.87E+01(atm)	3.75E+23	-3.7	17965.0
699. C3H6+HO2<=>C3H6O1-2+OH	1.13E+19	-1.7	23587.0
Rate coefficients at P=1.30E-02(atm)	3.73E+03	2.6	11173.0
Rate coefficients at P=9.87E-01(atm)	1.78E+12	0.1	16137.0
Rate coefficients at P=9.87E+00(atm)	3.90E+17	-1.4	20077.0
Rate coefficients at P=9.87E+01(atm)	1.13E+19	-1.7	23587.0
700. C3H6+HO2<=>IC3H7+O2	8.87E+22	-3.1	26586.0
Rate coefficients at P=1.30E-02(atm)	1.02E+07	1.2	10273.0
Rate coefficients at P=9.87E-01(atm)	1.31E+20	-2.6	19078.0
Rate coefficients at P=9.87E+00(atm)	4.14E+28	-4.9	26212.0
Rate coefficients at P=9.87E+01(atm)	8.87E+22	-3.1	26586.0
701. C3H6OOH2-1<=>C3H6O1-2+OH	6.91E+07	1.4	13373.0
Rate coefficients at P=1.30E-02(atm)	2.66E+35	-8.4	18056.0
Rate coefficients at P=9.87E-01(atm)	1.96E+35	-7.7	20595.0
Rate coefficients at P=9.87E+00(atm)	2.24E+33	-6.8	21619.0
Rate coefficients at P=9.87E+01(atm)	8.48E+26	-4.6	20278.0
702. C3H5-A+H<=>C3H4-A+H2	1.23E+03	3.0	2582.0
703. C3H5-A+OH<=>C3H4-A+H2O	6.00E+12	0.0	0.0
704. C3H5-A+CH3<=>C3H4-A+CH4	3.00E+12	-0.3	-131.0
705. C3H5-A+C2H5<=>C3H4-A+C2H6	4.00E+11	0.0	0.0
706. C3H5-A+C2H3<=>C3H4-A+C2H4	1.00E+12	0.0	0.0
707. C3H4-A+C3H4-A<=>C3H5-A+C3H3	5.00E+14	0.0	64746.7
708. C3H5-S+H<=>C3H4-A+H2	3.33E+12	0.0	0.0
709. C3H5-S+CH3<=>C3H4-A+CH4	1.00E+11	0.0	0.0
710. C3H5-S+H<=>C3H4-P+H2	3.34E+12	0.0	0.0
711. C3H5-S+CH3<=>C3H4-P+CH4	1.00E+11	0.0	0.0
712. C3H5-T+H<=>C3H4-P+H2	3.34E+12	0.0	0.0
713. C3H5-T+CH3<=>C3H4-P+CH4	1.00E+11	0.0	0.0
714. C3H5-A+C3H5-A<=>C3H4-A+C3H6	9.55E+40	-9.3	12470.0
Rate coefficients at P=1.00E+00(atm)	4.77E+40	-9.3	12470.0
Rate coefficients at P=4.00E+00(atm)	3.97E+32	-6.8	9180.0
Rate coefficients at P=1.00E+01(atm)	1.46E+28	-5.5	7410.0
715. C3H5-A+C2H5<=>C2H4+C3H6	4.00E+11	0.0	0.0
716. C3H5-A+HCO<=>C3H6+CO	6.00E+13	0.0	0.0
717. C3H5-S+HCO<=>C3H6+CO	9.00E+13	0.0	0.0
718. C3H5-T+HCO<=>C3H6+CO	9.00E+13	0.0	0.0
719. C3H5-S+O<=>C2H4+HCO	6.00E+13	0.0	0.0
720. C3H5-S+OH=>C2H4+HCO+H	5.00E+12	0.0	0.0
721. C3H5-S+HO2=>C2H4+HCO+OH	2.00E+13	0.0	0.0
722. C3H5-T+O<=>CH3+CH2CO	6.00E+13	0.0	0.0
723. C3H5-T+OH=>CH3+CH2CO+H	5.00E+12	0.0	0.0
724. C3H5-T+HO2=>CH3+CH2CO+OH	2.00E+13	0.0	0.0
725. C3H5-A+O<=>C2H3CHO+H	6.00E+13	0.0	0.0
726. C3H5-A+OH=>C2H3CHO+H+H	5.30E+37	-6.7	29306.0
Rate coefficients at P=1.00E-01(atm)	5.30E+37	-6.7	29306.0
Rate coefficients at P=1.00E+00(atm)	4.20E+32	-5.2	30126.0
Rate coefficients at P=1.00E+01(atm)	1.60E+20	-1.6	26330.0
727. C3H5-A+O2<=>C3H4-A+HO2	4.99E+15	-1.4	22428.0
Rate coefficients at P=1.00E+00(atm)	4.99E+15	-1.4	22428.0
Rate coefficients at P=1.00E+01(atm)	2.18E+21	-2.9	30755.0
728. C3H5-A+O2<=>CH3CO+CH2O	1.19E+15	-1.0	20128.0
Rate coefficients at P=1.00E+00(atm)	1.19E+15	-1.0	20128.0
Rate coefficients at P=1.00E+01(atm)	7.14E+15	-1.2	21046.0
729. C3H5-A+O2<=>C2H3CHO+OH	1.82E+13	-0.4	22859.0
Rate coefficients at P=1.00E+00(atm)	1.82E+13	-0.4	22859.0
Rate coefficients at P=1.00E+01(atm)	2.47E+13	-0.5	23017.0
730. C3H5-S+O2<=>CH3CHO+HCO	3.10E+31	-5.9	5748.4
731. C3H5-S+O2<=>CH3CHCHO+O	5.38E+18	-2.1	5142.9
732. C3H5-S+O2<=>C2H3CHO+OH	2.70E+19	-2.1	5142.9
733. C3H5-T+O2<=>CH3COCH2+O	9.86E+25	-3.8	11255.4
734. C3H5-T+O2<=>CH3CO+CH2O	2.55E+20	-2.6	1565.7
735. C3H5-T+O2<=>C3H4-A+HO2	3.59E+10	-0.3	-413.6
736. C3H5-A+HO2<=>C3H5O+OH	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	1.02E+13	-0.2	-1417.0
Rate coefficients at P=1.00E-01(atm)	4.98E+14	-0.6	-349.1
Rate coefficients at P=1.00E+00(atm)	7.77E+17	-1.5	2379.2
Rate coefficients at P=1.00E+01(atm)	2.93E+15	-0.7	3615.3
Rate coefficients at P=1.00E+02(atm)	1.64E+04	2.7	1144.4
737. C3H5-A+HO2<=>AC3H5OOH	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	1.91E+31	-7.2	1336.2
Rate coefficients at P=1.00E-01(atm)	6.31E+42	-10.3	5568.9
Rate coefficients at P=1.00E+00(atm)	1.03E+45	-10.6	7851.5
Rate coefficients at P=1.00E+01(atm)	2.79E+37	-7.9	6497.9
Rate coefficients at P=1.00E+02(atm)	1.44E+32	-6.0	6053.6
738. C3H5-A+HO2<=>C2H3CHO+H2O	1.00E+11	0.0	0.0

Rate coefficients at P=1.00E-02(atm)	1.09E+00	3.0	-3421.1
Rate coefficients at P=1.00E-01(atm)	6.35E+01	2.5	-2341.4
Rate coefficients at P=1.00E+00(atm)	6.05E+05	1.4	595.1
Rate coefficients at P=1.00E+01(atm)	3.10E+05	1.6	2677.6
Rate coefficients at P=1.00E+02(atm)	5.07E-05	4.6	927.5
739. AC3H5OOH<=>C2H3CHO+H2O	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	1.99E+50	-12.7	53531.9
Rate coefficients at P=1.00E-01(atm)	4.72E+47	-11.5	54360.9
Rate coefficients at P=1.00E+00(atm)	1.50E+40	-8.8	53179.2
Rate coefficients at P=1.00E+01(atm)	2.54E+28	-5.0	49919.4
Rate coefficients at P=1.00E+02(atm)	1.48E+16	-1.1	45949.3
740. AC3H5OOH<=>C3H5O+OH	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	1.49E+58	-13.9	54266.9
Rate coefficients at P=1.00E-01(atm)	1.80E+54	-12.4	54193.8
Rate coefficients at P=1.00E+00(atm)	3.36E+46	-9.8	52468.5
Rate coefficients at P=1.00E+01(atm)	2.39E+36	-6.5	49429.0
Rate coefficients at P=1.00E+02(atm)	1.28E+27	-3.6	46333.1
741. C3H5O<=>C2H3+CH2O	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	7.26E+06	0.2	17815.5
Rate coefficients at P=1.00E-02(atm)	6.97E+16	-2.5	20878.7
Rate coefficients at P=1.00E-01(atm)	6.64E+23	-4.2	23565.0
Rate coefficients at P=1.00E+00(atm)	1.07E+26	-4.6	24622.9
Rate coefficients at P=1.00E+01(atm)	6.50E+29	-5.4	26645.0
Rate coefficients at P=1.00E+02(atm)	4.63E+31	-5.6	28915.3
Rate coefficients at P=1.00E+03(atm)	8.52E+25	-3.6	27863.4
742. C3H5O<=>CH2CHOCH2	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	3.17E+20	-4.2	12121.3
Rate coefficients at P=1.00E-02(atm)	4.79E+24	-5.0	14606.1
Rate coefficients at P=1.00E-01(atm)	1.90E+26	-5.2	16124.4
Rate coefficients at P=1.00E+00(atm)	1.51E+28	-5.4	18165.4
Rate coefficients at P=1.00E+01(atm)	2.42E+28	-5.2	19691.2
Rate coefficients at P=1.00E+02(atm)	5.57E+24	-3.9	19395.2
Rate coefficients at P=1.00E+03(atm)	1.35E+18	-1.7	17386.5
743. C3H5O<=>CH2CH2CHO	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	5.25E-49	15.5	-15639.9
Rate coefficients at P=1.00E-02(atm)	1.46E-88	27.6	-35995.0
Rate coefficients at P=1.00E-01(atm)	4.44E-22	8.4	-3819.0
Rate coefficients at P=1.00E+00(atm)	6.23E+12	-1.4	10829.2
Rate coefficients at P=1.00E+01(atm)	3.48E+42	-9.9	25297.9
Rate coefficients at P=1.00E+02(atm)	1.88E+38	-8.2	25974.5
Rate coefficients at P=1.00E+03(atm)	1.67E+21	-2.7	20337.7
744. C3H5O<=>C2H3CHO+H	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	3.00E+15	-2.3	14667.9
Rate coefficients at P=1.00E-02(atm)	1.50E+22	-4.0	18283.0
Rate coefficients at P=1.00E-01(atm)	1.95E+23	-4.0	19143.3
Rate coefficients at P=1.00E+00(atm)	1.15E+25	-4.2	20311.2
Rate coefficients at P=1.00E+01(atm)	1.76E+28	-4.9	22765.2
Rate coefficients at P=1.00E+02(atm)	1.41E+27	-4.3	23770.6
Rate coefficients at P=1.00E+03(atm)	2.57E+20	-2.1	22040.1
745. C3H5O<=>C2H4+HCO	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	6.62E+16	-2.8	13197.0
Rate coefficients at P=1.00E-02(atm)	1.26E+20	-3.5	15469.2
Rate coefficients at P=1.00E-01(atm)	2.13E+21	-3.6	16584.5
Rate coefficients at P=1.00E+00(atm)	1.07E+24	-4.2	18985.0
Rate coefficients at P=1.00E+01(atm)	8.42E+25	-4.4	22382.6
Rate coefficients at P=1.00E+02(atm)	1.86E+21	-2.7	23658.8
Rate coefficients at P=1.00E+03(atm)	4.75E+08	1.1	20922.5
746. CH2CHOCH2<=>C2H3+CH2O	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	3.30E+09	-0.6	19747.8
Rate coefficients at P=1.00E-02(atm)	3.36E+21	-3.9	23945.2
Rate coefficients at P=1.00E-01(atm)	2.91E+29	-5.9	27249.7
Rate coefficients at P=1.00E+00(atm)	1.83E+34	-6.9	30690.4
Rate coefficients at P=1.00E+01(atm)	9.72E+33	-6.5	33002.5
Rate coefficients at P=1.00E+02(atm)	2.68E+27	-4.3	33305.6
Rate coefficients at P=1.00E+03(atm)	8.81E+14	-0.3	31553.1
747. CH2CHOCH2<=>CH2CH2CHO	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	8.01E-92	27.8	-37321.2
Rate coefficients at P=1.00E-02(atm)	7.78E-11	3.7	-2766.9
Rate coefficients at P=1.00E-01(atm)	5.11E+15	-2.8	15937.6
Rate coefficients at P=1.00E+00(atm)	4.48E+25	-5.2	21532.2
Rate coefficients at P=1.00E+01(atm)	3.97E+34	-7.4	28116.9
Rate coefficients at P=1.00E+02(atm)	5.62E+22	-3.6	25806.7
Rate coefficients at P=1.00E+03(atm)	2.51E+20	-2.6	29288.4
748. CH2CHOCH2<=>C2H3CHO+H	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	4.93E+24	-5.0	20108.4
Rate coefficients at P=1.00E-02(atm)	2.14E+28	-5.8	22219.4
Rate coefficients at P=1.00E-01(atm)	1.93E+32	-6.6	25108.2
Rate coefficients at P=1.00E+00(atm)	8.60E+34	-7.1	28209.1
Rate coefficients at P=1.00E+01(atm)	2.17E+34	-6.6	30647.6
Rate coefficients at P=1.00E+02(atm)	4.17E+28	-4.7	31231.9
Rate coefficients at P=1.00E+03(atm)	3.98E+18	-1.6	30129.8
749. CH2CHOCH2<=>C2H4+HCO	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	8.23E+26	-5.8	19356.9
Rate coefficients at P=1.00E-02(atm)	1.32E+29	-6.2	21293.6
Rate coefficients at P=1.00E-01(atm)	3.47E+32	-7.0	24197.3
Rate coefficients at P=1.00E+00(atm)	1.44E+36	-7.8	28007.8
Rate coefficients at P=1.00E+01(atm)	9.72E+37	-8.0	32394.6
Rate coefficients at P=1.00E+02(atm)	2.43E+31	-5.8	34295.8
Rate coefficients at P=1.00E+03(atm)	3.73E+14	-0.7	32008.3
750. CH2CH2CHO<=>C2H3+CH2O	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	6.89E-69	21.5	2638.0
Rate coefficients at P=1.00E-02(atm)	5.34E-33	11.1	16749.1
Rate coefficients at P=1.00E-01(atm)	6.11E+26	-6.0	44116.7
Rate coefficients at P=1.00E+00(atm)	8.04E+35	-8.3	46919.7

Rate coefficients at P=1.00E+01(atm)	5.52E+40	-9.2	50508.7
Rate coefficients at P=1.00E+02(atm)	5.85E+35	-7.2	52038.4
Rate coefficients at P=1.00E+03(atm)	1.93E+19	-1.9	48440.0
751. CH2CH2CHO<=>C2H3CHO+H	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	1.61E+10	-1.2	32371.3
Rate coefficients at P=1.00E-02(atm)	5.84E+15	-2.6	32878.4
Rate coefficients at P=1.00E-01(atm)	3.64E+23	-4.6	34275.3
Rate coefficients at P=1.00E+00(atm)	7.58E+31	-6.6	37895.4
Rate coefficients at P=1.00E+01(atm)	2.86E+32	-6.3	39990.7
Rate coefficients at P=1.00E+02(atm)	1.57E+23	-3.1	38011.7
Rate coefficients at P=1.00E+03(atm)	4.52E+12	0.2	34570.5
752. CH2CH2CHO<=>C2H4+HCO	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	2.90E+32	-7.2	25687.5
Rate coefficients at P=1.00E-02(atm)	5.30E+33	-7.3	27100.6
Rate coefficients at P=1.00E-01(atm)	2.00E+35	-7.4	29027.3
Rate coefficients at P=1.00E+00(atm)	1.01E+34	-6.7	30018.1
Rate coefficients at P=1.00E+01(atm)	9.76E+27	-4.6	28923.9
Rate coefficients at P=1.00E+02(atm)	2.11E+19	-1.9	26239.8
Rate coefficients at P=1.00E+03(atm)	1.59E+13	0.1	24086.3
753. C2H3+CH2O<=>C2H3CHO+H	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	2.60E+04	2.3	1510.3
Rate coefficients at P=1.00E-02(atm)	5.13E+04	2.2	1675.5
Rate coefficients at P=1.00E-01(atm)	3.99E+05	1.9	2218.3
Rate coefficients at P=1.00E+00(atm)	1.75E+07	1.4	3428.0
Rate coefficients at P=1.00E+01(atm)	1.35E+09	0.9	5173.0
Rate coefficients at P=1.00E+02(atm)	2.24E+11	0.4	8001.3
Rate coefficients at P=1.00E+03(atm)	6.01E+05	2.1	7895.6
754. C2H3+CH2O<=>C2H4+HCO	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	1.11E+07	1.1	1807.2
Rate coefficients at P=1.00E-02(atm)	2.47E+07	1.0	1994.9
Rate coefficients at P=1.00E-01(atm)	2.47E+08	0.7	2596.2
Rate coefficients at P=1.00E+00(atm)	1.42E+10	0.2	3934.2
Rate coefficients at P=1.00E+01(atm)	3.45E+13	-0.7	6944.3
Rate coefficients at P=1.00E+02(atm)	3.31E+14	-0.9	10965.7
Rate coefficients at P=1.00E+03(atm)	1.65E+01	3.2	9399.8
755. C3H5-A+CH3O2<=>C3H5O+CH3O	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	3.33E+12	-0.2	-1417.0
Rate coefficients at P=1.00E-01(atm)	1.66E+14	-0.6	-349.1
Rate coefficients at P=1.00E+00(atm)	2.60E+17	-1.5	2379.2
Rate coefficients at P=1.00E+01(atm)	9.78E+14	-0.7	3615.3
Rate coefficients at P=1.00E+02(atm)	5.47E+03	2.7	1144.4
756. C3H5-A+CH3O2<=>AC4H7OOH	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	1.91E+31	-7.2	1336.2
Rate coefficients at P=1.00E-01(atm)	6.31E+42	-10.3	5568.9
Rate coefficients at P=1.00E+00(atm)	1.03E+45	-10.6	7851.5
Rate coefficients at P=1.00E+01(atm)	2.79E+37	-7.9	6497.9
Rate coefficients at P=1.00E+02(atm)	3.40E+29	-5.3	4539.8
757. AC4H7OOH<=>C3H5O+CH3O	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	1.49E+58	-13.9	54266.9
Rate coefficients at P=1.00E-01(atm)	1.80E+54	-12.4	54193.8
Rate coefficients at P=1.00E+00(atm)	3.36E+46	-9.8	52468.5
Rate coefficients at P=1.00E+01(atm)	2.39E+36	-6.5	49429.0
Rate coefficients at P=1.00E+02(atm)	2.56E+27	-3.6	46333.1
758. C3H6+OH<=>C3H5OH+H	2.29E+13	0.1	10580.0
Rate coefficients at P=1.30E-03(atm)	2.67E+13	0.1	10611.0
Rate coefficients at P=1.00E-02(atm)	2.75E+13	0.1	10623.0
Rate coefficients at P=1.30E-02(atm)	2.87E+13	0.0	10634.0
Rate coefficients at P=2.50E-02(atm)	1.59E+14	-0.2	11125.0
Rate coefficients at P=1.00E-01(atm)	3.10E+14	-0.2	11407.0
Rate coefficients at P=1.32E-01(atm)	3.78E+14	-0.2	11458.0
Rate coefficients at P=1.00E+00(atm)	9.15E+07	1.4	10087.0
Rate coefficients at P=1.00E+01(atm)	3.66E+05	2.1	10410.0
Rate coefficients at P=1.00E+02(atm)	8.19E+02	2.8	10481.0
759. C3H6+OH<=>C2H3OH+CH3	1.29E+06	1.6	1233.0
Rate coefficients at P=1.30E-03(atm)	1.29E+06	1.6	1233.0
Rate coefficients at P=1.00E-02(atm)	1.82E+04	2.1	1162.0
Rate coefficients at P=1.30E-02(atm)	2.04E+03	2.5	1128.0
Rate coefficients at P=2.50E-02(atm)	2.88E+02	2.8	1152.0
Rate coefficients at P=1.00E-01(atm)	1.40E+01	3.2	1208.0
Rate coefficients at P=1.32E-01(atm)	7.71E+00	3.3	1216.0
Rate coefficients at P=1.00E+00(atm)	1.13E+04	2.5	3238.0
Rate coefficients at P=1.00E+01(atm)	2.41E+19	-1.7	13107.0
Rate coefficients at P=1.00E+02(atm)	3.30E-01	3.7	3665.0
760. C3H6+OH<=>IC3H5OH+H	2.87E+00	2.9	625.0
Rate coefficients at P=1.30E-03(atm)	2.87E+00	2.9	625.0
Rate coefficients at P=1.00E-02(atm)	4.84E-01	3.0	704.0
Rate coefficients at P=1.30E-02(atm)	3.13E-01	3.0	721.0
Rate coefficients at P=2.50E-02(atm)	9.33E-03	3.6	677.0
Rate coefficients at P=1.00E-01(atm)	4.64E-05	4.5	687.0
Rate coefficients at P=1.32E-01(atm)	2.71E-05	4.6	707.0
Rate coefficients at P=1.00E+00(atm)	7.65E-07	5.0	874.0
Rate coefficients at P=1.00E+01(atm)	2.64E+15	-0.8	12728.0
Rate coefficients at P=1.00E+02(atm)	4.87E-04	4.3	4020.0
761. C3H6+OH<=>SC3H5OH+H	2.87E+00	2.9	625.0
Rate coefficients at P=1.30E-03(atm)	3.47E+06	1.5	4288.0
Rate coefficients at P=1.00E-02(atm)	1.08E+07	1.3	4576.0
Rate coefficients at P=1.30E-02(atm)	9.76E+06	1.3	4589.0
Rate coefficients at P=2.50E-02(atm)	5.14E+06	1.4	4594.0
Rate coefficients at P=1.00E-01(atm)	3.13E+05	1.7	4603.0
Rate coefficients at P=1.32E-01(atm)	1.39E+05	1.8	4603.0
Rate coefficients at P=1.00E+00(atm)	1.03E+02	2.8	4530.0
Rate coefficients at P=1.00E+01(atm)	3.40E-02	3.9	4390.0
Rate coefficients at P=1.00E+02(atm)	4.46E-06	5.0	4132.0
762. C3H6+OH<=>CH3CHO+CH3	6.93E+05	1.5	-536.0

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     Rate coefficients at P=1.30E-03(atm)          6.93E+05    1.5     -536.0
     Rate coefficients at P=1.00E-02(atm)          5.94E+03    2.0     -560.0
     Rate coefficients at P=1.30E-02(atm)          1.10E+03    2.2     -680.0
     Rate coefficients at P=2.50E-02(atm)          1.07E+02    2.5     -759.0
     Rate coefficients at P=1.00E-01(atm)          7.83E-01    3.1     -919.0
     Rate coefficients at P=1.32E-01(atm)          3.07E-01    3.2     -946.0
     Rate coefficients at P=1.00E+00(atm)          3.16E-04    4.0    -1144.0
     Rate coefficients at P=1.00E+01(atm)          7.59E-06    4.5     -680.0
     Rate coefficients at P=1.00E+02(atm)          5.45E-05    4.2     1141.0
763. C3H6+OH<=>C3H6OH1-2                            5.10E+54  -20.7    32402.0
     Rate coefficients at P=1.30E-03(atm)          2.30E+78  -20.7    32402.0
     Rate coefficients at P=1.00E-02(atm)          2.74E+77  -20.0    33874.0
     Rate coefficients at P=1.30E-02(atm)          1.07E+76  -19.6    32874.0
     Rate coefficients at P=2.50E-02(atm)          3.68E+73  -18.8    31361.0
     Rate coefficients at P=1.00E-01(atm)          1.04E+68  -17.0    27909.0
     Rate coefficients at P=1.32E-01(atm)          7.23E+66  -16.6    27162.0
     Rate coefficients at P=1.00E+00(atm)          1.95E+59  -14.2    23079.0
     Rate coefficients at P=1.00E+01(atm)          7.58E+53  -12.2    22976.0
     Rate coefficients at P=1.00E+02(atm)          1.43E+48  -10.2    23772.0
     Declared duplicate reaction...
764. C3H6+OH<=>C3H6OH1-2                            1.42E+36  -15.8    11594.0
     Rate coefficients at P=1.30E-03(atm)          6.41E+59  -15.8    11594.0
     Rate coefficients at P=1.00E-02(atm)          7.28E+59  -15.5    12898.0
     Rate coefficients at P=1.30E-02(atm)          2.79E+59  -15.3    12913.0
     Rate coefficients at P=2.50E-02(atm)          2.65E+58  -14.9    12936.0
     Rate coefficients at P=1.00E-01(atm)          1.35E+56  -14.0    12945.0
     Rate coefficients at P=1.32E-01(atm)          3.98E+55  -13.8    12887.0
     Rate coefficients at P=1.00E+00(atm)          1.55E+50  -12.0    11493.0
     Rate coefficients at P=1.00E+01(atm)          6.41E+41   -9.3     8921.0
     Rate coefficients at P=1.00E+02(atm)          2.30E+32   -6.3     6088.0
     Declared duplicate reaction...
765. C3H6+OH<=>C3H6OH2-1                            5.10E+54  -20.7    32402.0
     Rate coefficients at P=1.30E-03(atm)          2.14E+59  -15.8    11594.0
     Rate coefficients at P=1.00E-02(atm)          2.43E+59  -15.5    12898.0
     Rate coefficients at P=1.30E-02(atm)          9.30E+58  -15.3    12913.0
     Rate coefficients at P=2.50E-02(atm)          8.83E+57  -14.9    12936.0
     Rate coefficients at P=1.00E-01(atm)          4.50E+55  -14.0    12945.0
     Rate coefficients at P=1.32E-01(atm)          1.33E+55  -13.8    12887.0
     Rate coefficients at P=1.00E+00(atm)          5.18E+49  -12.0    11493.0
     Rate coefficients at P=1.00E+01(atm)          2.14E+41   -9.3     8921.0
     Rate coefficients at P=1.00E+02(atm)          7.65E+31   -6.3     6088.0
     Declared duplicate reaction...
766. C3H6+OH<=>C3H6OH2-1                            1.42E+36  -15.8    11594.0
     Rate coefficients at P=1.30E-03(atm)          7.68E+77  -20.7    32402.0
     Rate coefficients at P=1.00E-02(atm)          9.13E+76  -20.0    33874.0
     Rate coefficients at P=1.30E-02(atm)          3.55E+75  -19.6    32874.0
     Rate coefficients at P=2.50E-02(atm)          1.23E+73  -18.8    31361.0
     Rate coefficients at P=1.00E-01(atm)          3.45E+67  -17.0    27909.0
     Rate coefficients at P=1.32E-01(atm)          2.41E+66  -16.6    27162.0
     Rate coefficients at P=1.00E+00(atm)          6.50E+58  -14.2    23079.0
     Rate coefficients at P=1.00E+01(atm)          2.53E+53  -12.2    22976.0
     Rate coefficients at P=1.00E+02(atm)          4.78E+47  -10.2    23772.0
     Declared duplicate reaction...
767. CH2CCH2OH+H<=>C3H5OH                           1.00E+14    0.0        0.0
768. C3H5OH+H<=>CH2CCH2OH+H2                        3.90E+05    2.5     5821.0
769. C3H5OH+O2<=>CH2CCH2OH+HO2                      4.00E+13    0.0    60690.0
770. C3H5OH+OH<=>CH2CCH2OH+H2O                      5.06E+12    0.0     5960.0
771. C3H5OH+CH3<=>CH2CCH2OH+CH4                     2.40E+11    0.0     8030.0
772. CH2CCH2OH+H2O2<=>C3H5OH+HO2                    3.01E+09    0.0     2583.0
773. CH2CCH2OH<=>C2H2+CH2OH                         2.16E+40   -8.3    45110.0
774. CH2CCH2OH<=>CH2O+C2H3                          9.24E+10    0.9    30460.0
775. CH2CCH2OH<=>C2H3CHO+H                          1.11E+11    0.5    36770.0
776. CH2CCH2OH<=>HCO+C2H4                           9.24E+10    0.9    30460.0
777. CH2CCH2OH+O2=>CH2OH+CO+CH2O                    4.34E+12    0.0        0.0
778. C3H5O+O2<=>C2H3CHO+HO2                         1.00E+12    0.0     6000.0
779. CH3COCH3+H<=>C3H6OH2-1                         8.00E+12    0.0     9500.0
780. IC3H5OH+H<=>C3H6OH2-1                          6.25E+11    0.5     4020.0
781. C2H5CHO+H<=>C3H6OH1-2                          8.00E+12    0.0     9500.0
782. C3H5-T+OH<=>IC3H5OH                            5.00E+13    0.0        0.0
783. C3H6OH2-1+O2<=>CH3COCH3+HO2                    1.50E+12    0.0     5000.0
784. C3H6OH1-2+O2<=>C2H5CHO+HO2                     1.50E+12    0.0     5000.0
785. C3H6OH1-2+O2<=>HOC3H6O2                        1.20E+11    0.0    -1100.0
786. C3H6OH2-1+O2<=>HOC3H6O2                        1.20E+11    0.0    -1100.0
787. HOC3H6O2=>CH3CHO+CH2O+OH                       1.25E+10    0.0    18900.0
788. SC3H5OH<=>C2H5CHO                              8.59E+11    0.3    55900.0
789. SC3H5OH+O2=>C2H3CHO+H+HO2                      3.00E+13    0.0    39100.0
790. SC3H5OH+OH=>C2H3CHO+H+H2O                      3.10E+06    2.0     -298.0
791. SC3H5OH+H=>C2H3CHO+H+H2                        1.73E+05    2.5     2492.0
792. SC3H5OH+O=>C2H3CHO+H+OH                        1.75E+12    0.7     5884.0
793. SC3H5OH+HO2=>C2H3CHO+H+H2O2                    9.60E+03    2.6    13900.0
794. SC3H5OH+CH3=>C2H3CHO+H+CH4                     2.21E+00    3.5     5675.0
795. SC3H5OH+CH3O2=>C2H3CHO+H+CH3O2H                9.60E+03    2.6    13900.0
796. SC3H5OH+CH3O=>C2H3CHO+H+CH3OH                  8.30E+10    0.0     2600.0
797. SC3H5OH+HO2<=>C2H5CHO+HO2                      1.49E+05    1.7     6810.0
798. SC3H5OH+HOCHO<=>C2H5CHO+HOCHO                  2.81E-02    3.3    -4509.0
799. C3H5-A+C2H2<=>CVCCVCCJ                         1.00E+12    0.0     6883.4
800. C3H5-A+C2H3=>C5H6+H+H                          1.60E+35  -14.0    61137.7
801. C2H+CH3<=>C3H4-P                               8.00E+13    0.0        0.0
802. C3H4-A<=>C3H4-P                                4.79E+48  -10.0    88685.0
     Rate coefficients at P=1.00E+00(atm)          7.76E+39   -7.8    78446.0
     Rate coefficients at P=1.00E+01(atm)          4.79E+48  -10.0    88685.0
803. CC3H4<=>C3H4-P                                 1.66E+37   -7.2    48013.0
     Rate coefficients at P=3.95E-02(atm)          2.51E+50  -11.8    50914.0
     Rate coefficients at P=1.00E+00(atm)          1.23E+37   -7.5    45551.0
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     Rate coefficients at P=1.00E+01(atm)          1.66E+37   -7.2    48013.0
804. C3H3+H=C3H4-P                                  3.63E+36   -7.4     6039.0
     Rate coefficients at P=3.95E-02(atm)          3.63E+36   -7.4     6039.0
     Rate coefficients at P=1.00E+00(atm)          7.94E+29   -5.1     4861.0
     Rate coefficients at P=1.00E+01(atm)          1.07E+24   -3.1     3261.0
805. C3H3+H=C3H4-A                                  3.39E+36   -7.4     6337.0
     Rate coefficients at P=3.95E-02(atm)          3.39E+36   -7.4     6337.0
     Rate coefficients at P=1.00E+00(atm)          3.16E+29   -5.0     4711.0
     Rate coefficients at P=1.00E+01(atm)          8.71E+23   -3.2     3255.0
806. C3H3+H=CC3H4                                   8.91+112  -28.3    83611.0
     Rate coefficients at P=3.95E-02(atm)          8.91+112  -28.3    83611.0
     Rate coefficients at P=1.00E+00(atm)          1.07E+21   -3.0     2687.0
     Rate coefficients at P=1.00E+01(atm)          3.24E+18   -2.0     2053.0
807. C3H4-P+C3H3<=>C3H4-A+C3H3                      6.14E+06    1.7    10450.0
808. C3H4-P+O2<=>C3H3+HO2                           3.00E+13    0.0    42630.0
809. C3H4-P+O<=>C3H3+OH                             7.65E+08    1.5     8600.0
810. C3H4-P+H<=>C3H3+H2                             3.57E+04    2.8     4821.0
811. C3H4-P+OH<=>C3H3+H2O                           4.94E+06    2.0     1059.6
812. C3H4-P+HO2<=>C3H3+H2O2                         9.55E-02    4.2     9632.8
813. C3H4-P+CH3<=>C3H3+CH4                          1.80E+12    0.0     7700.0
814. C3H4-P+CH3O2<=>C3H3+CH3O2H                     9.55E-02    4.2     9632.8
815. C3H4-P+C2H<=>C2H2+C3H3                         1.00E+13    0.0        0.0
816. C3H4-P+C2H3<=>C3H3+C2H4                        1.00E+12    0.0     7700.0
817. C3H4-P+C3H5-A<=>C3H3+C3H6                      3.00E+12    0.0     7700.0
818. C3H4-A+H<=>C3H3+H2                             6.62E+03    3.1     5522.0
819. C3H4-A+O2<=>C3H3+HO2                           4.00E+13    0.0    41320.0
820. C3H4-A+OH<=>C3H3+H2O                           1.48E+05    2.5     1807.2
821. C3H4-A+CH3<=>C3H3+CH4                          1.30E+12    0.0     7700.0
822. C3H4-A+HO2<=>C3H3+H2O2                         3.58E-02    4.2     9632.8
823. C3H4-A+CH3O2<=>C3H3+CH3O2H                     7.16E-02    4.2     9632.8
824. C3H4-A+C3H5-A<=>C3H3+C3H6                      2.00E+11    0.0     7700.0
825. C3H4-A+H<=>C3H4-P+H                            2.44E+10    1.0     2159.0
     Rate coefficients at P=1.00E-03(atm)          8.49E+10    0.9     2503.0
     Rate coefficients at P=3.90E-02(atm)          1.48E+13    0.3     4103.0
     Rate coefficients at P=1.00E+00(atm)          2.48E+15   -0.3     6436.0
     Rate coefficients at P=1.00E+01(atm)          2.35E+25   -3.2    13165.0
     Rate coefficients at P=1.00E+02(atm)          1.02E+24   -2.7    15552.0
     Declared duplicate reaction...
826. C3H4-A+H<=>C3H4-P+H                            2.44E+10    1.0     2159.0
     Rate coefficients at P=1.00E-03(atm)          1.00E-10    0.0        0.0
     Rate coefficients at P=3.90E-02(atm)          1.00E-10    0.0        0.0
     Rate coefficients at P=1.00E+00(atm)          1.00E-10    0.0        0.0
     Rate coefficients at P=1.00E+01(atm)          1.79E+07    2.0     4521.0
     Rate coefficients at P=1.00E+02(atm)          4.63E+04    2.6     4466.0
     Declared duplicate reaction...
827. C3H4-A+H<=>C3H5-A                              2.21E+61  -15.2    20076.0
     Rate coefficients at P=1.00E-03(atm)          2.21E+61  -15.2    20076.0
     Rate coefficients at P=3.90E-02(atm)          1.24E+52  -12.0    17839.0
     Rate coefficients at P=1.00E+00(atm)          4.67E+51  -11.4    21340.0
     Rate coefficients at P=1.00E+01(atm)          3.75E+48  -10.3    22511.0
     Rate coefficients at P=1.00E+02(atm)          4.23E+43   -8.6    22522.0
     Declared duplicate reaction...
828. C3H4-A+H<=>C3H5-A                              2.21E+61  -15.2    20076.0
     Rate coefficients at P=1.00E-03(atm)          2.80E+38   -8.7     8035.0
     Rate coefficients at P=3.90E-02(atm)          9.33E+36   -8.2     7462.0
     Rate coefficients at P=1.00E+00(atm)          3.32E+30   -5.8     6913.0
     Rate coefficients at P=1.00E+01(atm)          2.29E+26   -4.3     6163.0
     Rate coefficients at P=1.00E+02(atm)          4.38E+21   -2.7     5187.0
     Declared duplicate reaction...
829. C3H4-A+H<=>C3H5-S                              1.10E+30   -6.5    15200.0
     Rate coefficients at P=1.00E-01(atm)          1.10E+30   -6.5    15200.0
     Rate coefficients at P=1.00E+00(atm)          5.40E+29   -6.1    16300.0
     Rate coefficients at P=1.00E+01(atm)          2.60E+31   -6.2    18700.0
     Rate coefficients at P=1.00E+02(atm)          3.20E+31   -5.9    21500.0
830. C3H4-A+H<=>C3H5-T                              6.44+102  -27.5    51768.0
     Rate coefficients at P=1.00E-03(atm)          6.44+102  -27.5    51768.0
     Rate coefficients at P=3.90E-02(atm)          1.55E+53  -13.1    14472.0
     Rate coefficients at P=1.00E+00(atm)          1.90E+53  -12.6    16726.0
     Rate coefficients at P=1.00E+01(atm)          7.95E+51  -11.8    18286.0
     Rate coefficients at P=1.00E+02(atm)          4.21E+52  -11.6    22262.0
     Declared duplicate reaction...
831. C3H4-A+H<=>C3H5-T                              6.44+102  -27.5    51768.0
     Rate coefficients at P=1.00E-03(atm)          1.10E+54  -14.3    10809.0
     Rate coefficients at P=3.90E-02(atm)          9.88E+44  -11.2     8212.0
     Rate coefficients at P=1.00E+00(atm)          2.81E+40   -9.4     7850.0
     Rate coefficients at P=1.00E+01(atm)          2.60E+35   -7.6     7147.0
     Rate coefficients at P=1.00E+02(atm)          9.88E+29   -5.5     6581.0
     Declared duplicate reaction...
832. C3H4-A+H<=>CH3+C2H2                            3.74E+01    3.4       57.8
     Rate coefficients at P=1.00E-03(atm)          1.23E+08    1.5     4737.0
     Rate coefficients at P=3.90E-02(atm)          2.72E+09    1.2     6834.0
     Rate coefficients at P=1.00E+00(atm)          1.26E+20   -1.8    15003.0
     Rate coefficients at P=1.00E+01(atm)          1.68E+16   -0.6    14754.0
     Rate coefficients at P=1.00E+02(atm)          1.37E+17   -0.8    17603.0
     Declared duplicate reaction...
833. C3H4-A+H<=>CH3+C2H2                            3.74E+01    3.4       57.8
     Rate coefficients at P=1.00E-03(atm)          1.00E-10    0.0        0.0
     Rate coefficients at P=3.90E-02(atm)          1.00E-10    0.0        0.0
     Rate coefficients at P=1.00E+00(atm)          1.23E+04    2.7     6335.0
     Rate coefficients at P=1.00E+01(atm)          3.31E+08    1.1     8886.0
     Rate coefficients at P=1.00E+02(atm)          1.28E+06    1.7     9774.0
     Declared duplicate reaction...
834. C3H4-P+H<=>C3H5-T                              8.85E+51  -13.0    12325.0
     Rate coefficients at P=1.00E-03(atm)          8.85E+51  -13.0    12325.0
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     Rate coefficients at P=3.90E-02(atm)          3.17E+52  -12.7    14226.0
     Rate coefficients at P=1.00E+00(atm)          2.87E+53  -12.5    16853.0
     Rate coefficients at P=1.00E+01(atm)          9.51E+51  -11.7    18331.0
     Rate coefficients at P=1.00E+02(atm)          4.51E+52  -11.6    22207.0
     Declared duplicate reaction...
835. C3H4-P+H<=>C3H5-T                              8.85E+51  -13.0    12325.0
     Rate coefficients at P=1.00E-03(atm)          1.97E+46  -11.9     7456.0
     Rate coefficients at P=3.90E-02(atm)          2.59E+45  -11.2     8046.0
     Rate coefficients at P=1.00E+00(atm)          6.93E+39   -9.1     7458.0
     Rate coefficients at P=1.00E+01(atm)          6.80E+34   -7.3     6722.0
     Rate coefficients at P=1.00E+02(atm)          5.65E+29   -5.4     6150.0
     Declared duplicate reaction...
836. C3H4-P+H<=>C3H5-S                              3.38E+49  -12.8    14072.0
     Rate coefficients at P=1.00E-03(atm)          1.00E-10    0.0        0.0
     Rate coefficients at P=3.90E-02(atm)          3.38E+49  -12.8    14072.0
     Rate coefficients at P=1.00E+00(atm)          1.37E+51  -12.6    15428.0
     Rate coefficients at P=1.00E+01(atm)          3.88E+50  -11.9    16915.0
     Rate coefficients at P=1.00E+02(atm)          2.17E+49  -11.1    18746.0
     Declared duplicate reaction...
837. C3H4-P+H<=>C3H5-S                              3.38E+49  -12.8    14072.0
     Rate coefficients at P=1.00E-03(atm)          1.49E+38  -10.1     7458.0
     Rate coefficients at P=3.90E-02(atm)          2.98E+43  -11.4     8736.0
     Rate coefficients at P=1.00E+00(atm)          5.75E+39   -9.5     8772.0
     Rate coefficients at P=1.00E+01(atm)          4.33E+40   -9.6     9401.0
     Rate coefficients at P=1.00E+02(atm)          3.44E+34   -7.4     8558.0
     Declared duplicate reaction...
838. C3H4-P+H<=>CH3+C2H2                            2.12E+10    1.1     3945.0
     Rate coefficients at P=1.00E-03(atm)          2.44E+10    1.0     3980.0
     Rate coefficients at P=3.90E-02(atm)          3.89E+10    1.0     4114.0
     Rate coefficients at P=1.00E+00(atm)          3.46E+12    0.4     5463.0
     Rate coefficients at P=1.00E+01(atm)          1.72E+14    0.0     7134.0
     Rate coefficients at P=1.00E+02(atm)          1.90E+15   -0.3     8306.0
839. C3H4-P+H<=>C3H5-A                              1.10E+60  -14.6    28100.0
     Rate coefficients at P=1.00E-01(atm)          1.10E+60  -14.6    28100.0
     Rate coefficients at P=1.00E+00(atm)          4.91E+60  -14.4    31644.0
     Rate coefficients at P=2.00E+00(atm)          3.04E+60  -14.2    32642.0
     Rate coefficients at P=5.00E+00(atm)          9.02E+59  -13.9    33953.0
     Rate coefficients at P=1.00E+01(atm)          2.20E+59  -13.6    34900.0
     Rate coefficients at P=1.00E+02(atm)          1.60E+55  -12.1    37500.0
840. C3H5-A<=>C3H5-T                                3.90E+59  -15.4    75400.0
     Rate coefficients at P=1.00E-01(atm)          3.90E+59  -15.4    75400.0
     Rate coefficients at P=1.00E+00(atm)          7.06E+56  -14.1    75868.0
     Rate coefficients at P=2.00E+00(atm)          4.80E+55  -13.6    75949.0
     Rate coefficients at P=5.00E+00(atm)          4.86E+53  -12.8    75883.0
     Rate coefficients at P=1.00E+01(atm)          6.40E+51  -12.1    75700.0
     Rate coefficients at P=1.00E+02(atm)          2.80E+43   -9.3    74000.0
841. C3H5-A<=>C3H5-S                                1.30E+55  -14.5    73800.0
     Rate coefficients at P=1.00E-01(atm)          1.30E+55  -14.5    73800.0
     Rate coefficients at P=1.00E+00(atm)          5.00E+51  -13.0    73300.0
     Rate coefficients at P=1.00E+01(atm)          9.70E+48  -11.7    73700.0
     Rate coefficients at P=1.00E+02(atm)          4.86E+44   -9.8    73400.0
842. C2H2+CH3<=>C3H5-T                              6.80E+20   -4.2    18000.0
     Rate coefficients at P=1.00E-01(atm)          6.80E+20   -4.2    18000.0
     Rate coefficients at P=1.00E+00(atm)          4.99E+22   -4.4    18850.0
     Rate coefficients at P=2.00E+00(atm)          6.00E+23   -4.6    19571.0
     Rate coefficients at P=5.00E+00(atm)          7.31E+25   -5.1    21150.0
     Rate coefficients at P=1.00E+01(atm)          9.30E+27   -5.5    22900.0
     Rate coefficients at P=1.00E+02(atm)          3.80E+36   -7.6    31300.0
843. C3H5-T<=>C3H5-S                                1.60E+44  -12.2    52200.0
     Rate coefficients at P=1.00E-01(atm)          1.60E+44  -12.2    52200.0
     Rate coefficients at P=1.00E+00(atm)          1.50E+48  -12.7    53900.0
     Rate coefficients at P=1.00E+01(atm)          5.10E+52  -13.4    57200.0
     Rate coefficients at P=1.00E+02(atm)          5.80E+51  -12.4    59200.0
844. C2H2+CH3<=>C3H5-A                              8.20E+53  -13.3    33200.0
     Rate coefficients at P=1.00E-01(atm)          8.20E+53  -13.3    33200.0
     Rate coefficients at P=1.00E+00(atm)          2.68E+53  -12.8    35730.0
     Rate coefficients at P=2.00E+00(atm)          3.64E+52  -12.5    36127.0
     Rate coefficients at P=5.00E+00(atm)          1.04E+51  -11.9    36476.0
     Rate coefficients at P=1.00E+01(atm)          4.40E+49  -11.4    36700.0
     Rate coefficients at P=1.00E+02(atm)          3.80E+44   -9.6    37600.0
845. CH3+C2H2<=>C3H5-S                              1.78E+42  -10.4    13647.0
     Rate coefficients at P=1.00E-03(atm)          1.78E+42  -10.4    13647.0
     Rate coefficients at P=3.90E-02(atm)          1.52E+44  -10.7    15256.0
     Rate coefficients at P=1.00E+00(atm)          1.19E+44  -10.2    18728.0
     Rate coefficients at P=1.00E+01(atm)          6.02E+43   -9.7    20561.0
     Rate coefficients at P=1.00E+02(atm)          1.42E+42   -8.9    22235.0
     Declared duplicate reaction...
846. CH3+C2H2<=>C3H5-S                              1.78E+42  -10.4    13647.0
     Rate coefficients at P=1.00E-03(atm)          1.00E-10    0.0        0.0
     Rate coefficients at P=3.90E-02(atm)          1.00E-10    0.0        0.0
     Rate coefficients at P=1.00E+00(atm)          8.49E+35   -8.4    12356.0
     Rate coefficients at P=1.00E+01(atm)          3.04E+32   -7.0    12357.0
     Rate coefficients at P=1.00E+02(atm)          1.69E+27   -5.1    11690.0
     Declared duplicate reaction...
847. C3H4-P+O<=>HCCO+CH3                            7.30E+12    0.0     2250.0
848. C3H4-P+O<=>C2H4+CO                             1.00E+13    0.0     2250.0
849. C3H4-P+O<=>C2H3+HCO                            3.20E+12    0.0     2010.0
850. C3H4-A+O<=>C2H4+CO                             2.00E+07    1.8     1000.0
851. C3H4-A+O<=>C2H2+CH2O                           3.00E-03    4.6    -4243.0
852. C3H4-A+OH<=>CH2CCH2OH                          1.11E+12    0.0     -304.0
853. C3H4-A+OH<=>SC3H4OH                            2.22E+12    0.0     -304.0
854. SC3H4OH<=>CH2CO+CH3                            9.24E+10    0.9    30460.0
855. C3H4-P+OH<=>PC3H4OH-2                          3.93E+11    0.0        0.0
856. C3H4-P+OH<=>SC3H4OH                            2.36E+12    0.0        0.0
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857. PC3H4OH-2<=>CH3CHCHO 3.56E+10 0.9 23238.0
858. CH3CHCHO<=>C2H3CHO+H 1.00E+00 1.0 1.0
Rate coefficients at P=1.00E-02(atm) 1.74E+50 -11.7 52870.0
Rate coefficients at P=1.00E-01(atm) 1.13E+47 -10.6 50479.0
Rate coefficients at P=1.00E+00(atm) 2.94E+43 -9.3 48810.0
Rate coefficients at P=2.50E+00(atm) 1.16E+42 -8.8 48382.0
Rate coefficients at P=5.00E+00(atm) 9.48E+40 -8.4 48095.0
Rate coefficients at P=1.00E+01(atm) 7.19E+39 -8.0 47818.0
Rate coefficients at P=2.50E+01(atm) 2.13E+38 -7.5 47438.0
Rate coefficients at P=5.00E+01(atm) 1.42E+37 -7.1 47128.0
859. CH3CHCHO<=>CH3CHCO+H 8.33E+12 0.0 32410.0
860. CH3CHCHO+H2<=>C2H5CHO+H 2.16E+05 2.4 18990.0
861. C3H4-P+HO2=>C2H4+CO+OH 3.00E+12 0.0 19000.0
862. C3H4-A+HO2=>C2H4+CO+OH 1.00E+11 0.0 14000.0
863. C3H4-A+HO2=>CH2CO+CH2+OH 4.00E+12 0.0 19000.0
864. C3H4-A+C2H<=>C2H2+C3H3 1.00E+13 0.0 0.0
865. C3H3+O<=>CH2O+C2H 2.00E+13 0.0 0.0
866. C3H3+HO2=>OH+CO+C2H3 8.00E+11 0.0 0.0
867. C3H3+HCO<=>C3H4-A+CO 2.50E+13 0.0 0.0
868. C3H3+HCO<=>C3H4-P+CO 2.50E+13 0.0 0.0
869. C2H5+C2H<=>C3H3+CH3 1.81E+13 0.0 0.0
870. C3H3+O2<=>CH2CO+HCO 1.70E+05 1.7 1500.0
871. C3H3+CH<=>C4H3-N+H 7.00E+13 0.0 0.0
872. C3H3+HO2<=>C3H3O+OH 1.00E+11 0.0 0.0
Rate coefficients at P=1.00E-02(atm) 1.02E+13 -0.2 -1417.0
Rate coefficients at P=1.00E-01(atm) 4.98E+14 -0.6 -349.1
Rate coefficients at P=1.00E+00(atm) 7.77E+17 -1.5 2379.2
Rate coefficients at P=1.00E+01(atm) 2.93E+15 -0.7 3615.3
Rate coefficients at P=1.00E+02(atm) 1.64E+04 2.7 1144.4
873. C3H3+HO2<=>C3H3O2H 1.00E+11 0.0 0.0
Rate coefficients at P=1.00E-02(atm) 1.91E+31 -7.2 1336.2
Rate coefficients at P=1.00E-01(atm) 6.31E+42 -10.3 5568.9
Rate coefficients at P=1.00E+00(atm) 1.03E+45 -10.6 7851.5
Rate coefficients at P=1.00E+01(atm) 2.79E+37 -7.9 6497.9
Rate coefficients at P=1.00E+02(atm) 4.73E+25 -4.1 2923.8
874. C3H3+HO2<=>C2HCHO+H2O 1.00E+11 0.0 0.0
Rate coefficients at P=1.00E-02(atm) 1.09E+00 3.0 -3421.1
Rate coefficients at P=1.00E-01(atm) 6.35E+01 2.5 -2341.4
Rate coefficients at P=1.00E+00(atm) 6.05E+05 1.4 595.1
Rate coefficients at P=1.00E+01(atm) 3.10E+05 1.6 2677.6
Rate coefficients at P=1.00E+02(atm) 5.07E-05 4.6 927.5
875. C3H3O2H<=>C2HCHO+H2O 1.00E+11 0.0 0.0
Rate coefficients at P=1.00E-02(atm) 1.99E+50 -12.7 53531.9
Rate coefficients at P=1.00E-01(atm) 4.72E+47 -11.5 54360.9
Rate coefficients at P=1.00E+00(atm) 1.50E+40 -8.8 53179.2
Rate coefficients at P=1.00E+01(atm) 2.54E+28 -5.0 49919.4
Rate coefficients at P=1.00E+02(atm) 1.48E+16 -1.1 45949.3
876. C2H+CH2O<=>C3H3O 1.00E+11 0.0 0.0
Rate coefficients at P=1.00E-03(atm) 5.93E-04 2.6 -4297.3
Rate coefficients at P=1.00E-02(atm) 5.69E+06 -0.1 -1234.1
Rate coefficients at P=1.00E-01(atm) 5.39E+13 -1.8 1452.2
Rate coefficients at P=1.00E+00(atm) 8.73E+15 -2.1 2510.1
Rate coefficients at P=1.00E+01(atm) 5.30E+19 -2.9 4532.2
Rate coefficients at P=1.00E+02(atm) 3.78E+21 -3.2 6802.5
877. C2HCHO<=>C2H2+CO 2.51E+14 0.0 68000.0
878. C2H+HCO<=>C2HCHO 1.00E+13 0.0 0.0
879. C3H3+H<=>C3H2+H2 2.14E+05 2.5 7453.0
880. C3H3+H<=>C3H2(S)+H2 3.31E+13 0.2 17579.0
Rate coefficients at P=3.95E-02(atm) 2.95E+09 1.3 13474.0
Rate coefficients at P=1.00E+00(atm) 1.10E+10 1.1 13929.0
Rate coefficients at P=1.00E+01(atm) 3.31E+13 0.2 17579.0
881. C3H3+H<=>H2CCC(S)+H2 1.00E+18 -1.2 15111.0
Rate coefficients at P=3.95E-02(atm) 2.69E+09 1.1 5371.0
Rate coefficients at P=1.00E+00(atm) 2.88E+13 0.0 9448.0
Rate coefficients at P=1.00E+01(atm) 1.00E+18 -1.2 15111.0
882. C3H3+H<=>C3H2C+H2 7.24E+09 0.6 18356.0
Rate coefficients at P=3.95E-02(atm) 1.07E+07 1.4 15557.0
Rate coefficients at P=1.00E+00(atm) 1.35E+07 1.3 15560.0
Rate coefficients at P=1.00E+01(atm) 7.24E+09 0.6 18356.0
883. C3H2C+O2<=>C2H2+CO2 1.00E+13 0.0 0.0
884. C3H3+OH<=>C3H2+H2O 2.00E+13 0.0 8000.0
885. C3H3+OH<=>CH2O+C2H2 2.00E+12 0.0 0.0
886. C3H3+OH<=>C2H3+HCO 1.00E+13 0.0 0.0
887. C3H3+OH<=>C2H4+CO 1.00E+13 0.0 0.0
888. C3H3+OH<=>C3H2(S)+H2O 1.00E+12 0.0 0.0
889. C3H3+OH<=>H2CCC(S)+H2O 1.00E+12 0.0 0.0
890. C3H2(S)+M<=>C3H2+M 1.00E+13 0.0 0.0
891. C3H2(S)+H<=>H2CCC(S)+H 1.00E+13 0.0 0.0
892. H2CCC(S)+O2<=>CO2+C2H2 1.00E+13 0.0 0.0
893. C3H3+C3H3<=>C6H5+H 1.05E+54 -11.9 28757.0
Rate coefficients at P=3.95E-02(atm) 1.05E+54 -11.9 28757.0
Rate coefficients at P=1.00E+00(atm) 1.70E+48 -10.0 36755.0
Rate coefficients at P=1.00E+01(atm) 3.67E+26 -3.9 28963.0
894. C3H3+C3H3<=>C6H6 1.82E+74 -18.1 31896.0
Rate coefficients at P=3.95E-02(atm) 1.64E+66 -15.9 27529.0
Rate coefficients at P=1.00E+00(atm) 3.16E+55 -12.6 22264.0
Rate coefficients at P=1.00E+01(atm) 3.89E+50 -11.0 20320.0
895. C3H3+C3H3<=>FULVENE 6.31E+76 -19.1 31542.0
Rate coefficients at P=3.95E-02(atm) 7.25E+65 -16.0 25035.0
Rate coefficients at P=1.00E+00(atm) 1.38E+66 -15.7 28260.0
Rate coefficients at P=1.00E+01(atm) 1.26E+56 -12.6 23515.0
896. C3H3+C3H5-A=>FULVENE+H+H 3.26E+29 -5.4 3390.0
897. C3H3+C3H4-A<=>C6H6+H 1.40E+12 0.0 9990.4
898. CH3CHCO+OH<=>C2H5+CO2 1.73E+12 0.0 -1010.0

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899. CH3CHCO+OH<=>SC2H4OH+CO                        2.00E+12    0.0    -1010.0
900. CH3CHCO+H<=>C2H5+CO                            4.40E+12    0.0     1459.0
901. CH3CHCO+O<=>CH3CHO+CO                          3.20E+12    0.0     -437.0
902. CH3COCH3<=>CH3CO+CH3                           2.05E+58  -12.8   100030.1
     Rate coefficients at P=1.00E-02(atm)          2.05E+58  -12.8   100030.1
     Rate coefficients at P=1.00E-01(atm)          3.30E+51  -10.6    98221.2
     Rate coefficients at P=1.00E+00(atm)          1.31E+42   -7.7    94660.6
     Rate coefficients at P=1.00E+01(atm)          2.16E+33   -5.0    90916.5
     Rate coefficients at P=1.00E+02(atm)          9.40E+28   -3.7    89022.8
903. CH3COCH2+H<=>CH3COCH3                          1.00E+13    0.0        0.0
904. CH3COCH3+OH<=>CH3COCH2+H2O                     1.25E+05    2.5      445.0
905. CH3COCH3+H<=>CH3COCH2+H2                       9.80E+05    2.4     5160.0
906. CH3COCH3+O<=>CH3COCH2+OH                       5.13E+11    0.2     4890.0
907. CH3COCH3+CH3<=>CH3COCH2+CH4                    3.96E+11    0.0     9784.0
908. CH3COCH3+CH3O<=>CH3COCH2+CH3OH                 4.34E+11    0.0     6460.0
909. CH3COCH3+O2<=>CH3COCH2+HO2                     6.03E+13    0.0    48500.0
910. CH3COCH3+HO2<=>CH3COCH2+H2O2                   1.70E+13    0.0    20460.0
911. CH3COCH3+CH3O2<=>CH3COCH2+CH3O2H               1.70E+13    0.0    20460.0
912. CH3COCH3+CH3COCH2O2<=>CH3COCH2+C3KET21         1.00E+11    0.0     5000.0
913. CH3COCH2+HO2<=>CH3COCH2O+OH                    2.41E+13    0.0        0.0
914. CH3COCH2+CH3O2<=>CH3COCH2O+CH3O                1.20E+13    0.0        0.0
915. CH3COCH2O<=>CH3CO+CH2O                         5.87E+20   -2.4    10535.8
916. CH3COCH2+O2<=>CH3COCH2O2                       1.20E+11    0.0    -1100.0
917. CH2CO+CH3<=>CH3COCH2                           1.76E+04    2.5     6130.0
918. CH2O+CH3COCH2O2<=>HCO+C3KET21                  1.29E+11    0.0     9000.0
919. HO2+CH3COCH2O2<=>C3KET21+O2                    1.00E+12    0.0        0.0
920. C2H3+HCO<=>C2H3CHO                             1.81E+13    0.0        0.0
921. C2H3CHO+H<=>C2H3CO+H2                          1.34E+13    0.0     3300.0
922. C2H3CHO+O<=>C2H3CO+OH                          5.94E+12    0.0     1868.0
923. C2H3CHO+OH<=>C2H3CO+H2O                        9.24E+06    1.5     -962.0
924. C2H3CHO+O2<=>C2H3CO+HO2                        1.00E+13    0.0    40700.0
925. C2H3CHO+HO2<=>C2H3CO+H2O2                      3.01E+12    0.0    11920.0
926. C2H3CHO+CH3<=>C2H3CO+CH4                       2.61E+06    1.8     5911.0
927. C2H3CHO+C2H3<=>C2H3CO+C2H4                     1.74E+12    0.0     8440.0
928. C2H3CHO+CH3O<=>C2H3CO+CH3OH                    1.00E+12    0.0     3300.0
929. C2H3CHO+CH3O2<=>C2H3CO+CH3O2H                  3.01E+12    0.0    11920.0
930. C2H3+CO<=>C2H3CO                               1.51E+11    0.0     4810.0
931. C2H5+HCO<=>C2H5CHO                             1.81E+13    0.0        0.0
932. C2H5CHO+H<=>C2H5CO+H2                          4.00E+13    0.0     4200.0
933. C2H5CHO+O<=>C2H5CO+OH                          5.00E+12    0.0     1790.0
934. C2H5CHO+OH<=>C2H5CO+H2O                        2.69E+10    0.8     -340.0
935. C2H5CHO+CH3<=>C2H5CO+CH4                       2.61E+06    1.8     5911.0
936. C2H5CHO+HO2<=>C2H5CO+H2O2                      2.80E+12    0.0    13600.0
937. C2H5CHO+CH3O<=>C2H5CO+CH3OH                    1.00E+12    0.0     3300.0
938. C2H5CHO+CH3O2<=>C2H5CO+CH3O2H                  3.01E+12    0.0    11920.0
939. C2H5CHO+C2H5<=>C2H5CO+C2H6                     1.00E+12    0.0     8000.0
940. C2H5CHO+C2H5O<=>C2H5CO+C2H5OH                  6.03E+11    0.0     3300.0
941. C2H5CHO+C2H5O2<=>C2H5CO+C2H5O2H                3.01E+12    0.0    11920.0
942. C2H5CHO+O2<=>C2H5CO+HO2                        1.00E+13    0.0    40700.0
943. C2H5CHO+CH3CO3<=>C2H5CO+CH3CO3H                3.01E+12    0.0    11920.0
944. C2H5CHO+C2H3<=>C2H5CO+C2H4                     1.70E+12    0.0     8440.0
945. C2H5CHO+NC3H7<=>C2H5CO+C3H8                    1.70E+12    0.0     8440.0
946. C2H5CHO+IC3H7<=>C2H5CO+C3H8                    1.70E+12    0.0     8440.0
947. C2H5CHO+C3H5-A<=>C2H5CO+C3H6                   1.70E+12    0.0     8440.0
948. C2H5+CO<=>C2H5CO                               1.51E+11    0.0     4810.0
949. C4H10(+M)<=>C2H5+C2H5(+M)                      1.36E+37   -6.0    92929.0
     Low pressure limit:  0.47200E+19  0.00000E+00  0.49578E+05
     TROE centering:      0.79980E-01  0.10000E-19  0.32430E+05  0.48580E+04
950. C4H10(+M)<=>NC3H7+CH3(+M)                      6.60E+52  -10.6   100330.0
     Low pressure limit:  0.53400E+18  0.00000E+00  0.42959E+05
     TROE centering:      0.95020E-01  0.10000E-19  0.53480E+04  0.43260E+04
951. C4H10<=>PC4H9+H                                4.80E+40   -7.1   115302.0
     Rate coefficients at P=1.00E-02(atm)          4.45E+90  -21.9   140564.0
     Rate coefficients at P=1.00E-01(atm)          4.63E+76  -17.6   134669.0
     Rate coefficients at P=1.00E+00(atm)          4.94E+58  -12.3   125435.0
     Rate coefficients at P=1.00E+01(atm)          4.80E+40   -7.1   115302.0
     Rate coefficients at P=1.00E+02(atm)          1.49E+27   -3.1   107323.0
952. C4H10<=>SC4H9+H                                8.52E+38   -6.6   110556.0
     Rate coefficients at P=1.00E-02(atm)          3.10E+88  -21.2   136355.0
     Rate coefficients at P=1.00E-01(atm)          4.34E+73  -16.8   129590.0
     Rate coefficients at P=1.00E+00(atm)          7.39E+55  -11.5   120199.0
     Rate coefficients at P=1.00E+01(atm)          8.52E+38   -6.6   110556.0
     Rate coefficients at P=1.00E+02(atm)          5.40E+26   -3.0   103313.0
953. C4H10+H<=>PC4H9+H2                             3.49E+05    2.7     6450.0
954. C4H10+O2<=>PC4H9+HO2                           6.00E+13    0.0    52340.0
955. C4H10+O<=>PC4H9+OH                             1.13E+14    0.0     7850.0
956. C4H10+OH<=>PC4H9+H2O                           1.05E+10    1.0     1586.0
957. C4H10+HO2<=>PC4H9+H2O2                         4.08E+01    3.6    17160.0
958. C4H10+CH3<=>PC4H9+CH4                          9.04E-01    3.6     7154.0
959. C4H10+CH3O<=>PC4H9+CH3OH                       3.00E+11    0.0     7000.0
960. C4H10+CH3O2<=>PC4H9+CH3O2H                     1.39E+00    4.0    18280.0
961. C4H10+O2CHO<=>PC4H9+HO2CHO                     1.68E+13    0.0    20440.0
962. C4H10+C2H5<=>PC4H9+C2H6                        1.58E+11    0.0    12300.0
963. C4H10+C2H3<=>PC4H9+C2H4                        1.00E+12    0.0    18000.0
964. C4H10+C2H5O<=>PC4H9+C2H5OH                     3.00E+11    0.0     7000.0
965. C4H10+C2H5O2<=>PC4H9+C2H5O2H                   4.08E+01    3.6    17160.0
966. C4H10+CH3CO3<=>PC4H9+CH3CO3H                   1.70E+13    0.0    20460.0
967. C4H10+C3H5-A<=>PC4H9+C3H6                      7.94E+11    0.0    20500.0
968. C4H10+NC3H7O2<=>PC4H9+NC3H7O2H                 1.70E+13    0.0    20460.0
969. C4H10+IC3H7O2<=>PC4H9+IC3H7O2H                 1.70E+13    0.0    20460.0
970. C4H10+PC4H9<=>SC4H9+C4H10                      1.00E+11    0.0    10400.0
971. C4H10+PC4H9O2<=>PC4H9+PC4H9O2H                 1.70E+13    0.0    20460.0
972. C4H10+SC4H9O2<=>PC4H9+SC4H9O2H                 1.70E+13    0.0    20460.0
973. C4H10+IC4H9O2<=>PC4H9+IC4H9O2H                 1.70E+13    0.0    20460.0
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974.	C4H10+TC4H9O2<=>PC4H9+TC4H9O2H	1.70E+13	0.0	20460.0
975.	C4H10+H<=>SC4H9+H2	2.60E+06	2.4	4471.0
976.	C4H10+O2<=>SC4H9+HO2	4.00E+13	0.0	49800.0
977.	C4H10+O<=>SC4H9+OH	5.62E+13	0.0	5200.0
978.	C4H10+OH<=>SC4H9+H2O	9.34E+07	1.6	-35.0
979.	C4H10+HO2<=>SC4H9+H2O2	1.26E+02	3.4	13720.0
980.	C4H10+CH3<=>SC4H9+CH4	3.02E+00	3.5	5481.0
981.	C4H10+CH3O<=>SC4H9+CH3OH	6.00E+11	0.0	7000.0
982.	C4H10+CH3O2<=>SC4H9+CH3O2H	2.04E+01	3.6	14810.0
983.	C4H10+O2CHO<=>SC4H9+HO2CHO	1.12E+13	0.0	17690.0
984.	C4H10+C2H5<=>SC4H9+C2H6	1.00E+11	0.0	10400.0
985.	C4H10+C2H3<=>SC4H9+C2H4	8.00E+11	0.0	16800.0
986.	C4H10+C2H5O<=>SC4H9+C2H5OH	6.00E+11	0.0	7000.0
987.	C4H10+C2H5O2<=>SC4H9+C2H5O2H	1.26E+02	3.4	13720.0
988.	C4H10+CH3CO3<=>SC4H9+CH3CO3H	1.12E+13	0.0	17700.0
989.	C4H10+C3H5-A<=>SC4H9+C3H6	3.16E+11	0.0	16400.0
990.	C4H10+NC3H7O2<=>SC4H9+NC3H7O2H	1.12E+13	0.0	17700.0
991.	C4H10+IC3H7O2<=>SC4H9+IC3H7O2H	1.12E+13	0.0	17700.0
992.	C4H10+PC4H9O2<=>SC4H9+PC4H9O2H	1.12E+13	0.0	17700.0
993.	C4H10+SC4H9O2<=>SC4H9+SC4H9O2H	1.12E+13	0.0	17700.0
994.	C4H10+IC4H9O2<=>SC4H9+IC4H9O2H	1.12E+13	0.0	17700.0
995.	C4H10+TC4H9O2<=>SC4H9+TC4H9O2H	1.12E+13	0.0	17700.0
996.	PC4H9+HO2<=>PC4H9O+OH	7.00E+12	0.0	-1000.0
997.	CH3O2+PC4H9<=>CH3O+PC4H9O	7.00E+12	0.0	-1000.0
998.	SC4H9+HO2<=>SC4H9O+OH	7.00E+12	0.0	-1000.0
999.	SC4H9+CH3O2<=>CH3O+SC4H9O	7.00E+12	0.0	-1000.0
1000.	C2H5+CH3CHO<=>SC4H9O	3.33E+10	0.0	6397.0
1001.	PC4H9+O2<=>C4H8-1+HO2	8.37E-01	3.6	11960.0
1002.	PC4H9+O2<=>PC4H9O2	6.86E+16	-1.6	198.7
1003.	SC4H9+O2<=>C4H8-1+HO2	5.35E-01	3.7	9322.0
1004.	SC4H9+O2<=>C4H8-2+HO2	1.07E+00	3.7	9322.0
1005.	SC4H9+O2<=>SC4H9O2	3.49E+14	-0.8	-536.5
1006.	PC4H9O2+H2<=>PC4H9O2H+H	3.01E+13	0.0	26030.0
1007.	PC4H9O2+HO2<=>PC4H9O2H+O2	1.75E+10	0.0	-3275.0
1008.	PC4H9O2+H2O2<=>PC4H9O2H+HO2	2.40E+12	0.0	10000.0
1009.	PC4H9O2+CH4<=>PC4H9O2H+CH3	1.12E+13	0.0	24640.0
1010.	PC4H9O2+CH3OH<=>PC4H9O2H+CH2OH	6.30E+12	0.0	19360.0
1011.	PC4H9O2+CH2O<=>PC4H9O2H+HCO	5.60E+12	0.0	13600.0
1012.	PC4H9O2+C2H6<=>PC4H9O2H+C2H5	1.70E+13	0.0	20460.0
1013.	PC4H9O2+CH3CHO<=>PC4H9O2H+CH3CO	2.80E+12	0.0	13600.0
1014.	PC4H9O2+C2H4<=>PC4H9O2H+C2H3	1.13E+13	0.0	30430.0
1015.	PC4H9O2+C3H6<=>PC4H9O2H+C3H5-A	5.35E-02	4.2	13288.1
1016.	PC4H9O2+C2H5CHO<=>PC4H9O2H+C2H5CO	2.00E+11	0.0	9500.0
1017.	PC4H9O2+C2H3CHO<=>PC4H9O2H+C2H3CO	2.80E+12	0.0	13600.0
1018.	PC4H9O2+C3H8<=>PC4H9O2H+NC3H7	1.70E+13	0.0	20460.0
1019.	PC4H9O2+C3H8<=>PC4H9O2H+IC3H7	2.00E+12	0.0	17000.0
1020.	PC4H9O2+CH3<=>PC4H9O+CH3O	7.00E+12	0.0	-1000.0
1021.	PC4H9O2+C2H5<=>PC4H9O+C2H5O	7.00E+12	0.0	-1000.0
1022.	PC4H9O2+IC3H7<=>PC4H9O+IC3H7O	7.00E+12	0.0	-1000.0
1023.	PC4H9O2+NC3H7<=>PC4H9O+NC3H7O	7.00E+12	0.0	-1000.0
1024.	PC4H9O2+C3H5-A<=>PC4H9O+C3H5O	7.00E+12	0.0	-1000.0
1025.	PC4H9O2+PC4H9<=>PC4H9O+PC4H9O	7.00E+12	0.0	-1000.0
1026.	PC4H9O2+SC4H9<=>PC4H9O+SC4H9O	7.00E+12	0.0	-1000.0
1027.	PC4H9O2+C4H71-3<=>PC4H9O+C4H71-O	7.00E+12	0.0	-1000.0
1028.	PC4H9O2H<=>PC4H9O+OH	1.50E+16	0.0	42500.0
1029.	PC4H9O2+CH3O2=>PC4H9O+CH3O+O2	1.40E+16	-1.6	1860.0
1030.	PC4H9O2+CH3CO3=>PC4H9O+CH3CO2+O2	1.40E+16	-1.6	1860.0
1031.	PC4H9O2+C2H5O2=>PC4H9O+C2H5O+O2	1.40E+16	-1.6	1860.0
1032.	PC4H9O2+NC3H7O2=>PC4H9O+NC3H7O+O2	1.40E+16	-1.6	1860.0
1033.	PC4H9O2+IC3H7O2=>PC4H9O+IC3H7O+O2	1.40E+16	-1.6	1860.0
1034.	PC4H9O2+PC4H9O2=>PC4H9O+PC4H9O+O2	1.40E+16	-1.6	1860.0
1035.	PC4H9O2+SC4H9O2=>PC4H9O+SC4H9O+O2	1.40E+16	-1.6	1860.0
1036.	PC4H9O2<=>C4H8OOH1-2	4.01E+08	1.1	30100.0
1037.	PC4H9O2<=>C4H8OOH1-3	1.36E+07	1.3	18200.0
1038.	PC4H9O2<=>C4H8OOH1-4	1.23E+06	1.5	20000.0
1039.	PC4H9O2<=>C4H8-1+HO2	1.26E+08	1.4	28900.0
1040.	IC3H7O2+PC4H9<=>IC3H7O+PC4H9O	7.00E+12	0.0	-1000.0
1041.	NC3H7O2+PC4H9<=>NC3H7O+PC4H9O	7.00E+12	0.0	-1000.0
1042.	SC4H9O2+PC4H9<=>SC4H9O+PC4H9O	7.00E+12	0.0	-1000.0
1043.	IC3H7O2+SC4H9<=>IC3H7O+SC4H9O	7.00E+12	0.0	-1000.0
1044.	NC3H7O2+SC4H9<=>NC3H7O+SC4H9O	7.00E+12	0.0	-1000.0
1045.	SC4H9O2+H2<=>SC4H9O2H+H	3.01E+13	0.0	26030.0
1046.	SC4H9O2+HO2<=>SC4H9O2H+O2	1.75E+10	0.0	-3275.0
1047.	SC4H9O2+CH2O<=>SC4H9O2H+HCO	5.60E+12	0.0	13600.0
1048.	SC4H9O2+CH3CHO<=>SC4H9O2H+CH3CO	2.80E+12	0.0	13600.0
1049.	SC4H9O2+C2H6<=>SC4H9O2H+C2H5	1.70E+13	0.0	20460.0
1050.	SC4H9O2+C2H5CHO<=>SC4H9O2H+C2H5CO	2.00E+11	0.0	9500.0
1051.	SC4H9O2+C3H6<=>SC4H9O2H+C3H5-A	5.35E-02	4.2	13288.1
1052.	SC4H9O2+C2H4<=>SC4H9O2H+C2H3	1.13E+13	0.0	30430.0
1053.	SC4H9O2+CH3OH<=>SC4H9O2H+CH2OH	6.30E+12	0.0	19360.0
1054.	SC4H9O2+C2H3CHO<=>SC4H9O2H+C2H3CO	2.80E+12	0.0	13600.0
1055.	SC4H9O2+CH4<=>SC4H9O2H+CH3	1.12E+13	0.0	24640.0
1056.	SC4H9O2+H2O2<=>SC4H9O2H+HO2	2.40E+12	0.0	10000.0
1057.	SC4H9O2+C3H8<=>SC4H9O2H+NC3H7	1.70E+13	0.0	20460.0
1058.	SC4H9O2+C3H8<=>SC4H9O2H+IC3H7	2.00E+12	0.0	17000.0
1059.	SC4H9O2+CH3O2=>SC4H9O+CH3O+O2	1.40E+16	-1.6	1860.0
1060.	SC4H9O2+CH3CO3=>SC4H9O+CH3CO2+O2	1.40E+16	-1.6	1860.0
1061.	SC4H9O2+NC3H7O2=>SC4H9O+NC3H7O+O2	1.40E+16	-1.6	1860.0
1062.	SC4H9O2+IC3H7O2=>SC4H9O+IC3H7O+O2	1.40E+16	-1.6	1860.0
1063.	SC4H9O2+SC4H9O2=>SC4H9O+SC4H9O+O2	1.40E+16	-1.6	1860.0
1064.	SC4H9O2+C2H5O2=>SC4H9O+C2H5O+O2	1.40E+16	-1.6	1860.0
1065.	SC4H9O2+CH3<=>SC4H9O+CH3O	7.00E+12	0.0	-1000.0
1066.	SC4H9O2+C2H5<=>SC4H9O+C2H5O	7.00E+12	0.0	-1000.0
1067.	SC4H9O2+IC3H7<=>SC4H9O+IC3H7O	7.00E+12	0.0	-1000.0

1068.	SC4H9O2+NC3H7<=>SC4H9O+NC3H7O	7.00E+12	0.0	-1000.0
1069.	SC4H9O2+SC4H9<=>SC4H9O+SC4H9O	7.00E+12	0.0	-1000.0
1070.	SC4H9O2+C3H5-A<=>SC4H9O+C3H5O	7.00E+12	0.0	-1000.0
1071.	SC4H9O2+C4H71-3<=>SC4H9O+C4H71-O	7.00E+12	0.0	-1000.0
1072.	SC4H9O+OH<=>SC4H9O2H	1.00E+15	-0.8	0.0
1073.	SC4H9O2<=>C4H8OOH2-1	1.46E+09	1.1	33500.0
1074.	SC4H9O2<=>C4H8OOH2-3	1.72E+09	0.9	29500.0
1075.	SC4H9O2<=>C4H8OOH2-4	1.44E+07	1.4	20800.0
1076.	SC4H9O2<=>C4H8-1+HO2	5.13E+09	1.0	30400.0
1077.	C4H8OOH1-2<=>C4H8O1-2+OH	1.71E+09	1.1	10900.0
1078.	C4H8OOH1-3<=>C4H8O1-3+OH	2.59E+09	0.7	16000.0
1079.	C4H8OOH1-4<=>C4H8O1-4+OH	1.72E+08	0.8	11100.0
1080.	C4H8OOH2-4<=>C4H8O1-3+OH	2.44E+09	0.8	18000.0
1081.	C4H8O1-2+H=>CH2O+C3H5-A+H2	5.00E+12	0.0	0.0
1082.	C4H8O1-2+O=>CH2O+C3H5-A+OH	5.00E+12	0.0	0.0
1083.	C4H8O1-2+OH=>CH2O+C3H5-A+H2O	5.00E+12	0.0	0.0
1084.	C4H8O1-2+HO2=>CH2O+C3H5-A+H2O2	1.00E+13	0.0	15000.0
1085.	C4H8O1-2+CH3=>CH2O+C3H5-A+CH4	2.00E+11	0.0	10000.0
1086.	C4H8O1-2+CH3O2=>CH2O+C3H5-A+CH3O2H	1.00E+13	0.0	19000.0
1087.	C4H8O1-3+H=>CH2O+C3H5-A+H2	5.00E+12	0.0	0.0
1088.	C4H8O1-3+O=>CH2O+C3H5-A+OH	5.00E+12	0.0	0.0
1089.	C4H8O1-3+OH=>CH2O+C3H5-A+H2O	5.00E+12	0.0	0.0
1090.	C4H8O1-3+HO2=>CH2O+C3H5-A+H2O2	1.00E+13	0.0	15000.0
1091.	C4H8O1-3+CH3=>CH2O+C3H5-A+CH4	2.00E+11	0.0	10000.0
1092.	C4H8O1-3+CH3O2=>CH2O+C3H5-A+CH3O2H	1.00E+13	0.0	19000.0
1093.	C4H8O1-4+H=>CH2O+C3H5-A+H2	5.00E+12	0.0	0.0
1094.	C4H8O1-4+O=>CH2O+C3H5-A+OH	5.00E+12	0.0	0.0
1095.	C4H8O1-4+OH=>CH2O+C3H5-A+H2O	5.00E+12	0.0	0.0
1096.	C4H8O1-4+HO2=>CH2O+C3H5-A+H2O2	1.00E+13	0.0	15000.0
1097.	C4H8O1-4+CH3=>CH2O+C3H5-A+CH4	2.00E+11	0.0	10000.0
1098.	C4H8O1-4+CH3O2=>CH2O+C3H5-A+CH3O2H	1.00E+13	0.0	19000.0
1099.	C4H8O2-3+H=>CH2O+C3H5-A+H2	5.00E+12	0.0	0.0
1100.	C4H8O2-3+OH=>CH2O+C3H5-A+H2O	5.00E+12	0.0	0.0
1101.	C4H8O2-3+O=>CH2O+C3H5-A+OH	5.00E+12	0.0	0.0
1102.	C4H8O2-3+HO2=>CH2O+C3H5-A+H2O2	1.00E+13	0.0	15000.0
1103.	C4H8O2-3+CH3O2=>CH2O+C3H5-A+CH3O2H	1.00E+13	0.0	19000.0
1104.	C4H8O2-3+CH3=>CH2O+C3H5-A+CH4	2.00E+11	0.0	10000.0
1105.	C4H8OOH1-3=>OH+CH2O+C3H6	1.23E+09	1.3	24900.0
1106.	C4H8OOH2-4=>OH+CH3CHO+C2H4	3.08E+08	1.5	23500.0
1107.	C4H8OOH1-2+O2<=>C4H8OOH1-2O2	1.74E+14	-0.8	-536.5
1108.	C4H8OOH1-3+O2<=>C4H8OOH1-3O2	1.74E+14	-0.8	-536.5
1109.	C4H8OOH1-4+O2<=>C4H8OOH1-4O2	3.43E+16	-1.6	198.7
1110.	C4H8OOH2-1+O2<=>C4H8OOH2-1O2	3.43E+16	-1.6	198.7
1111.	C4H8OOH2-3+O2<=>C4H8OOH2-3O2	1.74E+14	-0.8	-536.5
1112.	C4H8OOH2-4+O2<=>C4H8OOH2-4O2	3.43E+16	-1.6	198.7
1113.	C4H8OOH1-2O2<=>C4H72-1OOH+HO2	2.54E+10	0.8	30098.5
1114.	C4H8OOH1-3O2<=>C4H71-4OOH+HO2	5.13E+09	1.0	30400.0
1115.	C4H8OOH1-3O2<=>C4H72-1OOH+HO2	2.54E+10	0.8	30098.5
1116.	C4H8OOH1-4O2<=>C4H71-4OOH+HO2	1.44E+07	1.4	28900.0
1117.	C4H8OOH2-3O2<=>C4H71-3OOH+HO2	5.13E+09	1.0	30400.0
1118.	C4H8OOH2-4O2<=>C4H71-3OOH+HO2	1.44E+07	1.4	28900.0
1119.	C4H8OOH1-2O2<=>C4H71-3,4OOH	1.44E+07	1.4	20800.0
1120.	C4H8OOH1-2O2<=>C4H72-3,4OOH	1.72E+09	0.9	29500.0
1121.	C4H8OOH1-2O2<=>NC4KET12+OH	2.44E+07	1.6	27900.0
1122.	C4H8OOH1-3O2<=>C4H71-2,4OOH	1.46E+09	1.1	33500.0
1123.	C4H8OOH1-3O2<=>C4H72-1,3OOH	1.72E+09	0.9	29500.0
1124.	C4H8OOH1-3O2<=>NC4KET13+OH	1.09E+04	2.4	19900.0
1125.	C4H8OOH1-4O2<=>C4H72-1,4OOH	1.36E+07	1.3	18200.0
	Declared duplicate reaction...			
1126.	C4H8OOH1-4O2<=>C4H72-1,4OOH	4.01E+08	1.1	30100.0
	Declared duplicate reaction...			
1127.	C4H8OOH1-4O2<=>NC4KET14+OH	4.80E+03	1.7	16600.0
1128.	C4H8OOH2-1O2<=>C4H72-3,4OOH	1.72E+09	0.9	29500.0
1129.	C4H8OOH2-1O2<=>C4H71-3,4OOH	1.23E+06	1.5	20000.0
1130.	C4H8OOH2-1O2<=>NC4KET21+OH	2.76E+08	1.2	25700.0
1131.	C4H8OOH2-3O2<=>C4H71-2,3OOH	1.46E+09	1.1	33500.0
	Declared duplicate reaction...			
1132.	C4H8OOH2-3O2<=>C4H71-2,3OOH	1.44E+07	1.4	20800.0
	Declared duplicate reaction...			
1133.	C4H8OOH2-3O2<=>NC4KET23+OH	1.75E+06	1.7	26000.0
1134.	C4H8OOH2-4O2<=>C4H71-2,4OOH	1.23E+06	1.5	20000.0
1135.	C4H8OOH2-4O2<=>C4H72-1,3OOH	4.01E+08	1.1	30100.0
1136.	C4H8OOH2-4O2<=>NC4KET24+OH	5.79E+01	2.9	17000.0
1137.	C4H71-3,4OOH<=>C4H7O1-3OOH-4+OH	2.44E+09	0.8	18000.0
1138.	C4H71-3,4OOH<=>C4H7O1-4OOH-2+OH	1.72E+09	0.8	11100.0
1139.	C4H72-3,4OOH<=>C4H7O2-3OOH-1+OH	6.99E+09	0.8	9788.3
1140.	C4H72-3,4OOH<=>C4H7O1-3OOH-2+OH	2.59E+09	0.7	16000.0
1141.	C4H71-2,4OOH<=>C4H7O1-2OOH-4+OH	2.35E+10	0.7	10800.0
1142.	C4H71-2,4OOH<=>C4H7O1-4OOH-2+OH	1.72E+09	0.8	11100.0
1143.	C4H72-1,3OOH<=>C4H7O1-2OOH-3+OH	1.71E+09	1.1	10900.0
1144.	C4H72-1,3OOH<=>C4H7O2-3OOH-1+OH	6.99E+09	0.8	9788.3
1145.	C4H72-1,4OOH<=>C4H7O1-2OOH-4+OH	1.71E+09	1.1	10900.0
1146.	C4H72-1,4OOH<=>C4H7O1-3OOH-4+OH	2.59E+09	0.7	16000.0
1147.	C4H71-2,3OOH<=>C4H7O1-2OOH-3+OH	2.35E+10	0.7	10800.0
1148.	C4H71-2,3OOH<=>C4H7O1-3OOH-2+OH	2.44E+09	0.8	18000.0
1149.	C4H71-3,4OOH=>C2H4+OH+HO2CH2CHO	1.23E+09	1.3	24900.0
1150.	C4H72-3,4OOH<=>C4H72-1OOH+HO2	2.57E+11	0.5	15324.7
1151.	C4H71-2,4OOH<=>C4H71-4OOH+HO2	2.67E+11	0.5	15800.0
1152.	C4H72-1,3OOH<=>C4H72-1OOH+HO2	2.57E+11	0.5	15324.7
1153.	C4H72-1,3OOH<=>C4H71-3OOH+HO2	6.03E+09	0.9	15200.0
1154.	C4H72-1,4OOH<=>C4H71-4OOH+HO2	2.57E+11	0.5	15324.7
1155.	C4H71-2,3OOH<=>C4H71-3OOH+HO2	6.03E+09	0.9	15200.0
1156.	C4H72-1,4OOH<=>C4H72-1OOH+HO2	2.67E+11	0.5	15800.0
1157.	C4H72-1OOH=>CH2O+C3H5-S+OH	1.50E+16	0.0	42000.0

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1158. C4H71-3OOH=>C2H3CHO+CH3+OH                    1.05E+16    0.0    41600.0
1159. C4H71-3OOH=>CH3CHO+C2H3+OH                    1.05E+16    0.0    41600.0
1160. NC4KET12=>C2H5CHO+HCO+OH                      1.05E+16    0.0    41600.0
1161. NC4KET13=>CH3CHO+CH2CHO+OH                    1.05E+16    0.0    43000.0
1162. NC4KET14=>CH2CH2CHO+CH2O+OH                   1.50E+16    0.0    42000.0
1163. NC4KET21=>CH2O+C2H5CO+OH                      1.50E+16    0.0    42000.0
1164. NC4KET23=>CH3CHO+CH3CO+OH                     1.05E+16    0.0    41600.0
1165. NC4KET24=>CH2O+CH3COCH2+OH                    1.50E+16    0.0    43000.0
1166. HO2CH2CHO=>CH2O+HCO+OH                        1.50E+16    0.0    42000.0
1167. IC4H10(+M)<=>CH3+IC3H7(+M)                    2.52E+31   -4.1    91495.0
      Low pressure limit:  0.24100E+20  0.00000E+00  0.52576E+05
      TROE centering:      0.36620E+00  0.81530E+03  0.60790E+02  0.10000E+21
1168. IC4H10<=>TC4H9+H                              2.51E+98  -23.8   145300.0
1169. IC4H10<=>IC4H9+H                              9.85E+95  -23.1   147600.0
1170. IC4H10+CH3<=>IC4H9+CH4                        1.36E+00    3.6     7154.0
1171. IC4H10+H<=>IC4H9+H2                           1.81E+06    2.5     6756.0
1172. IC4H10+OH<=>IC4H9+H2O                         6.65E+04    2.7     -168.9
1173. IC4H10+C2H5<=>IC4H9+C2H6                      1.51E+12    0.0    10400.0
1174. IC4H10+HO2<=>IC4H9+H2O2                       6.12E+01    3.6    17160.0
1175. IC4H10+O<=>IC4H9+OH                           4.05E+07    2.0     5136.0
1176. IC4H10+CH3O<=>IC4H9+CH3OH                     4.80E+11    0.0     7000.0
1177. IC4H10+O2<=>IC4H9+HO2                         9.00E+13    0.0    52290.0
1178. IC4H10+CH3O2<=>IC4H9+CH3O2H                   2.08E+00    4.0    18280.0
1179. IC4H10+C2H5O2<=>IC4H9+C2H5O2H                 2.55E+13    0.0    20460.0
1180. IC4H10+CH3CO3<=>IC4H9+CH3CO3H                 2.55E+13    0.0    20460.0
1181. IC4H10+NC3H7O2<=>IC4H9+NC3H7O2H               2.55E+13    0.0    20460.0
1182. IC4H10+IC3H7O2<=>IC4H9+IC3H7O2H               2.55E+13    0.0    20460.0
1183. IC4H10+IC4H9O2<=>IC4H9+IC4H9O2H               2.55E+13    0.0    20460.0
1184. IC4H10+TC4H9O2<=>IC4H9+TC4H9O2H               2.55E+13    0.0    20460.0
1185. IC4H10+O2CHO<=>IC4H9+HO2CHO                   2.52E+13    0.0    20440.0
1186. IC4H10+SC4H9O2<=>IC4H9+SC4H9O2H               2.25E+13    0.0    20460.0
1187. IC4H10+SC4H9O2<=>TC4H9+SC4H9O2H               2.80E+12    0.0    16000.0
1188. IC4H10+PC4H9O2<=>IC4H9+PC4H9O2H               2.25E+13    0.0    20460.0
1189. IC4H10+H<=>TC4H9+H2                           6.02E+05    2.4     2583.0
1190. IC4H10+CH3<=>TC4H9+CH4                        9.04E-01    3.5     4598.0
1191. IC4H10+OH<=>TC4H9+H2O                         2.92E+04    2.5    -1659.0
1192. IC4H10+C2H5<=>TC4H9+C2H6                      1.00E+11    0.0     7900.0
1193. IC4H10+HO2<=>TC4H9+H2O2                       4.33E+02    3.0    12090.0
1194. IC4H10+O<=>TC4H9+OH                           1.97E+05    2.4     1150.0
1195. IC4H10+CH3O<=>TC4H9+CH3OH                     1.90E+10    0.0     2800.0
1196. IC4H10+O2<=>TC4H9+HO2                         1.00E+13    0.0    48200.0
1197. IC4H10+O2CHO<=>TC4H9+HO2CHO                   2.80E+12    0.0    16010.0
1198. IC4H10+PC4H9O2<=>TC4H9+PC4H9O2H               2.80E+12    0.0    16000.0
1199. IC4H10+CH3O2<=>TC4H9+CH3O2H                   1.37E+02    3.1    13190.0
1200. IC4H10+C2H5O2<=>TC4H9+C2H5O2H                 2.80E+12    0.0    16000.0
1201. IC4H10+CH3CO3<=>TC4H9+CH3CO3H                 2.80E+12    0.0    16000.0
1202. IC4H10+NC3H7O2<=>TC4H9+NC3H7O2H               2.80E+12    0.0    16000.0
1203. IC4H10+IC3H7O2<=>TC4H9+IC3H7O2H               2.80E+12    0.0    16000.0
1204. IC4H10+IC4H9O2<=>TC4H9+IC4H9O2H               2.80E+12    0.0    16000.0
1205. IC4H10+TC4H9O2<=>TC4H9+TC4H9O2H               2.80E+12    0.0    16000.0
1206. IC4H10+IC4H9<=>TC4H9+IC4H10                   2.50E+10    0.0     7900.0
1207. IC4H9<=>TC4H9                                 3.56E+10    0.9    34600.0
1208. IC4H9<=>C3H6+CH3                              1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-01(atm)         3.15E+41   -9.5    33486.0
      Rate coefficients at P=1.00E+00(atm)         6.75E+44  -10.1    37209.0
      Rate coefficients at P=1.00E+01(atm)         7.79E+44   -9.7    39751.0
      Rate coefficients at P=1.00E+02(atm)         3.61E+39   -7.8    39583.0
1209. TC4H9+HO2<=>TC4H9O+OH                         7.00E+12    0.0    -1000.0
1210. TC4H9+CH3O2<=>TC4H9O+CH3O                     7.00E+12    0.0    -1000.0
1211. TC4H9+NC3H7O2<=>TC4H9O+NC3H7O                 7.00E+12    0.0    -1000.0
1212. TC4H9+SC4H9O2<=>TC4H9O+SC4H9O                 7.00E+12    0.0    -1000.0
1213. TC4H9+PC4H9O2<=>TC4H9O+PC4H9O                 7.00E+12    0.0    -1000.0
1214. TC4H9+IC3H7O2<=>TC4H9O+IC3H7O                 7.00E+12    0.0    -1000.0
1215. IC4H9+HO2<=>IC4H9O+OH                         7.00E+12    0.0    -1000.0
1216. IC4H9+CH3O2<=>IC4H9O+CH3O                     7.00E+12    0.0    -1000.0
1217. IC4H9+NC3H7O2<=>IC4H9O+NC3H7O                 7.00E+12    0.0    -1000.0
1218. IC4H9+SC4H9O2<=>IC4H9O+SC4H9O                 7.00E+12    0.0    -1000.0
1219. IC4H9+PC4H9O2<=>IC4H9O+PC4H9O                 7.00E+12    0.0    -1000.0
1220. IC4H9+IC3H7O2<=>IC4H9O+IC3H7O                 7.00E+12    0.0    -1000.0
1221. CH3COCH3+CH3<=>TC4H9O                         1.50E+11    0.0    11900.0
1222. TC4H9O+O2<=>IC4H8O+HO2                        8.10E+11    0.0     4700.0
1223. IC4H9O+H<=>IC3H7CHO+H2                        1.99E+13    0.0        0.0
1224. IC4H9O+O2<=>IC3H7CHO+HO2                      1.93E+11    0.0     1660.0
1225. IC4H9O+O<=>IC3H7CHO+OH                        6.00E+12    0.0        0.0
1226. IC4H9O+OH<=>IC3H7CHO+H2O                      1.81E+13    0.0        0.0
1227. IC4H9O+HO2<=>IC3H7CHO+H2O2                    1.00E+12    0.0        0.0
1228. IC4H9O+CH3<=>IC3H7CHO+CH4                     2.40E+13    0.0        0.0
1229. IC3H7CHO+H<=>IC4H9O                           1.00E+12    0.0     5860.0
1230. CH2O+IC3H7<=>IC4H9O                           5.00E+10    0.0     2330.0
1231. TC3H6CHO+H<=>IC3H7CHO                         2.00E+14    0.0        0.0
1232. SC4H7OH-I<=>IC3H7CHO                          8.59E+11    0.3    55900.0
1233. IC3H7+HCO<=>IC3H7CHO                          1.81E+13    0.0        0.0
1234. IC4H8O<=>IC3H7CHO                             4.18E+13    0.0    52720.0
1235. IC3H7CHO+HO2<=>IC3H7CO+H2O2                   3.00E+12    0.0    11920.0
1236. IC3H7CHO+CH3<=>IC3H7CO+CH4                    3.98E+12    0.0     8700.0
1237. IC3H7CHO+O<=>IC3H7CO+OH                       7.18E+12    0.0     1389.0
1238. IC3H7CHO+O2<=>IC3H7CO+HO2                     4.00E+13    0.0    37600.0
1239. IC3H7CHO+OH<=>IC3H7CO+H2O                     2.69E+10    0.8     -340.0
1240. IC3H7CHO+H<=>IC3H7CO+H2                       2.60E+12    0.0     2600.0
1241. IC3H7CHO+OH<=>IC3H6CHO+H2O                    3.12E+06    2.0     -298.0
1242. IC3H7CHO+HO2<=>IC3H6CHO+H2O2                  2.74E+04    2.5    15500.0
1243. IC3H7CHO+CH3O2<=>IC3H6CHO+CH3O2H              4.76E+04    2.5    16490.0
1244. TC3H6CHO+H2<=>IC3H7CHO+H                      2.16E+05    2.4    18990.0
1245. IC3H7CHO+HO2<=>TC3H6CHO+H2O2                  8.00E+10    0.0    11920.0
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1246. IC3H7CHO+OH<=>TC3H6CHO+H2O	1.68E+12	0.0	-781.0
1247. IC4H8O+OH<=>IC3H6CHO+H2O	7.52E+04	2.5	-1474.1
1248. IC4H8O+H<=>IC3H6CHO+H2	8.79E+04	2.7	2910.0
1249. IC4H8O+HO2<=>IC3H6CHO+H2O2	2.45E-05	5.3	7475.1
1250. IC4H8O+CH3O2<=>IC3H6CHO+CH3O2H	1.22E-05	5.3	7475.1
1251. IC4H8O+CH3<=>IC3H6CHO+CH4	1.99E+01	3.4	7634.0
1252. IC4H8O+O<=>IC3H6CHO+OH	1.45E+05	2.5	876.0
1253. IC4H8O+O2<=>IC3H6CHO+HO2	1.50E+13	0.0	50150.0
1254. IC3H5CHO+H<=>TC3H6CHO	1.30E+13	0.0	1200.0
1255. IC3H6CO+H<=>TC3H6CHO	1.30E+13	0.0	4800.0
1256. IC3H6CO+OH<=>IC3H7+CO2	1.73E+12	0.0	-1010.0
1257. IC3H6CO+OH<=>C3H6OH2-1+CO	2.00E+12	0.0	-1010.0
1258. TC3H6CHO+HO2<=>IC3H7CHO+O2	3.68E+12	0.0	1310.0
1259. TC3H6CHO+CH3<=>IC3H5CHO+CH4	3.01E+12	-0.3	-131.0
1260. TC3H6CHO+CH2O<=>IC3H7CHO+HCO	2.52E+08	1.9	18190.0
1261. TC3H6CHO+IC4H8<=>IC3H7CHO+IC4H7	4.70E+02	3.3	19840.0
1262. TC3H6CHO+O2<=>TC3H6O2CHO	1.99E+17	-2.1	0.0
1263. TC3H6O2CHO<=>IC3H5O2HCHO	6.00E+11	0.0	29880.0
1264. TC3H6O2CHO<=>TC3H6O2HCO	1.00E+11	0.0	25750.0
1265. IC3H5CHO+HO2<=>IC3H5O2HCHO	2.23E+11	0.0	10600.0
1266. TC3H6OCHO+OH<=>TC3H6CHO+HO2	2.02E+17	-1.2	21010.0
1267. TC3H6OCHO<=>CH3COCH3+HCO	3.98E+13	0.0	9700.0
1268. TC3H6CHO+OH<=>IC3H6OHCHO	5.00E+13	0.0	0.0
1269. C3H6OH2-1+HCO<=>IC3H6OHCHO	1.81E+13	0.0	0.0
1270. IC3H5CHO+H<=>IC3H5CO+H2	7.15E+05	2.4	1577.2
1271. IC3H5CHO+O2<=>IC3H5CO+HO2	2.00E+13	0.0	40700.0
1272. IC3H5CHO+O<=>IC3H5CO+OH	7.18E+12	0.0	1389.0
1273. IC3H5CHO+OH<=>IC3H5CO+H2O	6.13E+04	2.6	-4586.4
1274. IC3H5CHO+HO2<=>IC3H5CO+H2O2	1.18E-04	4.9	3684.3
1275. IC3H5CHO+CH3<=>IC3H5CO+CH4	1.25E+00	3.6	4328.9
1276. IC3H5CHO+H<=>IC3H4CHO-A+H2	3.64E+05	2.5	4361.2
1277. IC3H5CHO+O2<=>IC3H4CHO-A+HO2	5.96E+19	-1.7	46192.1
1278. IC3H5CHO+OH<=>IC3H4CHO-A+H2O	4.46E+06	2.1	1050.8
1279. IC3H5CHO+O<=>IC3H4CHO-A+OH	5.24E+11	0.7	5884.0
1280. IC3H5CHO+HO2<=>IC3H4CHO-A+H2O2	3.07E-02	4.4	13547.2
1281. IC3H5CHO+CH3<=>IC3H4CHO-A+CH4	2.21E+00	3.5	5675.0
1282. IC3H5CO<=>C3H5-T+CO	1.28E+20	-1.9	34460.0
1283. C3H4-A+HCO<=>IC3H4CHO-A	4.02E+04	2.5	8847.5
1284. IC3H7+CO<=>IC3H7CO	1.50E+11	0.0	4810.0
1285. C2H3CHO+CH3<=>IC3H6CHO	1.00E+11	0.0	7800.0
1286. SC4H7OH-I+HO2<=>IC3H7CHO+HO2	1.49E+05	1.7	6810.0
1287. SC4H7OH-I+HOCHO<=>IC3H7CHO+HOCHO	2.81E-02	3.3	-4509.0
1288. SC4H7OH-I+H<=>IC4H6OH+H2	7.29E+05	2.5	4361.2
1289. SC4H7OH-I+O<=>IC4H6OH+OH	1.05E+12	0.7	5884.0
1290. SC4H7OH-I+OH<=>IC4H6OH+H2O	4.40E+04	2.7	-827.1
1291. SC4H7OH-I+HO2<=>IC4H6OH+H2O2	2.92E-01	4.1	12802.0
1292. SC4H7OH-I+CH3<=>IC4H6OH+CH4	4.42E+00	3.5	5675.0
1293. SC4H7OH-I+CH3O<=>IC4H6OH+CH3OH	1.68E+11	0.0	2600.0
1294. SC4H7OH-I+CH3O2<=>IC4H6OH+CH3O2H	1.93E+04	2.6	13910.0
1295. IC4H6OH+H=>CH3+C3H4-A+OH	4.02E+04	2.5	8847.5
1296. TC4H9+O2<=>IC4H8+HO2	8.37E-01	3.6	11960.0
1297. IC4H9+O2<=>IC4H8+HO2	1.07E+00	3.7	9322.0
1298. IC4H9+O2<=>IC4H9O2	6.69E+13	-0.3	-187.2
1299. TC4H9+O2<=>TC4H9O2	6.69E+13	-0.3	-187.2
1300. IC4H9O2<=>IC4H8+HO2	1.94E+08	1.3	29600.0
1301. IC4H9O2<=>IC4H8O2H-I	9.82E+07	1.3	21500.0
1302. IC4H9O2<=>IC4H8O2H-T	2.31E+09	0.8	27100.0
1303. TC4H9O2<=>TC4H8O2H-I	4.52E+09	1.2	33500.0
1304. IC4H8O2H-I<=>CC4H8O+OH	4.47E+11	0.0	21900.0
1305. IC4H8O2H-I=>OH+CH2O+C3H6	8.45E+15	-0.7	29170.0
1306. CC4H8O+OH=>CH2O+C3H5-A+H2O	5.00E+12	0.0	0.0
1307. CC4H8O+H=>CH2O+C3H5-A+H2	3.51E+07	2.0	5000.0
1308. CC4H8O+O=>CH2O+C3H5-A+OH	1.12E+14	0.0	5200.0
1309. CC4H8O+HO2=>CH2O+C3H5-A+H2O2	1.00E+13	0.0	15000.0
1310. CC4H8O+CH3O2=>CH2O+C3H5-A+CH3O2H	1.00E+13	0.0	19000.0
1311. CC4H8O+CH3=>CH2O+C3H5-A+CH4	2.00E+11	0.0	10000.0
1312. IC4H8O2H-I+O2<=>IC4H8OOH-IO2	9.35E+11	0.1	-1010.9
1313. IC4H8O2H-T+O2<=>IC4H8OOH-TO2	5.04E+12	-0.1	-655.2
1314. TC4H8O2H-I+O2<=>TC4H8OOH-IO2	2.28E+10	0.5	-786.2
1315. IC4H8OOH-IO2<=>IC4KETII+OH	5.00E+10	0.0	21400.0
1316. IC4H8OOH-TO2<=>IC4KETIT+OH	4.00E+11	0.0	31500.0
1317. IC4H8OOH-TO2<=>TIC4H7Q2-I	6.00E+11	0.0	34500.0
1318. IC4H8OOH-IO2<=>IIC4H7Q2-I	3.75E+10	0.0	24400.0
1319. IC4H8OOH-IO2<=>IIC4H7Q2-T	1.00E+11	0.0	29200.0
1320. TC4H8OOH-IO2<=>TIC4H7Q2-I	9.82E+07	1.3	21500.0
1321. IC4H8O2H-T<=>IC4H8O+OH	1.55E+12	0.0	13400.0
1322. AC3H5OOH+CH2O2H<=>IIC4H7Q2-I	8.50E+10	0.0	10600.0
1323. IC4H7OOH+HO2<=>IIC4H7Q2-T	1.00E+11	0.0	7800.0
1324. TIC4H7Q2-I<=>IC4H7OOH+HO2	1.60E+12	0.2	15200.0
1325. IC4KETII=>CH2O+C2H5CO+OH	1.50E+16	0.0	42000.0
1326. IC4H9O2+CH3O2=>IC4H9O+CH3O+O2	1.40E+16	-1.6	1860.0
1327. IC4H9O2+C2H5O2=>IC4H9O+C2H5O+O2	1.40E+16	-1.6	1860.0
1328. IC4H9O2+CH3CO3=>IC4H9O+CH3CO2+O2	1.40E+16	-1.6	1860.0
1329. IC4H9O2+IC4H9O2=>O2+IC4H9O+IC4H9O	1.40E+16	-1.6	1860.0
1330. IC4H9O2+TC4H9O2=>IC4H9O+TC4H9O+O2	1.40E+16	-1.6	1860.0
1331. IC4H9O2+PC4H9O2=>IC4H9O+PC4H9O+O2	1.40E+16	-1.6	1860.0
1332. IC4H9O2+SC4H9O2=>IC4H9O+SC4H9O+O2	1.40E+16	-1.6	1860.0
1333. IC4H9O2+NC3H7O2=>IC4H9O+NC3H7O+O2	1.40E+16	-1.6	1860.0
1334. IC4H9O2+IC3H7O2=>IC4H9O+IC3H7O+O2	1.40E+16	-1.6	1860.0
1335. IC4H9O2+HO2=>IC4H9O+OH+O2	1.40E+16	-1.6	1860.0
1336. TC4H9O2+CH3O2=>TC4H9O+CH3O+O2	1.40E+16	-1.6	1860.0
1337. TC4H9O2+C2H5O2=>TC4H9O+C2H5O+O2	1.40E+16	-1.6	1860.0
1338. TC4H9O2+CH3CO3=>TC4H9O+CH3CO2+O2	1.40E+16	-1.6	1860.0
1339. TC4H9O2+TC4H9O2=>O2+TC4H9O+TC4H9O	1.40E+16	-1.6	1860.0

1340.	TC4H9O2+PC4H9O2=>TC4H9O+PC4H9O+O2	1.40E+16	-1.6	1860.0
1341.	TC4H9O2+SC4H9O2=>TC4H9O+SC4H9O+O2	1.40E+16	-1.6	1860.0
1342.	TC4H9O2+NC3H7O2=>TC4H9O+NC3H7O+O2	1.40E+16	-1.6	1860.0
1343.	TC4H9O2+IC3H7O2=>TC4H9O+IC3H7O+O2	1.40E+16	-1.6	1860.0
1344.	TC4H9O2+HO2=>TC4H9O+OH+O2	1.40E+16	-1.6	1860.0
1345.	IC4H9O2+CH3<=>IC4H9O+CH3O	7.00E+12	0.0	-1000.0
1346.	IC4H9O2+C2H5<=>IC4H9O+C2H5O	7.00E+12	0.0	-1000.0
1347.	IC4H9O2+IC3H7<=>IC4H9O+IC3H7O	7.00E+12	0.0	-1000.0
1348.	IC4H9O2+NC3H7<=>IC4H9O+NC3H7O	7.00E+12	0.0	-1000.0
1349.	IC4H9O2+PC4H9<=>IC4H9O+PC4H9O	7.00E+12	0.0	-1000.0
1350.	IC4H9O2+SC4H9<=>IC4H9O+SC4H9O	7.00E+12	0.0	-1000.0
1351.	IC4H9O2+IC4H9<=>IC4H9O+IC4H9O	7.00E+12	0.0	-1000.0
1352.	IC4H9O2+TC4H9<=>IC4H9O+TC4H9O	7.00E+12	0.0	-1000.0
1353.	IC4H9O2+C3H5-A<=>IC4H9O+C3H5O	7.00E+12	0.0	-1000.0
1354.	IC4H9O2+C4H71-3<=>IC4H9O+C4H71-O	7.00E+12	0.0	-1000.0
1355.	IC4H9O2+IC4H7<=>IC4H9O+IC4H7O	7.00E+12	0.0	-1000.0
1356.	TC4H9O2+CH3<=>TC4H9O+CH3O	7.00E+12	0.0	-1000.0
1357.	TC4H9O2+C2H5<=>TC4H9O+C2H5O	7.00E+12	0.0	-1000.0
1358.	TC4H9O2+IC3H7<=>TC4H9O+IC3H7O	7.00E+12	0.0	-1000.0
1359.	TC4H9O2+NC3H7<=>TC4H9O+NC3H7O	7.00E+12	0.0	-1000.0
1360.	TC4H9O2+PC4H9<=>TC4H9O+PC4H9O	7.00E+12	0.0	-1000.0
1361.	TC4H9O2+SC4H9<=>TC4H9O+SC4H9O	7.00E+12	0.0	-1000.0
1362.	TC4H9O2+IC4H9<=>TC4H9O+IC4H9O	7.00E+12	0.0	-1000.0
1363.	TC4H9O2+TC4H9<=>TC4H9O+TC4H9O	7.00E+12	0.0	-1000.0
1364.	TC4H9O2+C3H5-A<=>TC4H9O+C3H5O	7.00E+12	0.0	-1000.0
1365.	TC4H9O2+C4H71-3<=>TC4H9O+C4H71-O	7.00E+12	0.0	-1000.0
1366.	IC4H9O2H=>IC4H9O+OH	1.50E+16	0.0	42500.0
1367.	IC4H9O2+HO2<=>IC4H9O2H+O2	1.75E+10	0.0	-3275.0
1368.	IC4H9O2+H2O2<=>IC4H9O2H+HO2	2.40E+12	0.0	10000.0
1369.	IC4H9O2+H2<=>IC4H9O2H+H	3.01E+13	0.0	26030.0
1370.	IC4H9O2+CH4<=>IC4H9O2H+CH3	1.13E+13	0.0	20460.0
1371.	IC4H9O2+CH3OH<=>IC4H9O2H+CH2OH	6.30E+12	0.0	19360.0
1372.	IC4H9O2+CH2O<=>IC4H9O2H+HCO	1.30E+11	0.0	9000.0
1373.	IC4H9O2+C2H6<=>IC4H9O2H+C2H5	1.70E+13	0.0	20460.0
1374.	IC4H9O2+C2H4<=>IC4H9O2H+C2H3	8.59E+00	3.8	27132.0
1375.	IC4H9O2+C2H5OH<=>IC4H9O2H+PC2H4OH	6.30E+12	0.0	19360.0
1376.	IC4H9O2+C2H5OH<=>IC4H9O2H+SC2H4OH	4.20E+12	0.0	15000.0
1377.	IC4H9O2+CH3CHO<=>IC4H9O2H+CH3CO	2.80E+12	0.0	13600.0
1378.	IC4H9O2+C3H8<=>IC4H9O2H+IC3H7	2.00E+12	0.0	17000.0
1379.	IC4H9O2+C3H8<=>IC4H9O2H+NC3H7	1.70E+13	0.0	20460.0
1380.	IC4H9O2+C2H3CHO<=>IC4H9O2H+C2H3CO	2.80E+12	0.0	13600.0
1381.	IC4H9O2+C2H5CHO<=>IC4H9O2H+C2H5CO	2.80E+12	0.0	13600.0
1382.	IC4H9O2+C3H6<=>IC4H9O2H+C3H5-A	5.35E-02	4.2	13288.1
1383.	TC4H9O2H<=>TC4H9O+OH	5.95E+15	0.0	42540.0
1384.	TC4H9O2+CH4<=>TC4H9O2H+CH3	1.13E+13	0.0	20460.0
1385.	TC4H9O2+C2H6<=>TC4H9O2H+C2H5	1.70E+13	0.0	20460.0
1386.	TC4H9O2+C3H8<=>TC4H9O2H+IC3H7	2.00E+12	0.0	17000.0
1387.	TC4H9O2+C3H8<=>TC4H9O2H+NC3H7	1.70E+13	0.0	20460.0
1388.	TC4H9O2+CH3OH<=>TC4H9O2H+CH2OH	6.30E+12	0.0	19360.0
1389.	TC4H9O2+C2H5OH<=>TC4H9O2H+PC2H4OH	6.30E+12	0.0	19360.0
1390.	TC4H9O2+C2H5OH<=>TC4H9O2H+SC2H4OH	4.20E+12	0.0	15000.0
1391.	TC4H9O2+CH3CHO<=>TC4H9O2H+CH3CO	2.80E+12	0.0	13600.0
1392.	TC4H9O2+C2H3CHO<=>TC4H9O2H+C2H3CO	2.80E+12	0.0	13600.0
1393.	TC4H9O2+C2H5CHO<=>TC4H9O2H+C2H5CO	2.80E+12	0.0	13600.0
1394.	TC4H9O2+HO2<=>TC4H9O2H+O2	1.75E+10	0.0	-3275.0
1395.	TC4H9O2+H2O2<=>TC4H9O2H+HO2	2.40E+12	0.0	10000.0
1396.	TC4H9O2+CH2O<=>TC4H9O2H+HCO	1.30E+11	0.0	9000.0
1397.	TC4H9O2+C2H4<=>TC4H9O2H+C2H3	8.59E+00	3.8	27132.0
1398.	TC4H9O2+H2<=>TC4H9O2H+H	3.01E+13	0.0	26030.0
1399.	TC4H9O2+C3H6<=>TC4H9O2H+C3H5-A	5.35E-02	4.2	13288.1
1400.	IC4H8<=>IC4H7-I1+H	7.71E+69	-16.1	140000.0
1401.	IC4H8<=>C3H5-T+CH3	1.42E+93	-22.8	133825.0
	Rate coefficients at P=1.00E-01(atm)	1.26E+94	-23.0	134024.0
	Rate coefficients at P=1.00E+00(atm)	6.76E+93	-22.5	137933.0
	Rate coefficients at P=3.50E+00(atm)	3.14E+90	-21.4	137866.0
	Rate coefficients at P=1.00E+01(atm)	9.20E+85	-19.9	136498.0
	Rate coefficients at P=3.50E+01(atm)	6.05E+78	-17.8	133437.0
	Rate coefficients at P=1.00E+02(atm)	4.87E+71	-15.7	129919.0
1402.	IC4H8<=>IC4H7+H	4.66E+92	-22.4	129059.0
	Rate coefficients at P=1.00E-01(atm)	7.51E+95	-23.4	129214.0
	Rate coefficients at P=1.00E+00(atm)	3.59E+88	-21.0	127813.0
	Rate coefficients at P=3.50E+00(atm)	2.96E+82	-19.1	125456.0
	Rate coefficients at P=1.00E+01(atm)	2.13E+76	-17.3	122629.0
	Rate coefficients at P=3.50E+01(atm)	1.13E+68	-14.8	118416.0
	Rate coefficients at P=1.00E+02(atm)	4.73E+60	-12.7	114404.0
1403.	IC4H8+OH<=>IC4H7+H2O	4.40E+04	2.7	-827.1
1404.	IC4H8+OH<=>IC4H7-I1+H2O	1.09E+04	2.8	1114.2
1405.	IC4H8+O2<=>IC4H7+HO2	3.12E+13	0.0	37450.0
1406.	IC4H8+O2<=>IC4H7-I1+HO2	2.00E+13	0.0	62270.0
1407.	IC4H8+H<=>IC4H7+H2	7.29E+05	2.5	4361.2
1408.	IC4H8+H<=>IC4H7-I1+H2	8.62E+02	3.2	12167.0
1409.	IC4H8+O<=>IC4H7+OH	1.05E+12	0.7	5884.0
1410.	IC4H8+O<=>IC4H7-I1+OH	1.20E+11	0.7	8959.1
1411.	IC4H8+HO2<=>IC4H7+H2O2	2.92E-01	4.1	12802.0
1412.	IC4H8+HO2<=>IC4H7-I1+H2O2	9.70E+04	2.5	24733.2
1413.	IC4H8+CH3<=>IC4H7+CH4	3.20E+12	0.0	10000.0
1414.	IC4H8+CH3<=>IC4H7-I1+CH4	2.00E+12	0.0	15000.0
1415.	IC4H8+CH3O<=>IC4H7+CH3OH	1.68E+11	0.0	2600.0
1416.	IC4H8+C3H5-A<=>IC4H7+C3H6	7.94E+11	0.0	20500.0
1417.	IC4H8+C3H5-S<=>IC4H7+C3H6	7.94E+11	0.0	20500.0
1418.	IC4H8+C3H5-T<=>IC4H7+C3H6	7.94E+11	0.0	20500.0
1419.	IC4H8+CH3O2<=>IC4H7+CH3O2H	1.54E-01	4.4	13547.2
1420.	IC4H8+CH3CO3<=>IC4H7+CH3CO3H	1.54E-01	4.4	13547.2
1421.	IC4H8+O2CHO<=>IC4H7+HO2CHO	1.93E+04	2.6	13910.0

1422. IC4H9O2+IC4H8<=>IC4H9O2H+IC4H7	1.40E+12	0.0	14900.0
1423. TC4H9O2+IC4H8<=>TC4H9O2H+IC4H7	1.40E+12	0.0	14900.0
1424. PC4H9O2+IC4H8<=>PC4H9O2H+IC4H7	1.40E+12	0.0	14900.0
1425. SC4H9O2+IC4H8<=>SC4H9O2H+IC4H7	1.40E+12	0.0	14900.0
1426. IC3H7O2+IC4H8<=>IC3H7O2H+IC4H7	1.40E+12	0.0	14900.0
1427. NC3H7O2+IC4H8<=>NC3H7O2H+IC4H7	1.40E+12	0.0	14900.0
1428. IC4H7O+IC4H8<=>IC4H7OH+IC4H7	2.70E+11	0.0	4000.0
1429. IC4H8+CH2CCH2OH<=>IC4H7+C3H5OH	7.94E+11	0.0	20500.0
1430. IC4H7<=>IC4H7-I1	1.30E+55	-14.5	73800.0
Rate coefficients at P=1.00E-01(atm)	1.30E+55	-14.5	73800.0
Rate coefficients at P=1.00E+00(atm)	5.00E+51	-13.0	73300.0
Rate coefficients at P=1.00E+01(atm)	9.70E+48	-11.7	73700.0
Rate coefficients at P=1.00E+02(atm)	4.86E+44	-9.8	73400.0
1431. C3H4-A+CH3<=>IC4H7	4.02E+04	2.5	8847.5
1432. IC4H7+HO2<=>IC4H7O+OH	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	1.02E+13	-0.2	-1417.0
Rate coefficients at P=1.00E-01(atm)	4.98E+14	-0.6	-349.1
Rate coefficients at P=1.00E+00(atm)	7.77E+17	-1.5	2379.2
Rate coefficients at P=1.00E+01(atm)	2.93E+15	-0.7	3615.3
Rate coefficients at P=1.00E+02(atm)	1.64E+04	2.7	1144.4
1433. IC4H7+HO2<=>IC4H7OOH	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	1.91E+31	-7.2	1336.2
Rate coefficients at P=1.00E-01(atm)	6.31E+42	-10.3	5568.9
Rate coefficients at P=1.00E+00(atm)	1.03E+45	-10.6	7851.5
Rate coefficients at P=1.00E+01(atm)	2.79E+37	-7.9	6497.9
Rate coefficients at P=1.00E+02(atm)	1.44E+32	-6.0	6053.6
1434. IC4H7+HO2<=>IC3H5CHO+H2O	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	1.09E+00	3.0	-3421.1
Rate coefficients at P=1.00E-01(atm)	6.35E+01	2.5	-2341.4
Rate coefficients at P=1.00E+00(atm)	6.05E+05	1.4	595.1
Rate coefficients at P=1.00E+01(atm)	3.10E+05	1.6	2677.6
Rate coefficients at P=1.00E+02(atm)	5.07E-05	4.6	927.5
1435. IC4H7OOH<=>IC3H5CHO+H2O	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	1.99E+50	-12.7	53531.9
Rate coefficients at P=1.00E-01(atm)	4.72E+47	-11.5	54360.9
Rate coefficients at P=1.00E+00(atm)	1.50E+40	-8.8	53179.2
Rate coefficients at P=1.00E+01(atm)	2.54E+28	-5.0	49919.4
Rate coefficients at P=1.00E+02(atm)	1.48E+16	-1.1	45949.3
1436. IC4H7OOH<=>IC4H7O+OH	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	1.49E+58	-13.9	54266.9
Rate coefficients at P=1.00E-01(atm)	1.80E+54	-12.4	54193.8
Rate coefficients at P=1.00E+00(atm)	3.36E+46	-9.8	52468.5
Rate coefficients at P=1.00E+01(atm)	2.39E+36	-6.5	49429.0
Rate coefficients at P=1.00E+02(atm)	1.28E+27	-3.6	46333.1
1437. IC4H7O<=>C3H5-T+CH2O	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	7.26E+06	0.2	17815.5
Rate coefficients at P=1.00E-02(atm)	6.97E+16	-2.5	20878.7
Rate coefficients at P=1.00E-01(atm)	6.64E+23	-4.2	23565.0
Rate coefficients at P=1.00E+00(atm)	1.07E+26	-4.6	24622.9
Rate coefficients at P=1.00E+01(atm)	6.50E+29	-5.4	26645.0
Rate coefficients at P=1.00E+02(atm)	4.63E+31	-5.6	28915.3
Rate coefficients at P=1.00E+03(atm)	8.52E+25	-3.6	27863.4
1438. IC4H7O<=>IC3H5OCH2	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	3.17E+20	-4.2	12121.3
Rate coefficients at P=1.00E-02(atm)	4.79E+24	-5.0	14606.1
Rate coefficients at P=1.00E-01(atm)	1.90E+26	-5.2	16124.4
Rate coefficients at P=1.00E+00(atm)	1.51E+28	-5.4	18165.4
Rate coefficients at P=1.00E+01(atm)	2.42E+28	-5.2	19691.2
Rate coefficients at P=1.00E+02(atm)	5.57E+24	-3.9	19395.2
Rate coefficients at P=1.00E+03(atm)	1.35E+18	-1.7	17386.5
1439. IC4H7O<=>IC3H6CHO	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	5.25E-49	15.5	-15639.9
Rate coefficients at P=1.00E-02(atm)	1.46E-88	27.6	-35995.0
Rate coefficients at P=1.00E-01(atm)	4.44E-22	8.4	-3819.0
Rate coefficients at P=1.00E+00(atm)	6.23E+12	-1.4	10829.2
Rate coefficients at P=1.00E+01(atm)	3.48E+42	-9.9	25297.9
Rate coefficients at P=1.00E+02(atm)	1.88E+38	-8.2	25974.5
Rate coefficients at P=1.00E+03(atm)	1.67E+21	-2.7	20337.7
1440. IC4H7O<=>IC3H5CHO+H	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	3.00E+15	-2.3	14667.9
Rate coefficients at P=1.00E-02(atm)	1.50E+22	-4.0	18283.0
Rate coefficients at P=1.00E-01(atm)	1.95E+23	-4.0	19143.3
Rate coefficients at P=1.00E+00(atm)	1.15E+25	-4.2	20311.2
Rate coefficients at P=1.00E+01(atm)	1.76E+28	-4.9	22765.2
Rate coefficients at P=1.00E+02(atm)	1.41E+27	-4.3	23770.6
Rate coefficients at P=1.00E+03(atm)	2.57E+20	-2.1	22040.1
1441. IC4H7O<=>C3H6+HCO	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	6.62E+16	-2.8	13197.0
Rate coefficients at P=1.00E-02(atm)	1.26E+20	-3.5	15469.2
Rate coefficients at P=1.00E-01(atm)	2.13E+21	-3.6	16584.5
Rate coefficients at P=1.00E+00(atm)	1.07E+24	-4.2	18985.0
Rate coefficients at P=1.00E+01(atm)	8.42E+25	-4.4	22382.6
Rate coefficients at P=1.00E+02(atm)	1.86E+21	-2.7	23658.8
Rate coefficients at P=1.00E+03(atm)	4.75E+08	1.1	20922.5
1442. IC3H5OCH2<=>C3H5-T+CH2O	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	3.30E+09	-0.6	19747.8
Rate coefficients at P=1.00E-02(atm)	3.36E+21	-3.9	23945.2
Rate coefficients at P=1.00E-01(atm)	2.91E+29	-5.9	27249.7
Rate coefficients at P=1.00E+00(atm)	1.83E+34	-6.9	30690.4
Rate coefficients at P=1.00E+01(atm)	9.72E+33	-6.5	33002.5
Rate coefficients at P=1.00E+02(atm)	2.68E+27	-4.3	33305.6
Rate coefficients at P=1.00E+03(atm)	8.81E+14	-0.3	31553.1
1443. IC3H5OCH2<=>IC3H6CHO	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	8.01E-92	27.8	-37321.2

Rate coefficients at P=1.00E-02(atm)	7.78E-11	3.7	-2766.9
Rate coefficients at P=1.00E-01(atm)	5.11E+15	-2.8	15937.6
Rate coefficients at P=1.00E+00(atm)	4.48E+25	-5.2	21532.2
Rate coefficients at P=1.00E+01(atm)	3.97E+34	-7.4	28116.9
Rate coefficients at P=1.00E+02(atm)	5.62E+22	-3.6	25806.7
Rate coefficients at P=1.00E+03(atm)	2.51E+20	-2.6	29288.4
1444. IC3H5OCH2<=>IC3H5CHO+H	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	4.93E+24	-5.0	20108.4
Rate coefficients at P=1.00E-02(atm)	2.14E+28	-5.8	22219.4
Rate coefficients at P=1.00E-01(atm)	1.93E+32	-6.6	25108.2
Rate coefficients at P=1.00E+00(atm)	8.60E+34	-7.1	28209.1
Rate coefficients at P=1.00E+01(atm)	2.17E+34	-6.6	30647.6
Rate coefficients at P=1.00E+02(atm)	4.17E+28	-4.7	31231.9
Rate coefficients at P=1.00E+03(atm)	3.98E+18	-1.6	30129.8
1445. IC3H5OCH2<=>C3H6+HCO	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	8.23E+26	-5.8	19356.9
Rate coefficients at P=1.00E-02(atm)	1.32E+29	-6.2	21293.6
Rate coefficients at P=1.00E-01(atm)	3.47E+32	-7.0	24197.3
Rate coefficients at P=1.00E+00(atm)	1.44E+36	-7.8	28007.8
Rate coefficients at P=1.00E+01(atm)	9.72E+37	-8.0	32394.6
Rate coefficients at P=1.00E+02(atm)	2.43E+31	-5.8	34295.8
Rate coefficients at P=1.00E+03(atm)	3.73E+14	-0.7	32008.3
1446. IC3H6CHO<=>C3H5-T+CH2O	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	6.89E-69	21.5	2638.0
Rate coefficients at P=1.00E-02(atm)	5.34E-33	11.1	16749.1
Rate coefficients at P=1.00E-01(atm)	6.11E+26	-6.0	44116.7
Rate coefficients at P=1.00E+00(atm)	8.04E+35	-8.3	46919.7
Rate coefficients at P=1.00E+01(atm)	5.52E+40	-9.2	50508.7
Rate coefficients at P=1.00E+02(atm)	5.85E+35	-7.2	52038.4
Rate coefficients at P=1.00E+03(atm)	1.93E+19	-1.9	48440.0
1447. IC3H6CHO<=>IC3H5CHO+H	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	1.61E+10	-1.2	32371.3
Rate coefficients at P=1.00E-02(atm)	5.84E+15	-2.6	32878.4
Rate coefficients at P=1.00E-01(atm)	3.64E+23	-4.6	34275.3
Rate coefficients at P=1.00E+00(atm)	7.58E+31	-6.6	37895.4
Rate coefficients at P=1.00E+01(atm)	2.86E+32	-6.3	39990.7
Rate coefficients at P=1.00E+02(atm)	1.57E+23	-3.1	38011.7
Rate coefficients at P=1.00E+03(atm)	4.52E+12	0.2	34570.5
1448. IC3H6CHO<=>C3H6+HCO	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	2.90E+32	-7.2	25687.5
Rate coefficients at P=1.00E-02(atm)	5.30E+33	-7.3	27100.6
Rate coefficients at P=1.00E-01(atm)	2.00E+35	-7.4	29027.3
Rate coefficients at P=1.00E+00(atm)	1.01E+34	-6.7	30018.1
Rate coefficients at P=1.00E+01(atm)	9.76E+27	-4.6	28923.9
Rate coefficients at P=1.00E+02(atm)	2.11E+19	-1.9	26239.8
Rate coefficients at P=1.00E+03(atm)	1.59E+13	0.1	24086.3
1449. C3H5-T+CH2O<=>IC3H5CHO+H	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	2.60E+04	2.3	1510.3
Rate coefficients at P=1.00E-02(atm)	5.13E+04	2.2	1675.5
Rate coefficients at P=1.00E-01(atm)	3.99E+05	1.9	2218.3
Rate coefficients at P=1.00E+00(atm)	1.75E+07	1.4	3428.0
Rate coefficients at P=1.00E+01(atm)	1.35E+09	0.9	5173.0
Rate coefficients at P=1.00E+02(atm)	2.24E+11	0.4	8001.3
Rate coefficients at P=1.00E+03(atm)	6.01E+05	2.1	7895.6
1450. C3H5-T+CH2O<=>C3H6+HCO	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-03(atm)	1.11E+07	1.1	1807.2
Rate coefficients at P=1.00E-02(atm)	2.47E+07	1.0	1994.9
Rate coefficients at P=1.00E-01(atm)	2.47E+08	0.7	2596.2
Rate coefficients at P=1.00E+00(atm)	1.42E+10	0.2	3934.2
Rate coefficients at P=1.00E+01(atm)	3.45E+13	-0.7	6944.3
Rate coefficients at P=1.00E+02(atm)	3.31E+14	-0.9	10965.7
Rate coefficients at P=1.00E+03(atm)	1.65E+01	3.2	9399.8
1451. IC4H7+CH3O2<=>IC4H7O+CH3O	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	3.33E+12	-0.2	-1417.0
Rate coefficients at P=1.00E-01(atm)	1.66E+14	-0.6	-349.1
Rate coefficients at P=1.00E+00(atm)	2.60E+17	-1.5	2379.2
Rate coefficients at P=1.00E+01(atm)	9.78E+14	-0.7	3615.3
Rate coefficients at P=1.00E+02(atm)	5.47E+03	2.7	1144.4
1452. IC4H7+CH3O2<=>IC4H7OOCH3	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	1.91E+31	-7.2	1336.2
Rate coefficients at P=1.00E-01(atm)	6.31E+42	-10.3	5568.9
Rate coefficients at P=1.00E+00(atm)	1.03E+45	-10.6	7851.5
Rate coefficients at P=1.00E+01(atm)	2.79E+37	-7.9	6497.9
Rate coefficients at P=1.00E+02(atm)	3.40E+29	-5.3	4539.8
1453. IC4H7OOCH3<=>IC4H7O+CH3O	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	1.49E+58	-13.9	54266.9
Rate coefficients at P=1.00E-01(atm)	1.80E+54	-12.4	54193.8
Rate coefficients at P=1.00E+00(atm)	3.36E+46	-9.8	52468.5
Rate coefficients at P=1.00E+01(atm)	2.39E+36	-6.5	49429.0
Rate coefficients at P=1.00E+02(atm)	2.56E+27	-3.6	46333.1
1454. IC4H7O2+IC4H7<=>IC4H7O+IC4H7O	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	2.55E+12	-0.2	-1417.0
Rate coefficients at P=1.00E-01(atm)	1.25E+14	-0.6	-349.1
Rate coefficients at P=1.00E+00(atm)	1.94E+17	-1.5	2379.2
Rate coefficients at P=1.00E+01(atm)	7.33E+14	-0.7	3615.3
Rate coefficients at P=1.00E+02(atm)	4.10E+03	2.7	1144.4
1455. IC4H7O2+IC4H7<=>IC4H7OOIC4H7	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	4.78E+30	-7.2	1336.2
Rate coefficients at P=1.00E-01(atm)	1.58E+42	-10.3	5568.9
Rate coefficients at P=1.00E+00(atm)	2.58E+44	-10.6	7851.5
Rate coefficients at P=1.00E+01(atm)	6.98E+36	-7.9	6497.9
Rate coefficients at P=1.00E+02(atm)	3.60E+31	-6.0	6053.6
1456. IC4H7OOIC4H7<=>IC4H7O+IC4H7O	1.00E+11	0.0	0.0
Rate coefficients at P=1.00E-02(atm)	3.73E+57	-13.9	54266.9

	Rate coefficients at P=1.00E-01(atm)	4.50E+53	-12.4	54193.8
	Rate coefficients at P=1.00E+00(atm)	8.40E+45	-9.8	52468.5
	Rate coefficients at P=1.00E+01(atm)	5.98E+35	-6.5	49429.0
	Rate coefficients at P=1.00E+02(atm)	3.20E+26	-3.6	46333.1
1457.	IC4H7+NC3H7O2<=>IC4H7O+NC3H7O	7.00E+12	0.0	-1000.0
1458.	IC4H7+PC4H9O2<=>IC4H7O+PC4H9O	7.00E+12	0.0	-1000.0
1459.	IC4H7+SC4H9O2<=>IC4H7O+SC4H9O	7.00E+12	0.0	-1000.0
1460.	IC4H7+IC3H7O2<=>IC4H7O+IC3H7O	7.00E+12	0.0	-1000.0
1461.	IC4H7+TC4H9O2<=>IC4H7O+TC4H9O	7.00E+12	0.0	-1000.0
1462.	IC4H7+IC4H7<=>C3H4-A+AC5H10	9.55E+40	-9.3	12470.0
	Rate coefficients at P=1.00E+00(atm)	4.10E+40	-9.3	12470.0
	Rate coefficients at P=4.00E+00(atm)	3.41E+32	-6.8	9180.0
	Rate coefficients at P=1.00E+01(atm)	1.26E+28	-5.5	7410.0
1463.	IC4H7+IC4H7<=>H15DE25DM	1.00E+11	0.0	0.0
	Rate coefficients at P=3.90E-02(atm)	3.27E+64	-15.9	20230.0
	Rate coefficients at P=7.80E-02(atm)	7.50E+59	-14.5	18600.0
	Rate coefficients at P=1.56E-01(atm)	1.14E+55	-13.0	16700.0
1464.	H15DE25DM+H<=>H15DE25DM-S+H2	1.42E+06	2.3	2076.0
1465.	H15DE25DM+O2<=>H15DE25DM-S+HO2	4.00E+14	0.0	38890.0
1466.	H15DE25DM+O<=>H15DE25DM-S+OH	1.59E+11	0.7	13.0
1467.	H15DE25DM+OH<=>H15DE25DM-S+H2O	8.95E+04	2.6	-6.0
1468.	H15DE25DM+HO2<=>H15DE25DM-S+H2O2	1.00E+00	3.9	9386.4
1469.	H15DE25DM+CH3<=>H15DE25DM-S+CH4	1.00E+00	3.6	3374.1
1470.	H15DE25DM+H<=>H15DE25DM-A+H2	7.29E+05	2.5	4361.2
1471.	H15DE25DM+O2<=>H15DE25DM-A+HO2	1.86E+09	1.3	40939.0
1472.	H15DE25DM+O<=>H15DE25DM-A+OH	1.05E+12	0.7	5884.0
1473.	H15DE25DM+OH<=>H15DE25DM-A+H2O	2.53E+05	2.5	729.4
1474.	H15DE25DM+HO2<=>H15DE25DM-A+H2O2	2.92E-01	4.1	12802.0
1475.	H15DE25DM+CH3<=>H15DE25DM-A+CH4	4.42E+00	3.5	5675.0
1476.	C3H5-T+B13DE2M<=>H15DE25DM-S	7.07E+03	2.5	6130.0
1477.	C3H4-A+AC5H9-D<=>H15DE25DM-A	2.84E+04	2.5	8847.5
1478.	H15DE25DM-S+HO2<=>H15DE25DM-SO+OH	7.00E+12	0.0	-1000.0
1479.	IC3H5CHO+IC4H7<=>H15DE25DM-SO	2.50E+10	0.0	6329.7
1480.	C3H5-T+IC4H7CHO<=>H15DE25DM-SO	2.50E+10	0.0	15526.4
1481.	IC4H7CHO+OH=>CH2CHO+C3H4-A+H2O	5.06E+07	2.5	729.4
1482.	H15DE25DM-A+HO2<=>H15DE25DM-AO+OH	7.00E+12	0.0	-1000.0
1483.	H15DE2M-T+CH2O<=>H15DE25DM-AO	2.50E+10	0.0	4786.6
1484.	IC4H7+C3H4-A<=>H15DE2M-T	8.80E+03	2.5	6130.0
1485.	IC4H7-I1+H<=>C3H4-A+CH4	3.33E+12	0.0	0.0
1486.	IC4H7-I1+H<=>C3H4-P+CH4	3.34E+12	0.0	0.0
1487.	IC4H7-I1+O<=>C3H6+HCO	6.00E+13	0.0	0.0
1488.	IC4H7-I1+OH=>C3H6+HCO+H	5.00E+12	0.0	0.0
1489.	IC4H7-I1+HO2=>C3H6+HCO+OH	2.00E+13	0.0	0.0
1490.	IC4H7-I1+HCO<=>IC4H8+CO	9.00E+13	0.0	0.0
1491.	IC4H7-I1+CH3<=>C3H4-P+C2H6	1.00E+11	0.0	0.0
1492.	IC4H7-I1+O2<=>CH3COCH3+HCO	3.10E+31	-5.9	5748.4
1493.	IC4H7-I1+O2<=>TC3H6CHO+O	5.38E+18	-2.1	5142.9
1494.	IC4H7-I1+O2<=>IC3H5CHO+OH	2.70E+19	-2.1	5142.9
1495.	IC4H7+O2<=>IC4H7O2	1.09E+10	0.6	2290.0
1496.	IC4H7+O<=>IC3H5CHO+H	6.03E+13	0.0	0.0
1497.	IC4H7O2<=>IC4H6OOH-I	1.41E+05	1.8	19820.0
1498.	IC4H7O2<=>CCYCCOOC-T1	1.19E+08	0.8	28020.0
1499.	IC4H7O2<=>C2CYCOOC-I1	1.07E+08	0.9	29720.0
1500.	IC4H7O2<=>IC4H7O+O	1.82E+14	0.0	60620.0
1501.	IC4H7O2<=>IC3H5CHO+OH	1.52E+09	1.0	39460.0
1502.	IC4H6OOH-I<=>CVCYCCOC+OH	6.82E+12	-0.3	42140.0
1503.	IC4H6OOH-I<=>C3H4-A+CH2O2H	1.18E+12	0.9	51390.0
1504.	IC4H6OOH-I<=>IC3H5CHO+OH	2.42E+09	0.9	54090.0
1505.	CCYCCOOC-T1<=>CCYC2OCO	4.56E+11	0.9	17470.0
1506.	CCYCCOOC-T1<=>CCYCCOOC-I2	3.56E+13	0.0	38820.0
1507.	CCYCCOOC-I2<=>CHOIC3H6O	3.19E+14	0.0	3000.0
1508.	C2CYCOOC-I1<=>IC3H5OOCH2	4.41E+13	-0.2	18500.0
1509.	IC3H5OOCH2<=>CH3COCH2+CH2O	1.41E+10	0.0	1000.0
1510.	CHOIC3H6O<=>CH3CHCHO+CH2O	4.30E+12	0.0	9780.0
1511.	CCYC2OCO<=>CCYCCO-T1+CH2O	1.74E+13	0.0	18150.0
1512.	C2CYCOOC-I1<=>CCYC2OCO	1.21E+13	0.1	20320.0
1513.	IC4H7O2+IC4H7O2=>IC4H7O+IC4H7O+O2	1.40E+16	-1.6	1860.0
1514.	IC4H7O2+IC4H8<=>IC4H7+IC4H7OOH	1.46E-01	4.1	12802.0
1515.	IC4H8+H<=>IC4H9	1.00E+00	1.0	0.0
	Rate coefficients at P=1.30E-03(atm)	7.99E+81	-23.2	22239.0
	Rate coefficients at P=4.00E-02(atm)	4.24E+68	-18.4	19665.0
	Rate coefficients at P=1.00E+00(atm)	1.04E+49	-11.5	15359.0
	Rate coefficients at P=1.00E+01(atm)	6.20E+41	-8.9	14637.0
	Declared duplicate reaction...			
1516.	IC4H8+H<=>IC4H9	1.00E+00	1.0	0.0
	Rate coefficients at P=1.30E-03(atm)	1.85E+26	-5.8	3865.8
	Rate coefficients at P=4.00E-02(atm)	2.82E+30	-6.5	5470.8
	Rate coefficients at P=1.00E+00(atm)	3.78E+28	-5.6	5625.1
	Rate coefficients at P=1.00E+01(atm)	1.46E+25	-4.3	5247.8
	Rate coefficients at P=1.00E+02(atm)	4.22E+27	-4.4	9345.8
	Declared duplicate reaction...			
1517.	IC4H8+H<=>TC4H9	1.00E+00	1.0	1.0
	Rate coefficients at P=1.30E-03(atm)	1.35E+44	-10.7	8196.4
	Rate coefficients at P=4.00E-02(atm)	2.11E+57	-14.2	15147.0
	Rate coefficients at P=1.00E+00(atm)	3.26E+61	-14.9	20161.0
	Rate coefficients at P=1.00E+01(atm)	5.30E+56	-13.1	20667.0
	Rate coefficients at P=1.00E+02(atm)	1.11E+50	-10.8	20202.0
	Declared duplicate reaction...			
1518.	IC4H8+H<=>TC4H9	1.00E+00	1.0	1.0
	Rate coefficients at P=1.30E-03(atm)	2.17+130	-32.6	136140.0
	Rate coefficients at P=4.00E-02(atm)	2.25E+29	-5.8	4241.9
	Rate coefficients at P=1.00E+00(atm)	1.06E+30	-5.6	5613.4
	Rate coefficients at P=1.00E+01(atm)	6.11E+26	-4.4	5182.3
	Rate coefficients at P=1.00E+02(atm)	2.73E+23	-3.3	4597.0

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     Declared duplicate reaction...
1519. IC4H8+H<=>C3H6+CH3                          1.00E+00    1.0        1.0
     Rate coefficients at P=1.30E-03(atm)         5.13E+08    1.4     2542.0
     Rate coefficients at P=4.00E-02(atm)         2.63E+10    0.9     3599.6
     Rate coefficients at P=1.00E+00(atm)         8.90E+11    0.5     5431.1
     Rate coefficients at P=1.00E+01(atm)         3.08E+22   -2.6    12898.0
     Rate coefficients at P=1.00E+02(atm)         4.40E+22   -2.4    16500.0
     Declared duplicate reaction...
1520. IC4H8+H<=>C3H6+CH3                          1.00E+00    1.0        1.0
     Rate coefficients at P=1.30E-03(atm)         7.70E+02    1.4     2542.0
     Rate coefficients at P=4.00E-02(atm)         3.94E+04    0.9     3599.6
     Rate coefficients at P=1.00E+00(atm)         1.34E+06    0.5     5431.1
     Rate coefficients at P=1.00E+01(atm)         4.13E+04    2.5     3679.1
     Rate coefficients at P=1.00E+02(atm)         8.37E+02    2.9     3980.9
     Declared duplicate reaction...
1521. IC4H8+HO2<=>TC4H9O2                         1.04E-01    3.5     4338.0
1522. IC4H8+HO2<=>IC4H8O2H-T                      1.64E+04    2.4     8300.0
1523. IC4H8+HO2<=>TC4H8O2H-I                      1.00E+11    0.0        0.0
     Rate coefficients at P=1.30E-02(atm)         6.67E+14   -2.1    14188.0
     Rate coefficients at P=9.87E-01(atm)         6.25E+06    0.6     9073.0
     Rate coefficients at P=9.87E+00(atm)         7.96E+06    0.8     8771.0
     Rate coefficients at P=9.87E+01(atm)         2.05E+13   -0.8    12919.0
1524. IC4H8+HO2<=>IC4H8O+OH                       1.00E+11    0.0        0.0
     Rate coefficients at P=1.30E-02(atm)         1.18E+04    2.3    11321.0
     Rate coefficients at P=9.87E-01(atm)         5.30E+04    2.1    11797.0
     Rate coefficients at P=9.87E+00(atm)         1.47E+09    0.8    14808.0
     Rate coefficients at P=9.87E+01(atm)         1.96E+17   -1.4    21195.0
1525. TC4H8O2H-I<=>IC4H8O+OH                      1.00E+11    0.0        0.0
     Rate coefficients at P=1.30E-02(atm)         5.23E+17   -3.0     8215.0
     Rate coefficients at P=9.87E-01(atm)         4.39E+22   -3.9    11424.0
     Rate coefficients at P=9.87E+00(atm)         4.00E+25   -4.5    13952.0
     Rate coefficients at P=9.87E+01(atm)         1.21E+27   -4.7    16324.0
1526. IC4H8+O<=>IC3H7+HCO                         7.45E+06    1.9      183.0
1527. IC4H8+O=>CH2CO+CH3+CH3                      3.05E+06    1.9      183.0
1528. IC4H8+O=>IC3H6CO+H+H                        3.05E+06    1.9      183.0
1529. IC4H8+OH<=>IC4H7OH+H                        2.29E+13    0.1    10580.0
     Rate coefficients at P=1.30E-03(atm)         2.67E+13    0.1    10611.0
     Rate coefficients at P=1.00E-02(atm)         2.75E+13    0.1    10623.0
     Rate coefficients at P=1.30E-02(atm)         2.87E+13    0.0    10634.0
     Rate coefficients at P=2.50E-02(atm)         1.59E+14   -0.2    11125.0
     Rate coefficients at P=1.00E-01(atm)         3.10E+14   -0.2    11407.0
     Rate coefficients at P=1.32E-01(atm)         3.78E+14   -0.2    11458.0
     Rate coefficients at P=1.00E+00(atm)         9.15E+07    1.4    10087.0
     Rate coefficients at P=1.00E+01(atm)         3.66E+05    2.1    10410.0
     Rate coefficients at P=1.00E+02(atm)         8.19E+02    2.8    10481.0
1530. IC4H8+OH<=>SC3H5OH+CH3                      1.29E+06    1.6     1233.0
     Rate coefficients at P=1.30E-03(atm)         5.16E+05    1.6     1233.0
     Rate coefficients at P=1.00E-02(atm)         7.28E+03    2.1     1162.0
     Rate coefficients at P=1.30E-02(atm)         8.16E+02    2.5     1128.0
     Rate coefficients at P=2.50E-02(atm)         1.15E+02    2.8     1152.0
     Rate coefficients at P=1.00E-01(atm)         5.60E+00    3.2     1208.0
     Rate coefficients at P=1.32E-01(atm)         3.08E+00    3.3     1216.0
     Rate coefficients at P=1.00E+00(atm)         4.52E+03    2.5     3238.0
     Rate coefficients at P=1.00E+01(atm)         9.64E+18   -1.7    13107.0
     Rate coefficients at P=1.00E+02(atm)         1.32E-01    3.7     3665.0
1531. IC4H8+OH<=>IC3H5OH+CH3                      1.29E+06    1.6     1233.0
     Rate coefficients at P=1.30E-03(atm)         2.06E+06    1.6     1233.0
     Rate coefficients at P=1.00E-02(atm)         2.91E+04    2.1     1162.0
     Rate coefficients at P=1.30E-02(atm)         3.26E+03    2.5     1128.0
     Rate coefficients at P=2.50E-02(atm)         4.61E+02    2.8     1152.0
     Rate coefficients at P=1.00E-01(atm)         2.24E+01    3.2     1208.0
     Rate coefficients at P=1.32E-01(atm)         1.23E+01    3.3     1216.0
     Rate coefficients at P=1.00E+00(atm)         1.81E+04    2.5     3238.0
     Rate coefficients at P=1.00E+01(atm)         3.86E+19   -1.7    13107.0
     Rate coefficients at P=1.00E+02(atm)         5.28E-01    3.7     3665.0
1532. IC4H8+OH<=>SC4H7OH-I+H                      2.87E+00    2.9      625.0
     Rate coefficients at P=1.30E-03(atm)         2.87E+00    2.9      625.0
     Rate coefficients at P=1.00E-02(atm)         4.84E-01    3.0      704.0
     Rate coefficients at P=1.30E-02(atm)         3.13E-01    3.0      721.0
     Rate coefficients at P=2.50E-02(atm)         9.33E-03    3.6      677.0
     Rate coefficients at P=1.00E-01(atm)         4.64E-05    4.5      687.0
     Rate coefficients at P=1.32E-01(atm)         2.71E-05    4.6      707.0
     Rate coefficients at P=1.00E+00(atm)         7.65E-07    5.0      874.0
     Rate coefficients at P=1.00E+01(atm)         2.64E+15   -0.8    12728.0
     Rate coefficients at P=1.00E+02(atm)         4.87E-04    4.3     4020.0
1533. IC4H8+OH<=>CH3COCH3+CH3                     6.93E+05    1.5     -536.0
     Rate coefficients at P=1.30E-03(atm)         6.93E+05    1.5     -536.0
     Rate coefficients at P=1.00E-02(atm)         5.94E+03    2.0     -560.0
     Rate coefficients at P=1.30E-02(atm)         1.10E+03    2.2     -680.0
     Rate coefficients at P=2.50E-02(atm)         1.07E+02    2.5     -759.0
     Rate coefficients at P=1.00E-01(atm)         7.83E-01    3.1     -919.0
     Rate coefficients at P=1.32E-01(atm)         3.07E-01    3.2     -946.0
     Rate coefficients at P=1.00E+00(atm)         3.16E-04    4.0    -1144.0
     Rate coefficients at P=1.00E+01(atm)         7.59E-06    4.5     -680.0
     Rate coefficients at P=1.00E+02(atm)         5.45E-05    4.2     1141.0
1534. IC4H8+OH<=>IC4H8OH-IT                       5.10E+54  -20.7    32402.0
     Rate coefficients at P=1.30E-03(atm)         2.30E+78  -20.7    32402.0
     Rate coefficients at P=1.00E-02(atm)         2.74E+77  -20.0    33874.0
     Rate coefficients at P=1.30E-02(atm)         1.07E+76  -19.6    32874.0
     Rate coefficients at P=2.50E-02(atm)         3.68E+73  -18.8    31361.0
     Rate coefficients at P=1.00E-01(atm)         1.04E+68  -17.0    27909.0
     Rate coefficients at P=1.32E-01(atm)         7.23E+66  -16.6    27162.0
     Rate coefficients at P=1.00E+00(atm)         1.95E+59  -14.2    23079.0
     Rate coefficients at P=1.00E+01(atm)         7.58E+53  -12.2    22976.0
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      Rate coefficients at P=1.00E+02(atm)          1.43E+48  -10.2    23772.0
      Declared duplicate reaction...
1535. IC4H8+OH<=>IC4H8OH-IT                          1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.30E-03(atm)          6.41E+59  -15.8    11594.0
      Rate coefficients at P=1.00E-02(atm)          7.28E+59  -15.5    12898.0
      Rate coefficients at P=1.30E-02(atm)          2.79E+59  -15.3    12913.0
      Rate coefficients at P=2.50E-02(atm)          2.65E+58  -14.9    12936.0
      Rate coefficients at P=1.00E-01(atm)          1.35E+56  -14.0    12945.0
      Rate coefficients at P=1.32E-01(atm)          3.98E+55  -13.8    12887.0
      Rate coefficients at P=1.00E+00(atm)          1.55E+50  -12.0    11493.0
      Rate coefficients at P=1.00E+01(atm)          6.41E+41   -9.3     8921.0
      Rate coefficients at P=1.00E+02(atm)          2.30E+32   -6.3     6088.0
      Declared duplicate reaction...
1536. IC4H8+OH<=>IC4H8OH-TI                          5.10E+54  -20.7    32402.0
      Rate coefficients at P=1.30E-03(atm)          2.14E+59  -15.8    11594.0
      Rate coefficients at P=1.00E-02(atm)          2.43E+59  -15.5    12898.0
      Rate coefficients at P=1.30E-02(atm)          9.30E+58  -15.3    12913.0
      Rate coefficients at P=2.50E-02(atm)          8.83E+57  -14.9    12936.0
      Rate coefficients at P=1.00E-01(atm)          4.50E+55  -14.0    12945.0
      Rate coefficients at P=1.32E-01(atm)          1.33E+55  -13.8    12887.0
      Rate coefficients at P=1.00E+00(atm)          5.18E+49  -12.0    11493.0
      Rate coefficients at P=1.00E+01(atm)          2.14E+41   -9.3     8921.0
      Rate coefficients at P=1.00E+02(atm)          7.65E+31   -6.3     6088.0
      Declared duplicate reaction...
1537. IC4H8+OH<=>IC4H8OH-TI                          1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.30E-03(atm)          7.68E+77  -20.7    32402.0
      Rate coefficients at P=1.00E-02(atm)          9.13E+76  -20.0    33874.0
      Rate coefficients at P=1.30E-02(atm)          3.55E+75  -19.6    32874.0
      Rate coefficients at P=2.50E-02(atm)          1.23E+73  -18.8    31361.0
      Rate coefficients at P=1.00E-01(atm)          3.45E+67  -17.0    27909.0
      Rate coefficients at P=1.32E-01(atm)          2.41E+66  -16.6    27162.0
      Rate coefficients at P=1.00E+00(atm)          6.50E+58  -14.2    23079.0
      Rate coefficients at P=1.00E+01(atm)          2.53E+53  -12.2    22976.0
      Rate coefficients at P=1.00E+02(atm)          4.78E+47  -10.2    23772.0
      Declared duplicate reaction...
1538. IC4H8OH-IT+O2<=>TQJC4H8OH                      1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          1.05+114  -33.8    24741.0
      Rate coefficients at P=1.00E-02(atm)          2.13+114  -33.4    26448.0
      Rate coefficients at P=1.00E-01(atm)          1.62+110  -31.8    26612.0
      Rate coefficients at P=1.00E+00(atm)          6.00+101  -28.8    25197.0
      Rate coefficients at P=1.00E+01(atm)          5.36E+89  -24.8    22402.0
      Rate coefficients at P=4.00E+01(atm)          1.55E+81  -21.9    20197.0
      Rate coefficients at P=1.00E+02(atm)          1.51E+75  -20.0    18578.0
      Rate coefficients at P=2.00E+02(atm)          3.16E+70  -18.5    17287.0
1539. IC4H8OH-IT+O2<=>IC4H7OH+HO2                    1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          1.21E+26   -5.1     5755.0
      Rate coefficients at P=1.00E-02(atm)          1.41E+31   -6.5     8781.0
      Rate coefficients at P=1.00E-01(atm)          5.08E+34   -7.5    11702.0
      Rate coefficients at P=1.00E+00(atm)          1.67E+34   -7.3    13418.0
      Rate coefficients at P=1.00E+01(atm)          2.82E+28   -5.4    13318.0
      Rate coefficients at P=4.00E+01(atm)          2.50E+22   -3.5    12314.0
      Rate coefficients at P=1.00E+02(atm)          2.82E+17   -2.0    11286.0
      Rate coefficients at P=2.00E+02(atm)          1.93E+13   -0.7    10340.0
      Declared duplicate reaction...
1540. IC4H8OH-IT+O2<=>IC4H7OH+HO2                    1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          2.45E+21   -4.2     6837.0
      Rate coefficients at P=1.00E-02(atm)          1.40E+30   -6.8    11554.0
      Rate coefficients at P=1.00E-01(atm)          9.11E+39   -9.6    17834.0
      Rate coefficients at P=1.00E+00(atm)          5.16E+42  -10.2    22412.0
      Rate coefficients at P=1.00E+01(atm)          6.07E+32   -6.9    22738.0
      Rate coefficients at P=4.00E+01(atm)          3.88E+20   -3.1    20677.0
      Rate coefficients at P=1.00E+02(atm)          3.32E+10    0.0    18552.0
      Rate coefficients at P=2.00E+02(atm)          1.22E+02    2.6    16623.0
      Declared duplicate reaction...
1541. IC4H8OH-IT+O2<=>SC4H7OH-I+HO2                  1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          1.26E+25   -4.7     5755.0
      Rate coefficients at P=1.00E-02(atm)          1.44E+30   -6.2     8785.0
      Rate coefficients at P=1.00E-01(atm)          4.78E+33   -7.1    11695.0
      Rate coefficients at P=1.00E+00(atm)          1.40E+33   -6.8    13395.0
      Rate coefficients at P=1.00E+01(atm)          2.12E+27   -5.0    13277.0
      Rate coefficients at P=4.00E+01(atm)          1.78E+21   -3.1    12265.0
      Rate coefficients at P=1.00E+02(atm)          1.97E+16   -1.5    11234.0
      Rate coefficients at P=2.00E+02(atm)          1.32E+12   -0.2    10285.0
      Declared duplicate reaction...
1542. IC4H8OH-IT+O2<=>SC4H7OH-I+HO2                  1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          3.22E+23   -4.7     5341.0
      Rate coefficients at P=1.00E-02(atm)          4.80E+28   -6.2     8461.0
      Rate coefficients at P=1.00E-01(atm)          1.71E+32   -7.2    11410.0
      Rate coefficients at P=1.00E+00(atm)          1.53E+32   -7.0    13378.0
      Rate coefficients at P=1.00E+01(atm)          5.55E+29   -6.1    15100.0
      Rate coefficients at P=4.00E+01(atm)          1.72E+26   -5.0    15849.0
      Rate coefficients at P=1.00E+02(atm)          4.46E+21   -3.5    15644.0
      Rate coefficients at P=2.00E+02(atm)          5.06E+16   -2.0    14979.0
      Declared duplicate reaction...
1543. IC4H8OH-IT+O2<=>TQC4H8OI                       1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          6.36+104  -33.7    22390.0
      Rate coefficients at P=1.00E-02(atm)          7.96+103  -33.0    22966.0
      Rate coefficients at P=1.00E-01(atm)          6.99E+96  -30.5    20584.0
      Rate coefficients at P=1.00E+00(atm)          1.04E+88  -27.5    16629.0
      Rate coefficients at P=1.00E+01(atm)          3.13E+96  -29.6    20346.0
      Rate coefficients at P=4.00E+01(atm)          2.79+105  -32.0    24971.0
      Rate coefficients at P=1.00E+02(atm)          4.64+109  -33.1    27657.0
      Rate coefficients at P=2.00E+02(atm)          2.06+111  -33.5    29197.0
1544. IC4H8OH-IT+O2=>CH3COCH3+CH2O+OH                1.42E+36  -15.8    11594.0
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      Rate coefficients at P=1.00E-03(atm)          3.03E+37   -8.3     6940.0
      Rate coefficients at P=1.00E-02(atm)          1.07E+42   -9.6     9965.0
      Rate coefficients at P=1.00E-01(atm)          9.22E+43  -10.1    12427.0
      Rate coefficients at P=1.00E+00(atm)          1.14E+42   -9.4    13806.0
      Rate coefficients at P=1.00E+01(atm)          1.80E+38   -8.1    15131.0
      Rate coefficients at P=4.00E+01(atm)          1.61E+34   -6.8    15691.0
      Rate coefficients at P=1.00E+02(atm)          7.00E+29   -5.4    15552.0
      Rate coefficients at P=2.00E+02(atm)          3.74E+25   -4.1    15118.0
1545. IC4H8OH-IT+O2<=>QC4H7OHP                       1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          1.18+118  -37.6    26229.0
      Rate coefficients at P=1.00E-02(atm)          1.91+131  -40.7    34079.0
      Rate coefficients at P=1.00E-01(atm)          5.81+138  -42.2    40750.0
      Rate coefficients at P=1.00E+00(atm)          5.05+134  -40.2    43580.0
      Rate coefficients at P=1.00E+01(atm)          2.07+117  -34.3    41516.0
      Rate coefficients at P=4.00E+01(atm)          1.71+101  -29.0    38094.0
      Rate coefficients at P=1.00E+02(atm)          1.25E+89  -25.1    35203.0
      Rate coefficients at P=2.00E+02(atm)          2.98E+79  -22.1    32802.0
1546. IC4H8OH-IT+O2<=>CCY(CCO)COH+OH                 1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          2.11E+18   -2.9     6870.0
      Rate coefficients at P=1.00E-02(atm)          3.02E+27   -5.5    11842.0
      Rate coefficients at P=1.00E-01(atm)          1.36E+37   -8.3    18165.0
      Rate coefficients at P=1.00E+00(atm)          1.21E+39   -8.7    22517.0
      Rate coefficients at P=1.00E+01(atm)          1.53E+28   -5.1    22530.0
      Rate coefficients at P=4.00E+01(atm)          2.72E+15   -1.2    20283.0
      Rate coefficients at P=1.00E+02(atm)          1.06E+05    2.1    18044.0
      Rate coefficients at P=2.00E+02(atm)          2.30E-04    4.7    16037.0
1547. IC4H8OH-IT+O2<=>TQC4H7OHI                      1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          1.76E+53  -19.9     9019.0
      Rate coefficients at P=1.00E-02(atm)          4.68E+67  -23.9    11892.0
      Rate coefficients at P=1.00E-01(atm)          2.07E+91  -30.6    17347.0
      Rate coefficients at P=1.00E+00(atm)          2.84+100  -32.4    20041.0
      Rate coefficients at P=1.00E+01(atm)          1.16+115  -35.8    27656.0
      Rate coefficients at P=4.00E+01(atm)          4.87+123  -37.8    33314.0
      Rate coefficients at P=1.00E+02(atm)          7.95+124  -37.8    35683.0
      Rate coefficients at P=2.00E+02(atm)          4.58+122  -36.9    36374.0
1548. IC4H8OH-IT+O2<=>C2CY(COC)OH+OH                 1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          1.42E+32   -7.0     6210.0
      Rate coefficients at P=1.00E-02(atm)          5.19E+36   -8.2     9233.0
      Rate coefficients at P=1.00E-01(atm)          5.77E+38   -8.8    11715.0
      Rate coefficients at P=1.00E+00(atm)          2.86E+36   -8.0    12823.0
      Rate coefficients at P=1.00E+01(atm)          1.37E+32   -6.5    13646.0
      Rate coefficients at P=4.00E+01(atm)          2.15E+29   -5.6    14541.0
      Rate coefficients at P=1.00E+02(atm)          1.20E+26   -4.5    14778.0
      Rate coefficients at P=2.00E+02(atm)          3.31E+22   -3.4    14606.0
1549. TQJC4H8OH<=>IC4H7OH+HO2                        1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          9.73E+65  -18.5    42975.0
      Rate coefficients at P=1.00E-02(atm)          1.04E+64  -17.2    44419.0
      Rate coefficients at P=1.00E-01(atm)          7.90E+59  -15.6    44504.0
      Rate coefficients at P=1.00E+00(atm)          9.35E+53  -13.5    43566.0
      Rate coefficients at P=1.00E+01(atm)          4.13E+44  -10.4    41279.0
      Rate coefficients at P=4.00E+01(atm)          6.57E+38   -8.5    39745.0
      Rate coefficients at P=1.00E+02(atm)          8.32E+34   -7.2    38675.0
      Rate coefficients at P=2.00E+02(atm)          9.46E+31   -6.3    37849.0
      Declared duplicate reaction...
1550. TQJC4H8OH<=>IC4H7OH+HO2                        1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          5.27E+64  -18.0    42872.0
      Rate coefficients at P=1.00E-02(atm)          4.82E+62  -16.7    44284.0
      Rate coefficients at P=1.00E-01(atm)          3.42E+58  -15.1    44348.0
      Rate coefficients at P=1.00E+00(atm)          4.05E+52  -13.0    43402.0
      Rate coefficients at P=1.00E+01(atm)          1.93E+43   -9.9    41120.0
      Rate coefficients at P=4.00E+01(atm)          3.28E+37   -8.0    39593.0
      Rate coefficients at P=1.00E+02(atm)          4.35E+33   -6.7    38527.0
      Rate coefficients at P=2.00E+02(atm)          5.13E+30   -5.8    37706.0
      Declared duplicate reaction...
1551. TQJC4H8OH<=>TQC4H8OI                           1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          3.78E+50  -12.9    31539.0
      Rate coefficients at P=1.00E-02(atm)          1.42E+45  -10.9    30864.0
      Rate coefficients at P=1.00E-01(atm)          1.50E+40   -9.2    29932.0
      Rate coefficients at P=1.00E+00(atm)          3.12E+35   -7.6    28864.0
      Rate coefficients at P=1.00E+01(atm)          2.73E+29   -5.7    27243.0
      Rate coefficients at P=4.00E+01(atm)          8.88E+25   -4.5    26272.0
      Rate coefficients at P=1.00E+02(atm)          4.60E+23   -3.8    25622.0
      Rate coefficients at P=2.00E+02(atm)          9.08E+21   -3.2    25131.0
1552. TQJC4H8OH<=>QC4H7OHP                           1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          9.16E+62  -18.0    45297.0
      Rate coefficients at P=1.00E-02(atm)          2.56E+62  -17.1    47393.0
      Rate coefficients at P=1.00E-01(atm)          1.25E+59  -15.6    47984.0
      Rate coefficients at P=1.00E+00(atm)          1.97E+53  -13.5    47281.0
      Rate coefficients at P=1.00E+01(atm)          1.91E+43  -10.2    44926.0
      Rate coefficients at P=4.00E+01(atm)          7.68E+36   -8.1    43267.0
      Rate coefficients at P=1.00E+02(atm)          3.49E+32   -6.6    42089.0
      Rate coefficients at P=2.00E+02(atm)          1.77E+29   -5.6    41173.0
1553. TQJC4H8OH<=>TQC4H7OHI                          1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          9.57E+58  -16.0    38293.0
      Rate coefficients at P=1.00E-02(atm)          7.27E+54  -14.2    38593.0
      Rate coefficients at P=1.00E-01(atm)          8.30E+49  -12.4    38031.0
      Rate coefficients at P=1.00E+00(atm)          1.90E+44  -10.5    36905.0
      Rate coefficients at P=1.00E+01(atm)          2.18E+36   -7.9    34865.0
      Rate coefficients at P=4.00E+01(atm)          4.10E+31   -6.4    33581.0
      Rate coefficients at P=1.00E+02(atm)          3.00E+28   -5.3    32704.0
      Rate coefficients at P=2.00E+02(atm)          1.34E+26   -4.6    32035.0
1554. TQC4H8OI=>CH3COCH3+CH2O+OH                     1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          8.09E+38   -9.9    19096.0
      Rate coefficients at P=1.00E-02(atm)          9.09E+39   -9.9    19135.0
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      Rate coefficients at P=1.00E-01(atm)          1.89E+41  -10.0    19407.0
      Rate coefficients at P=1.00E+00(atm)          7.47E+23   -4.1    14658.0
      Rate coefficients at P=1.00E+01(atm)          2.95E+33   -6.8    18685.0
      Rate coefficients at P=4.00E+01(atm)          4.24E+36   -7.6    20307.0
      Rate coefficients at P=1.00E+02(atm)          7.83E+36   -7.5    20747.0
      Rate coefficients at P=2.00E+02(atm)          7.63E+35   -7.2    20641.0
1555. QC4H7OHP<=>IC4H7OH+HO2                         1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          3.29E+57  -15.6    28576.0
      Rate coefficients at P=1.00E-02(atm)          9.65E+58  -15.8    29927.0
      Rate coefficients at P=1.00E-01(atm)          2.19E+50  -12.7    28547.0
      Rate coefficients at P=1.00E+00(atm)          1.67E+49  -12.1    29204.0
      Rate coefficients at P=1.00E+01(atm)          7.08E+40   -9.3    27188.0
      Rate coefficients at P=4.00E+01(atm)          1.32E+30   -5.8    24071.0
      Rate coefficients at P=1.00E+02(atm)          1.15E+30   -5.8    24053.0
      Rate coefficients at P=2.00E+02(atm)          1.12E+30   -5.8    24050.0
1556. QC4H7OHP<=>CCY(CCO)COH+OH                      1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          1.11E+51  -13.0    28497.0
      Rate coefficients at P=1.00E-02(atm)          5.58E+51  -12.9    29529.0
      Rate coefficients at P=1.00E-01(atm)          3.03E+44  -10.3    28326.0
      Rate coefficients at P=1.00E+00(atm)          1.42E+44  -10.0    28986.0
      Rate coefficients at P=1.00E+01(atm)          9.69E+37   -7.9    27491.0
      Rate coefficients at P=4.00E+01(atm)          5.90E+29   -5.3    25095.0
      Rate coefficients at P=1.00E+02(atm)          5.27E+29   -5.3    25081.0
      Rate coefficients at P=2.00E+02(atm)          5.15E+29   -5.3    25078.0
1557. TQC4H7OHI<=>C2CY(COC)OH+OH                     1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          1.10E+31   -7.2    14640.0
      Rate coefficients at P=1.00E-02(atm)          1.37E+32   -7.2    14716.0
      Rate coefficients at P=1.00E-01(atm)          3.34E+33   -7.3    15127.0
      Rate coefficients at P=1.00E+00(atm)          1.86E+23   -3.7    12864.0
      Rate coefficients at P=1.00E+01(atm)          9.88E+31   -6.2    16040.0
      Rate coefficients at P=4.00E+01(atm)          1.25E+34   -6.8    17056.0
      Rate coefficients at P=1.00E+02(atm)          7.73E+33   -6.7    17176.0
      Rate coefficients at P=2.00E+02(atm)          2.13E+33   -6.5    17170.0
1558. TQC4H7OHI<=>SC4H7OH-I+HO2                      1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          6.01E+27   -7.3    14658.0
      Rate coefficients at P=1.00E-02(atm)          7.78E+28   -7.3    14733.0
      Rate coefficients at P=1.00E-01(atm)          3.27E+30   -7.5    15191.0
      Rate coefficients at P=1.00E+00(atm)          2.81E+17   -2.8    12336.0
      Rate coefficients at P=1.00E+01(atm)          1.92E+26   -5.2    16146.0
      Rate coefficients at P=4.00E+01(atm)          7.61E+27   -5.5    17483.0
      Rate coefficients at P=1.00E+02(atm)          1.91E+26   -4.9    17429.0
      Rate coefficients at P=2.00E+02(atm)          2.94E+24   -4.2    17285.0
1559. IC4H8OH-TI+O2<=>IQJC4H8OH                      1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          3.34+111  -32.7    25143.0
      Rate coefficients at P=1.00E-02(atm)          4.84+107  -31.1    25460.0
      Rate coefficients at P=1.00E-01(atm)          2.41+100  -28.4    24474.0
      Rate coefficients at P=1.00E+00(atm)          4.55E+89  -24.8    22176.0
      Rate coefficients at P=1.00E+01(atm)          1.14E+76  -20.3    18721.0
      Rate coefficients at P=4.00E+01(atm)          9.25E+66  -17.4    16238.0
      Rate coefficients at P=1.00E+02(atm)          6.20E+60  -15.4    14499.0
      Rate coefficients at P=2.00E+02(atm)          1.30E+56  -13.9    13159.0
1560. IC4H8OH-TI+O2<=>IC3H6OHCHO+OH                  1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          1.59E+15   -1.6     8947.0
      Rate coefficients at P=1.00E-02(atm)          5.07E+20   -3.2    11938.0
      Rate coefficients at P=1.00E-01(atm)          5.00E+25   -4.7    15251.0
      Rate coefficients at P=1.00E+00(atm)          3.18E+26   -4.8    17388.0
      Rate coefficients at P=1.00E+01(atm)          6.00E+20   -3.0    17297.0
      Rate coefficients at P=4.00E+01(atm)          1.70E+14   -0.9    16099.0
      Rate coefficients at P=1.00E+02(atm)          7.91E+08    0.7    14913.0
      Rate coefficients at P=2.00E+02(atm)          3.03E+04    2.1    13854.0
1561. IC4H8OH-TI+O2<=>IQC4H8OT                       1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          1.12+102  -32.4    23496.0
      Rate coefficients at P=1.00E-02(atm)          4.23E+95  -30.0    22067.0
      Rate coefficients at P=1.00E-01(atm)          3.45E+83  -26.1    17114.0
      Rate coefficients at P=1.00E+00(atm)          8.16E+82  -25.6    16198.0
      Rate coefficients at P=1.00E+01(atm)          1.04E+97  -29.5    22648.0
      Rate coefficients at P=4.00E+01(atm)          7.25+103  -31.4    26487.0
      Rate coefficients at P=1.00E+02(atm)          2.48+106  -32.1    28397.0
      Rate coefficients at P=2.00E+02(atm)          1.39+107  -32.2    29446.0
1562. IC4H8OH-TI+O2=>CH3COCH3+CH2O+OH                1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          4.39E+48  -11.9    11603.0
      Rate coefficients at P=1.00E-02(atm)          9.82E+50  -12.5    14143.0
      Rate coefficients at P=1.00E-01(atm)          3.43E+49  -11.9    15561.0
      Rate coefficients at P=1.00E+00(atm)          2.43E+45  -10.6    16415.0
      Rate coefficients at P=1.00E+01(atm)          4.98E+39   -8.7    17473.0
      Rate coefficients at P=4.00E+01(atm)          7.99E+33   -6.8    17502.0
      Rate coefficients at P=1.00E+02(atm)          1.02E+29   -5.3    17165.0
      Rate coefficients at P=2.00E+02(atm)          7.18E+24   -4.0    16747.0
1563. IC4H8OH-TI+O2<=>CH3+C3KET21                    1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          2.91E+40   -9.2    10830.0
      Rate coefficients at P=1.00E-02(atm)          9.66E+43  -10.2    13698.0
      Rate coefficients at P=1.00E-01(atm)          1.34E+44  -10.1    15661.0
      Rate coefficients at P=1.00E+00(atm)          2.57E+41   -9.2    17047.0
      Rate coefficients at P=1.00E+01(atm)          1.82E+36   -7.5    18330.0
      Rate coefficients at P=4.00E+01(atm)          8.82E+29   -5.4    18205.0
      Rate coefficients at P=1.00E+02(atm)          1.74E+24   -3.6    17600.0
      Rate coefficients at P=2.00E+02(atm)          2.16E+19   -2.1    16925.0
1564. IC4H8OH-TI+O2<=>IQC4H7OHT                      1.42E+36  -15.8    11594.0
      Rate coefficients at P=1.00E-03(atm)          1.03+115  -35.1    25407.0
      Rate coefficients at P=1.00E-02(atm)          1.10+129  -38.9    32891.0
      Rate coefficients at P=1.00E-01(atm)          5.15+135  -40.4    38573.0
      Rate coefficients at P=1.00E+00(atm)          7.27+129  -38.1    39933.0
      Rate coefficients at P=1.00E+01(atm)          4.50+112  -32.5    37045.0
      Rate coefficients at P=4.00E+01(atm)          7.72E+97  -27.8    33612.0
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Rate coefficients at P=1.00E+02(atm)	5.17E+86	-24.3	30799.0
Rate coefficients at P=2.00E+02(atm)	4.70E+77	-21.4	28440.0
1565. IC4H8OH-TI+O2=>IC3H5OH+CH2O+OH	1.42E+36	-15.8	11594.0
Rate coefficients at P=1.00E-03(atm)	5.10E+24	-4.3	13009.0
Rate coefficients at P=1.00E-02(atm)	6.91E+33	-7.0	17935.0
Rate coefficients at P=1.00E-01(atm)	1.74E+41	-9.0	23613.0
Rate coefficients at P=1.00E+00(atm)	2.26E+36	-7.3	25633.0
Rate coefficients at P=1.00E+01(atm)	3.15E+17	-1.4	22782.0
Rate coefficients at P=4.00E+01(atm)	9.35E+00	3.7	19114.0
Rate coefficients at P=1.00E+02(atm)	5.59E-12	7.5	16156.0
Rate coefficients at P=2.00E+02(atm)	1.27E-21	10.4	13733.0
1566. IC4H8OH-TI+O2<=>CCY(CCOC)OH+OH	1.42E+36	-15.8	11594.0
Rate coefficients at P=1.00E-03(atm)	3.06E+33	-7.2	11476.0
Rate coefficients at P=1.00E-02(atm)	6.56E+42	-9.9	17197.0
Rate coefficients at P=1.00E-01(atm)	8.24E+46	-10.9	22090.0
Rate coefficients at P=1.00E+00(atm)	4.48E+38	-8.2	23019.0
Rate coefficients at P=1.00E+01(atm)	1.01E+18	-1.8	19496.0
Rate coefficients at P=4.00E+01(atm)	1.16E+01	3.4	15637.0
Rate coefficients at P=1.00E+02(atm)	4.85E-12	7.2	12599.0
Rate coefficients at P=2.00E+02(atm)	8.64E-22	10.2	10126.0
1567. IQJC4H8OH<=>IC3H6OHCHO+OH	1.42E+36	-15.8	11594.0
Rate coefficients at P=1.00E-03(atm)	3.58E+71	-20.6	52656.0
Rate coefficients at P=1.00E-02(atm)	9.67E+71	-20.1	54935.0
Rate coefficients at P=1.00E-01(atm)	3.39E+67	-18.2	55330.0
Rate coefficients at P=1.00E+00(atm)	7.26E+58	-15.1	54016.0
Rate coefficients at P=1.00E+01(atm)	4.57E+46	-11.0	51172.0
Rate coefficients at P=4.00E+01(atm)	4.31E+38	-8.4	49054.0
Rate coefficients at P=1.00E+02(atm)	2.12E+33	-6.7	47587.0
Rate coefficients at P=2.00E+02(atm)	2.72E+29	-5.4	46486.0
1568. IQJC4H8OH<=>IQC4H8OT	1.42E+36	-15.8	11594.0
Rate coefficients at P=1.00E-03(atm)	1.04E+45	-11.2	31755.0
Rate coefficients at P=1.00E-02(atm)	2.90E+40	-9.6	30945.0
Rate coefficients at P=1.00E-01(atm)	4.85E+35	-8.0	29850.0
Rate coefficients at P=1.00E+00(atm)	2.62E+30	-6.3	28498.0
Rate coefficients at P=1.00E+01(atm)	3.37E+24	-4.4	26873.0
Rate coefficients at P=4.00E+01(atm)	9.75E+20	-3.2	25861.0
Rate coefficients at P=1.00E+02(atm)	5.61E+18	-2.5	25208.0
Rate coefficients at P=2.00E+02(atm)	1.44E+17	-2.0	24740.0
1569. IQJC4H8OH<=>IQC4H7OHT	1.42E+36	-15.8	11594.0
Rate coefficients at P=1.00E-03(atm)	1.36E+50	-12.9	36743.0
Rate coefficients at P=1.00E-02(atm)	3.36E+45	-11.3	36143.0
Rate coefficients at P=1.00E-01(atm)	1.13E+40	-9.4	34990.0
Rate coefficients at P=1.00E+00(atm)	5.93E+33	-7.3	33438.0
Rate coefficients at P=1.00E+01(atm)	4.24E+26	-5.0	31502.0
Rate coefficients at P=4.00E+01(atm)	1.97E+22	-3.6	30275.0
Rate coefficients at P=1.00E+02(atm)	3.43E+19	-2.7	29477.0
Rate coefficients at P=2.00E+02(atm)	3.69E+17	-2.1	28900.0
1570. IQC4H7OHT=>IC3H5OH+CH2O+OH	1.42E+36	-15.8	11594.0
Rate coefficients at P=1.00E-03(atm)	4.25E+16	-3.7	19364.0
Rate coefficients at P=1.00E-02(atm)	2.98E+33	-8.0	27106.0
Rate coefficients at P=1.00E-01(atm)	3.46E+38	-8.8	31412.0
Rate coefficients at P=1.00E+00(atm)	7.07E+28	-5.5	29633.0
Rate coefficients at P=1.00E+01(atm)	2.01E+13	-0.4	25278.0
Rate coefficients at P=4.00E+01(atm)	1.43E+13	-0.4	25238.0
Rate coefficients at P=1.00E+02(atm)	1.38E+13	-0.4	25234.0
Rate coefficients at P=2.00E+02(atm)	1.37E+13	-0.4	25233.0
1571. IQC4H7OHT<=>CCY(CCOC)OH+OH	1.42E+36	-15.8	11594.0
Rate coefficients at P=1.00E-03(atm)	1.12E+25	-5.6	19349.0
Rate coefficients at P=1.00E-02(atm)	7.20E+32	-7.6	23093.0
Rate coefficients at P=1.00E-01(atm)	2.22E+34	-7.7	25130.0
Rate coefficients at P=1.00E+00(atm)	2.40E+27	-5.3	23663.0
Rate coefficients at P=1.00E+01(atm)	2.24E+17	-2.0	20810.0
Rate coefficients at P=4.00E+01(atm)	1.82E+17	-2.0	20786.0
Rate coefficients at P=1.00E+02(atm)	1.78E+17	-2.0	20783.0
Rate coefficients at P=2.00E+02(atm)	1.77E+17	-2.0	20782.0
1572. IQC4H7OHT<=>IC4H7OOH+OH	1.42E+36	-15.8	11594.0
Rate coefficients at P=1.00E-03(atm)	6.07E+13	-4.2	22478.0
Rate coefficients at P=1.00E-02(atm)	9.74E+39	-10.9	33616.0
Rate coefficients at P=1.00E-01(atm)	2.18E+49	-12.7	40359.0
Rate coefficients at P=1.00E+00(atm)	3.32E+37	-8.4	38539.0
Rate coefficients at P=1.00E+01(atm)	2.34E+16	-1.6	32712.0
Rate coefficients at P=4.00E+01(atm)	1.44E+16	-1.5	32656.0
Rate coefficients at P=1.00E+02(atm)	1.38E+16	-1.5	32651.0
Rate coefficients at P=2.00E+02(atm)	1.37E+16	-1.5	32649.0
1573. IQC4H8OT=>CH3COCH3+CH2O+OH	3.64E+09	1.3	23700.0
1574. IQC4H8OT<=>CH3+C3KET21	4.95E+10	0.8	27900.0
1575. IQC4H7OHT<=>CH2COHCH2OOH+CH3	4.95E+10	0.8	27900.0
1576. TQC4H7OHIO2<=>TQC4H7OHIQ-I	2.56E+12	-0.1	34360.0
1577. TQC4H7OHIQ-I=>HO2CHO+CH3COCH3+OH	5.82E+05	2.4	22790.0
1578. TQC4H7OHIQ-I<=>IC4KETIT+HO2	1.83E+10	0.8	15100.0
1579. IC4KETIT=>CH3COCH3+HCO+OH	9.50E+15	0.0	42540.0
1580. IC4KETIT+OH<=>TC3H6O2HCO+H2O	6.13E+04	2.7	-4586.4
1581. IC4KETIT+HO2<=>TC3H6O2HCO+H2O2	1.18E-04	4.9	3684.3
1582. TC3H6O2HCO=>CH3COCH3+CO+OH	1.28E+20	-1.9	34460.0
1583. TQC4H7OHIO2<=>TQC4H7OHIQ-P	5.69E+08	0.8	21850.0
1584. TQC4H7OHIQ-P<=>IC3H5COHQ+HO2	1.83E+10	0.8	15100.0
1585. TQC4H7OHIQ-P<=>CH2CQCOHQ+CH3	5.38E+11	0.1	24800.0
1586. TQC4H7OHIQ-P=>IC3H5Q+HOCHO+OH	5.38E+11	0.1	24800.0
1587. TQC4H7OHIQ-P<=>COHQCYC(COC)+OH	2.28E+08	1.3	9890.0
1588. TQC4H7OHIQ-P<=>QCYC(CCOC)OH+OH	4.58E+15	-1.1	18440.0
1589. IC3H5COHQ=>HOCHO+C3H5-T+OH	1.59E+20	-1.5	42879.5
1590. CH2CQCOHQ=>HOCHO+CH2CO+2OH	1.59E+20	-1.5	42879.5
1591. CH2CQCOHQ=>HCO+CH2CO+3OH	1.59E+20	-1.5	42879.5
1592. IC3H5Q=>CH2CO+CH3+OH	1.59E+20	-1.5	42879.5

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1593. COHQCYC(COC)=>HOCHO+CH2O+C2H3+OH                1.59E+20   -1.5    42879.5
1594. QCYC(CCOC)OH=>HOCHO+CH2CO+CH3+OH                1.59E+20   -1.5    42879.5
1595. TQC4H7OHIO2<=>TQC4H7OHTO2                       2.96E+09    0.0    16350.0
1596. TQC4H7OHTO2<=>HOCOCQ(CH3)2+OH                   1.75E+08    1.7    26000.0
1597. HOCOCQ(CH3)2=>CO+CH3COCH3+2OH                   1.59E+20   -1.5    42879.5
1598. IQC4H7OHTO2<=>IQC4H7OHTQ-P                      2.06E+07    1.0    21070.0
1599. IQC4H7OHTQ-P=>OH+CH2O+CH2COHCH2OOH              1.20E+10    0.3    15700.0
1600. CH2COHCH2OOH=>OH+CH2O+CH2CO+H                   1.59E+20   -1.5    42879.5
1601. IQC4H7OHTQ-P<=>OH+IC4H6Q2-II                    1.00E+11    0.0        0.0
      Rate coefficients at P=1.00E-02(atm)           2.53E+40   -9.9    32631.4
      Rate coefficients at P=1.00E-01(atm)           2.54E+37   -8.7    32909.5
      Rate coefficients at P=1.00E+00(atm)           1.12E+31   -6.5    31806.6
      Rate coefficients at P=1.00E+01(atm)           1.98E+21   -3.3    29137.8
      Rate coefficients at P=1.00E+02(atm)           1.95E+10    0.2    25612.0
1602. IC4H6Q2-II=>OH+CH2O+HO2+C3H4-A                  1.59E+20   -1.5    42879.5
1603. IQC4H7OHTO2<=>IQC4H8OTQ-I                       4.13E+07    1.0    21070.0
1604. IQC4H8OTQ-I=>OH+CH2O+C3KET21                    1.20E+10    0.3    15700.0
1605. IQC4H8OTQ-I<=>CH3+CO(CH2OOH)2                   2.74E+13    0.2    29830.0
1606. CO(CH2OOH)2=>2OH+2CH2O+CO                       1.59E+20   -1.5    42879.5
1607. IQC4H7OHTO2<=>CHOC(CH3)OHCH2Q+OH                1.20E+10    0.3    15700.0
1608. CHOC(CH3)OHCH2Q=>OH+CH2O+H+CH3COCHO             1.59E+20   -1.5    42879.5
1609. CH3COCHO+OH=>2CO+CH3+H2O                        6.13E+04    2.7    -4586.4
1610. TQC4H7OHI+O2<=>TQC4H7OHIO2                      3.49E+14   -0.8     -536.5
1611. IQC4H7OHT+O2<=>IQC4H7OHTO2                      6.87E+16   -1.6      198.7
1612. C2CY(COC)OH+OH=>IC3H6CO+OH+H2O                  2.26E+03    2.7    -4688.0
1613. C2CY(COC)OH+HO2=>IC3H6CO+OH+H2O2                8.60E+00    3.5     9732.3
1614. CCY(CCO)COH+OH=>IC3H5CHO+OH+H2O                 5.66E+02    2.9    -4039.4
1615. CCY(CCO)COH+HO2=>IC3H5CHO+OH+H2O2               1.81E-01    4.0     9056.7
1616. CCY(CCO)COH+OH=>PC3H4OH-2+CH2O+H2O              1.26E+03    3.0    -2660.6
1617. CCY(CCO)COH+HO2=>PC3H4OH-2+CH2O+H2O2            1.40E-05    5.3     8267.9
1618. CCY(CCOC)OH+OH=>CH2O+SC3H4OH+H2O                5.66E+02    2.9    -4039.4
1619. CCY(CCOC)OH+HO2=>CH2O+SC3H4OH+H2O2              1.81E-01    4.0     9056.7
1620. IC4H7+OH<=>IC4H7OH                              3.00E+13    0.0        0.0
1621. IC4H7O+H<=>IC4H7OH                              4.00E+13    0.0        0.0
1622. IC4H6OH+H<=>IC4H7OH                             1.00E+14    0.0        0.0
1623. CH2CCH2OH+CH3<=>IC4H7OH                         3.00E+13    0.0        0.0
1624. IC4H7OH+O2<=>IC4H6OH+HO2                        6.00E+13    0.0    39900.0
1625. IC4H7OH+OH<=>IC4H6OH+H2O                        1.26E+03    3.0    -2660.6
1626. IC4H7OH+HO2<=>IC4H6OH+H2O2                      1.45E-05    5.3     8267.9
1627. IC4H6OH+H2<=>IC4H7OH+H                          2.16E+04    2.4    18990.0
1628. IC4H6OH+CH2O<=>IC4H7OH+HCO                      6.30E+08    1.9    18190.0
1629. IC4H6OH+IC4H8<=>IC4H7OH+IC4H7                   4.70E+02    3.3    19840.0
1630. IC4H7O+H2<=>IC4H7OH+H                           9.05E+06    2.0    17830.0
1631. IC4H7OH+HCO<=>IC4H7O+CH2O                       3.02E+11    0.0    18160.0
1632. C3H4-A+CH2OH<=>IC4H6OH                          1.00E+11    0.0     9200.0
1633. IC4H7O<=>IC4H6OH                                1.39E+11    0.0    15600.0
1634. IC4H6OH+HO2=>CH2CCH2OH+CH2O+OH                  1.45E+13    0.0        0.0
1635. IC4H7OH+H<=>IC4H8OH                             1.00E+13    0.0     1200.0
1636. IC4H7O+O2<=>IC3H5CHO+HO2                        3.00E+10    0.0     1649.0
1637. IC4H7O+HO2<=>IC3H5CHO+H2O2                      3.00E+11    0.0        0.0
1638. IC4H7O+CH3<=>IC3H5CHO+CH4                       2.40E+13    0.0        0.0
1639. IC4H7O+O<=>IC3H5CHO+OH                          6.00E+12    0.0        0.0
1640. IC4H7O+OH<=>IC3H5CHO+H2O                        1.81E+13    0.0        0.0
1641. IC4H7O+H<=>IC3H5CHO+H2                          1.99E+13    0.0        0.0
1642. IC3H6OHCHO+OH=>TC3H6OH+CO+H2O                   6.13E+04    2.6    -4586.4
1643. IC3H6OHCHO+H=>TC3H6OH+CO+H2                     8.66E+05    2.3     1426.0
1644. IC3H6OHCHO+HO2=>TC3H6OH+CO+H2O2                 1.01E-04    5.0     3429.0
1645. IC3H6OHCHO+CH3=>TC3H6OH+CO+CH4                  3.94E+00    3.6     4223.0
1646. TC3H6OH<=>CH3COCH3+H                            8.98E+11    0.3    32990.0
1647. TC3H6OH<=>IC3H5OH+H                             4.21E+10    1.0    40900.0
1648. TC3H6OH+O2<=>CH3COCH3+HO2                       2.23E+13    0.0        0.0
1649. C3H5-A+CH3(+M)<=>C4H8-1(+M)                     1.00E+14   -0.3     -262.3
      Low pressure limit:  0.39100E+61 -0.12810E+02  0.62500E+04
      TROE centering:      0.10400E+00  0.16060E+04  0.60000E+05  0.61184E+04
      H2              Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      CH4             Enhanced by    2.000E+00
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      C2H6            Enhanced by    3.000E+00
      AR              Enhanced by    7.000E-01
1650. C2H5+C2H3(+M)<=>C4H8-1(+M)                      1.50E+13    0.0        0.0
      Low pressure limit:  0.15500E+57 -0.11790E+02  0.89845E+04
      TROE centering:      0.19800E+00  0.22779E+04  0.60000E+05  0.57232E+04
      H2              Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      CH4             Enhanced by    2.000E+00
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      C2H6            Enhanced by    3.000E+00
      AR              Enhanced by    7.000E-01
1651. C4H71-4+H(+M)<=>C4H8-1(+M)                      3.60E+13    0.0        0.0
      Low pressure limit:  0.30100E+49 -0.93200E+01  0.58336E+04
      TROE centering:      0.49800E+00  0.13140E+04  0.13140E+04  0.50000E+05
      H2              Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      CH4             Enhanced by    2.000E+00
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      C2H6            Enhanced by    3.000E+00
      AR              Enhanced by    7.000E-01
1652. C4H71-3+H<=>C4H8-1                              5.00E+13    0.0     5000.0
1653. C3H5-S+CH3(+M)<=>C4H8-2(+M)                     5.00E+13    0.0        0.0
      Low pressure limit:  0.85400E+59 -0.11940E+02  0.97698E+04
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      TROE centering:      0.17500E+00  0.13406E+04  0.60000E+05  0.10140E+05
      H2              Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      CH4             Enhanced by    2.000E+00
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      C2H6            Enhanced by    3.000E+00
      AR              Enhanced by    7.000E-01
      C2H2            Enhanced by    3.000E+00
      C2H4            Enhanced by    3.000E+00
1654. C4H8-2<=>C3H5-A+CH3                          7.50E+65  -15.6    97300.0
1655. C4H8-2<=>H+C4H71-3                           4.60E+84  -20.0   132787.0
1656. C4H8-1+OH<=>C4H71-3+H2O                      7.77E+05    2.2     -437.2
1657. C4H8-1+OH<=>C4H71-4+H2O                      8.60E+06    2.0     2623.1
1658. C4H8-1+OH<=>C4H71-2+H2O                      3.00E+06    2.0     2847.7
1659. C4H8-1+OH<=>C4H71-1+H2O                      6.93E+06    1.9     4962.0
1660. C4H8-2+OH<=>C4H71-3+H2O                      4.46E+06    2.1     1050.8
1661. C4H8-2+OH<=>C4H72-2+H2O                      6.00E+06    2.0     2845.9
1662. C4H8-1+HO2<=>C4H71-3+H2O2                    7.82E-01    4.0    11702.0
1663. C4H8-2+HO2<=>C4H71-3+H2O2                    6.90E-01    4.0    12103.0
1664. C4H8-1+HO2<=>C4H71-4+H2O2                    4.08E+01    3.6    17160.0
1665. C4H8-1+HO2<=>C4H71-1+H2O2                    9.57E+02    3.1    20798.6
1666. C4H8-1+HO2<=>C4H71-2+H2O2                    1.56E+04    2.8    24427.9
1667. C4H8-2+HO2<=>C4H72-2+H2O2                    3.12E+04    2.8    24427.9
1668. C4H8-1+H<=>C4H71-4+H2                        3.84E+04    2.9     6611.0
1669. C4H8-1+H<=>C4H71-3+H2                        2.42E+03    3.0     1995.0
1670. C4H8-1+H<=>C4H71-2+H2                        2.37E+04    2.9     8917.0
1671. C4H8-1+H<=>C4H71-1+H2                        2.63E+04    2.8    12050.0
      Declared duplicate reaction...
1672. C4H8-1+H<=>C4H71-1+H2                        2.23E+04    2.9    11710.0
      Declared duplicate reaction...
1673. C4H8-2+H<=>C4H71-3+H2                        5.62E+02    3.5     1627.0
1674. C4H8-2+H<=>C4H72-2+H2                        8.47E+04    2.8     9304.0
1675. C4H8-1+O<=>C4H71-3+OH                        1.75E+11    0.7     5884.0
1676. C4H8-2+O<=>C4H71-3+OH                        2.19E+11    0.8     7550.0
1677. C4H8-1+O<=>C4H71-1+OH                        1.20E+11    0.7     8959.1
1678. C4H8-1+O<=>C4H71-2+OH                        6.03E+10    0.7     7632.0
1679. C4H8-2+O<=>C4H72-2+OH                        1.21E+11    0.7     7632.0
1680. C4H8-1+O<=>C4H71-4+OH                        1.13E+14    0.0     7850.0
1681. C4H8-1+O2<=>C4H71-3+HO2                      1.00E+14    0.0    37190.0
1682. C4H8-2+O2<=>C4H71-3+HO2                      2.00E+14    0.0    39390.0
1683. C4H8-1+O2<=>C4H71-1+HO2                      2.00E+13    0.0    62270.0
1684. C4H8-1+O2<=>C4H71-2+HO2                      1.00E+13    0.0    58770.0
1685. C4H8-2+O2<=>C4H72-2+HO2                      2.00E+13    0.0    58770.0
1686. C4H8-1+O2<=>C4H71-4+HO2                      6.00E+13    0.0    52340.0
1687. C4H8-1+CH3<=>C4H71-3+CH4                     2.21E+00    3.5     5675.0
1688. C4H8-1+CH3<=>C4H71-4+CH4                     4.52E-01    3.6     7154.0
1689. C4H8-2+CH3<=>C4H71-3+CH4                     7.14E+00    3.6     7642.0
1690. C4H8-1+CH3<=>C4H71-1+CH4                     1.35E+00    3.5    12850.0
1691. C4H8-1+CH3<=>C4H71-2+CH4                     8.40E-01    3.5    11660.0
1692. C4H8-2+CH3<=>C4H72-2+CH4                     1.68E+00    3.5    11660.0
1693. C4H8-1+CH3O2<=>C4H71-3+CH3O2H                2.70E+04    0.7     5884.0
1694. C4H8-1+CH3O2<=>C4H71-4+CH3O2H                2.38E+03    2.5    16490.0
1695. C4H8-1+CH3O<=>C4H71-3+CH3OH                  4.00E+01    2.9     8609.0
1696. C4H8-1+CH3O<=>C4H71-4+CH3OH                  2.17E+11    0.0     6458.0
1697. C4H8-2+CH3O<=>C4H71-3+CH3OH                  1.80E+01    3.0    11990.0
1698. C4H8-1+CH3CO3<=>C4H71-3+CH3CO3H              1.00E+11    0.0     8000.0
1699. C4H8-1+C3H5-A<=>C4H71-3+C3H6                 7.90E+10    0.0    12400.0
1700. C4H8-1+C2H5O2<=>C4H71-3+C2H5O2H              1.40E+12    0.0    14900.0
1701. C4H8-1+NC3H7O2<=>C4H71-3+NC3H7O2H            1.40E+12    0.0    14900.0
1702. C4H8-1+IC3H7O2<=>C4H71-3+IC3H7O2H            1.40E+12    0.0    14900.0
1703. C4H8-1+PC4H9O2<=>C4H71-3+PC4H9O2H            1.40E+12    0.0    14900.0
1704. C4H8-1+SC4H9O2<=>C4H71-3+SC4H9O2H            1.40E+12    0.0    14900.0
1705. C4H8-2+NC3H7O2<=>C4H71-3+NC3H7O2H            3.20E+12    0.0    14900.0
1706. C4H8-2+IC3H7O2<=>C4H71-3+IC3H7O2H            3.20E+12    0.0    14900.0
1707. C4H8-2+PC4H9O2<=>C4H71-3+PC4H9O2H            3.20E+12    0.0    14900.0
1708. C4H8-2+SC4H9O2<=>C4H71-3+SC4H9O2H            3.20E+12    0.0    14900.0
1709. C4H71-3+C2H5<=>C4H8-1+C2H4                   2.59E+12    0.0     -131.0
1710. C4H71-3+CH3O<=>C4H8-1+CH2O                   2.41E+13    0.0        0.0
1711. IC4H9O2+C4H8-1<=>IC4H9O2H+C4H71-3            1.40E+12    0.0    14900.0
1712. TC4H9O2+C4H8-1<=>TC4H9O2H+C4H71-3            1.40E+12    0.0    14900.0
1713. IC4H9O2+C4H8-2<=>IC4H9O2H+C4H71-3            1.40E+12    0.0    14900.0
1714. TC4H9O2+C4H8-2<=>TC4H9O2H+C4H71-3            1.40E+12    0.0    14900.0
1715. C4H71-1<=>C4H6-1+H                           8.95E+08    1.1    35636.5
1716. C4H71-1<=>C2H5+C2H2                          2.85E+12    0.7    33178.3
1717. C4H71-2<=>C4H6-1+H                           9.79E+08    1.2    38080.7
1718. C4H71-2<=>C4H612+H                           1.99E+08    1.6    37683.3
1719. C4H71-2<=>C3H4-A+CH3                         1.23E+10    1.2    32916.0
1720. C4H71-3<=>C4H612+H                           3.95E+11    0.9    61611.1
1721. C4H71-3<=>C4H6+H                             8.53E+07    1.9    47490.1
1722. C4H71-4<=>C2H4+C2H3                          2.84E+10    1.0    38998.8
1723. C4H71-4<=>C4H6+H                             1.32E+05    2.3    33245.9
1724. C4H72-2<=>C4H6-2+H                           7.87E+09    1.2    36173.0
1725. C4H72-2<=>C4H612+H                           9.54E+07    1.8    38992.8
1726. C4H72-2<=>C3H4-P+CH3                         6.30E+11    0.9    34754.1
1727. C4H71-3<=>C4H71-4                            5.62E-12    7.2    36200.8
1728. C4H71-3<=>C4H72-2                            6.76E-23   10.2    41574.2
1729. C4H71-3+HO2<=>C4H71-3OOH                     1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-02(atm)        2.05E+01    1.2   -22589.0
      Rate coefficients at P=1.00E-01(atm)        3.69E+06    0.1   -18331.0
      Rate coefficients at P=1.00E+00(atm)        2.02E+13   -1.4   -11709.0
      Rate coefficients at P=2.00E+00(atm)        1.49E+15   -1.9    -9604.0
      Rate coefficients at P=5.00E+00(atm)        1.85E+17   -2.3    -6991.0
      Rate coefficients at P=1.00E+01(atm)        2.88E+18   -2.5    -5260.0
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Rate coefficients at P=3.00E+01(atm)	3.45E+19	-2.7	-3140.0
Rate coefficients at P=5.00E+01(atm)	5.33E+19	-2.7	-2438.0
1730. C4H71-3+HO2<=>C4H71-O+OH	1.00E+00	1.0	1.0
Rate coefficients at P=1.00E-02(atm)	6.90E+20	-2.7	229.0
Rate coefficients at P=1.00E-01(atm)	4.50E+22	-3.2	1760.0
Rate coefficients at P=1.00E+00(atm)	8.61E+27	-4.6	6415.0
Rate coefficients at P=2.00E+00(atm)	1.92E+30	-5.3	8578.0
Rate coefficients at P=5.00E+00(atm)	5.46E+33	-6.2	11879.0
Rate coefficients at P=1.00E+01(atm)	2.98E+36	-7.0	14600.0
Rate coefficients at P=3.00E+01(atm)	5.58E+40	-8.1	19040.0
Rate coefficients at P=5.00E+01(atm)	4.44E+42	-8.7	21071.0
1731. C4H71-3+HO2<=>C2H3COCH3+H2O	1.00E+00	1.0	1.0
Rate coefficients at P=1.00E-02(atm)	5.16E+14	-1.7	1910.0
Rate coefficients at P=1.00E-01(atm)	1.62E+16	-2.2	3167.0
Rate coefficients at P=1.00E+00(atm)	9.73E+20	-3.5	7339.0
Rate coefficients at P=2.00E+00(atm)	1.70E+23	-4.1	9378.0
Rate coefficients at P=5.00E+00(atm)	4.33E+26	-5.0	12574.0
Rate coefficients at P=1.00E+01(atm)	2.59E+29	-5.8	15275.0
Rate coefficients at P=3.00E+01(atm)	7.85E+33	-7.0	19801.0
Rate coefficients at P=5.00E+01(atm)	8.84E+35	-7.6	21918.0
1732. C4H71-3OOH<=>C4H71-O+OH	1.00E+00	1.0	1.0
Rate coefficients at P=1.00E-02(atm)	4.41E+35	-7.4	39745.0
Rate coefficients at P=1.00E-01(atm)	6.64E+37	-7.6	44224.0
Rate coefficients at P=1.00E+00(atm)	7.09E+37	-7.2	47692.0
Rate coefficients at P=2.00E+00(atm)	1.92E+37	-7.0	48350.0
Rate coefficients at P=5.00E+00(atm)	1.20E+36	-6.5	48849.0
Rate coefficients at P=1.00E+01(atm)	7.17E+34	-6.1	48933.0
Rate coefficients at P=3.00E+01(atm)	3.69E+32	-5.3	48614.0
Rate coefficients at P=5.00E+01(atm)	3.04E+31	-5.0	48341.0
1733. C4H71-3OOH<=>C2H3COCH3+H2O	1.00E+00	1.0	1.0
Rate coefficients at P=1.00E-02(atm)	3.58E+23	-4.6	38121.0
Rate coefficients at P=1.00E-01(atm)	2.85E+27	-5.4	43407.0
Rate coefficients at P=1.00E+00(atm)	2.63E+29	-5.5	48042.0
Rate coefficients at P=2.00E+00(atm)	2.83E+29	-5.4	49101.0
Rate coefficients at P=5.00E+00(atm)	1.04E+29	-5.2	50137.0
Rate coefficients at P=1.00E+01(atm)	2.12E+28	-4.9	50610.0
Rate coefficients at P=3.00E+01(atm)	5.39E+26	-4.3	50818.0
Rate coefficients at P=5.00E+01(atm)	7.76E+25	-4.0	50737.0
1734. C4H71-O<=>C2H3+CH3CHO	8.52E+25	-3.6	27863.4
1735. C4H71-O<=>AC3H5OCH2	1.35E+18	-1.7	17386.5
1736. C4H71-O<=>CH2CH2COCH3	1.67E+21	-2.7	20337.7
1737. C4H71-O<=>C2H3COCH3+H	2.57E+20	-2.1	22040.1
1738. C4H71-O<=>C2H4+CH3CO	4.75E+08	1.1	20922.5
1739. AC3H5OCH2<=>C3H5-A+CH2O	8.81E+14	-0.3	31553.1
1740. AC3H5OCH2<=>CH2CH2COCH3	2.51E+20	-2.6	29288.4
1741. AC3H5OCH2<=>C2H3COCH3+H	3.98E+18	-1.6	30129.8
1742. AC3H5OCH2<=>C3H6+HCO	3.73E+14	-0.7	32008.3
1743. CH2CH2COCH3<=>C2H3+CH3CHO	1.93E+19	-1.9	48440.0
1744. CH2CH2COCH3<=>C2H3COCH3+H	4.52E+12	0.2	34570.5
1745. CH2CH2COCH3<=>C2H4+CH3CO	1.59E+13	0.1	24086.3
1746. C2H3+CH3CHO<=>C2H4+CH3CO	1.65E+01	3.2	9399.8
1747. C4H71-3+HO2<=>C4H72-1OOH	1.00E+00	1.0	1.0
Rate coefficients at P=1.00E-02(atm)	1.00E+07	-0.3	-17896.0
Rate coefficients at P=1.00E-01(atm)	1.15E+11	-1.2	-14831.0
Rate coefficients at P=1.00E+00(atm)	2.95E+16	-2.3	-9451.0
Rate coefficients at P=2.00E+00(atm)	7.68E+17	-2.6	-7705.0
Rate coefficients at P=5.00E+00(atm)	2.21E+19	-2.9	-5556.0
Rate coefficients at P=1.00E+01(atm)	1.14E+20	-3.0	-4159.0
Rate coefficients at P=3.00E+01(atm)	2.80E+20	-3.0	-2503.0
Rate coefficients at P=5.00E+01(atm)	2.40E+20	-2.9	-1971.0
1748. C4H71-3+HO2<=>C4H7O2-1+OH	1.00E+00	1.0	1.0
Rate coefficients at P=1.00E-02(atm)	6.81E+20	-2.7	217.0
Rate coefficients at P=1.00E-01(atm)	2.25E+22	-3.1	1516.0
Rate coefficients at P=1.00E+00(atm)	2.75E+27	-4.5	6067.0
Rate coefficients at P=2.00E+00(atm)	6.27E+29	-5.1	8273.0
Rate coefficients at P=5.00E+00(atm)	1.96E+33	-6.1	11661.0
Rate coefficients at P=1.00E+01(atm)	1.16E+36	-6.8	14456.0
Rate coefficients at P=3.00E+01(atm)	2.51E+40	-8.0	19009.0
Rate coefficients at P=5.00E+01(atm)	2.18E+42	-8.6	21090.0
1749. C4H71-3+HO2<=>SC3H5CHO+H2O	1.00E+00	1.0	1.0
Rate coefficients at P=1.00E-02(atm)	1.62E+14	-1.6	1519.0
Rate coefficients at P=1.00E-01(atm)	3.19E+15	-2.0	2620.0
Rate coefficients at P=1.00E+00(atm)	1.69E+20	-3.3	6800.0
Rate coefficients at P=2.00E+00(atm)	3.39E+22	-3.9	8918.0
Rate coefficients at P=5.00E+00(atm)	1.09E+26	-4.8	12249.0
Rate coefficients at P=1.00E+01(atm)	7.81E+28	-5.6	15058.0
Rate coefficients at P=3.00E+01(atm)	3.14E+33	-6.9	19743.0
Rate coefficients at P=5.00E+01(atm)	4.07E+35	-7.5	21927.0
1750. C4H72-1OOH<=>C4H7O2-1+OH	1.00E+00	1.0	1.0
Rate coefficients at P=1.00E-02(atm)	5.07E+35	-7.4	39733.0
Rate coefficients at P=1.00E-01(atm)	7.69E+37	-7.6	43994.0
Rate coefficients at P=1.00E+00(atm)	2.76E+37	-7.1	47024.0
Rate coefficients at P=2.00E+00(atm)	4.32E+36	-6.8	47507.0
Rate coefficients at P=5.00E+00(atm)	1.21E+35	-6.2	47760.0
Rate coefficients at P=1.00E+01(atm)	3.92E+33	-5.7	47658.0
Rate coefficients at P=3.00E+01(atm)	8.62E+30	-4.9	47084.0
Rate coefficients at P=5.00E+01(atm)	5.29E+29	-4.5	46721.0
1751. C4H72-1OOH<=>SC3H5CHO+H2O	1.00E+00	1.0	1.0
Rate coefficients at P=1.00E-02(atm)	1.15E+24	-4.8	38584.0
Rate coefficients at P=1.00E-01(atm)	9.65E+27	-5.5	43561.0
Rate coefficients at P=1.00E+00(atm)	2.33E+29	-5.5	47626.0
Rate coefficients at P=2.00E+00(atm)	1.29E+29	-5.3	48469.0
Rate coefficients at P=5.00E+00(atm)	1.81E+28	-5.0	49208.0
Rate coefficients at P=1.00E+01(atm)	1.76E+27	-4.6	49458.0

	Rate coefficients at P=3.00E+01(atm)	1.59E+25	-3.9	49357.0
	Rate coefficients at P=5.00E+01(atm)	1.58E+24	-3.6	49164.0
1752.	C4H7O2-1<=>C3H5-S+CH2O	8.52E+25	-3.6	27863.4
1753.	C4H7O2-1<=>SC3H5OCH2-1	1.35E+18	-1.7	17386.5
1754.	C4H7O2-1<=>C3H6CHO-2	1.67E+21	-2.7	20337.7
1755.	C4H7O2-1<=>SC3H5CHO+H	2.57E+20	-2.1	22040.1
1756.	C4H7O2-1<=>C3H6+HCO	4.75E+08	1.1	20922.5
1757.	SC3H5OCH2-1<=>C3H5-S+CH2O	8.81E+14	-0.3	31553.1
1758.	SC3H5OCH2-1<=>C3H6CHO-2	2.51E+20	-2.6	29288.4
1759.	SC3H5OCH2-1<=>SC3H5CHO+H	3.98E+18	-1.6	30129.8
1760.	SC3H5OCH2-1<=>C3H6+HCO	3.73E+14	-0.7	32008.3
1761.	C3H6CHO-2<=>C3H5-S+CH2O	1.93E+19	-1.9	48440.0
1762.	C3H6CHO-2<=>SC3H5CHO+H	4.52E+12	0.2	34570.5
1763.	C3H6CHO-2<=>C3H6+HCO	1.59E+13	0.1	24086.3
1764.	C3H5-S+CH2O<=>C3H6+HCO	1.65E+01	3.2	9399.8
1765.	C4H71-3+CH3O2<=>C4H71-3OOCH3	1.00E+00	1.0	1.0
	Rate coefficients at P=1.00E-02(atm)	1.03E+01	1.2	-22589.0
	Rate coefficients at P=1.00E-01(atm)	1.85E+06	0.1	-18331.0
	Rate coefficients at P=1.00E+00(atm)	1.01E+13	-1.4	-11709.0
	Rate coefficients at P=2.00E+00(atm)	7.45E+14	-1.9	-9604.0
	Rate coefficients at P=5.00E+00(atm)	9.25E+16	-2.3	-6991.0
	Rate coefficients at P=1.00E+01(atm)	1.44E+18	-2.5	-5260.0
	Rate coefficients at P=3.00E+01(atm)	1.73E+19	-2.7	-3140.0
	Rate coefficients at P=5.00E+01(atm)	2.67E+19	-2.7	-2438.0
1766.	C4H71-3+CH3O2<=>C4H71-O+CH3O	1.00E+00	1.0	1.0
	Rate coefficients at P=1.00E-02(atm)	3.45E+20	-2.7	229.0
	Rate coefficients at P=1.00E-01(atm)	2.25E+22	-3.2	1760.0
	Rate coefficients at P=1.00E+00(atm)	4.31E+27	-4.6	6415.0
	Rate coefficients at P=2.00E+00(atm)	9.60E+29	-5.3	8578.0
	Rate coefficients at P=5.00E+00(atm)	2.73E+33	-6.2	11879.0
	Rate coefficients at P=1.00E+01(atm)	1.49E+36	-7.0	14600.0
	Rate coefficients at P=3.00E+01(atm)	2.79E+40	-8.1	19040.0
	Rate coefficients at P=5.00E+01(atm)	2.22E+42	-8.7	21071.0
1767.	C4H71-3OOCH3<=>C4H71-O+CH3O	1.00E+00	1.0	1.0
	Rate coefficients at P=1.00E-02(atm)	2.21E+35	-7.4	39745.0
	Rate coefficients at P=1.00E-01(atm)	3.32E+37	-7.6	44224.0
	Rate coefficients at P=1.00E+00(atm)	3.55E+37	-7.2	47692.0
	Rate coefficients at P=2.00E+00(atm)	9.60E+36	-7.0	48350.0
	Rate coefficients at P=5.00E+00(atm)	6.00E+35	-6.5	48849.0
	Rate coefficients at P=1.00E+01(atm)	3.59E+34	-6.1	48933.0
	Rate coefficients at P=3.00E+01(atm)	1.85E+32	-5.3	48614.0
	Rate coefficients at P=5.00E+01(atm)	1.52E+31	-5.0	48341.0
1768.	C4H71-3+CH3O2<=>C4H72-1OOCH3	1.00E+00	1.0	1.0
	Rate coefficients at P=1.00E-02(atm)	5.00E+06	-0.3	-17896.0
	Rate coefficients at P=1.00E-01(atm)	5.75E+10	-1.2	-14831.0
	Rate coefficients at P=1.00E+00(atm)	1.48E+16	-2.3	-9451.0
	Rate coefficients at P=2.00E+00(atm)	3.84E+17	-2.6	-7705.0
	Rate coefficients at P=5.00E+00(atm)	1.11E+19	-2.9	-5556.0
	Rate coefficients at P=1.00E+01(atm)	5.70E+19	-3.0	-4159.0
	Rate coefficients at P=3.00E+01(atm)	1.40E+20	-3.0	-2503.0
	Rate coefficients at P=5.00E+01(atm)	1.20E+20	-2.9	-1971.0
1769.	C4H71-3+CH3O2<=>C4H7O2-1+CH3O	1.00E+00	1.0	1.0
	Rate coefficients at P=1.00E-02(atm)	3.41E+20	-2.7	217.0
	Rate coefficients at P=1.00E-01(atm)	1.13E+22	-3.1	1516.0
	Rate coefficients at P=1.00E+00(atm)	1.38E+27	-4.5	6067.0
	Rate coefficients at P=2.00E+00(atm)	3.14E+29	-5.1	8273.0
	Rate coefficients at P=5.00E+00(atm)	9.80E+32	-6.1	11661.0
	Rate coefficients at P=1.00E+01(atm)	5.80E+35	-6.8	14456.0
	Rate coefficients at P=3.00E+01(atm)	1.26E+40	-8.0	19009.0
	Rate coefficients at P=5.00E+01(atm)	1.09E+42	-8.6	21090.0
1770.	C4H72-1OOCH3<=>C4H7O2-1+CH3O	1.00E+00	1.0	1.0
	Rate coefficients at P=1.00E-02(atm)	2.54E+35	-7.4	39733.0
	Rate coefficients at P=1.00E-01(atm)	3.85E+37	-7.6	43994.0
	Rate coefficients at P=1.00E+00(atm)	1.38E+37	-7.1	47024.0
	Rate coefficients at P=2.00E+00(atm)	2.16E+36	-6.8	47507.0
	Rate coefficients at P=5.00E+00(atm)	6.05E+34	-6.2	47760.0
	Rate coefficients at P=1.00E+01(atm)	1.96E+33	-5.7	47658.0
	Rate coefficients at P=3.00E+01(atm)	4.31E+30	-4.9	47084.0
	Rate coefficients at P=5.00E+01(atm)	2.65E+29	-4.5	46721.0
1771.	C4H71-3+C2H5O2<=>C4H71-O+C2H5O	3.80E+12	0.0	-1200.0
1772.	IC3H7O2+C4H71-3<=>IC3H7O+C4H71-O	3.80E+12	0.0	-1200.0
1773.	NC3H7O2+C4H71-3<=>NC3H7O+C4H71-O	3.80E+12	0.0	-1200.0
1774.	C4H71-O<=>C2H3CHO+CH3	7.94E+14	0.0	19000.0
1775.	C4H71-3+O<=>C2H3CHO+CH3	6.03E+13	0.0	0.0
1776.	C4H71-3+O2<=>C4H6+HO2	1.07E+00	3.7	9322.0
1777.	H+C4H71-3<=>C4H6+H2	3.16E+13	0.0	0.0
1778.	C2H5+C4H71-3<=>C4H6+C2H6	3.98E+12	0.0	0.0
1779.	C2H3+C4H71-3<=>C2H4+C4H6	3.98E+12	0.0	0.0
1780.	C3H5-A+C4H71-3<=>C3H6+C4H6	6.31E+12	0.0	0.0
1781.	C4H71-3+C4H71-3<=>C8H141-5,3-4	4.11E+16	-1.3	1560.6
1782.	C4H71-3+C4H71-3<=>C8H141-5,3	4.11E+16	-1.3	1560.6
1783.	C4H71-3+C4H71-3<=>C8H142-6	4.11E+16	-1.3	1560.6
1784.	C8H141-5,3-4+OH<=>C8H131-5,3-4,TA+H2O	2.50E+06	2.0	-2629.1
1785.	C8H141-5,3+OH<=>C8H131-5,3,TA+H2O	1.30E+06	2.0	-2629.1
1786.	C8H141-5,3+OH<=>C8H131-5,3,SA+H2O	3.20E+06	2.0	-1434.0
1787.	C8H141-5,3+OH<=>C8H131-5,3,PA+H2O	3.00E+06	2.0	-239.0
1788.	C8H142-6+OH<=>C8H132-6,SA+H2O	6.30E+06	2.0	-1434.0
1789.	C8H142-6+OH<=>C8H132-6,PA+H2O	6.00E+06	2.0	-239.0
1790.	C8H141-5,3-4+HO2<=>C8H131-5,3-4,TA+H2O2	3.20E+04	2.6	10755.3
1791.	C8H141-5,3+HO2<=>C8H131-5,3,TA+H2O2	1.60E+04	2.6	10755.3
1792.	C8H141-5,3+HO2<=>C8H131-5,3,SA+H2O2	6.30E+03	2.6	12428.3
1793.	C8H141-5,3+HO2<=>C8H131-5,3,PA+H2O2	9.50E+03	2.6	13862.3
1794.	C8H142-6+HO2<=>C8H132-6,SA+H2O2	1.30E+04	2.6	12428.3
1795.	C8H142-6+HO2<=>C8H132-6,PA+H2O2	1.90E+04	2.6	13862.3

1796.	C8H141-5,3-4+H<=>C8H131-5,3-4,TA+H2	5.00E+04	2.5	-2868.1
1797.	C8H141-5,3+H<=>C8H131-5,3,TA+H2	2.50E+04	2.5	-2868.1
1798.	C8H141-5,3+H<=>C8H131-5,3,SA+H2	5.00E+04	2.5	-1673.0
1799.	C8H141-5,3+H<=>C8H131-5,3,PA+H2	1.90E+05	2.5	2390.1
1800.	C8H142-6+H<=>C8H132-6,SA+H2	1.00E+05	2.5	-1673.0
1801.	C8H142-6+H<=>C8H132-6,PA+H2	3.80E+05	2.5	2390.1
1802.	C8H141-5,3-4+O<=>C8H131-5,3-4,TA+OH	6.30E+10	0.7	1195.0
1803.	C8H141-5,3+O<=>C8H131-5,3,TA+OH	3.20E+10	0.7	1195.0
1804.	C8H141-5,3+O<=>C8H131-5,3,SA+OH	8.00E+10	0.7	3107.1
1805.	C8H141-5,3+O<=>C8H131-5,3,PA+OH	6.30E+10	0.7	5975.1
1806.	C8H142-6+O<=>C8H132-6,SA+OH	1.60E+11	0.7	3107.1
1807.	C8H142-6+O<=>C8H132-6,PA+OH	1.30E+11	0.7	5975.1
1808.	C8H141-5,3-4+CH3<=>C8H131-5,3-4,TA+CH4	1.60E+12	0.0	5258.1
1809.	C8H141-5,3+CH3<=>C8H131-5,3,TA+CH4	7.90E+11	0.0	5258.1
1810.	C8H141-5,3+CH3<=>C8H131-5,3,SA+CH4	1.60E+12	0.0	6931.2
1811.	C8H141-5,3+CH3<=>C8H131-5,3,PA+CH4	1.50E-01	3.5	5736.1
1812.	C8H142-6+CH3<=>C8H132-6,SA+CH4	3.20E+12	0.0	6931.2
1813.	C8H142-6+CH3<=>C8H132-6,PA+CH4	3.00E-01	3.5	5736.1
1814.	C8H141-5,3-4+O2<=>C8H131-5,3-4,TA+HO2	1.60E+13	0.0	35420.0
1815.	C8H141-5,3+O2<=>C8H131-5,3,TA+HO2	8.00E+12	0.0	35420.0
1816.	C8H141-5,3+O2<=>C8H131-5,3,SA+HO2	2.00E+13	0.0	37190.0
1817.	C8H141-5,3+O2<=>C8H131-5,3,PA+HO2	2.00E+13	0.0	39390.0
1818.	C8H142-6+O2<=>C8H132-6,SA+HO2	4.00E+13	0.0	37190.0
1819.	C8H142-6+O2<=>C8H132-6,PA+HO2	4.00E+13	0.0	39390.0
1820.	C6H101-3,3+C2H3<=>C8H131-5,3-4,TA	4.40E+04	2.5	6130.0
1821.	B13DE2M+C3H5-S<=>C8H131-5,3,TA	4.40E+04	2.5	6130.0
1822.	C6H10D24+C2H3<=>C8H131-5,3,SA	8.80E+03	2.5	6130.0
1823.	C4H6+C4H71-3<=>C8H131-5,3,PA	1.30E+03	2.5	8520.0
1824.	C5H81-3+C3H5-S<=>C8H132-6,SA	8.80E+03	2.5	6130.0
1825.	C4H6+C4H71-3<=>C8H132-6,PA	1.30E+03	2.5	8520.0
1826.	C8H131-5,3-4,TA+HO2<=>C8H131-5,3-4,TAO+OH	1.64E+04	2.7	1144.4
1827.	C8H131-5,3,SA+HO2<=>C8H131-5,3,SAO+OH	1.64E+04	2.7	1144.4
1828.	C8H131-5,3,PA+HO2<=>C8H131-5,3,PAO+OH	1.64E+04	2.7	1144.4
1829.	C8H132-6,SA+HO2<=>C8H132-6,SAO+OH	1.64E+04	2.7	1144.4
1830.	C8H132-6,PA+HO2<=>C8H132-6,PAO+OH	1.64E+04	2.7	1144.4
1831.	C4H71-3+C2H3COCH3<=>C8H131-5,3-4,TAO	2.50E+10	0.0	10090.0
1832.	C4H71-3+C2H3COCH3<=>C8H131-5,3,TAO	2.50E+10	0.0	10090.0
1833.	C4H71-3+SC3H5CHO<=>C8H131-5,3,SAO	3.33E+10	0.0	6397.0
1834.	C7H111-5,3,6P+CH2O<=>C8H131-5,3,PAO	1.00E+11	0.0	3496.0
1835.	C4H71-3+SC3H5CHO<=>C8H132-6,SAO	3.33E+10	0.0	6397.0
1836.	C7H111-5,1P+CH2O<=>C8H132-6,PAO	1.00E+11	0.0	3496.0
1837.	CC5H9-A+C2H2<=>C7H111-5,3,6P	1.32E+04	2.5	6130.0
1838.	C5H92-5+C2H2<=>C7H111-5,1P	1.32E+04	2.5	6130.0
1839.	C4H71-4+O2<=>C4H6+HO2	1.00E+11	0.0	0.0
1840.	C4H71-4+O2<=>C4H71-4O2	6.86E+16	-1.6	198.7
1841.	C4H71-4+HO2<=>C4H7O1-4+OH	7.00E+12	0.0	-1000.0
1842.	CH3O2+C4H71-4<=>CH3O+C4H7O1-4	7.00E+12	0.0	-1000.0
1843.	C4H71-4O2+H2<=>C4H71-4OOH+H	3.01E+13	0.0	26030.0
1844.	C4H71-4O2+HO2<=>C4H71-4OOH+O2	1.75E+10	0.0	-3275.0
1845.	C4H71-4O2+H2O2<=>C4H71-4OOH+HO2	2.40E+12	0.0	10000.0
1846.	C4H71-4O2+CH4<=>C4H71-4OOH+CH3	1.12E+13	0.0	24640.0
1847.	C4H71-4O2+CH3OH<=>C4H71-4OOH+CH2OH	6.30E+12	0.0	19360.0
1848.	C4H71-4O2+CH2O<=>C4H71-4OOH+HCO	5.60E+12	0.0	13600.0
1849.	C4H71-4O2+C2H6<=>C4H71-4OOH+C2H5	1.70E+13	0.0	20460.0
1850.	C4H71-4O2+CH3CHO<=>C4H71-4OOH+CH3CO	2.80E+12	0.0	13600.0
1851.	C4H71-4O2+C2H4<=>C4H71-4OOH+C2H3	1.13E+13	0.0	30430.0
1852.	C4H71-4O2+C3H6<=>C4H71-4OOH+C3H5-A	5.35E-02	4.2	13288.1
1853.	C4H71-4O2+C2H5CHO<=>C4H71-4OOH+C2H5CO	2.00E+11	0.0	9500.0
1854.	C4H71-4O2+C2H3CHO<=>C4H71-4OOH+C2H3CO	2.80E+12	0.0	13600.0
1855.	C4H71-4O2+C3H8<=>C4H71-4OOH+NC3H7	1.70E+13	0.0	20460.0
1856.	C4H71-4O2+C3H8<=>C4H71-4OOH+IC3H7	2.00E+12	0.0	17000.0
1857.	C4H71-4O2+CH3<=>C4H7O1-4+CH3O	7.00E+12	0.0	-1000.0
1858.	C4H71-4O2+C2H5<=>C4H7O1-4+C2H5O	7.00E+12	0.0	-1000.0
1859.	C4H71-4O2+IC3H7<=>C4H7O1-4+IC3H7O	7.00E+12	0.0	-1000.0
1860.	C4H71-4O2+NC3H7<=>C4H7O1-4+NC3H7O	7.00E+12	0.0	-1000.0
1861.	C4H71-4O2+C3H5-A<=>C4H7O1-4+C3H5O	7.00E+12	0.0	-1000.0
1862.	C4H71-4O2+PC4H9<=>C4H7O1-4+PC4H9O	7.00E+12	0.0	-1000.0
1863.	C4H71-4O2+SC4H9<=>C4H7O1-4+SC4H9O	7.00E+12	0.0	-1000.0
1864.	C4H71-4O2+C4H71-3<=>C4H7O1-4+C4H71-O	7.00E+12	0.0	-1000.0
1865.	C4H71-4OOH<=>C4H7O1-4+OH	1.50E+16	0.0	42500.0
1866.	C4H71-4O2+CH3O2=>C4H7O1-4+CH3O+O2	1.40E+16	-1.6	1860.0
1867.	C4H71-4O2+CH3CO3=>C4H7O1-4+CH3CO2+O2	1.40E+16	-1.6	1860.0
1868.	C4H71-4O2+C2H5O2=>C4H7O1-4+C2H5O+O2	1.40E+16	-1.6	1860.0
1869.	C4H71-4O2+NC3H7O2=>C4H7O1-4+NC3H7O+O2	1.40E+16	-1.6	1860.0
1870.	C4H71-4O2+IC3H7O2=>C4H7O1-4+IC3H7O+O2	1.40E+16	-1.6	1860.0
1871.	C4H71-4O2+C4H71-4O2=>C4H7O1-4+C4H7O1-4+O2	1.40E+16	-1.6	1860.0
1872.	C4H71-4O2+SC4H9O2=>C4H7O1-4+SC4H9O+O2	1.40E+16	-1.6	1860.0
1873.	C4H71-4O2<=>C4H61-3OOH4	4.01E+08	1.1	30100.0
1874.	C4H61-3OOH4<=>C2H3CHOCH2+OH	1.71E+09	1.1	10900.0
1875.	C4H61-3OOH4<=>C4H6O25+OH	1.72E+08	0.8	11100.0
1876.	C2H3CHOCH2+H=>C2H3+CH2CO+H2	5.00E+12	0.0	0.0
1877.	C2H3CHOCH2+O=>C2H3+CH2CO+OH	5.00E+12	0.0	0.0
1878.	C2H3CHOCH2+OH=>C2H3+CH2CO+H2O	5.00E+12	0.0	0.0
1879.	C2H3CHOCH2+HO2=>C2H3+CH2CO+H2O2	1.00E+13	0.0	15000.0
1880.	C2H3CHOCH2+CH3=>C2H3+CH2CO+CH4	2.00E+11	0.0	10000.0
1881.	C2H3CHOCH2+CH3O2=>C2H3+CH2CO+CH3O2H	1.00E+13	0.0	19000.0
1882.	C4H6O25+H<=>CH2CHCHCHO+H2	5.00E+12	0.0	0.0
1883.	C4H6O25+O<=>CH2CHCHCHO+OH	5.00E+12	0.0	0.0
1884.	C4H6O25+OH<=>CH2CHCHCHO+H2O	5.00E+12	0.0	0.0
1885.	C4H6O25+HO2<=>CH2CHCHCHO+H2O2	1.00E+13	0.0	15000.0
1886.	C4H6O25+CH3<=>CH2CHCHCHO+CH4	2.00E+11	0.0	10000.0
1887.	C4H6O25+CH3O2<=>CH2CHCHCHO+CH3O2H	1.00E+13	0.0	19000.0
1888.	C4H61-3OOH4+HO2<=>C4H6O1-3OOH4+OH	4.10E+03	2.7	1144.4
1889.	C4H61-3OOH4+HO2<=>C4H6O2-1OOH4+OH	4.10E+03	2.7	1144.4

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1890. C4H6O1-3OOH4<=>C2H3CHO+CH2O+OH                6.70E+39   -8.4    22782.0
1891. C4H6O1-3OOH4<=>C2H3+HO2CH2CHO                 2.67E+34   -6.6    22672.0
1892. C4H71-1+O2<=>C4H71-1O2                        4.07E+27   -4.7     5222.0
1893. C4H71-1O2<=>C3H6CHO-3+O                       1.22E+29   -4.7    42340.0
1894. C4H71-1O2<=>C2H5CHCO+OH                       1.55E+24   -3.9    49850.0
1895. C4H71-2+O2<=>C4H71-2O2                        4.07E+27   -4.7     5222.0
1896. C4H71-2O2<=>C2H5COCH2+O                       1.22E+29   -4.7    42340.0
1897. C4H72-2+O2<=>C4H72-2O2                        4.07E+27   -4.7     5222.0
1898. C4H72-2O2<=>CH3CHCOCH3+O                      1.22E+29   -4.7    42340.0
1899. C4H8-1+H<=>C2H4+C2H5                          1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)         2.55E+06    1.9     5564.0
      Rate coefficients at P=1.00E-02(atm)         5.56E+06    1.8     5802.0
      Rate coefficients at P=1.00E-01(atm)         1.21E+09    1.2     7472.0
      Rate coefficients at P=1.00E+00(atm)         9.47E+16   -1.0    13413.0
      Rate coefficients at P=1.00E+01(atm)         4.50E+28   -4.2    23618.0
      Rate coefficients at P=1.00E+02(atm)         7.02E+32   -5.2    31754.0
      Declared duplicate reaction...
1900. C4H8-1+H<=>C2H4+C2H5                          1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)         3.45E+07    1.8     2263.0
      Rate coefficients at P=1.00E-02(atm)         8.06E+07    1.7     2522.0
      Rate coefficients at P=1.00E-01(atm)         1.18E+10    1.1     4077.0
      Rate coefficients at P=1.00E+00(atm)         6.02E+15   -0.5     8452.0
      Rate coefficients at P=1.00E+01(atm)         7.58E+21   -2.1    14245.0
      Rate coefficients at P=1.00E+02(atm)         2.29E+21   -1.9    17243.0
      Declared duplicate reaction...
1901. C4H8-1+H<=>C3H6+CH3                           1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)         7.83E+09    1.2     1442.0
      Rate coefficients at P=1.00E-02(atm)         3.39E+10    1.0     1895.0
      Rate coefficients at P=1.00E-01(atm)         3.70E+13    0.1     4127.0
      Rate coefficients at P=1.00E+00(atm)         4.57E+19   -1.5     9061.0
      Rate coefficients at P=1.00E+01(atm)         8.57E+23   -2.7    14140.0
      Rate coefficients at P=1.00E+02(atm)         1.32E+20   -1.5    15383.0
      Declared duplicate reaction...
1902. C4H8-1+H<=>C3H6+CH3                           1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)         1.80E+06    1.8     5900.0
      Rate coefficients at P=1.00E-02(atm)         3.46E+06    1.7     6100.0
      Rate coefficients at P=1.00E-01(atm)         4.02E+08    1.1     7574.0
      Rate coefficients at P=1.00E+00(atm)         1.21E+16   -1.0    13175.0
      Rate coefficients at P=1.00E+01(atm)         7.14E+27   -4.2    23319.0
      Rate coefficients at P=1.00E+02(atm)         1.00E+33   -5.5    31922.0
      Declared duplicate reaction...
1903. C4H8-1+H<=>PC4H9                              1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)         1.35E+15   -2.8     1570.0
      Rate coefficients at P=1.00E-02(atm)         5.20E+16   -3.0     1992.0
      Rate coefficients at P=1.00E-01(atm)         1.91E+21   -4.0     4636.0
      Rate coefficients at P=1.00E+00(atm)         1.90E+31   -6.5    11968.0
      Rate coefficients at P=1.00E+01(atm)         2.10E+40   -8.6    21058.0
      Rate coefficients at P=1.00E+02(atm)         1.44E+37   -7.2    24896.0
      Declared duplicate reaction...
1904. C4H8-1+H<=>PC4H9                              1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)         4.33E+20   -4.2     -263.0
      Rate coefficients at P=1.00E-02(atm)         1.78E+22   -4.3      186.0
      Rate coefficients at P=1.00E-01(atm)         1.98E+26   -5.2     2518.0
      Rate coefficients at P=1.00E+00(atm)         3.78E+32   -6.6     7265.0
      Rate coefficients at P=1.00E+01(atm)         8.79E+34   -6.9    10952.0
      Rate coefficients at P=1.00E+02(atm)         7.80E+28   -4.8    10355.0
      Declared duplicate reaction...
1905. C4H8-1+H<=>SC4H9                              1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)         4.07E+22   -4.5     -771.0
      Rate coefficients at P=1.00E-02(atm)         3.90E+24   -4.8      -34.0
      Rate coefficients at P=1.00E-01(atm)         2.03E+29   -5.8     2970.0
      Rate coefficients at P=1.00E+00(atm)         3.53E+34   -7.0     7525.0
      Rate coefficients at P=1.00E+01(atm)         1.19E+34   -6.4     9810.0
      Rate coefficients at P=1.00E+02(atm)         1.37E+26   -3.8     8012.0
      Declared duplicate reaction...
1906. C4H8-1+H<=>SC4H9                              1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)         3.52E+12   -2.1     1466.0
      Rate coefficients at P=1.00E-02(atm)         1.02E+14   -2.3     1799.0
      Rate coefficients at P=1.00E-01(atm)         1.16E+18   -3.1     4049.0
      Rate coefficients at P=1.00E+00(atm)         5.22E+27   -5.5    10963.0
      Rate coefficients at P=1.00E+01(atm)         4.33E+37   -7.9    20354.0
      Rate coefficients at P=1.00E+02(atm)         2.22E+36   -7.1    25203.0
      Declared duplicate reaction...
1907. C4H8-2+H<=>C2H4+C2H5                          1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)         8.96E+06    1.9     6209.0
      Rate coefficients at P=1.00E-02(atm)         1.92E+07    1.8     6443.0
      Rate coefficients at P=1.00E-01(atm)         3.97E+09    1.1     8097.0
      Rate coefficients at P=1.00E+00(atm)         3.01E+17   -1.1    14023.0
      Rate coefficients at P=1.00E+01(atm)         1.88E+29   -4.3    24297.0
      Rate coefficients at P=1.00E+02(atm)         5.15E+33   -5.4    32601.0
1908. C4H8-2+H<=>C3H6+CH3                           1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)         6.39E+09    1.3     1834.0
      Rate coefficients at P=1.00E-02(atm)         2.60E+10    1.1     2267.0
      Rate coefficients at P=1.00E-01(atm)         2.48E+13    0.3     4456.0
      Rate coefficients at P=1.00E+00(atm)         2.91E+19   -1.4     9365.0
      Rate coefficients at P=1.00E+01(atm)         6.13E+23   -2.5    14463.0
      Rate coefficients at P=1.00E+02(atm)         1.23E+20   -1.4    15762.0
1909. C4H8-2+H<=>PC4H9                              1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)         3.90E+14   -2.5     1729.0
      Rate coefficients at P=1.00E-02(atm)         1.41E+16   -2.7     2133.0
      Rate coefficients at P=1.00E-01(atm)         4.31E+20   -3.7     4719.0
      Rate coefficients at P=1.00E+00(atm)         4.03E+30   -6.2    12020.0
      Rate coefficients at P=1.00E+01(atm)         5.19E+39   -8.3    21137.0
      Rate coefficients at P=1.00E+02(atm)         5.17E+36   -7.0    25063.0
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1910. C4H8-2+H<=>SC4H9                          1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)      8.34E+21   -4.2     -602.0
      Rate coefficients at P=1.00E-02(atm)      6.79E+23   -4.5       82.0
      Rate coefficients at P=1.00E-01(atm)      2.85E+28   -5.5     3003.0
      Rate coefficients at P=1.00E+00(atm)      5.45E+33   -6.6     7559.0
      Rate coefficients at P=1.00E+01(atm)      2.33E+33   -6.1     9893.0
      Rate coefficients at P=1.00E+02(atm)      3.27E+25   -3.5     8145.0
1911. C4H8-1+H<=>C4H8-2+H                       1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)      2.98E+07    1.9     3575.0
      Rate coefficients at P=1.00E-02(atm)      6.11E+07    1.8     3794.0
      Rate coefficients at P=1.00E-01(atm)      4.78E+09    1.2     5152.0
      Rate coefficients at P=1.00E+00(atm)      1.02E+15   -0.2     9233.0
      Rate coefficients at P=1.00E+01(atm)      6.51E+20   -1.8    14806.0
      Rate coefficients at P=1.00E+02(atm)      4.44E+19   -1.4    17409.0
      Declared duplicate reaction...
1912. C4H8-1+H<=>C4H8-2+H                       1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)      1.55E+04    2.3     7049.0
      Rate coefficients at P=1.00E-02(atm)      2.36E+04    2.3     7177.0
      Rate coefficients at P=1.00E-01(atm)      6.60E+05    1.9     8201.0
      Rate coefficients at P=1.00E+00(atm)      1.15E+12    0.1    12789.0
      Rate coefficients at P=1.00E+01(atm)      8.80E+23   -3.2    22546.0
      Rate coefficients at P=1.00E+02(atm)      3.72E+31   -5.2    32234.0
      Declared duplicate reaction...
1913. SC4H9<=>PC4H9                             1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)      9.60E+37  -11.0    38840.0
      Rate coefficients at P=1.00E-02(atm)      6.05E+40  -11.3    39461.0
      Rate coefficients at P=1.00E-01(atm)      1.64E+47  -12.5    43112.0
      Rate coefficients at P=1.00E+00(atm)      6.53E+55  -14.3    50351.0
      Rate coefficients at P=1.00E+01(atm)      2.13E+56  -13.7    54866.0
      Rate coefficients at P=1.00E+02(atm)      6.02E+45  -10.1    53399.0
1914. PC4H9<=>C2H4+C2H5                         1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)      3.44E+34   -8.1    28397.0
      Rate coefficients at P=1.00E-02(atm)      1.11E+39   -9.1    31891.0
      Rate coefficients at P=1.00E-01(atm)      7.74E+42   -9.8    35771.0
      Rate coefficients at P=1.00E+00(atm)      7.47E+43   -9.7    38722.0
      Rate coefficients at P=1.00E+01(atm)      2.06E+39   -8.0    38955.0
      Rate coefficients at P=1.00E+02(atm)      1.48E+29   -4.7    35950.0
1915. PC4H9<=>C3H6+CH3                          1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)      3.71E+25   -5.8    34965.0
      Rate coefficients at P=1.00E-02(atm)      1.85E+27   -6.0    35481.0
      Rate coefficients at P=1.00E-01(atm)      2.46E+32   -7.2    38637.0
      Rate coefficients at P=1.00E+00(atm)      2.05E+42   -9.6    46415.0
      Rate coefficients at P=1.00E+01(atm)      4.98E+48  -11.0    54456.0
      Rate coefficients at P=1.00E+02(atm)      2.23E+42   -8.7    56601.0
1916. SC4H9<=>C2H4+C2H5                         1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)      8.30E+25   -5.8    39343.0
      Rate coefficients at P=1.00E-02(atm)      4.12E+27   -5.9    39859.0
      Rate coefficients at P=1.00E-01(atm)      5.57E+32   -7.1    43029.0
      Rate coefficients at P=1.00E+00(atm)      4.54E+42   -9.5    50839.0
      Rate coefficients at P=1.00E+01(atm)      1.06E+49  -10.9    58899.0
      Rate coefficients at P=1.00E+02(atm)      9.94E+42   -8.7    61203.0
1917. SC4H9<=>C3H6+CH3                          1.00E+00    1.0        1.0
      Rate coefficients at P=1.00E-03(atm)      2.89E+40   -9.8    33601.0
      Rate coefficients at P=1.00E-02(atm)      1.80E+44  -10.5    37007.0
      Rate coefficients at P=1.00E-01(atm)      2.51E+46  -10.7    40237.0
      Rate coefficients at P=1.00E+00(atm)      4.74E+44   -9.8    41841.0
      Rate coefficients at P=1.00E+01(atm)      3.79E+37   -7.4    40604.0
      Rate coefficients at P=1.00E+02(atm)      4.79E+26   -4.0    36898.0
1918. C4H71-1OH+H<=>PC4H8OH-1                   4.27E+12    0.5     4444.6
1919. NC3H7CHO+H<=>PC4H8OH-1                    9.80E+10    1.2     8785.6
1920. C2H3OH+C2H5<=>PC4H8OH-1                   3.00E+06    1.8     7337.9
1921. C4H8-1+OH<=>PC4H8OH-2                     2.10E+06    1.8    -3292.3
1922. C4H71-1OH+H<=>PC4H8OH-2                   1.60E+10    1.1     4389.2
1923. C4H72-1OH+H<=>PC4H8OH-2                   2.70E+11   -0.1     1584.7
1924. C3H6+CH2OH<=>PC4H8OH-3                    7.00E+03    2.4     7063.5
1925. C4H71-4OH+H<=>PC4H8OH-3                   1.50E+11    0.9     2750.6
1926. SC4H8OH-1<=>PC4H8OH-3                     2.90E+08    1.4    37866.0
1927. C3H6+CH2OH<=>PC4H8OH-4                    7.00E+03    2.4     7063.5
1928. C4H71-4OH+H<=>PC4H8OH-4                   1.50E+11    0.9     2750.6
1929. SC4H8OH-1<=>PC4H8OH-4                     2.90E+08    1.4    37866.0
1930. NC3H7CHO+H<=>PC4H9O                       4.70E+09    1.4     4357.9
1931. NC3H7+CH2O<=>PC4H9O                       5.00E+03    2.4     3238.9
1932. C4H71-2OH+H<=>SC4H8OH-2                   1.40E+08    1.5      218.8
1933. C2H5COCH3+H<=>SC4H8OH-2                   7.00E+07    1.8    13223.1
1934. C4H8-1+OH<=>SC4H8OH-1                     7.00E+05    1.8    -3290.2
1935. C2H3OH+C2H5<=>SC4H8OH-1                   6.40E+06    1.7    10270.2
1936. C4H8-2+OH<=>SC4H8OH-3                     1.40E+06    1.8    -3290.2
1937. SC3H5OH+CH3<=>SC4H8OH-3                   6.40E+06    1.7    10270.2
1938. C2H5COCH3+H<=>SC4H9O                      2.70E+07    1.8     6206.2
1939. C2H5CHO+CH3<=>SC4H9O                      1.20E+04    2.3     7978.1
1940. C4H71-4OH+OH<=>C4H64,2-1OH+H2O            2.02E+06    2.2     -437.2
1941. C4H71-4OH+HO2<=>C4H64,2-1OH+H2O2          3.91E-01    4.0    11702.0
1942. PC4H8OH-2+O2<=>PC4H8OH-2O2                3.60E+12    0.0        0.0
1943. PC4H8OH-2O2<=>SQC4H8OP                    2.91E+12   -0.2    22300.0
1944. PC4H8OH-2O2<=>C4H72-1OH+HO2               3.64E+14   -0.7    32710.0
1945. PC4H8OH-2O2<=>C4H71-1OH+HO2               2.44E+13   -0.3    32590.0
1946. SQC4H8OP=>C2H5CHO+CH2O+OH                 5.36E+12   -0.1    10790.0
1947. PC4H8OH-2O2<=>NC4KET21OH+OH               1.49E+09    0.1    41390.0
1948. C4H72-1OH+OH<=>C4H64,2-1OH+H2O            2.02E+06    2.2     -436.9
1949. C4H72-1OH+OH<=>C4H63,1-1OH+H2O            2.69E+06    2.2     -436.9
1950. C4H72-1OH+HO2<=>C4H64,2-1OH+H2O2          1.72E-01    4.0    12103.0
1951. C4H72-1OH+HO2<=>C4H63,1-1OH+H2O2          2.30E-01    4.0    12103.0
1952. C4H71-1OH+OH<=>C4H63,1-1OH+H2O            2.02E+06    2.2     -437.2
1953. C4H71-1OH+HO2<=>C4H63,1-1OH+H2O2          3.91E-01    4.0    11702.0
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1954.	C4H63,1-1OH<=>C4H5OH-13+H	7.72E+12	0.5	43940.0
1955.	C4H5OH-13<=>C2H3+CH2CHO	2.82E+24	-2.4	90130.0
1956.	NC4KET21OH+OH<=>C2H4COCH2OH+H2O	8.45E+11	0.0	-228.0
1957.	NC4KET21OH+HO2<=>C2H4COCH2OH+H2O2	2.00E+11	0.0	8698.0
1958.	NC4KET21OH+O<=>C2H4COCH2OH+OH	3.07E+13	0.0	3400.0
1959.	NC4KET21OH+H<=>C2H4COCH2OH+H2	4.46E+06	2.0	3200.0
1960.	NC4KET21OH+O2<=>C2H4COCH2OH+HO2	1.55E+13	0.0	41970.0
1961.	NC4KET21OH+CH3<=>C2H4COCH2OH+CH4	1.74E+00	3.5	3680.0
1962.	NC4KET21OH+CH3O<=>C2H4COCH2OH+CH3OH	1.45E+11	0.0	2771.0
1963.	NC4KET21OH+CH3O2<=>C2H4COCH2OH+CH3O2H	2.00E+12	0.0	15250.0
1964.	NC4KET21OH+C2H3<=>C2H4COCH2OH+C2H4	3.00E+11	0.0	3400.0
1965.	NC4KET21OH+C2H5<=>C2H4COCH2OH+C2H6	3.00E+10	0.0	8600.0
1966.	C2H4COCH2OH<=>CH3CHCO+CH2OH	9.44E+29	-4.9	38330.0
1967.	PC4H8OH-2O2<=>SQC4H7OHP-4	1.44E+07	1.4	20800.0
1968.	SQC4H7OHP-4<=>CY(CCCO)COH+OH	2.44E+09	0.8	18000.0
1969.	SQC4H7OHP-4=>OH+HOCH2CHO+C2H4	3.08E+08	1.5	23500.0
1970.	CY(CCCO)COH+H=>C2H4+HOCH2CO+H2	5.00E+12	0.0	0.0
1971.	CY(CCCO)COH+O=>C2H4+HOCH2CO+OH	5.00E+12	0.0	0.0
1972.	CY(CCCO)COH+OH=>C2H4+HOCH2CO+H2O	5.00E+12	0.0	0.0
1973.	CY(CCCO)COH+HO2=>C2H4+HOCH2CO+H2O2	1.00E+13	0.0	15000.0
1974.	CY(CCCO)COH+CH3=>C2H4+HOCH2CO+CH4	2.00E+11	0.0	10000.0
1975.	CY(CCCO)COH+CH3O2=>C2H4+HOCH2CO+CH3O2H	1.00E+13	0.0	19000.0
1976.	CY(CCCO)COH+H=>CH2O+CH2CCH2OH+H2	5.00E+12	0.0	0.0
1977.	CY(CCCO)COH+O=>CH2O+CH2CCH2OH+OH	5.00E+12	0.0	0.0
1978.	CY(CCCO)COH+OH=>CH2O+CH2CCH2OH+H2O	5.00E+12	0.0	0.0
1979.	CY(CCCO)COH+HO2=>CH2O+CH2CCH2OH+H2O2	1.00E+13	0.0	15000.0
1980.	CY(CCCO)COH+CH3=>CH2O+CH2CCH2OH+CH4	2.00E+11	0.0	10000.0
1981.	CY(CCCO)COH+CH3O2=>CH2O+CH2CCH2OH+CH3O2H	1.00E+13	0.0	19000.0
1982.	HOCH2CO<=>CH2OH+CO	1.07E+12	0.6	16900.0
1983.	SQC4H7OHP-4+O2<=>SQC4H7OHP-4O2	3.43E+16	-1.6	198.7
1984.	SQC4H7OHP-4O2<=>C4H6OHOOH1-4-3+HO2	1.44E+07	1.4	28900.0
1985.	SQC4H7OHP-4O2<=>NC4KET24OH-1+OH	5.79E+01	2.9	17000.0
1986.	C4H6OHOOH1-4-3=>C2H3CHO+CH2OH+OH	1.05E+16	0.0	41600.0
1987.	C4H6OHOOH1-4-3=>HOCH2CHO+C2H3+OH	1.05E+16	0.0	41600.0
1988.	NC4KET24OH-1=>CH2O+HOCH2COCH2+OH	1.50E+16	0.0	43000.0
1989.	HOCH2CHO+O2<=>HOCH2CO+HO2	3.01E+13	0.0	39150.0
1990.	HOCH2CHO+O<=>HOCH2CO+OH	5.94E+12	0.0	1868.0
1991.	HOCH2CHO+H<=>HOCH2CO+H2	1.31E+05	2.6	1220.0
1992.	HOCH2CHO+OH<=>HOCH2CO+H2O	3.37E+12	0.0	-619.0
1993.	HOCH2CHO+HO2<=>HOCH2CO+H2O2	3.01E+12	0.0	11920.0
1994.	HOCH2CHO+CH3<=>HOCH2CO+CH4	7.08E-04	4.6	1966.0
1995.	HOCH2CHO+CH3O2<=>HOCH2CO+CH3O2H	3.01E+12	0.0	11920.0
1996.	HOCH2CHO+CH3CO3<=>HOCH2CO+CH3CO3H	3.01E+12	0.0	11920.0
1997.	SC4H8OH-1+O2<=>SC4H8OH-1O2	3.60E+12	0.0	0.0
1998.	SC4H8OH-1O2<=>PQC4H8OS	9.30E+10	0.0	22890.0
1999.	SC4H8OH-1O2<=>NC4KET12OH+OH	1.49E+09	0.1	41390.0
2000.	PQC4H8OS=>C2H5CHO+CH2O+OH	6.70E+39	-8.4	22782.0
2001.	PQC4H8OS=>C2H5+HO2CH2CHO	2.67E+34	-6.6	22672.0
2002.	SC4H8OH-1O2<=>C4H71-2OH+HO2	2.44E+13	-0.3	32590.0
2003.	SC4H8OH-1O2<=>PQC4H7OHS-3	1.36E+07	1.3	18200.0
2004.	PQC4H7OHS-3<=>CCY(COCC)OH+OH	2.59E+09	0.7	16000.0
2005.	PQC4H7OHS-3=>OH+CH2O+SC3H5OH	1.23E+09	1.3	24900.0
2006.	C4H71-2OH+OH<=>C4H63,1-2OH+H2O	2.02E+06	2.2	-437.2
2007.	C4H71-2OH+HO2<=>C4H63,1-2OH+H2O2	3.91E-01	4.0	11702.0
2008.	NC4KET12OH+H<=>C2H5CHOHCO+H2	1.00E+05	2.6	1220.0
2009.	NC4KET12OH+OH<=>C2H5CHOHCO+H2O	1.70E+12	0.0	-619.0
2010.	NC4KET12OH+O<=>C2H5CHOHCO+OH	5.94E+12	0.0	1868.0
2011.	NC4KET12OH+HO2<=>C2H5CHOHCO+H2O2	9.50E+03	2.7	11520.0
2012.	NC4KET12OH+CH3<=>C2H5CHOHCO+CH4	1.42E-03	4.6	1966.0
2013.	NC4KET12OH+C2H5<=>C2H5CHOHCO+C2H6	7.36E+04	2.0	5917.1
2014.	NC4KET12OH+CH3O<=>C2H5CHOHCO+CH3OH	1.00E+12	0.0	3300.0
2015.	NC4KET12OH+CH3O2<=>C2H5CHOHCO+CH3O2H	3.01E+12	0.0	11920.0
2016.	NC4KET12OH+O2<=>C2H5CHOHCO+HO2	9.03E+13	0.0	43320.0
2017.	NC4KET12OH+C2H3<=>C2H5CHOHCO+C2H4	3.26E+05	2.0	3965.7
2018.	NC4KET12OH+C2H5O<=>C2H5CHOHCO+C2H5OH	6.03E+11	0.0	3300.0
2019.	C2H5CHOHCO<=>C3H6OH1-1+CO	5.78E+14	0.0	16843.5
2020.	C3H6OH1-1<=>C2H5CHO+H	8.98E+11	0.3	32990.0
2021.	C2H3OH+CH3<=>C3H6OH1-1	2.04E+40	-8.2	24214.0
	Declared duplicate reaction...			
2022.	C2H3OH+CH3<=>C3H6OH1-1	1.66E+21	-3.2	10241.0
	Declared duplicate reaction...			
2023.	CCY(COCC)OH+H=>OH+C2H3COCH3+H2	5.00E+12	0.0	0.0
2024.	CCY(COCC)OH+O=>OH+C2H3COCH3+OH	5.00E+12	0.0	0.0
2025.	CCY(COCC)OH+OH=>OH+C2H3COCH3+H2O	5.00E+12	0.0	0.0
2026.	CCY(COCC)OH+HO2=>OH+C2H3COCH3+H2O2	1.00E+13	0.0	15000.0
2027.	CCY(COCC)OH+CH3=>OH+C2H3COCH3+CH4	2.00E+11	0.0	10000.0
2028.	CCY(COCC)OH+CH3O2=>OH+C2H3COCH3+CH3O2H	1.00E+13	0.0	19000.0
2029.	CCY(COCC)OH+H=>OH+SC3H5CHO+H2	5.00E+12	0.0	0.0
2030.	CCY(COCC)OH+O=>OH+SC3H5CHO+OH	5.00E+12	0.0	0.0
2031.	CCY(COCC)OH+OH=>OH+SC3H5CHO+H2O	5.00E+12	0.0	0.0
2032.	CCY(COCC)OH+HO2=>OH+SC3H5CHO+H2O2	1.00E+13	0.0	15000.0
2033.	CCY(COCC)OH+CH3=>OH+SC3H5CHO+CH4	2.00E+11	0.0	10000.0
2034.	CCY(COCC)OH+CH3O2=>OH+SC3H5CHO+CH3O2H	1.00E+13	0.0	19000.0
2035.	CCY(COCC)OH+H=>C2H3OH+CH3CO+H2	5.00E+12	0.0	0.0
2036.	CCY(COCC)OH+O=>C2H3OH+CH3CO+OH	5.00E+12	0.0	0.0
2037.	CCY(COCC)OH+OH=>C2H3OH+CH3CO+H2O	5.00E+12	0.0	0.0
2038.	CCY(COCC)OH+HO2=>C2H3OH+CH3CO+H2O2	1.00E+13	0.0	15000.0
2039.	CCY(COCC)OH+CH3=>C2H3OH+CH3CO+CH4	2.00E+11	0.0	10000.0
2040.	CCY(COCC)OH+CH3O2=>C2H3OH+CH3CO+CH3O2H	1.00E+13	0.0	19000.0
2041.	CCY(COCC)OH+H=>HCO+SC3H5OH+H2	5.00E+12	0.0	0.0
2042.	CCY(COCC)OH+O=>HCO+SC3H5OH+OH	5.00E+12	0.0	0.0
2043.	CCY(COCC)OH+OH=>HCO+SC3H5OH+H2O	5.00E+12	0.0	0.0
2044.	CCY(COCC)OH+HO2=>HCO+SC3H5OH+H2O2	1.00E+13	0.0	15000.0
2045.	CCY(COCC)OH+CH3=>HCO+SC3H5OH+CH4	2.00E+11	0.0	10000.0

2046.	CCY(COCC)OH+CH3O2=>HCO+SC3H5OH+CH3O2H	1.00E+13	0.0	19000.0
2047.	PQC4H7OHS-3+O2<=>PQC4H7OHS-3O2	1.74E+14	-0.8	-536.5
2048.	PQC4H7OHS-3O2<=>NC4KET13OH-2+OH	1.09E+04	2.4	19900.0
2049.	NC4KET13OH-2=>CH3CHO+HOCHCHO+OH	1.05E+16	0.0	43000.0
2050.	PQC4H7OHS-3O2<=>C4H7O2-1,3OOH	2.91E+12	-0.2	22300.0
2051.	PQC4H7OHS-3O2<=>C4H6OHOOH1-3-4+HO2	3.64E+14	-0.7	32710.0
2052.	PQC4H7OHS-3O2<=>C4H6OHOOH2-2-1+HO2	2.44E+13	-0.3	32590.0
2053.	C4H7O2-1,3OOH=>C3KET12+CH2O+OH	5.36E+12	-0.1	10790.0
2054.	C4H7O2-1,3OOH=>HO2CH2CHO+CH3CHO+OH	6.70E+39	-8.4	22782.0
2055.	PQC4H7OHS-3O2<=>NC4KET24OH-3+OH	1.49E+09	0.1	41390.0
2056.	HOCHCHO+O<=>CHOCHO+OH	1.46E-03	4.7	1727.0
2057.	HOCHCHO+OH<=>CHOCHO+H2O	5.81E-03	4.3	-3560.0
2058.	HOCHCHO+H<=>CHOCHO+H2	9.45E+02	3.1	8701.1
2059.	HOCHCHO+HO2<=>CHOCHO+H2O2	6.47E-07	5.3	10533.1
2060.	HOCHCHO+CH3<=>CHOCHO+CH4	2.04E+00	3.6	7721.0
2061.	HOCHCHO+CH3O2<=>CHOCHO+CH3O2H	3.24E-07	5.3	10533.1
2062.	C4H6OHOOH1-3-4=>CH2O+PC3H4OH-3+OH	1.50E+16	0.0	42000.0
2063.	C4H6OHOOH2-2-1=>CH2O+PC3H4OH-1+OH	1.50E+16	0.0	42000.0
2064.	NC4KET24OH-3=>CH2O+CH3COCHOH+OH	1.50E+16	0.0	43000.0
2065.	PC3H4OH-3<=>C2H3CHO+H	5.69E+52	-13.4	45049.0
2066.	PC3H4OH-3<=>C3H5O	5.48E+45	-11.6	44328.0
2067.	PC3H4OH-3<=>CH2CCH2OH	2.65E+36	-8.9	51019.0
2068.	PC3H4OH-3+O2<=>C2H3CHO+HO2	5.26E+17	-1.6	869.0
2069.	PC3H4OH-1<=>CH3CHCO+H	5.69E+52	-13.4	45049.0
2070.	PC3H4OH-1<=>PC3H4OH-2	2.65E+36	-8.9	51019.0
2071.	PC3H4OH-1+O2<=>CH3CHCO+HO2	5.26E+17	-1.6	869.0
2072.	CH3COCHOH<=>CH3COCHO+H	5.69E+52	-13.4	45049.0
2073.	CH3COCHOH<=>CH3COCH2O	5.48E+45	-11.6	44328.0
2074.	CH3COCHOH+O2<=>CH3COCHO+HO2	5.26E+17	-1.6	869.0
2075.	SC4H8OH-3+O2<=>SC4H8OH-3O2	3.60E+12	0.0	0.0
2076.	SC4H8OH-3O2<=>SQC4H8OS	2.91E+12	-0.2	22300.0
2077.	SC4H8OH-3O2<=>C4H71-3OH+HO2	3.64E+14	-0.7	32710.0
2078.	SC4H8OH-3O2<=>C4H72-2OH+HO2	2.44E+13	-0.3	32590.0
2079.	SQC4H8OS=>CH3CHO+CH3CHO+OH	2.68E+13	-0.1	10790.0
2080.	SC4H8OH-3O2<=>NC4KET23OH+OH	1.49E+09	0.1	41390.0
2081.	SC4H8OH-3O2<=>SQC4H7OHS-4	1.44E+07	1.4	20800.0
2082.	SQC4H7OHS-4<=>CCY(COCC)OH+OH	2.44E+09	0.8	18000.0
2083.	SQC4H7OHS-4=>OH+CH3CHO+C2H3OH	3.08E+08	1.5	23500.0
2084.	C4H71-3OH+OH<=>C4H63,1-3OH+H2O	2.02E+06	2.2	-437.2
2085.	C4H71-3OH+HO2<=>C4H63,1-3OH+H2O2	3.91E-01	4.0	11702.0
2086.	C4H72-2OH+OH<=>C4H63,1-3OH+H2O	2.02E+06	2.2	-437.2
2087.	C4H72-2OH+HO2<=>C4H63,1-3OH+H2O2	3.91E-01	4.0	11702.0
2088.	NC4KET23OH+OH<=>CH3COCOHCH3+H2O	8.45E+11	0.0	-228.0
2089.	NC4KET23OH+HO2<=>CH3COCOHCH3+H2O2	2.00E+11	0.0	8698.0
2090.	NC4KET23OH+O<=>CH3COCOHCH3+OH	3.07E+13	0.0	3400.0
2091.	NC4KET23OH+H<=>CH3COCOHCH3+H2	4.46E+06	2.0	3200.0
2092.	NC4KET23OH+O2<=>CH3COCOHCH3+HO2	1.55E+13	0.0	41970.0
2093.	NC4KET23OH+CH3<=>CH3COCOHCH3+CH4	1.74E+00	3.5	3680.0
2094.	NC4KET23OH+CH3O<=>CH3COCOHCH3+CH3OH	1.45E+11	0.0	2771.0
2095.	NC4KET23OH+CH3O2<=>CH3COCOHCH3+CH3O2H	2.00E+12	0.0	15250.0
2096.	NC4KET23OH+C2H3<=>CH3COCOHCH3+C2H4	3.00E+11	0.0	3400.0
2097.	NC4KET23OH+C2H5<=>CH3COCOHCH3+C2H6	3.00E+10	0.0	8600.0
2098.	CH3COHCO+CH3<=>CH3COCOHCH3	1.23E+11	0.0	7800.0
2099.	CH3COHCO+OH<=>SC2H4OH+CO2	1.73E+12	0.0	-1010.0
2100.	CH3COHCO+H<=>SC2H4OH+CO	4.40E+12	0.0	1459.0
2101.	SQC4H7OHS-4+O2<=>SQC4H7OHS-4O2	3.43E+16	-1.6	198.7
2102.	SQC4H7OHS-4O2<=>NC4KET24OH-3+OH	5.79E+01	2.9	17000.0
2103.	SQC4H7OHS-4O2<=>C4H7O2-1,3OOH	9.30E+10	0.0	22890.0
2104.	SQC4H7OHS-4O2<=>C4H6OHOOH1-2-3+HO2	2.44E+13	-0.3	32590.0
2105.	SQC4H7OHS-4O2<=>NC4KET13OH-2+OH	1.49E+09	0.1	41390.0
2106.	C4H6OHOOH1-2-3=>CH2COHCHO+CH3+OH	1.05E+16	0.0	41600.0
2107.	C4H6OHOOH1-2-3=>CH3CHO+SC2H2OH+OH	1.05E+16	0.0	41600.0
2108.	SC2H2OH+HCO<=>CH2COHCHO	1.81E+13	0.0	0.0
2109.	CH2COHCHO+H<=>CH2COHCO+H2	1.34E+13	0.0	3300.0
2110.	CH2COHCHO+O<=>CH2COHCO+OH	5.94E+12	0.0	1868.0
2111.	CH2COHCHO+OH<=>CH2COHCO+H2O	9.24E+06	1.5	-962.0
2112.	CH2COHCHO+O2<=>CH2COHCO+HO2	1.00E+13	0.0	40700.0
2113.	CH2COHCHO+HO2<=>CH2COHCO+H2O2	3.01E+12	0.0	11920.0
2114.	CH2COHCHO+CH3<=>CH2COHCO+CH4	2.61E+06	1.8	5911.0
2115.	CH2COHCHO+C2H3<=>CH2COHCO+C2H4	1.74E+12	0.0	8440.0
2116.	CH2COHCHO+CH3O<=>CH2COHCO+CH3OH	1.00E+12	0.0	3300.0
2117.	CH2COHCHO+CH3O2<=>CH2COHCO+CH3O2H	3.01E+12	0.0	11920.0
2118.	SC2H2OH+CO<=>CH2COHCO	1.51E+11	0.0	4810.0
2119.	SC2H2OH<=>CH2CO+H	5.69E+52	-13.4	45049.0
2120.	SC2H2OH<=>C2H2OH	2.65E+36	-8.9	51019.0
2121.	SC2H2OH+O2<=>CH2CO+HO2	5.26E+17	-1.6	869.0
2122.	SC2H2OH+O2<=>HCCOH+HO2	5.51E+03	2.5	-414.0
2123.	C4H8-1+O<=>NC3H7+HCO	7.45E+06	1.9	183.0
2124.	C4H8-1+O=>CH2CO+C2H5+H	3.05E+06	1.9	183.0
2125.	C4H8-1+O=>C2H5CHCO+H+H	3.05E+06	1.9	183.0
2126.	C4H8-2+O<=>CH3+C2H5CO	7.45E+06	1.9	183.0
2127.	C4H8-2+O=>CH2CO+C2H5+H	3.05E+06	1.9	183.0
2128.	C4H8-2+O=>C2H5CHCO+H+H	3.05E+06	1.9	183.0
2129.	SC4H9O2<=>C4H8-2+HO2	7.25E+09	0.8	29900.0
	Declared duplicate reaction...			
2130.	SC4H9O2<=>C4H8-2+HO2	1.70E+10	0.7	30700.0
	Declared duplicate reaction...			
2131.	C4H8OOH1-2<=>C4H8-1+HO2	1.00E+00	1.0	1.0
	Rate coefficients at P=1.00E-02(atm)	1.09E+13	-1.4	9113.0
	Rate coefficients at P=1.00E-01(atm)	2.93E+18	-2.6	13142.0
	Rate coefficients at P=1.00E+00(atm)	7.80E+24	-4.0	18999.0
	Rate coefficients at P=2.00E+00(atm)	1.76E+26	-4.3	20657.0
	Rate coefficients at P=5.00E+00(atm)	7.86E+26	-4.3	22246.0
	Rate coefficients at P=1.00E+01(atm)	1.73E+26	-4.1	22736.0

Rate coefficients at P=3.00E+01(atm)	1.39E+23	-3.0	22032.0
Rate coefficients at P=5.00E+01(atm)	1.45E+21	-2.4	21227.0
2132. C4H8-1+HO2<=>C4H8OOH2-1	1.46E-01	3.5	5798.0
Rate coefficients at P=1.33E-02(atm)	9.74E+05	0.4	7570.0
Rate coefficients at P=1.00E+00(atm)	8.43E+14	-1.8	12124.0
Rate coefficients at P=1.00E+01(atm)	1.82E+20	-3.0	16135.0
Rate coefficients at P=1.00E+02(atm)	8.79E+17	-2.0	17111.0
2133. C4H8-1+HO2<=>C4H8O1-2+OH	1.00E+11	0.0	0.0
Rate coefficients at P=1.33E-02(atm)	2.96E+03	2.5	12199.0
Rate coefficients at P=1.00E+00(atm)	1.69E+10	0.5	16606.0
Rate coefficients at P=1.00E+01(atm)	2.19E+17	-1.5	22209.0
Rate coefficients at P=1.00E+02(atm)	2.73E+21	-2.5	27857.0
2134. C4H8OOH2-1<=>C4H8O1-2+OH	3.92E+06	1.6	12124.0
Rate coefficients at P=1.33E-02(atm)	2.75E+22	-4.4	12349.0
Rate coefficients at P=1.00E+00(atm)	2.44E+29	-5.9	17573.0
Rate coefficients at P=1.00E+01(atm)	1.52E+30	-5.8	19702.0
Rate coefficients at P=1.00E+02(atm)	1.93E+20	-2.7	16454.0
2135. C4H8-2+HO2<=>C4H8OOH2-3	9.55E+03	2.6	10347.0
Rate coefficients at P=1.33E-02(atm)	2.53E+12	-1.3	10098.0
Rate coefficients at P=1.00E+00(atm)	1.34E+11	-0.5	8480.0
Rate coefficients at P=1.00E+01(atm)	1.93E+17	-2.0	12122.0
Rate coefficients at P=1.00E+02(atm)	4.45E+19	-2.5	14812.0
2136. C4H8-2+HO2<=>C4H8O2-3+OH	1.00E+11	0.0	0.0
Rate coefficients at P=1.33E-02(atm)	7.65E+05	1.9	10745.0
Rate coefficients at P=1.00E+00(atm)	1.79E+08	1.3	12370.0
Rate coefficients at P=1.00E+01(atm)	1.75E+15	-0.7	17220.0
Rate coefficients at P=1.00E+02(atm)	8.37E+20	-2.3	22838.0
2137. C4H8OOH2-3<=>C4H8O2-3+OH	1.05E+10	0.7	11964.0
Rate coefficients at P=1.33E-02(atm)	3.02E+19	-3.5	9746.0
Rate coefficients at P=1.00E+00(atm)	6.37E+24	-4.5	13480.0
Rate coefficients at P=1.00E+01(atm)	1.39E+28	-5.2	16470.0
Rate coefficients at P=1.00E+02(atm)	1.54E+27	-4.7	17832.0
2138. C4H8-1+CH3O2<=>C4H8O1-2+CH3O	1.00E+12	0.0	14340.0
2139. C4H8-2+CH3O2<=>C4H8O2-3+CH3O	5.62E+11	0.0	12310.0
2140. C4H6<=>C4H5-I+H	5.70E+36	-6.3	112353.0
2141. C4H6<=>C4H5-N+H	5.30E+44	-8.6	123608.0
2142. C4H6<=>C4H4+H2	2.50E+15	0.0	94700.0
2143. H2CC+C2H4<=>C4H6	1.00E+12	0.0	0.0
2144. C4H6+H<=>C4H5-N+H2	1.33E+06	2.5	12240.0
2145. C4H5-N+HO2<=>C4H6+O2	6.00E+11	0.0	0.0
2146. C4H6+O<=>C4H5-N+OH	7.50E+06	1.9	3740.0
2147. C4H6+OH<=>C4H5-N+H2O	6.20E+06	2.0	3430.0
2148. C4H5-N+H2O2<=>C4H6+HO2	1.21E+10	0.0	-596.0
2149. C4H6+CH3<=>C4H5-N+CH4	2.00E+14	0.0	22800.0
2150. C4H6+C2H3<=>C4H5-N+C2H4	5.00E+13	0.0	22800.0
2151. C4H6+C3H3<=>C4H5-N+C3H4-A	1.00E+13	0.0	22500.0
2152. C4H6+C3H5-A<=>C4H5-N+C3H6	1.00E+13	0.0	22500.0
2153. C4H6+H<=>C4H5-I+H2	6.65E+05	2.5	9240.0
2154. C4H5-I+HO2<=>C4H6+O2	6.00E+11	0.0	0.0
2155. C4H6+O<=>C4H5-I+OH	7.50E+06	1.9	3740.0
2156. C4H6+OH<=>C4H5-I+H2O	3.10E+06	2.0	430.0
2157. C4H5-I+H2O2<=>C4H6+HO2	1.21E+10	0.0	-596.0
2158. C4H6+CH3<=>C4H5-I+CH4	1.00E+14	0.0	19800.0
2159. C4H6+C2H3<=>C4H5-I+C2H4	2.50E+13	0.0	19800.0
2160. C4H6+C3H3<=>C4H5-I+C3H4-A	5.00E+12	0.0	19500.0
2161. C4H6+C3H5-A<=>C4H5-I+C3H6	5.00E+12	0.0	19500.0
2162. C4H6+H<=>C2H4+C2H3	1.46E+30	-4.3	21647.0
Rate coefficients at P=1.00E+00(atm)	1.46E+30	-4.3	21647.0
Rate coefficients at P=1.00E+01(atm)	5.45E+30	-4.5	21877.0
2163. C4H6+H<=>C3H4-P+CH3	2.00E+12	0.0	7000.0
2164. C4H6+H<=>C3H4-A+CH3	2.00E+12	0.0	7000.0
2165. C4H6+O<=>C2H2+C2H4O1-2	1.00E+08	1.4	-860.0
2166. C4H6+O<=>SC3H5CO+H	5.00E+07	1.4	-860.0
2167. C4H6+O<=>CH2CHCHCHO+H	4.50E+08	1.4	-860.0
2168. C4H6+OH<=>C2H3CHO+CH3	1.37E+12	0.0	-1040.0
2169. C4H6+OH<=>C3H5-A+CH2O	1.37E+12	0.0	-1040.0
2170. C4H6+HO2<=>C4H6O25+OH	1.20E+12	0.0	14000.0
2171. C4H6+HO2<=>C2H3CHOCH2+OH	4.80E+12	0.0	14000.0
2172. C4H6O25<=>C4H4O+H2	5.30E+12	0.0	48500.0
2173. C2H3CHOCH2<=>C4H6O23	2.00E+14	0.0	50600.0
2174. C4H6O23<=>SC3H5CHO	1.95E+13	0.0	49400.0
2175. C4H6O23<=>C2H4+CH2CO	5.75E+15	0.0	69300.0
2176. C4H6O23<=>C2H2+C2H4O1-2	1.00E+16	0.0	75800.0
2177. C4H4O<=>CO+C3H4-P	1.78E+15	0.0	77500.0
2178. C4H4O<=>C2H2+CH2CO	5.01E+14	0.0	77500.0
2179. C2H3+C2H2<=>C4H4+H	7.20E+13	-0.5	6100.0
Rate coefficients at P=1.32E-02(atm)	7.20E+13	-0.5	6100.0
Rate coefficients at P=2.63E-02(atm)	5.00E+14	-0.7	6700.0
Rate coefficients at P=1.20E-01(atm)	4.60E+16	-1.2	8400.0
Rate coefficients at P=1.00E+00(atm)	2.00E+18	-1.7	10600.0
Rate coefficients at P=1.00E+01(atm)	4.90E+16	-1.1	11800.0
2180. C2H3+C2H2<=>C4H5-N	1.10E+31	-7.1	5600.0
Rate coefficients at P=1.32E-02(atm)	1.10E+31	-7.1	5600.0
Rate coefficients at P=2.63E-02(atm)	1.10E+32	-7.3	6200.0
Rate coefficients at P=1.20E-01(atm)	2.40E+31	-7.0	5600.0
Rate coefficients at P=1.00E+00(atm)	9.30E+38	-8.8	12000.0
Rate coefficients at P=1.00E+01(atm)	8.10E+37	-8.1	13400.0
2181. C2H3+C2H2<=>C4H5-I	5.00E+34	-8.4	7900.0
Rate coefficients at P=1.32E-02(atm)	5.00E+34	-8.4	7900.0
Rate coefficients at P=2.63E-02(atm)	2.10E+36	-8.8	9100.0
Rate coefficients at P=1.20E-01(atm)	1.00E+37	-8.8	9800.0
Rate coefficients at P=1.00E+00(atm)	1.60E+46	-11.0	18600.0
Rate coefficients at P=1.00E+01(atm)	5.10E+53	-12.6	28800.0
2182. C2H3+C2H3<=>C4H6	7.00E+57	-13.8	17629.0

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      Rate coefficients at P=2.63E-02(atm)          7.00E+57  -13.8    17629.0
      Rate coefficients at P=1.20E-01(atm)          1.50E+52  -12.0    16056.0
      Rate coefficients at P=1.00E+00(atm)          1.50E+42   -8.8    12483.0
2183. C2H3+C2H3<=>C4H5-I+H                           1.50E+30   -5.0    12958.0
      Rate coefficients at P=2.63E-02(atm)          1.50E+30   -5.0    12958.0
      Rate coefficients at P=1.20E-01(atm)          7.20E+28   -4.5    14273.0
      Rate coefficients at P=1.00E+00(atm)          1.20E+22   -2.4    13654.0
2184. C2H3+C2H3<=>C4H5-N+H                           1.10E+24   -3.3    12395.0
      Rate coefficients at P=2.63E-02(atm)          1.10E+24   -3.3    12395.0
      Rate coefficients at P=1.20E-01(atm)          4.60E+24   -3.4    14650.0
      Rate coefficients at P=1.00E+00(atm)          2.40E+20   -2.0    15361.0
2185. C4H5-N<=>C4H5-I                                2.40E+60  -16.1    47500.0
      Rate coefficients at P=1.32E-02(atm)          2.40E+60  -16.1    47500.0
      Rate coefficients at P=2.63E-02(atm)          1.30E+62  -16.4    49600.0
      Rate coefficients at P=1.20E-01(atm)          4.90E+66  -17.3    55400.0
      Rate coefficients at P=1.00E+00(atm)          1.50E+67  -16.9    59100.0
      Rate coefficients at P=1.00E+01(atm)          2.00E+60  -14.5    58600.0
2186. C4H4+H<=>C4H5-N                                1.20E+51  -12.6    12300.0
      Rate coefficients at P=1.32E-02(atm)          1.20E+51  -12.6    12300.0
      Rate coefficients at P=2.63E-02(atm)          4.20E+50  -12.3    12500.0
      Rate coefficients at P=1.20E-01(atm)          1.10E+50  -11.9    13400.0
      Rate coefficients at P=1.00E+00(atm)          1.30E+51  -11.9    16500.0
      Rate coefficients at P=1.00E+01(atm)          6.20E+45  -10.1    15800.0
2187. C4H4+H<=>C4H5-I                                6.10E+53  -13.2    14200.0
      Rate coefficients at P=1.32E-02(atm)          6.10E+53  -13.2    14200.0
      Rate coefficients at P=2.63E-02(atm)          9.60E+52  -12.8    14300.0
      Rate coefficients at P=1.20E-01(atm)          2.10E+52  -12.4    15500.0
      Rate coefficients at P=1.00E+00(atm)          4.90E+51  -11.9    17700.0
      Rate coefficients at P=1.00E+01(atm)          1.50E+48  -10.6    18800.0
2188. C4H5-N+H<=>C4H5-I+H                            3.10E+26   -3.4    17423.0
2189. C4H5-N+H<=>C4H4+H2                             1.50E+13    0.0        0.0
2190. C4H5-N+OH<=>C4H4+H2O                           2.00E+12    0.0        0.0
2191. C4H5-N+HCO<=>C4H6+CO                           5.00E+12    0.0        0.0
2192. C4H5-N+HO2=>C2H3+CH2CO+OH                      6.60E+12    0.0        0.0
2193. C4H5-N+O2<=>CH2CHCHCHO+O                       3.00E+11    0.3       11.0
2194. C4H5-N+O2<=>HCO+C2H3CHO                        9.20E+16   -1.4     1010.0
2195. C4H5-N+O2=>H+CO+C2H3CHO                        5.19E+15   -1.3     3312.6
2196. C4H5-I+H<=>C4H4+H2                             3.00E+13    0.0        0.0
2197. C4H5-I+H<=>C3H3+CH3                            2.00E+13    0.0     2000.0
2198. C4H5-I+OH<=>C4H4+H2O                           4.00E+12    0.0        0.0
2199. C4H5-I+HCO<=>C4H6+CO                           5.00E+12    0.0        0.0
2200. C4H5-I+HO2=>C2H3+CH2CO+OH                      6.60E+12    0.0        0.0
2201. C4H5-I+O2<=>CH2CO+CH2CHO                       2.16E+10    0.0     2500.0
2202. C4H5-2<=>C4H5-I                                1.50E+67  -16.9    59100.0
2203. C4H5-2+H<=>C4H5-I+H                            3.10E+26   -3.4    17423.0
2204. C4H5-2+HO2=>OH+C2H2+CH3CO                      8.00E+11    0.0        0.0
2205. C4H5-2+O2<=>CH3CO+CH2CO                        2.16E+10    0.0     2500.0
2206. C4H5-2+OH<=>CH2OH+C3H3                         3.00E+12    0.0        0.0
2207. C4H5-2+O<=>CH2O+C3H3                           3.00E+13    0.0        0.0
2208. C4H6+C2H3=>C6H6+H2+H                           5.62E+11    0.0     3240.0
2209. C4H5-I+C2H2<=>FULVENE+H                        9.74E+26   -3.8    21329.0
2210. C4H5-N+C2H2<=>FULVENE+H                        1.74E+19   -1.9    12384.0
2211. C4H5-N+C2H2<=>C6H6+H                           1.60E+16   -1.3     5400.0
2212. C4H5-N+C2H3<=>C6H6+H2                          1.84E-13    7.1    -3611.0
2213. C4H5-2+C2H<=>C3H3+C3H3                         4.00E+12    0.0        0.0
2214. C4H5-2+C2H2<=>C6H6+H                           5.00E+14    0.0    25000.0
2215. C4H5-2+C2H4<=>C5H6+CH3                         5.00E+14    0.0    25000.0
2216. C4H612<=>C4H5-I+H                              4.20E+15    0.0    92600.0
2217. C4H612<=>C4H6                                  3.00E+13    0.0    65000.0
2218. C3H3+CH3(+M)<=>C4H612(+M)                      1.50E+12    0.0        0.0
      Low pressure limit:  0.26000E+58 -0.11940E+02  0.97700E+04
      TROE centering:      0.17500E+00  0.13410E+04  0.60000E+05  0.97700E+04
      H2              Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      CH4             Enhanced by    2.000E+00
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      C2H6            Enhanced by    3.000E+00
      AR              Enhanced by    7.000E-01
2219. C4H612+H<=>C4H5-I+H2                           1.70E+05    2.5     2490.0
2220. C4H612+CH3<=>C4H5-I+CH4                        7.00E+13    0.0    18500.0
2221. C4H612+O<=>C4H5-I+OH                           1.80E+11    0.7     5880.0
2222. C4H612+OH<=>C4H5-I+H2O                         3.10E+06    2.0     -298.0
2223. C4H612+H<=>C4H6+H                              2.00E+13    0.0     4000.0
2224. C4H612+H<=>C3H4-A+CH3                          2.00E+13    0.0     2000.0
2225. C4H612+H<=>C3H4-P+CH3                          2.00E+13    0.0     2000.0
2226. C4H612+O<=>CH2CO+C2H4                          1.20E+08    1.6      327.0
2227. C4H6-2<=>C4H6                                  3.00E+13    0.0    65000.0
2228. C4H6-2<=>C4H612                                3.00E+13    0.0    67000.0
2229. C4H6-2+H<=>C4H612+H                            2.00E+13    0.0     4000.0
2230. C4H6-2+H<=>C4H5-2+H2                           3.40E+05    2.5     2490.0
2231. C4H6-2+H<=>CH3+C3H4-P                          2.60E+05    2.5     1000.0
2232. C4H6-2<=>H+C4H5-2                              5.00E+15    0.0    87300.0
2233. C4H6-2+CH3<=>C4H5-2+CH4                        1.40E+14    0.0    18500.0
2234. C4H3-I+H<=>C4H4                                3.40E+43   -9.0    12120.0
2235. C4H4+H<=>C4H3-N+H2                             6.65E+05    2.5    12240.0
2236. C4H4+OH<=>C4H3-N+H2O                           3.10E+07    2.0     3430.0
2237. C4H4+H<=>C4H3-I+H2                             3.33E+05    2.5     9240.0
2238. C4H4+OH<=>C4H3-I+H2O                           1.55E+07    2.0      430.0
2239. C4H4+CH3<=>C4H3-I+CH4                          5.00E+13    0.0    19800.0
2240. C4H4+CH3<=>C4H3-N+CH4                          1.00E+14    0.0    22800.0
2241. C3H3+CH2<=>C4H4+H                              5.00E+13    0.0        0.0
2242. C4H4+O<=>C3H3+HCO                              6.00E+08    1.4     -860.0
2243. C4H4+OH<=>CH2O+C3H3                            5.00E+12    0.0        0.0
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2244. C2H2+C2H(+M)<=>C4H3-N(+M)                      8.30E+10    0.9     -363.0
      Low pressure limit:  0.12400E+32 -0.47180E+01  0.18710E+04
      TROE centering:      0.10000E+01  0.10000E+03  0.56130E+04  0.13390E+05
      H2              Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      CH4             Enhanced by    2.000E+00
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      C2H6            Enhanced by    3.000E+00
      C2H2            Enhanced by    2.500E+00
      C2H4            Enhanced by    2.500E+00
2245. C2H2+C2H(+M)<=>C4H3-I(+M)                      8.30E+10    0.9     -363.0
      Low pressure limit:  0.12400E+32 -0.47180E+01  0.18710E+04
      TROE centering:      0.10000E+01  0.10000E+03  0.56130E+04  0.13390E+05
      H2              Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      CH4             Enhanced by    2.000E+00
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      C2H6            Enhanced by    3.000E+00
      C2H2            Enhanced by    2.500E+00
      C2H4            Enhanced by    2.500E+00
2246. C4H2+H<=>C4H3-N                                1.10E+42   -8.7    15300.0
2247. C4H2+H<=>C4H3-I                                1.10E+30   -4.9    10800.0
2248. C4H3-N<=>C4H3-I                                4.10E+43   -9.5    53000.0
2249. C4H3-N+H<=>C4H3-I+H                            2.50E+20   -1.7    10800.0
2250. C4H3-N+H<=>C2H2+H2CC                           6.30E+25   -3.3    10014.0
2251. C4H3-N+H<=>C4H4                                2.00E+47  -10.3    13070.0
2252. C4H3-N+H<=>C4H2+H2                             3.00E+13    0.0        0.0
2253. C4H3-N+OH<=>C4H2+H2O                           2.00E+12    0.0        0.0
2254. C4H3-N+C2H3<=>C3H3+C3H3                        4.00E+12    0.0        0.0
2255. C3H3+CH<=>C4H3-I+H                             5.00E+13    0.0        0.0
2256. C4H3-I+H<=>C2H2+H2CC                           2.80E+23   -2.5    10780.0
2257. C4H3-I+H<=>C4H2+H2                             6.00E+13    0.0        0.0
2258. C4H3-I+OH<=>C4H2+H2O                           4.00E+12    0.0        0.0
2259. C4H3-I+O2<=>HCCO+CH2CO                         7.86E+16   -1.8        0.0
2260. C4H3-I+CH2<=>C3H4-A+C2H                        2.00E+13    0.0        0.0
2261. C4H4+C2H<=>L-C6H4+H                            1.20E+13    0.0        0.0
2262. C4H3-N+C2H2<=>L-C6H4+H                         2.50E+14   -0.6    10600.0
2263. C4H3-N+C2H2<=>C-C6H4+H                         6.90E+46  -10.0    30100.0
2264. C4H3-N+C2H2<=>C6H5                             9.60E+70  -17.8    31300.0
2265. C4H3-I+CH3<=>C5H6                              1.00E+12    0.0        0.0
2266. C3H3+HCCO<=>C4H4+CO                            2.50E+13    0.0        0.0
2267. H2CC+C2H2(+M)<=>C4H4(+M)                       3.50E+05    2.1    -2400.0
      Low pressure limit:  0.14000E+61 -0.12599E+02  0.74170E+04
      TROE centering:      0.98000E+00  0.56000E+02  0.58000E+03  0.41640E+04
      H2              Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      CH4             Enhanced by    2.000E+00
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      C2H6            Enhanced by    3.000E+00
      C2H2            Enhanced by    3.000E+00
      C2H4            Enhanced by    3.000E+00
2268. C2H2+C2H<=>C4H2+H                              9.60E+13    0.0        0.0
2269. C4H2+OH<=>H2C4O+H                              6.60E+12    0.0     -410.0
2270. C4H2+OH<=>CO+C3H3                              2.58E+19   -2.4     3034.0
2271. H2C4O+H<=>C2H2+HCCO                            5.00E+13    0.0     3000.0
2272. H2C4O+OH<=>CH2CO+HCCO                          1.00E+07    2.0     2000.0
2273. C4H2+C2H<=>C6H2+H                              9.60E+13    0.0        0.0
2274. C4H2+C2H<=>C6H3                                4.50E+37   -7.7     7100.0
2275. NC3H7CHO+O2<=>NC3H7CO+HO2                      3.01E+13    0.0    39150.0
2276. NC3H7CHO+O<=>NC3H7CO+OH                        5.94E+12    0.0     1868.0
2277. NC3H7CHO+H<=>NC3H7CO+H2                        1.31E+05    2.6     1220.0
2278. NC3H7CHO+OH<=>NC3H7CO+H2O                      3.37E+12    0.0     -619.0
2279. NC3H7CHO+HO2<=>NC3H7CO+H2O2                    3.01E+12    0.0    11920.0
2280. NC3H7CHO+CH3<=>NC3H7CO+CH4                     7.08E-04    4.6     1966.0
2281. NC3H7CHO+CH3O2<=>NC3H7CO+CH3O2H                3.01E+12    0.0    11920.0
2282. NC3H7CHO+OH<=>C3H6CHO-3+H2O                    5.52E+02    3.1    -1176.0
2283. NC3H7CHO+HO2<=>C3H6CHO-3+H2O2                  3.44E+12    0.1    17880.0
2284. NC3H7CHO+CH3O2<=>C3H6CHO-3+CH3O2H              3.44E+12    0.1    17880.0
2285. NC3H7CHO+OH<=>C3H6CHO-2+H2O                    4.68E+07    1.6      -35.0
2286. NC3H7CHO+HO2<=>C3H6CHO-2+H2O2                  9.64E+03    2.6    13910.0
2287. NC3H7CHO+CH3O2<=>C3H6CHO-2+CH3O2H              9.64E+03    2.6    13910.0
2288. NC3H7CHO+OH<=>C3H6CHO-1+H2O                    5.28E+09    1.0     1586.0
2289. NC3H7CHO+HO2<=>C3H6CHO-1+H2O2                  2.38E+04    2.5    16490.0
2290. NC3H7CHO+CH3O2<=>C3H6CHO-1+CH3O2H              2.38E+04    2.5    16490.0
2291. NC3H7CO<=>NC3H7+CO                             1.00E+11    0.0     9600.0
2292. C2H5CHCO+H<=>C3H6CHO-3                         5.00E+12    0.0     1200.0
2293. C2H3CHO+CH3<=>C3H6CHO-3                        1.23E+11    0.0     7800.0
2294. C3H6CHO-1<=>C2H4+CH2CHO                        7.40E+11    0.0    21970.0
2295. C2H5CHCO+OH<=>NC3H7+CO2                        3.73E+12    0.0    -1010.0
2296. C2H5CHCO+H<=>NC3H7+CO                          4.40E+12    0.0     1459.0
2297. C2H5CHCO+O<=>C3H6+CO2                          3.20E+12    0.0     -437.0
2298. SC3H5CHO<=>C3H6+CO                             3.90E+14    0.0    69000.0
2299. SC3H5CO+H<=>SC3H5CHO                           1.00E+14    0.0        0.0
2300. CH2CHCHCHO+H<=>SC3H5CHO                        1.00E+14    0.0        0.0
2301. SC3H5CHO+OH<=>SC3H5CO+H2O                      3.37E+12    0.0     -619.0
2302. SC3H5CHO+HO2<=>SC3H5CO+H2O2                    1.00E+12    0.0    11920.0
2303. SC3H5CHO+CH3<=>SC3H5CO+CH4                     3.98E+12    0.0     8700.0
2304. SC3H5CHO+O<=>SC3H5CO+OH                        7.18E+12    0.0     1389.0
2305. SC3H5CHO+O2<=>SC3H5CO+HO2                      4.00E+13    0.0    37600.0
2306. SC3H5CHO+H<=>SC3H5CO+H2                        2.60E+12    0.0     2600.0
2307. SC3H5CHO+C2H3<=>SC3H5CO+C2H4                   1.11E+00    3.5     4682.0
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2308.	SC3H5CHO+H<=>CH2CHCHCHO+H2	1.70E+05	2.5	2490.0
2309.	SC3H5CHO+O<=>CH2CHCHCHO+OH	5.24E+11	0.7	5884.0
2310.	SC3H5CHO+OH<=>CH2CHCHCHO+H2O	4.46E+06	2.1	1051.0
2311.	SC3H5CHO+CH3<=>CH2CHCHCHO+CH4	2.10E+00	3.5	5675.0
2312.	SC3H5CHO+C2H3<=>CH2CHCHCHO+C2H4	2.21E+00	3.5	4682.0
2313.	SC3H5CHO+H<=>CH3+C2H3CHO	4.00E+21	-2.4	11180.0
2314.	SC3H5CHO+H<=>C3H6+HCO	4.00E+21	-2.4	11180.0
2315.	C3H5-S+CO<=>SC3H5CO	5.00E+12	0.0	8000.0
2316.	CH2CHCHCHO<=>C3H5-A+CO	6.10E+05	0.9	-1120.0
2317.	CH2CHCHCHO+O2<=>C2H3CHO+HOCO	1.20E+36	-7.2	33600.0
2318.	C2H3COCH3+OH<=>CH3CHO+CH3CO	1.00E+11	0.0	0.0
2319.	C2H3COCH3+OH=>CH2CO+C2H3+H2O	5.10E+11	0.0	1192.0
2320.	C2H3COCH3+HO2=>CH2CHO+CH3CO+OH	6.03E+09	0.0	7949.0
2321.	C2H3COCH3+HO2=>CH2CO+C2H3+H2O2	8.50E+12	0.0	20460.0
2322.	C2H3COCH3+CH3O2=>CH2CHO+CH3CO+CH3O	3.97E+11	0.0	17050.0
2323.	C2H3COCH3+CH3O2=>CH2CO+C2H3+CH3O2H	3.01E+12	0.0	17580.0
2324.	C2H5COCH3+OH<=>CH2CH2COCH3+H2O	7.55E+09	1.0	1586.0
2325.	C2H5COCH3+HO2<=>CH2CH2COCH3+H2O2	2.38E+04	2.5	16490.0
2326.	C2H5COCH3+O<=>CH2CH2COCH3+OH	2.25E+13	0.0	7700.0
2327.	C2H5COCH3+H<=>CH2CH2COCH3+H2	9.16E+06	2.0	7700.0
2328.	C2H5COCH3+O2<=>CH2CH2COCH3+HO2	2.05E+13	0.0	51310.0
2329.	C2H5COCH3+CH3<=>CH2CH2COCH3+CH4	3.19E+01	3.2	7172.0
2330.	C2H5COCH3+CH3O<=>CH2CH2COCH3+CH3OH	2.17E+11	0.0	6460.0
2331.	C2H5COCH3+CH3O2<=>CH2CH2COCH3+CH3O2H	3.01E+12	0.0	19380.0
2332.	C2H5COCH3+C2H3<=>CH2CH2COCH3+C2H4	5.00E+11	0.0	10400.0
2333.	C2H5COCH3+C2H5<=>CH2CH2COCH3+C2H6	5.00E+10	0.0	13400.0
2334.	C2H5COCH3+OH<=>CH3CHCOCH3+H2O	8.45E+11	0.0	-228.0
2335.	C2H5COCH3+HO2<=>CH3CHCOCH3+H2O2	2.00E+11	0.0	8698.0
2336.	C2H5COCH3+O<=>CH3CHCOCH3+OH	3.07E+13	0.0	3400.0
2337.	C2H5COCH3+H<=>CH3CHCOCH3+H2	4.46E+06	2.0	3200.0
2338.	C2H5COCH3+O2<=>CH3CHCOCH3+HO2	1.55E+13	0.0	41970.0
2339.	C2H5COCH3+CH3<=>CH3CHCOCH3+CH4	1.74E+00	3.5	3680.0
2340.	C2H5COCH3+CH3O<=>CH3CHCOCH3+CH3OH	1.45E+11	0.0	2771.0
2341.	C2H5COCH3+CH3O2<=>CH3CHCOCH3+CH3O2H	2.00E+12	0.0	15250.0
2342.	C2H5COCH3+C2H3<=>CH3CHCOCH3+C2H4	3.00E+11	0.0	3400.0
2343.	C2H5COCH3+C2H5<=>CH3CHCOCH3+C2H6	3.00E+10	0.0	8600.0
2344.	C2H5COCH3+OH<=>C2H5COCH2+H2O	5.10E+11	0.0	1192.0
2345.	C2H5COCH3+HO2<=>C2H5COCH2+H2O2	2.38E+04	2.5	14690.0
2346.	C2H5COCH3+O<=>C2H5COCH2+OH	5.00E+12	0.0	5962.0
2347.	C2H5COCH3+H<=>C2H5COCH2+H2	9.30E+12	0.0	6357.0
2348.	C2H5COCH3+O2<=>C2H5COCH2+HO2	2.05E+13	0.0	49150.0
2349.	C2H5COCH3+CH3<=>C2H5COCH2+CH4	1.62E+11	0.0	9630.0
2350.	C2H5COCH3+CH3O<=>C2H5COCH2+CH3OH	2.17E+11	0.0	4660.0
2351.	C2H5COCH3+CH3O2<=>C2H5COCH2+CH3O2H	3.01E+12	0.0	17580.0
2352.	C2H5COCH3+C2H3<=>C2H5COCH2+C2H4	6.15E+10	0.0	4278.0
2353.	C2H5COCH3+C2H5<=>C2H5COCH2+C2H6	5.00E+10	0.0	11600.0
2354.	C2H3COCH3+H<=>CH3CHCOCH3	5.00E+12	0.0	1200.0
2355.	CH3CHCO+CH3<=>CH3CHCOCH3	1.23E+11	0.0	7800.0
2356.	C2H5COCH2<=>CH2CO+C2H5	1.00E+14	0.0	35000.0
2357.	CH3CHCOCH3+O2<=>CH3CHOOCOCH3	1.00E+11	0.0	0.0
2358.	CH3CHOOCOCH3<=>CH2CHOOHCOCH3	8.90E+12	0.0	29700.0
2359.	C2H3COCH3+HO2<=>CH2CHOOHCOCH3	7.00E+10	0.0	7800.0
2360.	C5H81-3+OH<=>CH2O+C4H71-3	1.00E+12	0.0	0.0
2361.	C5H81-3+OH<=>C2H3CHO+C2H5	1.00E+12	0.0	0.0
2362.	C5H81-3+OH<=>CH3CHO+C3H5-S	1.00E+12	0.0	0.0
2363.	C4H7O1-4<=>CH2O+C3H5-A	1.33E+21	-2.3	25084.0
2364.	C5H10-1<=>C2H5+C3H5-A	9.86E+21	-2.1	75060.0
2365.	C4H71-3+CH3(+M)<=>C5H10-2(+M)	1.00E+14	-0.3	-262.3
	Low pressure limit: 0.39100E+61 -0.12810E+02 0.62500E+04			
	TROE centering: 0.10400E+00 0.16060E+04 0.60000E+05 0.61180E+04			
	H2 Enhanced by 2.000E+00			
	H2O Enhanced by 6.000E+00			
	CH4 Enhanced by 2.000E+00			
	CO Enhanced by 1.500E+00			
	CO2 Enhanced by 2.000E+00			
	C2H6 Enhanced by 3.000E+00			
	AR Enhanced by 7.000E-01			
2366.	C5H10-1+O2<=>C5H91-5+HO2	3.00E+13	0.0	52290.0
2367.	C5H10-1+O<=>C5H91-5+OH	9.80E+05	2.4	4750.0
2368.	C5H10-1+H<=>C5H91-5+H2	6.65E+05	2.5	6756.0
2369.	C5H10-1+OH<=>C5H91-5+H2O	5.27E+09	1.0	1586.0
2370.	C5H10-1+HO2<=>C5H91-5+H2O2	2.38E+04	2.5	16490.0
2371.	C5H10-1+CH3<=>C5H91-5+CH4	4.52E-01	3.6	7154.0
2372.	C5H10-1+CH3O<=>C5H91-5+CH3OH	2.17E+11	0.0	6458.0
2373.	C5H10-1+CH3O2<=>C5H91-5+CH3O2H	2.38E+04	2.5	16490.0
2374.	C5H10-2+O2<=>C5H92-5+HO2	3.00E+13	0.0	52290.0
2375.	C5H10-2+O<=>C5H92-5+OH	9.80E+05	2.4	4750.0
2376.	C5H10-2+H<=>C5H92-5+H2	6.65E+05	2.5	6756.0
2377.	C5H10-2+OH<=>C5H92-5+H2O	5.27E+09	1.0	1586.0
2378.	C5H10-2+HO2<=>C5H92-5+H2O2	2.38E+04	2.5	16490.0
2379.	C5H10-2+CH3<=>C5H92-5+CH4	4.52E-01	3.6	7154.0
2380.	C5H10-2+CH3O<=>C5H92-5+CH3OH	2.17E+11	0.0	6458.0
2381.	C5H10-2+CH3O2<=>C5H92-5+CH3O2H	2.38E+04	2.5	16490.0
2382.	C5H10-1+O2<=>C5H91-4+HO2	2.00E+13	0.0	49640.0
2383.	C5H10-1+O<=>C5H91-4+OH	5.51E+05	2.5	2830.0
2384.	C5H10-1+H<=>C5H91-4+H2	1.30E+06	2.4	4471.0
2385.	C5H10-1+OH<=>C5H91-4+H2O	4.67E+07	1.6	-35.0
2386.	C5H10-1+HO2<=>C5H91-4+H2O2	9.64E+03	2.6	13910.0
2387.	C5H10-1+CH3<=>C5H91-4+CH4	1.51E+00	3.5	5481.0
2388.	C5H10-1+CH3O<=>C5H91-4+CH3OH	1.45E+11	0.0	4571.0
2389.	C5H10-1+CH3O2<=>C5H91-4+CH3O2H	9.64E+03	2.6	13910.0
2390.	C5H10-2+O2<=>C5H91-3+HO2	3.30E+12	0.0	39900.0
2391.	C5H10-2+O<=>C5H91-3+OH	4.41E+05	2.4	3150.0
2392.	C5H10-2+H<=>C5H91-3+H2	1.73E+05	2.5	2492.0

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2393. C5H10-2+OH<=>C5H91-3+H2O                    3.12E+06    2.0     -298.0
2394. C5H10-2+HO2<=>C5H91-3+H2O2                  9.64E+03    2.6    13910.0
2395. C5H10-2+CH3<=>C5H91-3+CH4                   2.21E+00    3.5     5675.0
2396. C5H10-2+CH3O<=>C5H91-3+CH3OH                9.00E+01    3.0    11990.0
2397. C5H10-2+CH3O2<=>C5H91-3+CH3O2H              9.64E+03    2.6    13910.0
2398. C5H10-1+O2<=>C5H91-3+HO2                    2.20E+12    0.0    37220.0
2399. C5H10-1+O<=>C5H91-3+OH                      6.60E+05    2.4     1210.0
2400. C5H10-1+H<=>C5H91-3+H2                      3.38E+05    2.4      207.0
2401. C5H10-1+OH<=>C5H91-3+H2O                    2.76E+04    2.6    -1919.0
2402. C5H10-1+HO2<=>C5H91-3+H2O2                  4.82E+03    2.5    10530.0
2403. C5H10-1+CH3<=>C5H91-3+CH4                   3.69E+00    3.3     4002.0
2404. C5H10-1+CH3O<=>C5H91-3+CH3OH                4.00E+01    2.9     8609.0
2405. C5H10-1+CH3O2<=>C5H91-3+CH3O2H              4.82E+03    2.5    10530.0
2406. C5H10-2+O2<=>C5H92-4+HO2                    2.20E+12    0.0    37220.0
2407. C5H10-2+O<=>C5H92-4+OH                      9.90E+05    2.4     1210.0
2408. C5H10-2+H<=>C5H92-4+H2                      3.38E+05    2.4      207.0
2409. C5H10-2+OH<=>C5H92-4+H2O                    2.76E+04    2.6    -1919.0
2410. C5H10-2+HO2<=>C5H92-4+H2O2                  4.82E+03    2.5    10530.0
2411. C5H10-2+CH3<=>C5H92-4+CH4                   3.69E+00    3.3     4002.0
2412. C5H10-2+CH3O<=>C5H92-4+CH3OH                4.00E+01    2.9     8609.0
2413. C5H10-2+CH3O2<=>C5H92-4+CH3O2H              4.82E+03    2.5    10530.0
2414. C4H6+CH3<=>C5H91-3                          1.00E+11    0.0     7800.0
2415. C5H81-3+H<=>C5H91-3                         2.50E+11    0.5     2620.0
2416. C3H6+C2H3<=>C5H91-4                         1.00E+11    0.0     7800.0
2417. C2H4+C3H5-A<=>C5H91-5                       1.00E+11    0.0     7800.0
2418. C5H81-3+H<=>C5H92-4                         4.24E+11    0.5     1230.0
2419. C2H4+C3H5-S<=>C5H92-5                       2.00E+11    0.0     7800.0
2420. C5H9O1-3+OH<=>C5H91-3+HO2                   6.09E+15   -1.1    15720.0
2421. C5H9O1-3+CH3O<=>C5H91-3+CH3O2               5.95E+17   -1.6    20480.0
2422. C5H9O1-3+C2H5O<=>C5H91-3+C2H5O2             3.89E+14   -0.7    18330.0
2423. C5H9O2-4+OH<=>C5H92-4+HO2                   7.03E+15   -1.2    15890.0
2424. C5H9O2-4+CH3O<=>C5H92-4+CH3O2               6.86E+17   -1.8    20650.0
2425. C5H9O2-4+C2H5O<=>C5H92-4+C2H5O2             4.49E+14   -0.9    18490.0
2426. C5H9O1-3<=>C2H3CHO+C2H5                     3.13E+19   -1.9    10670.0
2427. C5H9O1-3<=>C2H5CHO+C2H3                     1.42E+18   -1.6    23340.0
2428. C5H9O2-4<=>SC3H5CHO+CH3                     5.98E+15   -1.1     9941.0
2429. C5H9O2-4<=>CH3CHO+C3H5-S                    1.07E+22   -2.7    29650.0
2430. BC5H10<=>C4H72-2+CH3                        1.22E+23   -1.9   101400.0
2431. BC5H10<=>IC4H7+CH3                          2.61E+19   -1.0    79020.0
2432. C4H71-3+CH3(+M)<=>CC5H10(+M)                1.00E+14   -0.3     -262.3
      Low pressure limit:  0.39100E+61 -0.12810E+02  0.62500E+04
      TROE centering:      0.10400E+00  0.16060E+04  0.60000E+05  0.61180E+04
      H2              Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      CH4             Enhanced by    2.000E+00
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      C2H6            Enhanced by    3.000E+00
      AR              Enhanced by    7.000E-01
2433. CC5H10+H<=>CC5H9-A+H2                       3.90E+06    2.4     4471.0
2434. CC5H10+OH<=>CC5H9-A+H2O                     1.40E+08    1.6      -35.0
2435. CC5H10+HO2<=>CC5H9-A+H2O2                   2.89E+04    2.6    13910.0
2436. CC5H10+CH3<=>CC5H9-A+CH4                    4.53E+00    3.5     5481.0
2437. CC5H10+CH3O<=>CC5H9-A+CH3OH                 4.35E+11    0.0     4571.0
2438. CC5H10+CH3O2<=>CC5H9-A+CH3O2H               2.89E+04    2.6    13910.0
2439. BC5H10+H<=>AC5H9-C+H2                       3.46E+05    2.5     2492.0
2440. BC5H10+H<=>CC5H9-B+H2                       1.73E+05    2.5     2492.0
2441. BC5H10+OH<=>AC5H9-C+H2O                     6.24E+06    2.0     -298.0
2442. BC5H10+OH<=>CC5H9-B+H2O                     3.12E+06    2.0     -298.0
2443. BC5H10+HO2<=>AC5H9-C+H2O2                   1.93E+04    2.6    13910.0
2444. BC5H10+HO2<=>CC5H9-B+H2O2                   9.64E+03    2.6    13910.0
2445. BC5H10+CH3<=>AC5H9-C+CH4                    4.42E+00    3.5     5675.0
2446. BC5H10+CH3<=>CC5H9-B+CH4                    2.21E+00    3.5     5675.0
2447. BC5H10+CH3O<=>AC5H9-C+CH3OH                 1.80E+02    3.0    11990.0
2448. BC5H10+CH3O<=>CC5H9-B+CH3OH                 9.00E+01    3.0    11990.0
2449. BC5H10+CH3O2<=>AC5H9-C+CH3O2H               1.93E+04    2.6    13910.0
2450. BC5H10+CH3O2<=>CC5H9-B+CH3O2H               9.64E+03    2.6    13910.0
2451. CC5H10+H<=>CC5H9-B+H2                       2.65E+06    2.2        0.0
2452. CC5H10+OH<=>CC5H9-B+H2O                     6.14E+02    3.2    -3500.0
2453. CC5H10+HO2<=>CC5H9-B+H2O2                   1.81E+03    2.5     7154.0
2454. CC5H10+CH3<=>CC5H9-B+CH4                    4.61E+00    3.1     2330.0
2455. CC5H10+CH3O<=>CC5H9-B+CH3OH                 1.00E+01    2.9     5231.0
2456. CC5H10+CH3O2<=>CC5H9-B+CH3O2H               1.81E+03    2.5     7154.0
2457. BC5H10+OH<=>IC3H7+CH3CHO                    2.00E+10    0.0     4000.0
2458. CC5H10+OH<=>IC4H9+CH2O                      2.00E+10    0.0     4000.0
2459. CC5H9-B+HO2<=>CC5H9O-B+OH                   7.00E+12    0.0    -1000.0
2460. CC5H9-B+CH3O2<=>CC5H9O-B+CH3O               7.00E+12    0.0    -1000.0
2461. CC5H9-B+C2H5O2<=>CC5H9O-B+C2H5O             9.64E+12    0.0        0.0
2462. AC5H9-D<=>AC5H9-A2                          1.11E+12    0.0    31700.0
2463. AC5H10<=>C3H5-T+C2H5                        8.92E+24   -2.4   100500.0
2464. IC4H7+CH3(+M)<=>AC5H10(+M)                  1.50E+14   -0.3     -262.3
      Low pressure limit:  0.58650E+61 -0.12810E+02  0.62500E+04
      TROE centering:      0.10400E+00  0.16060E+04  0.60000E+05  0.61180E+04
      H2              Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      CH4             Enhanced by    2.000E+00
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      C2H6            Enhanced by    3.000E+00
      AR              Enhanced by    7.000E-01
2465. AC5H10+H<=>AC5H9-A2+H2                      1.73E+05    2.5     2492.0
2466. AC5H10+O<=>AC5H9-A2+OH                      3.70E+05    2.6    -1130.0
2467. AC5H10+OH<=>AC5H9-A2+H2O                    3.12E+06    2.0     -298.0
2468. AC5H10+HO2<=>AC5H9-A2+H2O2                  9.64E+03    2.6    13910.0
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2469. AC5H10+CH3<=>AC5H9-A2+CH4                    2.21E+00    3.5     5675.0
2470. AC5H10+CH3O2<=>AC5H9-A2+CH3O2H               9.64E+03    2.6    13910.0
2471. AC5H10+CH3O<=>AC5H9-A2+CH3OH                 9.00E+01    3.0    11990.0
2472. AC5H10+H<=>AC5H9-C+H2                        3.38E+05    2.4      207.0
2473. AC5H10+OH<=>AC5H9-C+H2O                      2.76E+04    2.6    -1919.0
2474. AC5H10+HO2<=>AC5H9-C+H2O2                    4.82E+03    2.5    10530.0
2475. AC5H10+CH3<=>AC5H9-C+CH4                     3.69E+00    3.3     4002.0
2476. AC5H10+CH3O2<=>AC5H9-C+CH3O2H                4.82E+03    2.5    10530.0
2477. AC5H10+CH3O<=>AC5H9-C+CH3OH                  4.00E+01    2.9     8609.0
2478. AC5H10+H<=>AC5H9-D+H2                        1.95E+06    2.4     4471.0
2479. AC5H10+OH<=>AC5H9-D+H2O                      7.01E+07    1.6      -35.0
2480. AC5H10+CH3<=>AC5H9-D+CH4                     2.27E+00    3.5     5481.0
2481. AC5H10+HO2<=>AC5H9-D+H2O2                    1.45E+04    2.6    13910.0
2482. AC5H10+CH3O<=>AC5H9-D+CH3OH                  2.18E+11    0.0     4571.0
2483. AC5H10+CH3O2<=>AC5H9-D+CH3O2H                1.45E+04    2.6    13910.0
2484. AC5H9-A2<=>C3H4-A+C2H5                       1.98E+20   -1.6    59240.0
2485. B13DE2M+H<=>AC5H9-C                          4.00E+13    0.0     1300.0
2486. C4H612+CH3<=>AC5H9-C                         1.76E+04    2.5     6130.0
2487. B13DE2M+H<=>AC5H9-D                          2.50E+11    0.5     2620.0
2488. AC5H9-D<=>C3H5-T+C2H4                        1.22E+12    0.6    29370.0
2489. AC5H10+OH<=>SC4H9+CH2O                       2.00E+10    0.0     4000.0
2490. AC5H10+O<=>SC4H9+HCO                         7.23E+05    2.3    -1050.0
2491. AC5H10+O<=>IC3H7+CH3CO                       7.23E+05    2.3    -1050.0
2492. AC5H10+O<=>IC4H9+HCO                         7.23E+05    2.3    -1050.0
2493. AC5H9-C+HO2<=>AC5H9O-C+OH                    7.00E+12    0.0    -1000.0
2494. AC5H9-C+CH3O2<=>AC5H9O-C+CH3O                7.00E+12    0.0    -1000.0
2495. AC5H9-C+C2H5O2<=>AC5H9O-C+C2H5O              9.64E+12    0.0        0.0
2496. CH3CHO+C3H5-T<=>AC5H9O-C                     9.45E+02    2.7     6850.0
2497. AC5H9-C+HO2<=>B2E2M1OJ+OH                    7.00E+12    0.0    -1000.0
2498. AC5H9-C+CH3O2<=>B2E2M1OJ+CH3O                7.00E+12    0.0    -1000.0
2499. CH2O+C4H72-2<=>B2E2M1OJ                      8.80E+03    2.5     6100.0
2500. C2H3+C3H5-T<=>B13DE2M                        8.00E+12    0.0        0.0
2501. H+B13DE2MJ<=>B13DE2M                         1.00E+14    0.0        0.0
2502. B13DE2M+H<=>B13DE2MJ+H2                      3.64E+05    2.5     4361.2
2503. B13DE2M+O2<=>B13DE2MJ+HO2                    5.96E+19   -1.7    46192.1
2504. B13DE2M+OH<=>B13DE2MJ+H2O                    4.46E+06    2.1     1050.8
2505. B13DE2M+HO2<=>B13DE2MJ+H2O2                  3.07E-02    4.4    13547.2
2506. B13DE2M+CH3<=>B13DE2MJ+CH4                   2.21E+00    3.5     5675.0
2507. B13DE2M+CH3O2<=>B13DE2MJ+CH3O2H              7.68E-02    4.4    13547.2
2508. C2H3+C3H4-A<=>B13DE2MJ                       9.45E+02    2.7     6850.0
2509. B13DE2M+H<=>CC5H9-B                          4.24E+11    0.5     1230.0
2510. B13DE2M+H<=>CC5H9-A                          2.50E+11    0.5     2620.0
2511. B12DE3M+H<=>CC5H9-B                          4.24E+11    0.5     1230.0
2512. C2H3+C3H6<=>CC5H9-A                          9.45E+02    2.7     6850.0
2513. C2H3+CH3COCH3<=>CC5H9O-B                     9.45E+02    2.7     6850.0
2514. CC5H9-B+HO2<=>B2E3M1OJ+OH                    7.00E+12    0.0    -1000.0
2515. CC5H9-B+CH3O2<=>B2E3M1OJ+CH3O                7.00E+12    0.0    -1000.0
2516. CH2O+IC4H7-I1<=>B2E3M1OJ                     8.80E+03    2.5     6100.0
2517. TC4H8CHO<=>IC3H5CHO+CH3                      1.00E+13    0.0    26290.0
2518. TC4H8CHO<=>IC4H8+HCO                         8.52E+12    0.0    20090.0
2519. TC4H8CHO+O2<=>O2C4H8CHO                      2.00E+12    0.0        0.0
2520. O2C4H8CHO<=>O2HC4H8CO                        2.16E+11    0.0    15360.0
2521. IC4H8O2H-T+CO<=>O2HC4H8CO                    1.50E+11    0.0     4809.0
2522. C6H101-5<=>C3H5-A+C3H5-A                     4.90E+22   -2.1    63355.5
      Rate coefficients at P=1.00E+00(atm)        5.07E+47   -9.7    72680.0
      Rate coefficients at P=4.00E+00(atm)        4.22E+39   -7.3    69390.0
      Rate coefficients at P=1.00E+01(atm)        2.12E+35   -6.0    67620.0
2523. C6H101-5+H<=>C6H9-A+H2                       6.75E+05    2.4      207.0
2524. C6H101-5+O2<=>C6H9-A+HO2                     4.00E+14    0.0    38890.0
2525. C6H101-5+O<=>C6H9-A+OH                       1.32E+06    2.4     1210.0
2526. C6H101-5+OH<=>C6H9-A+H2O                     5.53E+04    2.6    -1919.0
2527. C6H101-5+CH3<=>C6H9-A+CH4                    7.38E+00    3.3     4002.0
2528. C4H6+C2H3<=>C6H9-A                           8.80E+05    2.5     6130.0
2529. C6H101-5+H=>C3H4-A+C3H5-A+H2                 1.00E+12    0.0        0.0
2530. C6H101-5+H<=>C3H5-A+C3H6                     1.00E+13    0.0        0.0
2531. L-C6H4+H<=>C-C6H4+H                          1.40E+54  -11.7    34500.0
2532. C-C6H4+H<=>C6H5                              2.40E+60  -13.7    29500.0
2533. L-C6H4+H<=>C6H5                              1.70E+78  -19.7    31400.0
2534. C6H3+H<=>L-C6H4                              3.40E+43   -9.0    12120.0
2535. L-C6H4+H<=>C6H3+H2                           1.33E+06    2.5     9240.0
2536. L-C6H4+OH<=>C6H3+H2O                         3.10E+06    2.0      430.0
2537. C6H2+H<=>C6H3                                1.10E+30   -4.9    10800.0
2538. C6H3+H<=>C6H2+H2                             3.00E+13    0.0        0.0
2539. C6H3+OH<=>C6H2+H2O                           4.00E+12    0.0        0.0
2540. C6H3+H<=>C4H2+C2H2                           2.80E+23   -2.5    10780.0
2541. C6H5+H(+M)<=>C6H6(+M)                        1.00E+14    0.0        0.0
      Low pressure limit:  0.66000E+76 -0.16300E+02  0.70000E+04
      TROE centering:      0.10000E+01  0.10000E+00  0.58490E+03  0.61130E+04
      H2              Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      CH4             Enhanced by    2.000E+00
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
2542. FULVENE<=>C6H6                               2.95E+31   -5.0    88470.0
2543. FULVENE<=>C6H5+H                             8.51E+24   -2.5   113330.0
2544. C6H6+H<=>FULVENE+H                           8.43E+32   -5.0    51244.0
2545. C6H6+H<=>C6H5+H2                             2.50E+14    0.0    16000.0
2546. C6H6+O2<=>C6H5+HO2                           6.30E+13    0.0    60000.0
2547. C6H6+O<=>C6H5+OH                             2.00E+13    0.0    14700.0
2548. C6H6+OH<=>C6H5+H2O                           1.20E+00    4.1     -301.0
2549. C6H6+HO2<=>C6H5+H2O2                         5.50E+12    0.0    28900.0
2550. C6H6+CH3<=>C6H5+CH4                          7.32E+12    0.0    18920.0
2551. C6H5+CH2O<=>C6H6+HCO                         8.55E+04    2.2       38.0
2552. C6H5+HCO<=>C6H6+CO                           8.55E+04    2.2       38.0
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2553. C6H5=>H+C4H2+C2H2                          4.30E+12    0.6    77294.0
2554. C6H6+O<=>C6H5O+H                           2.20E+13    0.0     4530.0
2555. C6H6+OH<=>C6H5OH+H                         1.32E+02    3.2     5590.0
2556. C6H5+HO2<=>C6H5O+OH                        5.00E+12    0.0        0.0
2557. C6H5+O2<=>C6H5O+O                          2.60E+13    0.0     6120.0
2558. C6H5+O2<=>O-C6H4O2+H                       3.00E+13    0.0     8980.0
2559. C6H5+O2<=>C6H5OO                           1.86E+13   -0.2     -711.0
2560. C6H5OO<=>C6H5O+O                           1.27E+15   -0.2    38536.0
2561. C6H5O+OH<=>C6H5OOH                         2.00E+13    0.0        0.0
2562. C6H5O+H(+M)<=>C6H5OH(+M)                   2.00E+14    0.0        0.0
      Low pressure limit:  0.10000E+95 -0.21840E+02  0.13880E+05
      TROE centering:      0.43000E-01  0.30420E+03  0.60000E+05  0.58960E+04
2563. C6H4OH+H<=>C6H5OH                          1.00E+14    0.0        0.0
2564. C6H5OH<=>C5H6+CO                           4.31E+15   -0.6    74115.0
2565. C6H5OH+H<=>C6H5O+H2                        1.20E+14    0.0    12400.0
2566. C6H5OH+O2<=>C6H5O+HO2                      1.00E+13    0.0    38800.0
2567. C6H5OH+O<=>C6H5O+OH                        1.30E+13    0.0     2900.0
2568. C6H5OH+OH<=>C6H5O+H2O                      1.40E+08    1.4     -960.0
2569. C6H5OH+HO2<=>C6H5O+H2O2                    1.00E+12    0.0    10000.0
2570. C6H5OH+CH3<=>C6H5O+CH4                     1.80E+11    0.0     7700.0
2571. C6H5OH+C3H5-A<=>C6H5O+C3H6                 4.90E+11    0.0     9400.0
2572. C6H5OH+C4H5-I<=>C6H5O+C4H6                 4.90E+11    0.0     9400.0
2573. C6H5OH+C6H5<=>C6H5O+C6H6                   4.90E+12    0.0     4400.0
2574. C6H5OH+C6H5OO<=>C6H5O+C6H5OOH              1.33E+11    0.0    14000.0
2575. C6H5OH+H<=>C6H4OH+H2                       1.70E+14    0.0    16000.0
2576. C6H5OH+O<=>C6H4OH+OH                       2.00E+13    0.0    14700.0
2577. C6H5OH+OH<=>C6H4OH+H2O                     1.40E+13    0.0     4600.0
2578. C6H5OH+HO2<=>C6H4OH+H2O2                   4.00E+11    0.0    28900.0
2579. C6H5OH+CH3<=>C6H4OH+CH4                    2.00E+12    0.0    15000.0
2580. C6H5OH+O<=>OC6H4OH+H                       1.60E+13    0.0     3400.0
2581. C6H5O<=>CO+C5H5                            2.00E+11    0.0    43900.0
2582. C6H5O+H<=>CO+C5H6                          1.00E+13    0.0        0.0
2583. C6H5O+O<=>C5H5+CO2                         1.00E+13    0.0        0.0
2584. C6H5O+O<=>OC6H4OH                          2.60E+10    0.5      800.0
2585. C6H4OH+O2<=>OC6H4OH+O                      2.10E+13    0.0     6100.0
2586. OC6H4OH<=>C5H4OH+CO                        7.40E+11    0.0    43800.0
2587. C6H5O+O<=>P-C6H4O2+H                       4.25E+13    0.0        0.0
2588. C6H5O+O<=>O-C6H4O2+H                       8.50E+13    0.0        0.0
2589. P-C6H4O2+H<=>P-OC6H5OJ                     4.00E+12    0.0     9740.0
2590. O-C6H4O2+H<=>O-OC6H5OJ                     4.00E+12    0.0     6960.0
2591. O-C6H4O2<=>C5H4O+CO                        1.00E+12    0.0    40000.0
2592. P-C6H4O2<=>C5H4O+CO                        3.70E+11    0.0    59000.0
2593. P-C6H3O2+H<=>P-C6H4O2                      1.00E+14    0.0        0.0
2594. P-C6H4O2+H<=>P-C6H3O2+H2                   2.00E+12    0.0     8100.0
2595. P-C6H4O2+O<=>P-C6H3O2+OH                   1.40E+13    0.0    14700.0
2596. P-C6H4O2+OH<=>P-C6H3O2+H2O                 1.00E+06    2.0     4000.0
2597. P-C6H4O2+H<=>C5H5O+CO                      2.50E+13    0.0     4700.0
2598. P-C6H4O2+O=>2CO+C2H2+CH2CO                 3.00E+13    0.0     5000.0
2599. P-C6H3O2+H<=>2C2H2+2CO                     1.00E+14    0.0        0.0
2600. P-C6H3O2+O=>C2H2+HCCO+2CO                  1.00E+14    0.0        0.0
2601. C5H6+C2H3<=>C6H6+CH3                       2.10E+67  -16.1    42460.0
2602. C5H5+H(+M)<=>C5H6(+M)                      2.60E+14    0.0        0.0
      Low pressure limit:  0.44000E+81 -0.18280E+02  0.12994E+05
      TROE centering:      0.68000E-01  0.40070E+03  0.41360E+04  0.55020E+04
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      H2              Enhanced by    2.000E+00
      CH4             Enhanced by    2.000E+00
2603. C5H6(+M)<=>C3H4-A+C2H2(+M)                 3.80E+17    0.0   104000.0
      Low pressure limit:  0.10000E+99 -0.22250E+02  0.12632E+06
      TROE centering:      0.14410E+00  0.53580E+01  0.32840E+04  0.67100E+10
      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      H2              Enhanced by    2.000E+00
      CH4             Enhanced by    2.000E+00
2604. C#CCVCCJ+H<=>C5H6                          1.00E+14    0.0        0.0
2605. C5H6+H<=>C5H5+H2                           7.20E+13    0.0     3500.0
2606. C5H6+O2<=>C5H5+HO2                         4.00E+13    0.0    37150.0
2607. C5H6+O<=>C5H5+OH                           4.80E+04    2.7     1100.0
2608. C5H6+OH<=>C5H5+H2O                         3.08E+06    2.0        0.0
2609. C5H6+HO2<=>C5H5+H2O2                       1.10E+04    2.6    12900.0
2610. C5H6+CH3<=>C5H5+CH4                        1.80E-01    4.0        0.0
2611. C5H6+HCO<=>C5H5+CH2O                       1.08E+08    1.9    16000.0
2612. C5H6+C2H3<=>C5H5+C2H4                      1.20E-01    4.0        0.0
2613. C5H6+C3H5-A<=>C5H5+C3H6                    5.50E+10    0.0     5505.0
2614. C5H6+C4H5-I<=>C5H5+C4H6                    6.00E+12    0.0        0.0
2615. C5H6+C4H5-N<=>C5H5+C4H6                    6.00E+12    0.0        0.0
2616. C5H6+C6H5<=>C5H5+C6H6                      1.00E-01    4.0        0.0
2617. C5H6+C6H5O<=>C5H5+C6H5OH                   3.16E+11    0.0     8000.0
2618. C5H6+H<=>C2H2+C3H5-A                       1.55E+37   -6.2    32890.0
2619. C5H6+H<=>C5H7                              2.40E+73  -17.9    31500.0
2620. C5H6+H<=>CVCCJCVC                          1.10E+14   -0.2     3100.0
2621. C5H6+OH<=>CVCCJCVCOH                       1.10E+13   -0.1      870.0
2622. CVCCJCVCOH+O2<=>HOCVCCVO+CH2CHO            1.20E+36   -7.2    33600.0
2623. C5H7<=>CVCCJCVC                            3.20E+15    0.0    39500.0
2624. CVCCJCVC<=>CVCCVCCJ                        5.40E+11   -0.7       60.0
2625. CVCCVCCJ+H(+M)<=>C5H81-3(+M)               2.00E+14    0.0        0.0
      Low pressure limit:  0.13300E+61 -0.12000E+02  0.59678E+04
      TROE centering:      0.20000E-01  0.10966E+04  0.10966E+04  0.68595E+04
      H2              Enhanced by    2.000E+00
      H2O             Enhanced by    6.000E+00
      CH4             Enhanced by    2.000E+00
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      CO              Enhanced by    1.500E+00
      CO2             Enhanced by    2.000E+00
      C2H6            Enhanced by    3.000E+00
      AR              Enhanced by    7.000E-01
2626. CVCCJCVC+O2<=>C2H3CHO+CH2CHO                  1.20E+36  -7.2    33600.0
2627. CVCCJCVC+O<=>C2H3CHO+C2H3                     2.00E+14   0.0        0.0
2628. CVCCVCCJ+H<=>C4H5-N+CH3                       2.90E+26  -2.2    36770.0
2629. C5H81-3+H<=>CVCCVCCJ+H2                       7.00E+06   2.0     5000.0
2630. C5H81-3+OH<=>CVCCVCCJ+H2O                     7.00E+06   2.0        0.0
2631. C5H81-3+H<=>C4H6+CH3                          5.20E+71 -16.4    51000.0
2632. CVCCVCCJ+OH<=>CVCCVCCOH                       1.50E+13   0.0        0.0
2633. CVCCVCCJ+O2<=>CH2CHCHCHO+CH2O                 8.20E+10   0.2     9140.0
2634. CVCCVCCOH+H<=>C4H6+CH2OH                      2.50E+34  -6.1    16250.0
2635. C5H7+O2<=>OC5H7O                              8.90E+24  -3.8    20000.0
2636. OC5H7O+O2<=>OC4H6O+HOCO                       6.30E+05  -7.2    33600.0
2637. OC4H6O+H<=>OC4H5O+H2                          2.30E+10   1.1     3279.0
2638. OC4H6O+OH<=>OC4H5O+H2O                        3.50E+09   1.2     -447.0
2639. OC4H5O+O2<=>O2CCHOOJ+C2H4                     1.60E+45  -9.9    20670.0
2640. O2CCHOOJ<=>HOCO+CO2                           3.00E+13   0.0     4000.0
2641. C5H7+H<=>C5H6+H2                              3.60E+12   0.0        0.0
2642. C5H7+O<=>C5H6+OH                              1.00E+13   0.0        0.0
2643. C5H7+OH<=>C5H6+H2O                            2.40E+13   0.0        0.0
2644. C5H6+HO2<=>C5H7+O2                            1.30E+15  -1.1     9530.0
2645. HOCVCCVO+OH<=>HOCVCCJVO+H2O                   2.69E+10   0.8     -340.0
2646. HOCVCCVO+HO2<=>HOCVCCJVO+H2O2                 1.00E+12   0.0    11920.0
2647. HOCVCCVO+CH3<=>HOCVCCJVO+CH4                  3.98E+12   0.0     8700.0
2648. HOCVCCVO+O<=>HOCVCCJVO+OH                     7.18E+12   0.0     1389.0
2649. HOCVCCVO+O2<=>HOCVCCJVO+HO2                   2.00E+13   0.0    40700.0
2650. HOCVCCVO+H<=>HOCVCCJVO+H2                     2.60E+12   0.0     2600.0
2651. C2H2OH+CO<=>HOCVCCJVO                         1.51E+11   0.0     4810.0
2652. C5H5<=>C3H3+C2H2                              1.98E+68 -15.0   124900.0
2653. C#CCVCCJ<=>C5H5                               8.00E+13   0.0    34058.3
2654. C3H3+C2H2<=>C#CCVCCJ                          4.11E+72 -18.2    45400.0
2655. C#CCVCCJ+H<=>C5H6-L                           1.00E+10   0.0        0.0
2656. C5H6-L+O<=>C#CCVCCJ+OH                        1.00E+10   0.0        0.0
2657. C5H6-L+OH<=>C#CCVCCJ+H2O                      1.00E+10   0.0        0.0
2658. C5H5+HO2<=>C5H5O+OH                           6.30E+29  -4.7    11650.0
2659. C5H5+O2<=>C4H4O+HCO                           6.00E+18  -2.5    10970.0
2660. C5H5+O<=>C4H5-N+CO                            3.20E+13  -0.2      440.0
2661. C5H5+O<=>C5H4O+H                              5.80E+13   0.0       20.0
2662. C5H5+OH<=>C5H5OH                              6.50E+14  -0.8    -2730.0
      Declared duplicate reaction...
2663. C5H5+OH<=>C5H5OH                              1.10E+43  -8.8    18730.0
      Declared duplicate reaction...
2664. C5H5+OH<=>C5H5OH                              1.10E+59 -13.1    33450.0
      Declared duplicate reaction...
2665. C5H5+OH<=>C5H4OH+H                            3.50E+57 -12.2    48350.0
2666. C5H5+OH<=>C4H6+CO                             4.00E+14   0.0     4500.0
2667. C5H4OH+H<=>C5H5OH                             1.00E+14   0.0        0.0
2668. C5H5OH+H<=>C5H5O+H2                           4.00E+13   0.0     6094.0
2669. C5H5OH+O<=>C5H5O+OH                           1.00E+13   0.0     4683.0
2670. C5H5OH+OH<=>C5H5O+H2O                         1.00E+13   0.0     1697.0
2671. C5H5OH+HO2<=>C5H5O+H2O2                       1.00E+13   0.0    15800.0
2672. C5H5OH+H<=>C5H4OH+H2                          3.20E+12   0.0        0.0
2673. C5H5OH+O<=>C5H4OH+OH                          4.70E+11   0.0        0.0
2674. C5H5OH+OH<=>C5H4OH+H2O                        5.50E+12   0.0     1731.0
2675. C5H5OH+HO2<=>C5H4OH+H2O2                      3.60E+03   2.5    10531.0
2676. C5H5O<=>C4H5-N+CO                             1.10E+79 -19.6    66250.0
2677. C5H5O<=>CJVCCVCCVO                            2.00E+13   0.0    14338.0
2678. C5H5O+O2<=>C5H4O+HO2                          6.00E+10   0.0     1600.0
2679. CJVCCVCCVO<=>CVCCVCCJVO                       4.30E+11  -1.1     4118.0
2680. C4H5-N+CO<=>CVCCVCCJVO                        1.51E+11   0.0     4810.0
2681. CJVCCVCCVO<=>C2H2+CJVCCVO                     3.00E+13   0.0    43710.0
2682. CJVCCVO<=>C2H3CO                              1.40E+09   1.0    32100.0
2683. C2H2+HCO<=>CJVCCVO                            7.77E+06   1.4     7755.0
2684. C5H4OH+H<=>C5H4O+H2                           2.10E+13   0.0    54000.0
2685. C5H4OH+O2<=>C5H4O+HO2                         3.00E+13   0.0     5000.0
2686. C5H4O=>CO+C2H2+C2H2                           5.70E+32  -6.8    68500.0
      Declared duplicate reaction...
2687. C5H4O=>CO+C2H2+C2H2                           6.20E+41  -7.9    98700.0
      Declared duplicate reaction...
2688. C5H3O+H<=>C5H4O                               1.00E+14   0.0        0.0
2689. C5H4O+H<=>C5H3O+H2                            2.00E+12   0.0     8100.0
2690. C5H4O+O<=>C5H3O+OH                            1.40E+13   0.0     1470.0
2691. C5H4O+OH<=>C5H3O+H2O                          1.10E+08   1.4     1450.0
2692. C5H3O=>C2H2+CO+C2H                            2.00E+13   0.0    51000.0
2693. C5H3O+O2=>CO2+C2H2+HCCO                       9.70E+58 -13.5    38180.0
2694. C5H4O+H<=>C4H5-N+CO                           2.10E+61 -13.3    40810.0
2695. C5H4O+O<=>C4H4+CO2                            1.00E+13   0.0     2000.0
2696. C4H4O+H<=>C3H5-A+CO                           6.60E+13   0.0     2740.0
      Declared duplicate reaction...
2697. C4H4O+H<=>C3H5-A+CO                           5.90E+06   2.0     1300.0
      Declared duplicate reaction...
2698. C4H4O+O<=>CH2CHO+HCCO                         3.00E+08   1.4     -860.0
2699. C4H4O+OH<=>C3H5-A+CO2                         3.00E+12   0.0        0.0
2700. C4H4O+OH=>C2H2+HCCO+H2O                       2.02E+13   0.0     5933.0
2701. COCCOC<=>CH3OH+COC*C                          1.68E+49 -10.9    84260.0
      Rate coefficients at P=1.00E-02(atm)         1.68E+49 -10.9    84260.0
      Rate coefficients at P=1.00E-01(atm)         3.93E+37  -7.4    79470.0
      Rate coefficients at P=1.00E+00(atm)         1.59E+26  -3.9    74540.0
      Rate coefficients at P=1.00E+01(atm)         4.00E+16  -1.0    70230.0
      Rate coefficients at P=1.00E+02(atm)         1.52E+10   0.9    67280.0
2702. COCCOC<=>CH3OCH2+CH3OCH2                      6.12E+69 -16.3   103300.0
      Rate coefficients at P=1.00E-02(atm)         6.12E+69 -16.3   103300.0
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      Rate coefficients at P=1.00E-01(atm)          8.79E+56  -12.3    98360.0
      Rate coefficients at P=1.00E+00(atm)          5.59E+43   -8.3    92810.0
      Rate coefficients at P=1.00E+01(atm)          1.94E+32   -4.9    87750.0
      Rate coefficients at P=1.00E+02(atm)          2.77E+24   -2.5    84170.0
2703. COCCOC<=>CH3+COCCOJ                            1.22E+71  -16.6   104800.0
      Rate coefficients at P=1.00E-02(atm)          1.22E+71  -16.6   104800.0
      Rate coefficients at P=1.00E-01(atm)          1.01E+58  -12.5    99780.0
      Rate coefficients at P=1.00E+00(atm)          2.48E+44   -8.4    94090.0
      Rate coefficients at P=1.00E+01(atm)          2.82E+32   -4.8    88840.0
      Rate coefficients at P=1.00E+02(atm)          1.51E+24   -2.3    85070.0
2704. COCCOC<=>CH3O+COCCJ                            2.29E+73  -17.3   107600.0
      Rate coefficients at P=1.00E-02(atm)          2.29E+73  -17.3   107600.0
      Rate coefficients at P=1.00E-01(atm)          1.21E+60  -13.2   102600.0
      Rate coefficients at P=1.00E+00(atm)          1.09E+46   -8.9    96750.0
      Rate coefficients at P=1.00E+01(atm)          3.60E+33   -5.1    91280.0
      Rate coefficients at P=1.00E+02(atm)          6.49E+24   -2.5    87310.0
2705. COCCOC+H<=>COCCOCJ+H2                          6.22E+05    2.6     4170.0
2706. COCCOC+H<=>COCCJOC+H2                          1.10E+07    2.2     3600.0
2707. COCCOC+OH<=>COCCOCJ+H2O                        4.00E+07    1.8       30.0
2708. COCCOC+OH<=>COCCJOC+H2O                        2.26E+03    2.9    -4040.0
2709. COCCOC+O<=>COCCOCJ+OH                          2.69E+07    2.0     2632.0
2710. COCCOC+O<=>COCCJOC+OH                          2.90E+05    2.5      876.0
2711. COCCOC+CH3<=>COCCOCJ+CH4                       2.45E-02    4.5     7749.0
2712. COCCOC+CH3<=>COCCJOC+CH4                       3.98E+01    3.4     7635.0
2713. COCCOC+HO2<=>COCCOCJ+H2O2                      1.68E+03    0.0    17690.0
2714. COCCOC+HO2<=>COCCJOC+H2O2                      3.62E-01    4.0     9057.0
2715. COCCOC+O2<=>COCCOCJ+HO2                        4.10E+13    0.0    44910.0
2716. COCCOC+O2<=>COCCJOC+HO2                        2.80E+13    0.0    46660.0
2717. COCCOC+CH3O<=>COCCOCJ+CH3OH                    6.02E+11    0.0     4074.0
2718. COCCOC+CH3O<=>COCCJOC+CH3OH                    4.76E+08    1.1    10390.0
2719. COCCOC+CH3O2<=>COCCOCJ+CH3O2H                  1.68E+03    0.0    17690.0
2720. COCCOC+CH3O2<=>COCCJOC+CH3O2H                  1.64E+04    2.5    10750.0
2721. COCCJOC<=>COCCOCJ                              3.39E+43  -11.3    27210.0
      Rate coefficients at P=1.00E-02(atm)          3.39E+43  -11.3    27210.0
      Rate coefficients at P=1.00E-01(atm)          3.87E+43  -10.9    29180.0
      Rate coefficients at P=1.00E+00(atm)          6.92E+41  -10.0    30620.0
      Rate coefficients at P=1.00E+01(atm)          1.34E+35   -7.6    29890.0
      Rate coefficients at P=1.00E+02(atm)          7.38E+25   -4.6    27550.0
2722. COCCOCJ<=>COCCJ+CH2O                           1.09E+47  -11.1    33990.0
      Rate coefficients at P=1.00E-02(atm)          1.09E+47  -11.1    33990.0
      Rate coefficients at P=1.00E-01(atm)          2.77E+42   -9.4    34220.0
      Rate coefficients at P=1.00E+00(atm)          7.93E+33   -6.5    32270.0
      Rate coefficients at P=1.00E+01(atm)          8.58E+24   -3.7    29360.0
      Rate coefficients at P=1.00E+02(atm)          4.95E+17   -1.5    26490.0
2723. COCCJOC<=>COCC*O+CH3                           2.82E+46  -11.4    29610.0
      Rate coefficients at P=1.00E-02(atm)          2.82E+46  -11.4    29610.0
      Rate coefficients at P=1.00E-01(atm)          2.51E+48  -11.6    32120.0
      Rate coefficients at P=1.00E+00(atm)          6.68E+48  -11.3    34440.0
      Rate coefficients at P=1.00E+01(atm)          4.03E+43   -9.3    34460.0
      Rate coefficients at P=1.00E+02(atm)          1.47E+35   -6.5    32610.0
2724. COCCJOC<=>COC*C+CH3O                           1.47E+47  -11.5    28990.0
      Rate coefficients at P=1.00E-02(atm)          1.47E+47  -11.5    28990.0
      Rate coefficients at P=1.00E-01(atm)          1.84E+48  -11.4    31120.0
      Rate coefficients at P=1.00E+00(atm)          5.95E+47  -10.9    32930.0
      Rate coefficients at P=1.00E+01(atm)          1.12E+42   -8.9    32530.0
      Rate coefficients at P=1.00E+02(atm)          4.91E+33   -6.1    30510.0
2725. COCCJ<=>CH3O+C2H4                              1.47E+47  -11.5    28990.0
      Rate coefficients at P=1.00E-02(atm)          1.47E+47  -11.5    28990.0
      Rate coefficients at P=1.00E-01(atm)          1.84E+48  -11.4    31120.0
      Rate coefficients at P=1.00E+00(atm)          5.95E+47  -10.9    32930.0
      Rate coefficients at P=1.00E+01(atm)          1.12E+42   -8.9    32530.0
      Rate coefficients at P=1.00E+02(atm)          4.91E+33   -6.1    30510.0
2726. COCCOJ<=>CH3OCH2+CH2O                          2.72E+21   -2.5    16990.0
2727. COCCJ+H<=>COCC                                 1.00E+14    0.0        0.0
2728. COCCJ<=>COCJC                                  1.00E+05    0.0        0.0
2729. COC*C+H<=>CJOC*C+H2                            6.22E+05    2.6     4170.0
2730. COC*C+OH<=>CJOC*C+H2O                          4.00E+07    1.8       30.0
2731. COC*C+CH3<=>CJOC*C+CH4                         2.45E-02    4.5     7749.0
2732. COC*C+O<=>CJOC*C+OH                            2.69E+07    2.0     2632.0
2733. COC*C+HO2<=>CJOC*C+H2O2                        1.68E+03    0.0    17690.0
2734. COC*C+O2<=>CJOC*C+HO2                          4.10E+13    0.0    44910.0
2735. COC*C+CH3O<=>CJOC*C+CH3OH                      6.02E+11    0.0     4074.0
2736. COC*C+H=COCJ*C+H2                              4.10E+05    2.5     9790.0
2737. COC*C+O=COCJ*C+OH                              6.00E+10    0.7     7630.0
2738. COC*C+OH=COCJ*C+H2O                            1.10E+06    2.0     1450.0
2739. COC*C+CH3=COCJ*C+CH4                           9.80E-01    3.5    11700.0
2740. COC*C+H=COC*CJ+H2                              8.20E+05    2.5    12280.0
2741. COC*C+O=COC*CJ+OH                              1.20E+11    0.7     8960.0
2742. COC*C+OH=COC*CJ+H2O                            2.20E+06    2.0     2780.0
2743. COC*C+CH3=COC*CJ+CH4                           1.36E+00    3.5    12900.0
2744. COCJ*C=>CH2CO+CH3                              8.50E+12    0.0    28000.0
2745. COC*CJ=>C2H2+CH3O                              8.50E+12    0.0    28000.0
2746. CJOC*C<=>CH2O+C2H3                             1.09E+47  -11.1    33990.0
      Rate coefficients at P=1.00E-02(atm)          1.09E+47  -11.1    33990.0
      Rate coefficients at P=1.00E-01(atm)          2.77E+42   -9.4    34220.0
      Rate coefficients at P=1.00E+00(atm)          7.93E+33   -6.5    32270.0
      Rate coefficients at P=1.00E+01(atm)          8.58E+24   -3.7    29360.0
      Rate coefficients at P=1.00E+02(atm)          4.95E+17   -1.5    26490.0
2747. COCC*O+H<=>COCCJ*O+H2                          2.14E+06    2.4     1577.0
2748. COCC*O+H<=>COCJC*O+H2                          1.10E+07    2.2     3600.0
2749. COCC*O+H<=>CJOCC*O+H2                          6.22E+05    2.6     4170.0
2750. COCC*O+OH<=>COCCJ*O+H2O                        6.13E+04    2.7    -4586.0
2751. COCC*O+OH<=>COCJC*O+H2O                        2.26E+03    2.9    -4040.0
2752. COCC*O+OH<=>CJOCC*O+H2O                        4.00E+07    1.8       30.0
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2753. COCC*O+CH3<=>COCCJ*O+CH4                      2.50E+00    3.6     4329.0
2754. COCC*O+CH3<=>COCJC*O+CH4                      3.98E+01    3.4     7635.0
2755. COCC*O+CH3<=>CJOCC*O+CH4                      2.45E-02    4.5     7749.0
2756. COCC*O+O<=>COCCJ*O+OH                         5.94E+12    0.0     1868.0
2757. COCC*O+O<=>COCJC*O+OH                         2.90E+05    2.5      876.0
2758. COCC*O+O<=>CJOCC*O+OH                         2.69E+07    2.0     2632.0
2759. COCC*O+HO2<=>COCCJ*O+H2O2                     1.18E-04    4.9     3684.0
2760. COCC*O+HO2<=>COCJC*O+H2O2                     3.62E-01    4.0     9057.0
2761. COCC*O+HO2<=>CJOCC*O+H2O2                     1.68E+03    0.0    17690.0
2762. COCC*O+O2<=>COCCJ*O+HO2                       3.01E+13    0.0    39150.0
2763. COCC*O+O2<=>COCJC*O+HO2                       2.80E+13    0.0    46660.0
2764. COCC*O+O2<=>CJOCC*O+HO2                       4.10E+13    0.0    44910.0
2765. COCC*O+CH3O<=>COCCJ*O+CH3OH                   1.00E+12    0.0     3300.0
2766. COCC*O+CH3O<=>COCJC*O+CH3OH                   4.76E+08    1.1    10390.0
2767. COCC*O+CH3O<=>CJOCC*O+CH3OH                   6.02E+11    0.0     4074.0
2768. COCCJ*O(+M)<=>CH3OCH2+CO(+M)                  1.07E+12    0.6    16900.0
      Low pressure limit:  0.56500E+19 -0.97000E+00  0.14600E+05
      TROE centering:      0.62900E+00  0.87300E+10  0.55200E+01  0.76000E+08
2769. COCJC*O<=>CH3+(CHO)2                          7.40E+13    0.1    22800.0
2770. CJOCC*O<=>CH2CHO+CH2O                         1.09E+47  -11.1    33990.0
      Rate coefficients at P=1.00E-02(atm)         1.09E+47  -11.1    33990.0
      Rate coefficients at P=1.00E-01(atm)         2.77E+42   -9.4    34220.0
      Rate coefficients at P=1.00E+00(atm)         7.93E+33   -6.5    32270.0
      Rate coefficients at P=1.00E+01(atm)         8.58E+24   -3.7    29360.0
      Rate coefficients at P=1.00E+02(atm)         4.95E+17   -1.5    26490.0
2771. (CHO)2<=>HCO+HCO                              2.85E+53  -11.5    84210.0
2772. (CHO)2+H=>CO+H2+HCO                           5.40E+13    0.0    -4306.0
2773. (CHO)2+OH=>CO+H2O+HCO                         5.80E+11    0.0    -1029.0
2774. (CHO)2+HO2=>HOCHO+CO+OH                       3.32E-04    4.0      301.4
2775. COC*COC+H<=>COC*COCJ+H2                       6.22E+05    2.6     4170.0
2776. COC*COC+OH<=>COC*COCJ+H2O                     4.00E+07    1.8       30.0
2777. COC*COC+CH3<=>COC*COCJ+CH4                    2.45E-02    4.5     7749.0
2778. COC*COC+O<=>COC*COCJ+OH                       2.69E+07    2.0     2632.0
2779. COC*COC+HO2<=>COC*COCJ+H2O2                   1.68E+03    0.0    17690.0
2780. COC*COC+O2<=>COC*COCJ+HO2                     4.10E+13    0.0    44910.0
2781. COC*COC+CH3O<=>COC*COCJ+CH3OH                 6.02E+11    0.0     4074.0
2782. COC*COCJ<=>COC*CJ+CH2O                        1.09E+47  -11.1    33990.0
      Rate coefficients at P=1.00E-02(atm)         1.09E+47  -11.1    33990.0
      Rate coefficients at P=1.00E-01(atm)         2.77E+42   -9.4    34220.0
      Rate coefficients at P=1.00E+00(atm)         7.93E+33   -6.5    32270.0
      Rate coefficients at P=1.00E+01(atm)         8.58E+24   -3.7    29360.0
      Rate coefficients at P=1.00E+02(atm)         4.95E+17   -1.5    26490.0
2783. COCC(+M)<=>C2H5+CH3O(+M)                      8.30E+23   -2.2    85100.0
      Low pressure limit:  0.22580E+79 -0.17380E+02  0.97760E+05
      TROE centering:      0.38029E+00  0.14149E+04  0.17911E+02  0.37858E+04
2784. COCC(+M)<=>CH3+C2H5O(+M)                      9.66E+21   -1.6    84240.0
      Low pressure limit:  0.83080E+77 -0.16900E+02  0.97020E+05
      TROE centering:      0.14655E-03  0.85337E+03  0.86126E+01  0.32834E+04
2785. COCC(+M)<=>CH3+CH3OCH2(+M)                    4.04E+25   -2.6    90240.0
      Low pressure limit:  0.42990E+77 -0.16960E+02  0.10230E+06
      TROE centering:      0.10569E-02  0.83909E+03  0.14175E+11  0.26213E+04
2786. COCC(+M)<=>C2H4+CH3OH(+M)                     5.00E+13    0.0    65200.0
      Low pressure limit:  0.49000E+86 -0.19750E+02  0.80660E+05
      TROE centering:      0.90756E-01  0.32474E+03  0.39073E+12  0.53105E+08
2787. COCC+O2<=>CJOCC+HO2                           3.00E+13    0.0    52290.0
2788. COCC+O2<=>COCCJ+HO2                           3.00E+13    0.0    52290.0
2789. COCC+O2<=>COCJC+HO2                           2.00E+13    0.0    49640.0
2790. COCC+OH<=>CJOCC+H2O                           1.38E+00    3.9     3050.0
2791. COCC+OH<=>COCCJ+H2O                           5.28E+09    1.0     1586.0
2792. COCC+OH<=>COCJC+H2O                           1.13E+03    2.9    -4038.0
2793. COCC+HO2<=>CJOCC+H2O2                         2.38E+04    2.5    16490.0
2794. COCC+HO2<=>COCCJ+H2O2                         2.38E+04    2.5    16490.0
2795. COCC+HO2<=>COCJC+H2O2                         9.64E+03    2.6    13910.0
2796. COCC+CH3<=>CJOCC+CH4                          4.53E-01    3.6     7154.0
2797. COCC+CH3<=>COCCJ+CH4                          4.53E-01    3.6     7154.0
2798. COCC+CH3<=>COCJC+CH4                          1.51E+00    3.5     5481.0
2799. COCC+O<=>CJOCC+OH                             9.81E+05    2.4     4750.0
2800. COCC+O<=>COCCJ+OH                             9.81E+05    2.4     4750.0
2801. COCC+O<=>COCJC+OH                             5.52E+05    2.5     2830.0
2802. COCC+H<=>CJOCC+H2                             9.81E+04    2.8     3900.0
2803. COCC+H<=>COCCJ+H2                             6.66E+05    2.5     6756.0
2804. COCC+H<=>COCJC+H2                             5.74E+05    2.5     2300.0
2805. COCC+CH3O<=>CJOCC+CH3OH                       2.17E+11    0.0     6458.0
2806. COCC+CH3O<=>COCCJ+CH3OH                       2.17E+11    0.0     6458.0
2807. COCC+CH3O<=>COCJC+CH3OH                       1.45E+11    0.0     4571.0
2808. COCC+CH3O2<=>CJOCC+CH3O2H                     2.38E+04    2.5    16490.0
2809. COCJC<=>CH3CHO+CH3                            1.00E+12    0.5    12140.0
2810. CJOCC<=>C2H5+CH2O                             4.13E+15   -0.9    16300.0
2811. COCCOCJ+O2=COCCOCOOJ                          1.37E+19   -2.5     1137.0
      Rate coefficients at P=1.00E+00(atm)         1.37E+19   -2.5     1137.0
      Rate coefficients at P=1.00E+01(atm)         3.73E+13   -0.6     -164.0
2812. COCCJOC+O2=COCC(OOJ)OC                        2.06E+19   -2.5     1137.0
      Rate coefficients at P=1.00E+00(atm)         2.06E+19   -2.5     1137.0
      Rate coefficients at P=1.00E+01(atm)         5.60E+13   -0.6     -164.0
2813. COCCOCJ+O2=COCC*O+CH2O+OH                     9.53E+10    0.4     3416.0
      Rate coefficients at P=1.00E+00(atm)         3.50E+17   -1.4     4718.0
      Rate coefficients at P=1.00E+01(atm)         9.53E+10    0.4     3416.0
2814. COCCJOC+O2=COCC*O+CH2O+OH                     9.53E+10    0.4     3416.0
      Rate coefficients at P=1.00E+00(atm)         3.50E+17   -1.4     4718.0
      Rate coefficients at P=1.00E+01(atm)         9.53E+10    0.4     3416.0
2815. COCCOCOOJ=COCCJOCOOH                          9.30E+07    1.1    15200.0
2816. COCCOCOOJ=COCJCOCOOH                          1.03E+06    1.4    13400.0
2817. COCC(OOJ)OC=COCJC(OOH)OC                      9.56E+07    1.4    25600.0
2818. COCC(OOJ)OC=COCC(OOH)OCJ                      4.86E+07    1.2    18500.0
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2819.	COCC(OOJ)OC=CJOCC(OOH)OC	1.03E+06	1.5	17200.0
2820.	COCC(OOJ)OC=COC*COC+HO2	3.68E+09	1.0	30000.0
2821.	COCCOCOOJ=COCCOC*O+OH	6.50E+04	2.5	36500.0
2822.	COCC(OOJ)OC=COCC*OOC+OH	4.87E+04	2.2	35100.0
2823.	COCCJOCOOH=CE-4+OH	1.28E+05	1.8	14460.0
2824.	COCJCOCOOH=CE-5+OH	4.73E+05	1.2	8130.0
2825.	COCJC(OOH)OC=CE-3+OH	8.98E+07	1.2	10260.0
2826.	COCC(OOH)OCJ=CE-4+OH	2.40E+06	1.5	17240.0
2827.	CJOCC(OOH)OC=CE-5+OH	3.79E+05	1.3	10220.0
2828.	CE-4+OH=>COCCJ*O+CH2O+H2O	3.39E+06	2.1	-521.0
2829.	CE-4+HO2=>COCCJ*O+CH2O+H2O2	1.33E+13	0.0	16500.0
2830.	CE-4+OH=>COCC*O+HCO+H2O	1.70E+06	2.1	-521.0
2831.	CE-4+HO2=>COCC*O+HCO+H2O2	6.65E+12	0.0	16500.0
2832.	CE-5+OH=>COC*OCJ+CH2O+H2O	3.39E+06	2.1	-521.0
2833.	CE-5+HO2=>COC*OCJ+CH2O+H2O2	1.33E+13	0.0	16500.0
2834.	CE-5+OH=>COC*C+OCHO+H2O	1.70E+06	2.1	-521.0
2835.	CE-5+HO2=>COC*C+OCHO+H2O2	6.65E+12	0.0	16500.0
2836.	CE-3=>CH3CHO+CH3OCHO	3.63E+13	0.0	57200.0
2837.	COCJC(OOH)OC=COC*COC+HO2	2.88E+11	0.5	15200.0
2838.	COCCJOCOOH=COCC*O+CH2O2H	2.82E+46	-11.4	29610.0
	Rate coefficients at P=1.00E-02(atm)	2.82E+46	-11.4	29610.0
	Rate coefficients at P=1.00E-01(atm)	2.51E+48	-11.6	32120.0
	Rate coefficients at P=1.00E+00(atm)	6.68E+48	-11.3	34440.0
	Rate coefficients at P=1.00E+01(atm)	4.03E+43	-9.3	34460.0
	Rate coefficients at P=1.00E+02(atm)	1.47E+35	-6.5	32610.0
2839.	COCCJOCOOH=C*COCOOH+CH3O	1.47E+47	-11.5	28990.0
	Rate coefficients at P=1.00E-02(atm)	1.47E+47	-11.5	28990.0
	Rate coefficients at P=1.00E-01(atm)	1.84E+48	-11.4	31120.0
	Rate coefficients at P=1.00E+00(atm)	5.95E+47	-10.9	32930.0
	Rate coefficients at P=1.00E+01(atm)	1.12E+42	-8.9	32530.0
	Rate coefficients at P=1.00E+02(atm)	4.91E+33	-6.1	30510.0
2840.	COCJCOCOOH=COC*C+OCH2O2H	1.47E+47	-11.5	28990.0
	Rate coefficients at P=1.00E-02(atm)	1.47E+47	-11.5	28990.0
	Rate coefficients at P=1.00E-01(atm)	1.84E+48	-11.4	31120.0
	Rate coefficients at P=1.00E+00(atm)	5.95E+47	-10.9	32930.0
	Rate coefficients at P=1.00E+01(atm)	1.12E+42	-8.9	32530.0
	Rate coefficients at P=1.00E+02(atm)	4.91E+33	-6.1	30510.0
2841.	COCJCOCOOH=HOOCOCC*O+CH3	2.82E+46	-11.4	29610.0
	Rate coefficients at P=1.00E-02(atm)	2.82E+46	-11.4	29610.0
	Rate coefficients at P=1.00E-01(atm)	2.51E+48	-11.6	32120.0
	Rate coefficients at P=1.00E+00(atm)	6.68E+48	-11.3	34440.0
	Rate coefficients at P=1.00E+01(atm)	4.03E+43	-9.3	34460.0
	Rate coefficients at P=1.00E+02(atm)	1.47E+35	-6.5	32610.0
2842.	COCJC(OOH)OC=COC(OOH)C*O+CH3	2.82E+46	-11.4	29610.0
	Rate coefficients at P=1.00E-02(atm)	2.82E+46	-11.4	29610.0
	Rate coefficients at P=1.00E-01(atm)	2.51E+48	-11.6	32120.0
	Rate coefficients at P=1.00E+00(atm)	6.68E+48	-11.3	34440.0
	Rate coefficients at P=1.00E+01(atm)	4.03E+43	-9.3	34460.0
	Rate coefficients at P=1.00E+02(atm)	1.47E+35	-6.5	32610.0
2843.	COCJC(OOH)OC=COC*COOH+CH3O	1.47E+47	-11.5	28990.0
	Rate coefficients at P=1.00E-02(atm)	1.47E+47	-11.5	28990.0
	Rate coefficients at P=1.00E-01(atm)	1.84E+48	-11.4	31120.0
	Rate coefficients at P=1.00E+00(atm)	5.95E+47	-10.9	32930.0
	Rate coefficients at P=1.00E+01(atm)	1.12E+42	-8.9	32530.0
	Rate coefficients at P=1.00E+02(atm)	4.91E+33	-6.1	30510.0
2844.	COCC(OOH)OCJ=>COCC*O+OH+CH2O	1.09E+47	-11.1	33990.0
	Rate coefficients at P=1.00E-02(atm)	1.09E+47	-11.1	33990.0
	Rate coefficients at P=1.00E-01(atm)	2.77E+42	-9.4	34220.0
	Rate coefficients at P=1.00E+00(atm)	7.93E+33	-6.5	32270.0
	Rate coefficients at P=1.00E+01(atm)	8.58E+24	-3.7	29360.0
	Rate coefficients at P=1.00E+02(atm)	4.95E+17	-1.5	26490.0
2845.	CJOCC(OOH)OC=>COC*C+HO2+CH2O	1.09E+47	-11.1	33990.0
	Rate coefficients at P=1.00E-02(atm)	1.09E+47	-11.1	33990.0
	Rate coefficients at P=1.00E-01(atm)	2.77E+42	-9.4	34220.0
	Rate coefficients at P=1.00E+00(atm)	7.93E+33	-6.5	32270.0
	Rate coefficients at P=1.00E+01(atm)	8.58E+24	-3.7	29360.0
	Rate coefficients at P=1.00E+02(atm)	4.95E+17	-1.5	26490.0
2846.	COCCJOCOOH+O2=O2QOOH_13	7.00E+11	0.0	0.0
2847.	COCJCOCOOH+O2=O2QOOH_14	7.00E+11	0.0	0.0
2848.	COCJC(OOH)OC+O2=O2QOOH_34	7.00E+11	0.0	0.0
2849.	COCC(OOH)OCJ+O2=O2QOOH_31	7.00E+11	0.0	0.0
2850.	CJOCC(OOH)OC+O2=O2QOOH_41	7.00E+11	0.0	0.0
2851.	O2QOOH_13=KHP_13+OH	5.49E+03	2.4	16900.0
2852.	O2QOOH_14=KHP_14+OH	6.28E+02	2.2	14400.0
2853.	O2QOOH_34=KHP_34+OH	1.75E+08	1.7	23000.0
2854.	O2QOOH_31=KHP_31+OH	5.79E+01	2.9	14000.0
2855.	O2QOOH_41=KHP_41+OH	3.77E+02	2.2	12300.0
2856.	KHP_13=KHP_13OJ+OH	1.50E+16	0.0	42000.0
2857.	KHP_14=KHP_14OJ+OH	1.50E+16	0.0	42000.0
2858.	KHP_34=KHP_34OJ+OH	1.50E+16	0.0	42000.0
2859.	KHP_31=KHP_31OJ+OH	1.50E+16	0.0	42000.0
2860.	KHP_41=KHP_41OJ+OH	1.50E+16	0.0	42000.0
2861.	KHP_13=DCC_13+H2O	1.28E+07	2.2	44950.0
2862.	KHP_14=DCC_14+H2O	1.28E+07	2.2	44950.0
2863.	KHP_34=DCC_34+H2O	1.28E+07	2.2	44950.0
2864.	KHP_31=DCC_13+H2O	1.28E+07	2.2	44950.0
2865.	KHP_41=DCC_14+H2O	1.28E+07	2.2	44950.0
2866.	KHP_13OJ=COCC*O+OCHO	9.72E+15	-1.1	20640.0
2867.	KHP_13OJ=CH3OCH2+C*OOC*O	9.72E+15	-1.1	20640.0
2868.	KHP_13OJ=DCC_13+H	1.74E+16	-0.7	11720.0
2869.	KHP_14OJ=CH3OCHO+CH2OCHO	9.72E+15	-1.1	20640.0
2870.	KHP_14OJ=C*OOCC*O+CH3O	9.72E+15	-1.1	20640.0
2871.	KHP_14OJ=DCC_14+H	1.74E+16	-0.7	11720.0
2872.	KHP_34OJ=CH3OCHO+CH3OCO	9.72E+15	-1.1	20640.0

2873. KHP_34OJ=COC*OC*O+CH3O	9.72E+15	-1.1	20640.0
2874. KHP_34OJ=DCC_34+H	1.74E+16	-0.7	11720.0
2875. KHP_31OJ=COCC*OOJ+CH2O	9.72E+15	-1.1	20640.0
2876. KHP_31OJ=DCC_13+H	1.74E+16	-0.7	11720.0
2877. KHP_41OJ=COC*OCOJ+CH2O	9.72E+15	-1.1	20640.0
2878. KHP_41OJ=DCC_14+H	1.74E+16	-0.7	11720.0
2879. COCC*OOJ=CH3OCH2+CO2	4.40E+15	0.0	10500.0
2880. COC*OCOJ=CH2O+CH3OCO	5.87E+20	-2.4	10540.0
2881. C*OOC*O+OH=>HCO+CO2+H2O	3.16E+07	1.8	934.0
2882. C*OOC*O+HO2=>HCO+CO2+H2O2	9.64E+03	2.6	13910.0
2883. C*OOCC*O+OH=>CO2+CH2CHO+H2O	1.58E+07	1.8	934.0
2884. C*OOCC*O+HO2=>CO2+CH2CHO+H2O2	4.82E+03	2.6	13910.0
2885. C*OOCC*O+OH=>CH2CO+OCHO+H2O	3.37E+12	0.0	-619.0
2886. C*OOCC*O+HO2=>CH2CO+OCHO+H2O2	3.01E+12	0.0	11920.0
2887. COC*OC*O+OH=>CH3OCO+CO+H2O	2.90E+11	0.0	-1029.0
2888. COC*OC*O+HO2=>CH3OCO+CO+H2O2	1.66E-04	4.0	301.4
2889. COC*OC*O=>CH3OCO+HCO	2.85E+53	-11.5	84210.0
2890. DCC_13+OH=>CO2+COCCJ*O+H2O	3.16E+07	1.8	934.0
2891. DCC_13+HO2=>CO2+COCCJ*O+H2O2	4.82E+03	2.6	13910.0
2892. DCC_14+OH=>CO2+COC*OCJ+H2O	3.16E+07	1.8	934.0
2893. DCC_14+HO2=>CO2+COC*OCJ+H2O2	4.82E+03	2.6	13910.0
2894. DCC_34=CH3OCO+CH3OCO	2.85E+53	-11.5	84210.0
2895. COCCOCOOJ+COCCOCJ=COCCOCOJ+COCCOCOJ	7.00E+12	0.0	-1000.0
2896. COCCOCOOJ+COCCJOC=COCCOCOJ+COCC(OJ)OC	7.00E+12	0.0	-1000.0
2897. COCC(OOJ)OC+COCCJOC=COCC(OJ)OC+COCC(OJ)OC	7.00E+12	0.0	-1000.0
2898. COCC(OOJ)OC+COCCOCJ=COCCOCOJ+COCC(OJ)OC	7.00E+12	0.0	-1000.0
2899. COCCOCOOJ+HO2=COCCOCOOH+O2	1.75E+10	0.0	-3275.0
2900. COCC(OOJ)OC+HO2=COCC(OOH)OC+O2	1.75E+10	0.0	-3275.0
2901. COCCOCOOJ+H2O2=COCCOCOOH+HO2	2.40E+12	0.0	10000.0
2902. COCC(OOJ)OC+H2O2=COCC(OOH)OC+HO2	2.40E+12	0.0	10000.0
2903. COCCOCOOJ+CH3O2=COCCOCOJ+CH3O+O2	1.40E+16	-1.6	1860.0
2904. COCC(OOJ)OC+CH3O2=COCC(OJ)OC+CH3O+O2	1.40E+16	-1.6	1860.0
2905. COCCOCOOJ+COCCOCOOJ=COCCOCOJ+COCCOCOJ+O2	1.40E+16	-1.6	1860.0
2906. COCC(OOJ)OC+COCC(OOJ)OC	1.40E+16	-1.6	1860.0
=COCC(OJ)OC+COCC(OJ)OC+O2			
2907. COCCOCOOJ+COCC(OOJ)OC=COCCOCOJ+COCC(OJ)OC+O2	1.40E+16	-1.6	1860.0
2908. COCCOCOOH=COCCOCOJ+OH	1.26E+16	0.0	42500.0
2909. COCC(OOH)OC=COCC(OJ)OC+OH	1.26E+16	0.0	42500.0
2910. C*COCOOH=C*COCOJ+OH	1.50E+16	0.0	42000.0
2911. HOOCOCC*O=OJCOCC*O+OH	1.50E+16	0.0	42000.0
2912. COC(OOH)C*O=COC(OJ)C*O+OH	1.50E+16	0.0	42000.0
2913. COC*COOH=COC*COJ+OH	1.50E+16	0.0	42000.0
2914. COCCOCOJ=COCCOJ+CH2O	1.00E+11	0.0	100000.0
2915. COCCOCOJ=COCCOC*O+H	3.30E+13	0.0	26140.0
2916. COCC(OJ)OC=COCC*O+CH3O	5.33E+19	-1.7	17140.0
2917. COCC(OJ)OC=CH3OCH2+CH3OCHO	5.33E+19	-1.7	17140.0
2918. C*COCOJ=>CH2CHO+CH2O	6.50E+29	-5.4	26650.0
2919. OJCOCC*O=CH2O+CH2O+HCO	1.00E+11	0.0	100000.0
2920. COC(OJ)C*O=CH3O+(CHO)2	5.33E+19	-1.7	17140.0
2921. COC(OJ)C*O=CH3OCHO+HCO	5.33E+19	-1.7	17140.0
2922. COC*COJ=CH3O+CHCHO	1.00E+11	0.0	100000.0
2923. COCCOC*O+H=COCCOCJ*O+H2	6.50E+05	2.4	4471.0
2924. COCCOC*O+OH=COCCOCJ*O+H2O	1.58E+07	1.8	934.0
2925. COCCOC*O+HO2=COCCOCJ*O+H2O2	4.82E+03	2.6	13910.0
2926. COCCOC*O+H=COCCJOC*O+H2	6.65E+05	2.5	6756.0
2927. COCCOC*O+OH=COCCJOC*O+H2O	5.27E+09	1.0	1586.0
2928. COCCOC*O+HO2=COCCJOC*O+H2O2	2.38E+04	2.5	16490.0
2929. COCCOC*O+H=COCJCOC*O+H2	3.67E+06	2.2	3600.0
2930. COCCOC*O+OH=COCJCOC*O+H2O	7.53E+02	2.9	-4040.0
2931. COCCOC*O+HO2=COCJCOC*O+H2O2	3.62E-01	4.0	9057.0
2932. COCCOC*O+H=CJOCCOC*O+H2	3.11E+05	2.6	4170.0
2933. COCCOC*O+OH=CJOCCOC*O+H2O	2.00E+07	1.8	30.0
2934. COCCOC*O+HO2=CJOCCOC*O+H2O2	8.40E+02	0.0	17690.0
2935. COCCOCJ*O=COCCJ+CO2	8.69E+17	-1.8	13656.7
Rate coefficients at P=5.00E-02(atm)	9.72E+12	-1.3	9416.7
Rate coefficients at P=1.00E+00(atm)	1.25E+16	-1.8	11340.8
Rate coefficients at P=1.00E+01(atm)	1.04E+18	-2.1	12826.9
Rate coefficients at P=1.00E+02(atm)	8.69E+17	-1.8	13656.7
2936. COCCOCJ*O=COCCOJ+CO	2.83E+22	-3.4	23592.4
Rate coefficients at P=5.00E-02(atm)	1.03E+03	1.3	25401.0
Rate coefficients at P=1.00E+00(atm)	4.09E+05	0.8	21969.1
Rate coefficients at P=1.00E+01(atm)	9.02E+14	-1.7	21767.5
Rate coefficients at P=1.00E+02(atm)	2.83E+22	-3.4	23592.4
2937. COCCJOC*O=CH3O+C*COC*O	1.47E+47	-11.5	28990.0
Rate coefficients at P=1.00E-02(atm)	1.47E+47	-11.5	28990.0
Rate coefficients at P=1.00E-01(atm)	1.84E+48	-11.4	31120.0
Rate coefficients at P=1.00E+00(atm)	5.95E+47	-10.9	32930.0
Rate coefficients at P=1.00E+01(atm)	1.12E+42	-8.9	32530.0
Rate coefficients at P=1.00E+02(atm)	4.91E+33	-6.1	30510.0
2938. COCCJOC*O=HCO+COCC*O	2.82E+46	-11.4	29610.0
Rate coefficients at P=1.00E-02(atm)	2.82E+46	-11.4	29610.0
Rate coefficients at P=1.00E-01(atm)	2.51E+48	-11.6	32120.0
Rate coefficients at P=1.00E+00(atm)	6.68E+48	-11.3	34440.0
Rate coefficients at P=1.00E+01(atm)	4.03E+43	-9.3	34460.0
Rate coefficients at P=1.00E+02(atm)	1.47E+35	-6.5	32610.0
2939. COCJCOC*O=COC*C+OCHO	1.47E+47	-11.5	28990.0
Rate coefficients at P=1.00E-02(atm)	1.47E+47	-11.5	28990.0
Rate coefficients at P=1.00E-01(atm)	1.84E+48	-11.4	31120.0
Rate coefficients at P=1.00E+00(atm)	5.95E+47	-10.9	32930.0
Rate coefficients at P=1.00E+01(atm)	1.12E+42	-8.9	32530.0
Rate coefficients at P=1.00E+02(atm)	4.91E+33	-6.1	30510.0
2940. COCJCOC*O=C*OOCC*O+CH3	2.82E+46	-11.4	29610.0
Rate coefficients at P=1.00E-02(atm)	2.82E+46	-11.4	29610.0
Rate coefficients at P=1.00E-01(atm)	2.51E+48	-11.6	32120.0

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      Rate coefficients at P=1.00E+00(atm)          6.68E+48  -11.3    34440.0
      Rate coefficients at P=1.00E+01(atm)          4.03E+43   -9.3    34460.0
      Rate coefficients at P=1.00E+02(atm)          1.47E+35   -6.5    32610.0
2941. CJOCCOC*O=CH2O+C*OOCCJ                         1.09E+47  -11.1    33990.0
      Rate coefficients at P=1.00E-02(atm)          1.09E+47  -11.1    33990.0
      Rate coefficients at P=1.00E-01(atm)          2.77E+42   -9.4    34220.0
      Rate coefficients at P=1.00E+00(atm)          7.93E+33   -6.5    32270.0
      Rate coefficients at P=1.00E+01(atm)          8.58E+24   -3.7    29360.0
      Rate coefficients at P=1.00E+02(atm)          4.95E+17   -1.5    26490.0
2942. C*OOCCJ=C2H4+OCHO                              1.34E+13   -0.4    24610.0
2943. C*COC*O+OH=>C2H3+CO2+H2O                       1.58E+07    1.8      934.0
2944. C*COC*O+HO2=>C2H3+CO2+H2O2                     4.82E+03    2.6    13910.0
2945. COCC*OOC+H=COCC*OOCJ+H2                        6.65E+05    2.5     6756.0
2946. COCC*OOC+OH=COCC*OOCJ+H2O                      5.27E+09    1.0     1586.0
2947. COCC*OOC+HO2=COCC*OOCJ+H2O2                    2.38E+04    2.5    16490.0
2948. COCC*OOC+H=COCJC*OOC+H2                        3.67E+06    2.2     3600.0
2949. COCC*OOC+OH=COCJC*OOC+H2O                      7.53E+02    2.9    -4040.0
2950. COCC*OOC+HO2=COCJC*OOC+H2O2                    3.62E-01    4.0     9057.0
2951. COCC*OOC+H=CJOCC*OOC+H2                        3.11E+05    2.6     4170.0
2952. COCC*OOC+OH=CJOCC*OOC+H2O                      2.00E+07    1.8       30.0
2953. COCC*OOC+HO2=CJOCC*OOC+H2O2                    8.40E+02    0.0    17690.0
2954. COCCJ*O+CH2O=COCC*OOCJ                         1.50E+11    0.0    11900.0
2955. CH3OCHCO+CH3O=COCJC*OOC                        5.00E+11    0.0    -1000.0
2956. COCJC*OOC=COC*OC*O+CH3                         1.00E+12    0.5    12140.0
2957. CJOCC*OOC=COC*OCJ+CH2O                         6.61E+27   -4.7    29740.0
      Rate coefficients at P=1.00E-02(atm)          7.49E+23   -4.5    25236.1
      Rate coefficients at P=1.00E-01(atm)          6.92E+28   -5.7    27494.9
      Rate coefficients at P=1.00E+00(atm)          4.23E+29   -5.6    28898.3
      Rate coefficients at P=1.00E+01(atm)          6.61E+27   -4.7    29735.2
      Rate coefficients at P=1.00E+02(atm)          2.66E+29   -4.9    31785.5
2958. CH2CO+CH3O=COC*OCJ                             5.00E+11    0.0    -1000.0
2959. CH3OCO=CH3O+CO                                 8.69E+17   -1.8    13656.7
      Rate coefficients at P=5.00E-02(atm)          1.03E+03    1.3    25401.0
      Rate coefficients at P=1.00E+00(atm)          4.09E+05    0.8    21969.1
      Rate coefficients at P=1.00E+01(atm)          9.02E+14   -1.7    21767.5
      Rate coefficients at P=1.00E+02(atm)          2.83E+22   -3.4    23592.4
2960. CH3OCO=CH3+CO2                                 8.69E+17   -1.8    13656.7
      Rate coefficients at P=5.00E-02(atm)          9.72E+12   -1.3     9416.7
      Rate coefficients at P=1.00E+00(atm)          1.25E+16   -1.8    11340.8
      Rate coefficients at P=1.00E+01(atm)          1.04E+18   -2.1    12826.9
      Rate coefficients at P=1.00E+02(atm)          8.69E+17   -1.8    13656.7

 UNITS for the preceding reactions (unless otherwise noted):
       A units mole-cm-sec-K, E units cal/mol
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Maxence LAILLIAU

Etude expérimentale et modélisation cinétique de la combustion de composés modèles de biocarburants. Détermination d'intermédiaires par spectrométrie de masse à photo-ionisation par rayonnement synchrotron

Résumé :

Avec l'épuisement des ressources en combustible fossile, la recherche de nouveaux carburants alternatifs tels que les biocarburants produit à partir de biomasse s'est intensifiée. Une grande variété de composés peut être produite par traitement de cette biomasse. Les éthers en font partie et peuvent être utilisés comme additifs aux carburants classiques ou comme carburant. A cette fin, il faut disposer d'une meilleure connaissance de la cinétique chimique d'oxydation de ces composés qui diffèrent des carburants conventionnels par la présence d'atomes d'oxygène dans leur structure, rendant la chimie plus complexe. Cette thèse a pour objectif de développer des mécanismes cinétiques d'oxydation d'éthers simples à partir de données expérimentales obtenues en réacteur auto-agité par jets gazeux. L'oxydation de quatre éthers à pression atmosphérique et haute pression (10 atm) a été étudiée sur un large domaine de température (450 - 1250 K) dans différentes conditions de richesse de mélange (0,5 à 4). Les profils de fraction molaire des réactifs, produits de combustion et intermédiaires réactionnels stables ont été mesurés par chromatographie en phase gazeuse, spectrométrie infra-rouge ou spectrométrie de masse à photo-ionisation par rayonnement synchrotron. Les résultats ainsi obtenus ont ensuite servi de base pour valider des mécanismes cinétique modélisant l'oxydation de ces espèces dont l'accord avec les mesures est globalement satisfaisant pour des composés pour lesquels peu d'études sont disponibles.

Mots clés : cinétique, biocarburant, oxydation, réacteur auto-agité, combustion, modélisation, éthers

Experimental study and kinetic modeling of the combustion of biofuel. Determination of intermediates by photoionization mass spectrometry using synchrotron radiation

Abstract :

With the depletion of fossil fuel resources, the search for new alternatives such as biofuels produced from biomass has intensified. A wide variety of compounds can be produced by treating this biomass. Ethers are one of them and can be used as additives to conventional fuels or as fuel. To this end, it is necessary to have a better knowledge of the kinetics of the oxidation of these compounds which differ from conventional fuels by the presence of oxygen atoms in their structure, making the chemistry more complex. This thesis aims to develop kinetic mechanisms of the oxidation of simple ethers based on experimental data obtained in jet stirred reactor. The oxidation of four ethers at atmospheric pressure and high pressure (10 atm) was studied over a wide range of temperatures (450 - 1250 K) under different equivalence ratios (0.5 to 4). The mole fraction profiles of the reactants, products of combustion and main stable intermediates were measured by gas chromatography, infra-red spectrometry or photoionization mass spectrometry using synchrotron radiation. The results thus obtained then served as a basis for validating kinetic mechanisms modeling the oxidation of these species whose agreement with the measurements is globally satisfactory for compounds for which few studies are available.

Key words: kinetics, biofuel, oxidation, jet stirred reactor, combustion, modeling, ether

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