Number	Reaction				A	n	E	Ref.
1f	$H + O_2$	$\rightleftharpoons$	$OH + O$		3.520E+16	-0.70	71.4	[1]
2f	$H_2 + O$	$\rightleftharpoons$	$OH + H$		5.060E+04	2.67	26.3	[1]
3f	$H_2 + OH$	$\rightleftharpoons$	$H_2O + H$		1.170E+09	1.30	15.2	[1]
4f	$H_2O + O$	$\rightleftharpoons$	$2\ OH$		7.000E+05	2.33	60.9	[2]
5f[a]	$2\ H + M^{(1)}$	$\rightleftharpoons$	$H_2 + M^{(1)}$		1.300E+18	-1.00	0	[3]
6f[a]	$H + OH + M^{(2)}$	$\rightleftharpoons$	$H_2O + M^{(2)}$		4.000E+22	-2.00	0	[3]
7f[a]	$2\ O + M^{(3)}$	$\rightleftharpoons$	$O_2 + M^{(3)}$		6.170E+15	-0.50	0	[3]
8f[a]	$H + O + M^{(4)}$	$\rightleftharpoons$	$OH + M^{(4)}$		4.710E+18	-1.00	0	[3]
9f[a]	$O + OH + M^{(4)}$	$\rightleftharpoons$	$HO_2 + M^{(4)}$		8.000E+15	0.00	0	[3]
10f[a,b]	$H + O_2 + M^{(5)}$	$\rightleftharpoons$	$HO_2 + M^{(5)}$	k_0	5.750E+19	-1.40	0	[4, 3]
				k_∞	4.650E+12	0.44	0	
11f	$HO_2 + H$	$\rightleftharpoons$	$2\ OH$		7.080E+13	0.00	1.23	[5]
12f	$HO_2 + H$	$\rightleftharpoons$	$H_2 + O_2$		1.660E+13	0.00	3.44	[5]
13f	$HO_2 + H$	$\rightleftharpoons$	$H_2O + O$		3.100E+13	0.00	7.2	[1]
14f	$HO_2 + O$	$\rightleftharpoons$	$OH + O_2$		2.000E+13	0.00	0	[6]
15f	$HO_2 + OH$	$\rightleftharpoons$	$H_2O + O_2$		7.000E+12	0.00	-4.58	[7]
				DUPLICATE	4.500E+14	0.00	45.7	
16f[a,b]	$2\ OH + M^{(6)}$	$\rightleftharpoons$	$H_2O_2 + M^{(6)}$	k_0	2.760E+25	-3.20	0	[7]
				k_∞	9.550E+13	-0.27	0	
17f	$2\ HO_2$	$\rightleftharpoons$	$H_2O_2 + O_2$		1.030E+14	0.00	46.2	[2]
				DUPLICATE	1.940E+11	0.00	-5.89	
18f	$H_2O_2 + H$	$\rightleftharpoons$	$HO_2 + H_2$		2.300E+13	0.00	33.3	[8]
19f	$H_2O_2 + H$	$\rightleftharpoons$	$H_2O + OH$		1.000E+13	0.00	15	[9]
20f	$H_2O_2 + OH$	$\rightleftharpoons$	$H_2O + HO_2$		1.740E+12	0.00	6	[2]
				DUPLICATE	7.590E+13	0.00	30.4	
21f	$H_2O_2 + O$	$\rightleftharpoons$	$HO_2 + OH$		9.630E+06	2.00	16.7	[1]
a21f[a,b]	$CO + O + M^{(11)}$	$\rightleftharpoons$	$CO_2 + M^{(11)}$	k_0	1.550E+24	-2.79	17.5	[8]
				k_∞	1.800E+11	0.00	9.97	
22f	$CO + OH$	$\rightleftharpoons$	$CO_2 + H$		4.400E+06	1.50	-3.1	[1]
23f	$CO + HO_2$	$\rightleftharpoons$	$CO_2 + OH$		2.000E+13	0.00	96	[8]
24f	$CO + O_2$	$\rightleftharpoons$	$CO_2 + O$		1.000E+12	0.00	200	[3]
25f[a]	$HCO + M^{(7)}$	$\rightleftharpoons$	$CO + H + M^{(7)}$		1.860E+17	-1.00	71.1	[10]
26f	$HCO + H$	$\rightleftharpoons$	$CO + H_2$		5.000E+13	0.00	0	[11]
27f	$HCO + O$	$\rightleftharpoons$	$CO + OH$		3.000E+13	0.00	0	[1]
28f	$HCO + O$	$\rightleftharpoons$	$CO_2 + H$		3.000E+13	0.00	0	[1]
29f	$HCO + OH$	$\rightleftharpoons$	$CO + H_2O$		3.000E+13	0.00	0	[12]

Number	Reaction				A	n	E	Ref.
30f	$HCO + O_2$	$\rightleftharpoons$	$CO + HO_2$		7.580E+12	0.00	1.72	[11]
31f	$HCO + CH_3$	$\rightleftharpoons$	$CO + CH_4$		5.000E+13	0.00	0	[11]
32f^{a,b}	$H + HCO + M^{(8)}$	$\rightleftharpoons$	$CH_2O + M^{(8)}$	k_0	1.350E+24	-2.57	1.78	[13]
				k_∞	1.090E+12	0.48	-1.09	
33f	$CH_2O + H$	$\rightleftharpoons$	$HCO + H_2$		5.740E+07	1.90	11.5	[14]
34f	$CH_2O + O$	$\rightleftharpoons$	$HCO + OH$		3.500E+13	0.00	14.7	[1]
35f	$CH_2O + OH$	$\rightleftharpoons$	$HCO + H_2O$		3.900E+10	0.89	1.7	[1]
36f	$CH_2O + O_2$	$\rightleftharpoons$	$HCO + HO_2$		6.000E+13	0.00	170	[15]
37f	$CH_2O + HO_2$	$\rightleftharpoons$	$HCO + H_2O_2$		4.110E+04	2.50	42.7	[16]
38f	$CH_4 + H$	$\rightleftharpoons$	$H_2 + CH_3$		1.300E+04	3.00	33.6	[17]
39f	$CH_4 + OH$	$\rightleftharpoons$	$H_2O + CH_3$		1.600E+07	1.83	11.6	[17]
40f	$CH_4 + O$	$\rightleftharpoons$	$CH_3 + OH$		1.900E+09	1.44	36.3	[18]
41f	$CH_4 + O_2$	$\rightleftharpoons$	$CH_3 + HO_2$		3.980E+13	0.00	238	[10, 19]
42f	$CH_4 + HO_2$	$\rightleftharpoons$	$CH_3 + H_2O_2$		9.030E+12	0.00	103	[10, 19]
43f	$CH_3 + H$	$\rightleftharpoons$	$T\text{-}CH_2 + H_2$		1.800E+14	0.00	63.2	[18]
44f	$CH_3 + H$	$\rightleftharpoons$	$S\text{-}CH_2 + H_2$		1.550E+14	0.00	56.4	[18]
45f	$CH_3 + OH$	$\rightleftharpoons$	$S\text{-}CH_2 + H_2O$		4.000E+13	0.00	10.5	[20, 11]
46f	$CH_3 + O$	$\rightleftharpoons$	$CH_2O + H$		8.430E+13	0.00	0	[18]
47f	$CH_3 + T\text{-}CH_2$	$\rightleftharpoons$	$C_2H_4 + H$		4.220E+13	0.00	0	[15]
48f	$CH_3 + HO_2$	$\rightleftharpoons$	$CH_3O + OH$		5.000E+12	0.00	0	[15]
49f	$CH_3 + O_2$	$\rightleftharpoons$	$CH_2O + OH$		3.300E+11	0.00	37.4	[21]
50f	$CH_3 + O_2$	$\rightleftharpoons$	$CH_3O + O$		1.100E+13	0.00	116	[21]
51f	$2\ CH_3$	$\rightleftharpoons$	$C_2H_4 + H_2$		1.000E+14	0.00	134	[22]
52f	$2\ CH_3$	$\rightleftharpoons$	$C_2H_5 + H$		3.160E+13	0.00	61.5	[23]
53f^{a,b}	$H + CH_3 + M^{(9)}$	$\rightleftharpoons$	$CH_4 + M^{(9)}$	k_0	2.470E+33	-4.76	10.2	[11]
				k_∞	1.270E+16	-0.63	1.6	
54f^{a,b}	$2\ CH_3 + M^{(8)}$	$\rightleftharpoons$	$C_2H_6 + M^{(8)}$	k_0	1.270E+41	-7.00	11.6	[17]
				k_∞	1.810E+13	0.00	0	
55f	$S\text{-}CH_2 + OH$	$\rightleftharpoons$	$CH_2O + H$		3.000E+13	0.00	0	[18]
56f	$S\text{-}CH_2 + O_2$	$\rightleftharpoons$	$CO + OH + H$		3.130E+13	0.00	0	[18]
57f	$S\text{-}CH_2 + CO_2$	$\rightleftharpoons$	$CO + CH_2O$		3.000E+12	0.00	0	[24]
58f^{a}	$S\text{-}CH_2 + M^{(10)}$	$\rightleftharpoons$	$T\text{-}CH_2 + M^{(10)}$		6.000E+12	0.00	0	[18]
59f	$T\text{-}CH_2 + H$	$\rightleftharpoons$	$CH + H_2$		6.020E+12	0.00	-7.48	[15]
60f	$T\text{-}CH_2 + OH$	$\rightleftharpoons$	$CH_2O + H$		2.500E+13	0.00	0	[18]
61f	$T\text{-}CH_2 + OH$	$\rightleftharpoons$	$CH + H_2O$		1.130E+07	2.00	12.6	[18]
62f	$T\text{-}CH_2 + O$	$\rightleftharpoons$	$CO + 2\ H$		8.000E+13	0.00	0	[25]

Number	Reaction				A	n	E	Ref.
63f	$T\text{-}CH_2 + O$	$\rightleftharpoons$	$CO + H_2$		4.000E+13	0.00	0	[25]
64f	$T\text{-}CH_2 + O_2$	$\rightleftharpoons$	$CO_2 + H_2$		2.630E+12	0.00	6.24	[24]
65f	$T\text{-}CH_2 + O_2$	$\rightleftharpoons$	$CO + OH + H$		6.580E+12	0.00	6.24	[24]
66f	$2\ T\text{-}CH_2$	$\rightleftharpoons$	$C_2H_2 + 2\ H$		1.000E+14	0.00	0	[18]
67f	$CH + O$	$\rightleftharpoons$	$CO + H$		4.000E+13	0.00	0	[26]
68f	$CH + O_2$	$\rightleftharpoons$	$HCO + O$		1.770E+11	0.76	-2	[27]
69f	$CH + H_2O$	$\rightleftharpoons$	$CH_2O + H$		1.170E+15	-0.75	0	[24]
70f	$CH + CO_2$	$\rightleftharpoons$	$HCO + CO$		4.800E+01	3.22	-13.5	[27]
71f	$CH_3O + H$	$\rightleftharpoons$	$CH_2O + H_2$		2.000E+13	0.00	0	[28]
72f	$CH_3O + H$	$\rightleftharpoons$	$S\text{-}CH_2 + H_2O$		1.600E+13	0.00	0	[28]
73f	$CH_3O + OH$	$\rightleftharpoons$	$CH_2O + H_2O$		5.000E+12	0.00	0	[28]
74f	$CH_3O + O$	$\rightleftharpoons$	$OH + CH_2O$		1.000E+13	0.00	0	[28]
75f	$CH_3O + O_2$	$\rightarrow$	$CH_2O + HO_2$		4.280E-13	7.60	-14.8	[28]
76f[a]	$CH_3O + M^{(9)}$	$\rightleftharpoons$	$CH_2O + H + M^{(9)}$		7.780E+13	0.00	56.5	[11]
77f	$C_2H_6 + H$	$\rightleftharpoons$	$C_2H_5 + H_2$		5.400E+02	3.50	21.8	[18]
78f	$C_2H_6 + O$	$\rightleftharpoons$	$C_2H_5 + OH$		1.400E+00	4.30	11.6	[18]
79f	$C_2H_6 + OH$	$\rightleftharpoons$	$C_2H_5 + H_2O$		2.200E+07	1.90	4.7	[18]
80f	$C_2H_6 + CH_3$	$\rightleftharpoons$	$C_2H_5 + CH_4$		5.500E-01	4.00	34.7	[18]
81f[a,b]	$C_2H_6 + M^{(8)}$	$\rightleftharpoons$	$C_2H_5 + H + M^{(8)}$	k_0	4.900E+42	-6.43	448	[17, 13, 11]
				k_∞	8.850E+20	-1.23	428	
82f	$C_2H_6 + HO_2$	$\rightleftharpoons$	$C_2H_5 + H_2O_2$		1.320E+13	0.00	85.6	[15, 11]
83f	$C_2H_5 + H$	$\rightleftharpoons$	$C_2H_4 + H_2$		3.000E+13	0.00	0	[18]
84f	$C_2H_5 + O$	$\rightleftharpoons$	$C_2H_4 + OH$		3.060E+13	0.00	0	[18]
85f	$C_2H_5 + O$	$\rightleftharpoons$	$CH_3 + CH_2O$		4.240E+13	0.00	0	[18]
86f	$C_2H_5 + O_2$	$\rightleftharpoons$	$C_2H_4 + HO_2$		7.500E+14	-1.00	20.1	[29]
a86f	$C_2H_5 + O_2$	$\rightleftharpoons$	C_2H_4OOH		2.000E+12	0.00	0	[29]
b86f	C_2H_4OOH	$\rightleftharpoons$	$C_2H_4 + HO_2$		4.000E+34	-7.20	96.2	[29]
c86f	$C_2H_4OOH + O_2$	$\rightleftharpoons$	$OC_2H_3OOH + OH$		7.500E+05	1.30	-24.3	[29]
d86f	OC_2H_3OOH	$\rightleftharpoons$	$CH_2O + HCO + OH$		1.000E+15	0.00	180	[29]
87f[a,b]	$C_2H_5 + M^{(9)}$	$\rightleftharpoons$	$C_2H_4 + H + M^{(9)}$	k_0	3.990E+33	-4.99	167	[30, 11]
				k_∞	1.110E+10	1.04	154	
88f	$C_2H_4 + H$	$\rightleftharpoons$	$C_2H_3 + H_2$		4.490E+07	2.12	55.9	[31]
89f	$C_2H_4 + OH$	$\rightleftharpoons$	$C_2H_3 + H_2O$		5.530E+05	2.31	12.4	[31]
90f	$C_2H_4 + O$	$\rightleftharpoons$	$CH_3 + HCO$		2.250E+06	2.08	0	[15]
91f	$C_2H_4 + O$	$\rightleftharpoons$	$CH_2CHO + H$		1.210E+06	2.08	0	[15]
92f	$2\ C_2H_4$	$\rightleftharpoons$	$C_2H_3 + C_2H_5$		5.010E+14	0.00	271	[32]

Number	Reaction				A	n	E	Ref.
93f	$C_2H_4 + O_2$	$\rightleftharpoons$	$C_2H_3 + HO_2$		4.220E+13	0.00	241	[33]
94f	$C_2H_4 + HO_2$	$\rightleftharpoons$	$C_2H_4O + OH$		2.230E+12	0.00	71.9	[15]
95f	$C_2H_4O + HO_2$	$\rightleftharpoons$	$CH_3 + CO + H_2O_2$		4.000E+12	0.00	71.2	[15]
96f^a	$C_2H_4 + M^{(9)}$	$\rightleftharpoons$	$C_2H_3 + H + M^{(9)}$		2.600E+17	0.00	404	[34, 11]
97f^a	$C_2H_4 + M^{(9)}$	$\rightleftharpoons$	$C_2H_2 + H_2 + M^{(9)}$		3.500E+16	0.00	299	[34, 11]
98f	$C_2H_3 + H$	$\rightleftharpoons$	$C_2H_2 + H_2$		4.000E+13	0.00	0	[11]
99f^{a,b}	$C_2H_3 + M^{(9)}$	$\rightleftharpoons$	$C_2H_2 + H + M^{(9)}$	k_0	1.510E+14	0.10	137	[35, 11]
				k_∞	6.380E+09	1.00	157	
100f	$C_2H_3 + O_2$	$\rightleftharpoons$	$CH_2O + HCO$		1.700E+29	-5.31	27.2	[36]
101f	$C_2H_3 + O_2$	$\rightleftharpoons$	$CH_2CHO + O$		7.000E+14	-0.61	22	[35, 36]
102f	$C_2H_3 + O_2$	$\rightleftharpoons$	$C_2H_2 + HO_2$		5.190E+15	-1.26	13.9	[35, 36]
103f	$C_2H_2 + O$	$\rightleftharpoons$	$HCCO + H$		4.000E+14	0.00	44.6	[25]
104f	$C_2H_2 + O$	$\rightleftharpoons$	T-$CH_2 + CO$		1.600E+14	0.00	41.4	[25]
105f	$C_2H_2 + O_2$	$\rightleftharpoons$	$CH_2O + CO$		4.600E+15	-0.54	188	[37]
106f	$C_2H_2 + OH$	$\rightleftharpoons$	$CH_2CO + H$		1.900E+07	1.70	4.18	[10, 38]
107f	$C_2H_2 + OH$	$\rightleftharpoons$	$C_2H + H_2O$		3.370E+07	2.00	58.6	[10, 38]
108f	$CH_2CO + H$	$\rightleftharpoons$	$CH_3 + CO$		1.500E+09	1.43	11.2	[39]
109f	$CH_2CO + O$	$\rightleftharpoons$	T-$CH_2 + CO_2$		2.000E+13	0.00	9.6	[10, 38]
110f	$CH_2CO + O$	$\rightleftharpoons$	$HCCO + OH$		1.000E+13	0.00	8.37	[10, 38]
111f	$CH_2CO + CH_3$	$\rightleftharpoons$	$C_2H_5 + CO$		9.000E+10	0.00	0	[10, 38]
112f	$HCCO + H$	$\rightleftharpoons$	S-$CH_2 + CO$		1.500E+14	0.00	0	[25]
113f	$HCCO + OH$	$\rightleftharpoons$	$HCO + CO + H$		2.000E+12	0.00	0	[40]
114f	$HCCO + O$	$\rightleftharpoons$	$2\ CO + H$		9.640E+13	0.00	0	[25]
115f	$HCCO + O_2$	$\rightleftharpoons$	$2\ CO + OH$		2.880E+07	1.70	4.19	[35]
116f	$HCCO + O_2$	$\rightleftharpoons$	$CO_2 + CO + H$		1.400E+07	1.70	4.19	[35]
117f	$C_2H + OH$	$\rightleftharpoons$	$HCCO + H$		2.000E+13	0.00	0	[18, 38]
118f	$C_2H + O$	$\rightleftharpoons$	$CO + CH$		1.020E+13	0.00	0	[18, 38]
119f	$C_2H + O_2$	$\rightleftharpoons$	$HCCO + O$		6.020E+11	0.00	0	[18, 38]
120f	$C_2H + O_2$	$\rightleftharpoons$	$CH + CO_2$		4.500E+15	0.00	105	[18, 38]
121f	$C_2H + O_2$	$\rightleftharpoons$	$HCO + CO$		2.410E+12	0.00	0	[18, 38]
122f	$CH_2OH + H$	$\rightleftharpoons$	$CH_2O + H_2$		3.000E+13	0.00	0	[28]
123f	$CH_2OH + H$	$\rightleftharpoons$	$CH_3 + OH$		2.500E+17	-0.93	21.5	[11]
124f	$CH_2OH + OH$	$\rightleftharpoons$	$CH_2O + H_2O$		2.400E+13	0.00	0	[28]
125f	$CH_2OH + O_2$	$\rightleftharpoons$	$CH_2O + HO_2$		5.000E+12	0.00	0	[28]
126f^a	$CH_2OH + M^{(9)}$	$\rightleftharpoons$	$CH_2O + H + M^{(9)}$		5.000E+13	0.00	105	[28]
127f^a	$CH_3O + M^{(9)}$	$\rightleftharpoons$	$CH_2OH + M^{(9)}$		1.000E+14	0.00	80	[28]

Number	Reaction				A	n	E	Ref.
128f	$CH_2CO + OH$	$\rightleftharpoons$	$CH_2OH + CO$		1.020E+13	0.00	0	[28]
129f	$CH_3OH + OH$	$\rightleftharpoons$	$CH_2OH + H_2O$		1.440E+06	2.00	-3.51	[28]
130f	$CH_3OH + OH$	$\rightleftharpoons$	$CH_3O + H_2O$		4.400E+06	2.00	6.3	[11]
131f	$CH_3OH + H$	$\rightleftharpoons$	$CH_2OH + H_2$		1.354E+03	3.20	14.6	[41]
132f	$CH_3OH + H$	$\rightleftharpoons$	$CH_3O + H_2$		6.830E+01	3.40	30.3	[41]
133f	$CH_3OH + O$	$\rightleftharpoons$	$CH_2OH + OH$		3.880E+05	2.50	12.9	[42]
134f	$CH_3OH + HO_2$	$\rightleftharpoons$	$CH_2OH + H_2O_2$		8.000E+13	0.00	81.1	[43, 44]
135f	$CH_3OH + O_2$	$\rightleftharpoons$	$CH_2OH + HO_2$		2.000E+13	0.00	188	[28]
136f^{a,b}	$CH_3OH + M^{(9)}$	$\rightleftharpoons$	$CH_3 + OH + M^{(9)}$	k_0	2.950E+44	-7.35	399	[45, 11]
				k_∞	1.900E+16	0.00	384	
137f	CH_2CHO	$\rightleftharpoons$	$CH_2CO + H$		1.047E+37	-7.19	186	[33]
138f	$CH_2CHO + H$	$\rightleftharpoons$	$CH_3 + HCO$		5.000E+13	0.00	0	[14]
139f	$CH_2CHO + H$	$\rightleftharpoons$	$CH_2CO + H_2$		2.000E+13	0.00	0	[14]
140f	$CH_2CHO + O$	$\rightleftharpoons$	$CH_2O + HCO$		1.000E+14	0.00	0	[14]
141f	$CH_2CHO + OH$	$\rightleftharpoons$	$CH_2CO + H_2O$		3.000E+13	0.00	0	[14]
142f	$CH_2CHO + O_2$	$\rightleftharpoons$	$CH_2O + CO + OH$		3.000E+10	0.00	0	[14]
143f	$CH_2CHO + CH_3$	$\rightleftharpoons$	$C_2H_5 + CO + H$		4.900E+14	-0.50	0	[14]
144f	$CH_2CHO + HO_2$	$\rightleftharpoons$	$CH_2O + HCO + OH$		7.000E+12	0.00	0	[14]
145f	$CH_2CHO + HO_2$	$\rightleftharpoons$	$CH_3CHO + O_2$		3.000E+12	0.00	0	[14]
146f	CH_2CHO	$\rightleftharpoons$	$CH_3 + CO$		1.170E+43	-9.80	183	[14]
147f	CH_3CHO	$\rightleftharpoons$	$CH_3 + HCO$		7.000E+15	0.00	342	[14]
148f^{a,b}	$CH_3CO + M^{(9)}$	$\rightleftharpoons$	$CH_3 + CO + M^{(9)}$	k_0	1.200E+15	0.00	52.3	[14]
				k_∞	3.000E+12	0.00	69.9	
149f	$CH_3CHO + OH$	$\rightleftharpoons$	$CH_3CO + H_2O$		3.370E+12	0.00	-2.59	[14]
150f	$CH_3CHO + OH$	$\rightleftharpoons$	$CH_2CHO + H_2O$		3.370E+11	0.00	-2.59	[14]
151f	$CH_3CHO + O$	$\rightleftharpoons$	$CH_3CO + OH$		1.770E+18	-1.90	12.5	[14]
152f	$CH_3CHO + O$	$\rightleftharpoons$	$CH_2CHO + OH$		3.720E+13	-0.20	14.9	[14]
153f	$CH_3CHO + H$	$\rightleftharpoons$	$CH_3CO + H_2$		4.660E+13	-0.30	12.5	[14]
154f	$CH_3CHO + H$	$\rightleftharpoons$	$CH_2CHO + H_2$		1.850E+12	0.40	22.4	[14]
155f	$CH_3CHO + CH_3$	$\rightleftharpoons$	$CH_3CO + CH_4$		3.900E-07	5.80	9.21	[14]
156f	$CH_3CHO + CH_3$	$\rightleftharpoons$	$CH_2CHO + CH_4$		2.450E+01	3.10	24	[14]
157f	$CH_3CHO + HO_2$	$\rightleftharpoons$	$CH_3CO + H_2O_2$		3.600E+19	-2.20	58.6	[14]
158f	$CH_3CHO + HO_2$	$\rightleftharpoons$	$CH_2CHO + H_2O_2$		2.320E+11	0.40	62.3	[14]
159f	$CH_3CHO + O_2$	$\rightleftharpoons$	$CH_3CO + HO_2$		1.000E+14	0.00	177	[14]
160f^{a,b}	$C_2H_5OH + M^{(9)}$	$\rightleftharpoons$	$CH_3 + CH_2OH + M^{(9)}$	k_0	3.000E+16	0.00	243	[11, 46]
				k_∞	5.000E+15	0.00	343	

Number	Reaction				A	n	E	Ref.
161f[a,b]	$C_2H_5OH + M^{(9)}$	$\rightleftharpoons$	$C_2H_4 + H_2O + M^{(9)}$	k_0	1.000E+17	0.00	226	[11, 46]
				k_∞	8.000E+13	0.00	272	
162f	$C_2H_5OH + OH$	$\rightleftharpoons$	$CH_2CH_2OH + H_2O$		1.810E+11	0.40	3	[14, 46]
163f	$C_2H_5OH + OH$	$\rightleftharpoons$	$CH_3CHOH + H_2O$		3.090E+10	0.50	-1.59	[14, 46]
164f	$C_2H_5OH + OH$	$\rightleftharpoons$	$CH_3CH_2O + H_2O$		1.050E+10	0.80	3	[14, 46]
165f	$C_2H_5OH + H$	$\rightleftharpoons$	$CH_2CH_2OH + H_2$		1.900E+07	1.80	21.3	[14, 46]
166f	$C_2H_5OH + H$	$\rightleftharpoons$	$CH_3CHOH + H_2$		2.580E+07	1.60	11.8	[14, 46]
167f	$C_2H_5OH + H$	$\rightleftharpoons$	$CH_3CH_2O + H_2$		1.500E+07	1.60	12.7	[14, 46]
168f	$C_2H_5OH + O$	$\rightleftharpoons$	$CH_2CH_2OH + OH$		9.410E+07	1.70	22.8	[14, 46]
169f	$C_2H_5OH + O$	$\rightleftharpoons$	$CH_3CHOH + OH$		1.880E+07	1.90	7.62	[14, 46]
170f	$C_2H_5OH + O$	$\rightleftharpoons$	$CH_3CH_2O + OH$		1.580E+07	2.00	18.6	[14, 46]
171f	$C_2H_5OH + CH_3$	$\rightleftharpoons$	$CH_2CH_2OH + CH_4$		2.190E+02	3.20	40.2	[14, 46]
172f	$C_2H_5OH + CH_3$	$\rightleftharpoons$	$CH_3CHOH + CH_4$		7.280E+02	3.00	33.3	[14, 46]
173f	$C_2H_5OH + CH_3$	$\rightleftharpoons$	$CH_3CH_2O + CH_4$		1.450E+02	3.00	32	[14, 46]
174f	$C_2H_5OH + HO_2$	$\rightleftharpoons$	$CH_3CHOH + H_2O_2$		8.200E+03	2.50	45.2	[14, 46]
175f	$C_2H_5OH + HO_2$	$\rightleftharpoons$	$CH_2CH_2OH + H_2O_2$		2.430E+04	2.50	66.1	[14, 46]
176f	$C_2H_5OH + HO_2$	$\rightleftharpoons$	$CH_3CH_2O + H_2O_2$		3.800E+12	0.00	100	[14, 46]
177f	$C_2H_4 + OH$	$\rightleftharpoons$	CH_2CH_2OH		2.410E+11	0.00	-9.96	[14, 46]
178f	$C_2H_5 + HO_2$	$\rightleftharpoons$	$CH_3CH_2O + OH$		4.000E+13	0.00	0	[14, 46]
179f[a]	$CH_3CH_2O + M^{(9)}$	$\rightleftharpoons$	$CH_3CHO + H + M^{(9)}$		5.600E+34	-5.90	106	[14, 46]
180f[a]	$CH_3CH_2O + M^{(9)}$	$\rightleftharpoons$	$CH_3 + CH_2O + M^{(9)}$		5.350E+37	-7.00	99.6	[14, 46]
181f	$CH_3CH_2O + O_2$	$\rightleftharpoons$	$CH_3CHO + HO_2$		4.000E+10	0.00	4.6	[14, 46]
182f	$CH_3CH_2O + CO$	$\rightleftharpoons$	$C_2H_5 + CO_2$		4.680E+02	3.20	22.5	[14, 46]
183f	$CH_3CH_2O + H$	$\rightleftharpoons$	$CH_3 + CH_2OH$		3.000E+13	0.00	0	[14, 46]
184f	$CH_3CH_2O + H$	$\rightleftharpoons$	$C_2H_4 + H_2O$		3.000E+13	0.00	0	[14, 46]
185f	$CH_3CH_2O + OH$	$\rightleftharpoons$	$CH_3CHO + H_2O$		1.000E+13	0.00	0	[14, 46]
186f	$CH_3CHOH + O_2$	$\rightleftharpoons$	$CH_3CHO + HO_2$		4.820E+13	0.00	21	[14, 46]
187f	$CH_3CHOH + O$	$\rightleftharpoons$	$CH_3CHO + OH$		1.000E+14	0.00	0	[14, 46]
188f	$CH_3CHOH + H$	$\rightleftharpoons$	$C_2H_4 + H_2O$		3.000E+13	0.00	0	[14, 46]
189f	$CH_3CHOH + H$	$\rightleftharpoons$	$CH_3 + CH_2OH$		3.000E+13	0.00	0	[14, 46]
190f	$CH_3CHOH + HO_2$	$\rightleftharpoons$	$CH_3CHO + 2\ OH$		4.000E+13	0.00	0	[14, 46]
191f	$CH_3CHOH + OH$	$\rightleftharpoons$	$CH_3CHO + H_2O$		5.000E+12	0.00	0	[14, 46]
192f[a]	$CH_3CHOH + M^{(9)}$	$\rightleftharpoons$	$CH_3CHO + H + M^{(9)}$		1.000E+14	0.00	105	[14, 46]
193f	$C_3H_4 + O$	$\rightleftharpoons$	$C_2H_4 + CO$		2.000E+07	1.80	4.18	[47]
194f	$CH_3 + C_2H_2$	$\rightleftharpoons$	$C_3H_4 + H$		2.560E+09	1.10	57.1	[47]
195f	$C_3H_4 + O$	$\rightleftharpoons$	$HCCO + CH_3$		7.300E+12	0.00	9.41	[47]

Number	Reaction				A	n	E	Ref.
196f[a,b]	C_3H_3 + H + M	$\rightleftharpoons$	C_3H_4 + M	k_0	9.000E+15	1.00	0	[39]
				k_∞	3.000E+13	0.00	0	
197f	C_3H_3 + HO_2	$\rightleftharpoons$	C_3H_4 + O_2		2.500E+12	0.00	0	[39]
198f	C_3H_4 + OH	$\rightleftharpoons$	C_3H_3 + H_2O		5.300E+06	2.00	8.37	[48]
199f	C_3H_3 + O_2	$\rightleftharpoons$	CH_2CO + HCO		3.000E+10	0.00	12	[49]
200f[a,b]	C_3H_4 + H + M	$\rightleftharpoons$	C_3H_5 + M	k_0	3.000E+24	-2.00	0	[39]
				k_∞	4.000E+13	0.00	0	
201f	C_3H_5 + H	$\rightleftharpoons$	C_3H_4 + H_2		1.800E+13	0.00	0	[50]
202f	C_3H_5 + O_2	$\rightleftharpoons$	C_3H_4 + HO_2		4.990E+15	-1.40	93.8	[51]
203f	C_3H_5 + CH_3	$\rightleftharpoons$	C_3H_4 + CH_4		3.000E+12	-0.32	-0.548	[39]
204f[a,b]	C_2H_2 + CH_3 + M	$\rightleftharpoons$	C_3H_5 + M	k_0	2.000E+09	1.00	0	[39]
				k_∞	6.000E+08	0.00	0	
205f	C_3H_5 + OH	$\rightleftharpoons$	C_3H_4 + H_2O		6.000E+12	0.00	0	[39]
206f	C_3H_3 + HCO	$\rightleftharpoons$	C_3H_4 + CO		2.500E+13	0.00	0	[48]
207f	C_3H_3 + HO_2	$\rightleftharpoons$	OH + CO + C_2H_3		8.000E+11	0.00	0	[47]
208f	C_3H_4 + O_2	$\rightleftharpoons$	CH_3 + HCO + CO		4.000E+14	0.00	175	[52]
209f	C_3H_6 + O	$\rightleftharpoons$	C_2H_5 + HCO		3.500E+07	1.65	-4.07	[50]
210f	C_3H_6 + OH	$\rightleftharpoons$	C_3H_5 + H_2O		3.100E+06	2.00	-1.25	[50]
211f	C_3H_6 + O	$\rightleftharpoons$	CH_2CO + CH_3 + H		1.200E+08	1.65	1.37	[50]
212f	C_3H_6 + H	$\rightleftharpoons$	C_3H_5 + H_2		1.700E+05	2.50	10.4	[50]
213f[a,b]	C_3H_5 + H + $M^{(8)}$	$\rightleftharpoons$	C_3H_6 + $M^{(8)}$	k_0	1.330E+60	-12.00	25	[47]
				k_∞	2.000E+14	0.00	0	
214f	C_3H_5 + HO_2	$\rightleftharpoons$	C_3H_6 + O_2		2.660E+12	0.00	0	[15]
215f	C_3H_5 + HO_2	$\rightleftharpoons$	OH + C_2H_3 + CH_2O		3.000E+12	0.00	0	[15]
216f[a,b]	C_2H_3 + CH_3 + $M^{(8)}$	$\rightleftharpoons$	C_3H_6 + $M^{(8)}$	k_0	4.270E+58	-11.94	40.9	[47]
				k_∞	2.500E+13	0.00	0	
217f	C_3H_6 + H	$\rightleftharpoons$	C_2H_4 + CH_3		1.600E+22	-2.39	46.8	[47]
218f	CH_3 + C_2H_3	$\rightleftharpoons$	C_3H_5 + H		1.500E+24	-2.83	77.9	[47]
219f[a,b]	C_3H_8 + M	$\rightleftharpoons$	CH_3 + C_2H_5 + M	k_0	7.830E+18	0.00	272	[34]
				k_∞	1.100E+17	0.00	353	
220f	C_3H_8 + O_2	$\rightleftharpoons$	I-C_3H_7 + HO_2		4.000E+13	0.00	199	[53, 47, 54]
221f	C_3H_8 + O_2	$\rightleftharpoons$	N-C_3H_7 + HO_2		4.000E+13	0.00	213	[53, 47, 54]
222f	C_3H_8 + H	$\rightleftharpoons$	I-C_3H_7 + H_2		1.300E+06	2.40	18.7	[53, 47, 54]
223f	C_3H_8 + H	$\rightleftharpoons$	N-C_3H_7 + H_2		1.330E+06	2.54	28.3	[54, 55]
224f	C_3H_8 + O	$\rightleftharpoons$	I-C_3H_7 + OH		4.760E+04	2.71	8.82	[54, 47]
225f	C_3H_8 + O	$\rightleftharpoons$	N-C_3H_7 + OH		1.900E+05	2.68	15.6	[54, 47]

Number	Reaction					A	n	E	Ref.
226f	C_3H_8 + OH	$\rightleftharpoons$	N-C_3H_7 + H_2O			1.000E+10	1.00	6.69	[29]
227f	C_3H_8 + OH	$\rightleftharpoons$	I-C_3H_7 + H_2O			2.000E+07	-1.60	-0.418	[29]
228f	C_3H_8 + HO_2	$\rightleftharpoons$	I-C_3H_7 + H_2O_2			9.640E+03	2.60	58.2	[54, 55, 47]
229f	C_3H_8 + HO_2	$\rightleftharpoons$	N-C_3H_7 + H_2O_2			4.760E+04	2.55	69	[54, 55, 47]
230f	I-C_3H_7 + C_3H_8	$\rightleftharpoons$	N-C_3H_7 + C_3H_8			8.400E-03	4.20	36.3	[54, 56]
231f^{a,b}	C_3H_6 + H + $M^{(8)}$	$\rightleftharpoons$	I-C_3H_7 + $M^{(8)}$		k_0	8.700E+42	-7.50	19.8	[47]
					k_∞	1.330E+13	0.00	6.53	
232f	I-C_3H_7 + O_2	$\rightleftharpoons$	C_3H_6 + HO_2			1.300E+11	0.00	0	[54, 47]
233f^{a,b}	N-C_3H_7 + M	$\rightleftharpoons$	CH_3 + C_2H_4 + M		k_0	5.490E+49	-10.00	150	[54, 47]
					k_∞	1.230E+13	-0.10	126	
234f^{a,b}	H + C_3H_6 + $M^{(8)}$	$\rightleftharpoons$	N-C_3H_7 + $M^{(8)}$		k_0	6.260E+38	-6.66	29.3	[54, 47]
					k_∞	1.330E+13	0.00	13.6	
235f	N-C_3H_7 + O_2	$\rightleftharpoons$	C_3H_6 + HO_2			3.500E+16	-1.60	14.6	[29]
a235f	N-C_3H_7 + O_2	$\rightleftharpoons$	C_3H_6OOH			2.000E+12	0.00	0	[29]
b235f	C_3H_6OOH	$\rightleftharpoons$	C_3H_6 + HO_2			2.500E+35	-8.30	92	[29]
c235f	C_3H_6OOH + O_2	$\rightleftharpoons$	OC_3H_5OOH + OH			1.500E+08	0.00	-29.3	[29]
d235f	OC_3H_5OOH	$\rightleftharpoons$	CH_2CHO + CH_2O + OH			1.000E+15	0.00	180	[29]

Units are mol, cm^3, kJ, K.

The backward rates for all reversible reactions can be calculated from thermodynamic data.

^{a}Third-body efficiencies are:

[M1] = 0.5 [AR] + 0.5 [HE] + 2.5 [H2] + 12 [H2O] + 1.9 [CO] + 3.8 [CO2] + 1 [other].

[M2] = 0.38 [AR] + 0.38 [HE] + 2.5 [H2] + 12 [H2O] + 1.9 [CO] + 3.8 [CO2] + 1 [other].

[M3] = 0.2 [AR] + 0.2 [HE] + 2.5 [H2] + 12 [H2O] + 1.9 [CO] + 3.8 [CO2] + 1 [other].

[M4] = 0.75 [AR] + 0.75 [HE] + 2.5 [H2] + 12 [H2O] + 1.9 [CO] + 3.8 [CO2] + 1 [other].

[M5] = 0.7 [AR] + 0.7 [HE] + 2.5 [H2] + 16 [H2O] + 1.2 [CO] + 2.4 [CO2] + 1.5 [C2H6] + 1 [other].

[M] = 1 [other].

[M6] = 0.7 [AR] + 0.4 [HE] + 2.5 [H2] + 6 [H2O] + 6 [H2O2] + 1.5 [CO] + 2 [CO2] + 1 [other].

[M11] = 0.7 [AR] + 0.7 [HE] + 2.5 [H2] + 12 [H2O] + 2 [CO] + 4 [CO2] + 1 [other].

[M7] = 1.9 [H2] + 12 [H2O] + 2.5 [CO] + 2.5 [CO2] + 1 [other].

[M8] = 0.7 [AR] + 2 [H2] + 6 [H2O] + 1.5 [CO] + 2 [CO2] + 2 [CH4] + 3 [C2H6] + 1 [other].

[M9] = 0.7 [AR] + 2 [H2] + 6 [H2O] + 1.5 [CO] + 2 [CO2] + 2 [CH4] + 1 [other].

[M10] = 2.4 [H2] + 15.4 [H2O] + 1.8 [CO] + 3.6 [CO2] + 1 [other].

^{b}Pressure dependent reactions are described by the TROE-formulation [57]. The centering parameters are given by:

$F_{c,10f} = 0.5$.

$F_{c,15f} = 1$.

$F_{c,16f} = 0.43$.

$F_{c,17f} = 1$.

$F_{c,20f} = 1$.

$F_{c,a21f} = 1$.

$F_{c,32f} = 0.2176 \exp(-T/271\ K) + 0.7824 \exp(-T/2755\ K) + \exp(-6570\ K/T)$.

$F_{c,53f} = 0.217 \exp(-T/74\ K) + 0.783 \exp(-T/2941\ K) + \exp(-6964\ K/T)$.

$F_{c,54f}$ = 0.38 exp(-T/73 K) + 0.62 exp(-T/1180 K).
$F_{c,81f}$ = 0.16 exp(-T/125 K) + 0.84 exp(-T/2219 K) + exp(-6882 K/T).
$F_{c,87f}$ = 0.832 exp(-T/1203 K).
$F_{c,99f}$ = 0.7.
$F_{c,136f}$ = 0.586 exp(-T/279 K) + 0.414 exp(-T/5459 K).
$F_{c,148f}$ = 1.
$F_{c,160f}$ = 0.5.
$F_{c,161f}$ = 0.5.
$F_{c,196f}$ = 0.5.
$F_{c,200f}$ = 0.2.
$F_{c,204f}$ = 0.5.
$F_{c,213f}$ = 0.98 exp(-T/1097 K) + 0.02 exp(-T/1097 K) + exp(-6860 K/T).
$F_{c,216f}$ = 0.825 exp(-T/1341 K) + 0.175 exp(-T/60000 K) + exp(-10140 K/T).
$F_{c,219f}$ = 0.24 exp(-T/1946 K) + 0.76 exp(-T/38 K).
$F_{c,231f}$ = exp(-T/645.4 K) + exp(-6844 K/T).
$F_{c,233f}$ = 2.17 exp(-T/251 K) + exp(-1185 K/T).
$F_{c,234f}$ = exp(-T/1310 K) + exp(-48100 K/T).

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