

ELEMENTS H O C N AR HE S END

SPECIES

CH4 CH3 CH2 CH CH2O HCO CO2 CO H2 H O2 O OH HO2 H2O2 H2O
C2H C2H2 HCCO C2H3 C2H4 C2H5 C2H6 CH2OH CH3O H2CCCH C3H2 CH2(S)
CH2CO C C4H2 H2CCCCH HCCOH N2 NO N NH NH2 HNO HCN NCO CN N2O NNH HNCO
C2N2 NO2 HOCN HCNO H2CN NH3 CH2CHCCH2 C2O C3H4 C2 H2C4O
C3O2 AR HE

END

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! This mechanism table represents Miller/Bowman work PLUS:

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! Included are additions and revisions from:

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! Hupa, (1990)

! Glarborg, (1991)

! Dean, Hanson, and Bowman (1991) from J. Phys. Chem. on N chemistry

! and Miller and Melius (1992) from Comb & Flame on HC chemistry

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REACTIONS

CH3+CH3(+M)=C2H6(+M)	9.030E+16	-1.180	654.000	
LOW/3.18E41	-7.03	2762./		
TROE/0.6041	6927.	132./		
H2/2/ CO/2/ CO2/3/ H2O/5/				
CH3+H(+M)=CH4(+M)	6.000E+16	-1.000	0.000	
LOW/8.0E26	-3.0	0.0/		
SRI/0.45	797.	979./		
H2/2/ CO/2/ CO2/3/ H2O/5/				
CH4+O2=CH3+HO2	0.790E+14	0.000	56000.000	! SKINNER ET AL 1972
CH4+H=CH3+H2	0.220E+05	3.000	8750.000	! CLARK\$DOVE
CH4+OH=CH3+H2O	0.160E+07	2.100	2460.000	! TULLY\$RAVI
CH4+O=CH3+OH	1.020E+09	1.500	8604.000	! TSANG
!CH4+O=CH3+OH	1.020E+09	1.500	8604.000	! Miller 92
CH4+HO2=CH3+H2O2	0.180E+12	0.000	18700.000	! NBS
CH3+HO2=CH3O+OH	0.200E+14	0.000	0.000	! NBS
CH3+O2=CH3O+O	0.205E+19	-1.570	29229.000	! NBS
CH3+O=CH2O+H	0.800E+14	0.000	0.000	
CH2OH+H=CH3+OH	0.100E+15	0.000	0.000	! EST JAM
CH3O+H=CH3+OH	0.100E+15	0.000	0.000	! EST JAM
CH3+OH=CH2+H2O	0.750E+07	2.000	5000.000	! JAM
CH3+H=CH2+H2	7.200E+14	0.000	15100.000	! Bowman 1991
CH3O+M=CH2O+H+M	0.100E+15	0.000	25000.000	! PG
CH2OH+M=CH2O+H+M	0.100E+15	0.000	25000.000	
CH3O+H=CH2O+H2	0.200E+14	0.000	0.000	! PG
CH2OH+H=CH2O+H2	0.200E+14	0.000	0.000	
CH3O+OH=CH2O+H2O	0.100E+14	0.000	0.000	! PG
CH2OH+OH=CH2O+H2O	0.100E+14	0.000	0.000	
CH3O+O=CH2O+OH	0.100E+14	0.000	0.000	! PG
CH2OH+O=CH2O+OH	0.100E+14	0.000	0.000	
CH3O+O2=CH2O+HO2	0.630E+11	0.000	2600.000	! PG
CH2OH+O2=CH2O+HO2	0.148E+14	0.000	1500.000	! CODATA,EA ASSUMED
CH2+H=CH+H2	1.000E+13	0.000	0.000	! Bowman 1991
CH2+OH=CH+H2O	0.113E+08	2.000	3000.000	! JAM
CH2+OH=CH2O+H	0.250E+14	0.000	0.000	! PG
CH+O2=HCO+O	0.330E+14	0.000	0.000	! PG
CH+O=CO+H	0.570E+14	0.000	0.000	! PG
CH+OH=HCO+H	0.300E+14	0.000	0.000	! PG
CH+OH=C+H2O	4.000E+7	2.000	3000.000	! Miller 1992

CH+CO2=HCO+CO	0.340E+13	0.000	690.000	! PG
CH+H=C+H2	1.100E+14	0.000	0.000	! Bowman 1991
CH+H2O=CH2O+H	1.170E+15	-0.750	0.000	! JAM,LIN
CH+CH2O=CH2CO+H	0.946E+14	0.000	-515.000	! THORNE
CH+C2H2=C3H2+H	0.100E+15	0.000	0.000	! THORNE
CH+CH2=C2H2+H	0.400E+14	0.000	0.000	! PG
CH+CH3=C2H3+H	1.000E+13	0.000	0.000	! Bowman 1991
CH+CH4=C2H4+H	0.600E+14	0.000	0.000	! PG
C+O2=CO+O	0.200E+14	0.000	0.000	! THORNE
C+OH=CO+H	0.500E+14	0.000	0.000	! THORNE
C+CH3=C2H2+H	0.500E+14	0.000	0.000	! PG
C+CH2=C2H+H	0.500E+14	0.000	0.000	! PG
CH2+CO2=CH2O+CO	0.110E+12	0.000	1000.000	! PG
CH2+O=CO+H+H	0.500E+14	0.000	0.000	! JAM 2/87
CH2+O=CO+H2	0.300E+14	0.000	0.000	! JAM 2/87
CH2+O2=CO2+H+H	0.160E+13	0.000	1000.000	
CH2+O2=CH2O+O	0.500E+14	0.000	9000.000	! PG
CH2+O2=CO2+H2	0.690E+12	0.000	500.000	! PG
CH2+O2=CO+H2O	0.190E+11	0.000	-1000.000	! PG
CH2+O2=CO+OH+H	0.860E+11	0.000	-500.000	! PG
CH2+O2=HCO +OH	0.430E+11	0.000	-500.000	! PG
CH2O+OH=HCO+H2O	0.343E+10	1.180	-447.000	! NBS
CH2O+H=HCO+H2	0.219E+09	1.770	3000.000	! NBS
CH2O+M=HCO+H+M	0.331E+17	0.000	81000.000	! DEAN,C\$F 1980
CH2O+O=HCO+OH	0.180E+14	0.000	3080.000	! NBS
HCO+OH=H2O+CO	0.100E+15	0.000	0.000	! TEMPS
HCO+M=H+CO+M	0.250E+15	0.000	16802.000	! WARNATZ,WAG\$BOW
CO/1.87/ H2/1.87/ CH4/2.81/ CO2/3./ H2O/5./				
HCO+H=CO+H2	0.119E+14	0.250	0.000	! HARD.\$WAG.21ST, JAM
HCO+O=CO+OH	0.300E+14	0.000	0.000	! PG
HCO+O=CO2+H	0.300E+14	0.000	0.000	! PG
HCO+O2=HO2+CO	0.330E+14	-0.400	0.000	! VEYRET\$LESCLAUX
CO+O+M=CO2+M	0.617E+15	0.000	3000.000	! NBS
CO+OH=CO2+H	0.151E+08	1.300	-758.000	! BAULCH\$DRYS
CO+O2=CO2+O	2.530E+13	0.000	47688.000	! Miller 1992
HO2+CO=CO2+OH	0.580E+14	0.000	22934.000	! ATRI ET AL,C\$F 1977
C2H6+CH3=C2H5+CH4	0.550E+00	4.000	8300.000	
C2H6+H=C2H5+H2	0.540E+03	3.500	5210.000	! CLARK\$DOVE
C2H6+O=C2H5+OH	0.300E+08	2.000	5115.000	! WARNATZ REVIEW
C2H6+OH=C2H5+H2O	0.870E+10	1.050	1810.000	! PG
C2H4+H=C2H3+H2	0.110E+15	0.000	8500.000	! WARNATZ ?
C2H4+O=CH3+HCO	0.160E+10	1.200	746.000	! PG
C2H4+OH=C2H3+H2O	0.202E+14	0.000	5955.000	! TULLY 1987
CH2+CH3=C2H4+H	4.000E+13	0.000	0.000	! Bowman 1991
H+C2H4(+M)=C2H5(+M)	0.221E+14	0.000	2066.000	! MICHAEL,GLAN\$TROE
LOW/6.369E27 -2.76 -54./				
H2/2/ CO/2/ CO2/3/ H2O/5/				
C2H5+H=CH3+CH3	1.000E+14	0.000	0.000	
C2H5+O2=C2H4+HO2	0.843E+12	0.000	3875.000	! NBS
C2H2+O=CH2+CO	0.102E+08	2.000	1900.000	! JAM, FONT, PEETERS
C2H2+O=HCCO+H	0.102E+08	2.000	1900.000	! JAM, FONT, PEETERS
H2+C2H=C2H2+H	0.409E+06	2.390	864.300	! HARDING, PHYS, 1
H+C2H2(+M)=C2H3(+M)	0.554E+13	0.000	2410.000	
LOW/2.67E27 -3.5 2410./				
H2/2/ CO/2/ CO2/3/ H2O/5/				
C2H3+H=C2H2+H2	0.400E+14	0.000	0.000	! HOYERMANN
C2H3+O=CH2CO+H	0.300E+14	0.000	0.000	! HOYERMANN 21ST

C2H3+O2=CH2O+HCO	0.400E+13	0.000	-250.000	! PG
C2H3+OH=C2H2+H2O	2.000E+13	0.000	0.000	! Miller 1992
C2H3+CH2=C3H4+H	3.000E+13	0.000	0.000	! Miller 1992
C2H3+CH2=C2H2+CH3	0.300E+14	0.000	0.000	! MMSK
C2H3+C2H=C2H2+C2H2	0.300E+14	0.000	0.000	! MMSK
C2H3+C2H3=CH2CHCCH2+H	4.000E+13	0.000	0.000	! Miller 1992
C2H3+CH=CH2+C2H2	0.500E+14	0.000	0.000	! JAM
OH+C2H2=C2H+H2O	3.370E+07	2.000	14000.000	! MILLER
OH+C2H2=HCCOH+H	5.040E+05	2.300	13500.000	! MILLER
OH+C2H2=CH2CO+H	2.180E-04	4.500	-1000.000	! MILLER
OH+C2H2=CH3+CO	4.830E-04	4.000	-2000.000	! MILLER
HCCOH+H=CH2CO+H	0.100E+14	0.000	0.000	! JAM
C2H2+O=C2H+OH	0.316E+16	-0.600	15000.000	
CH2CO+O=CO2+CH2	0.175E+13	0.000	1350.000	! WAGNER,TEMPS ET AL
CH2CO+H=CH3+CO	0.113E+14	0.000	3428.000	! MICHAEL
CH2CO+H=HCCO+H2	0.500E+14	0.000	8000.000	! MMSK
CH2CO+O=HCCO+OH	0.100E+14	0.000	8000.000	! MMSK
CH2CO+OH=HCCO+H2O	0.750E+13	0.000	2000.000	! MMSK
CH2CO (+M)=CH2+CO (+M)	0.300E+15	0.000	70980.000	! WAGNER\$ZABEL
LOW/3.6E15 0.0 59270./				
C2H+O2=CO+CO+H	3.520E+13	0.000	0.000	! Miller 1992
C2H+C2H2=C4H2+H	0.300E+14	0.000	0.000	! MMSK
HCCO+C2H2=H2CCCH+CO	1.000E+11	0.000	3000.000	! Miller 1992
H+HCCO=CH2 (S)+CO	0.100E+15	0.000	0.000	! PEETERS 1985
O+HCCO=H+CO+CO	0.100E+15	0.000	0.000	! PEETERS 1985
HCCO+O2=CO+CO+OH	0.160E+13	0.000	854.000	! PEETERS
HCCO+O2=CO2+CO+H	1.400E+09	1.000	0.000	! Miller 1992
CH+HCCO=C2H2+CO	0.500E+14	0.000	0.000	! JAM EST
HCCO+HCCO=C2H2+CO+CO	0.100E+14	0.000	0.000	! MMSK
HCCO+OH=C2O+H2O	3.000E+13	0.000	0.000	! Miller 1992
C2O+H=CH+CO	5.000E+13	0.000	0.000	! Miller 1992
C2O+O=CO+CO	5.000E+13	0.000	0.000	! Miller 1992
C2O+OH=CO+CO+H	2.000E+13	0.000	0.000	! Miller 1992
C2O+O2=CO+CO+O	2.000E+13	0.000	0.000	! Miller 1992
CH2 (S)+M=CH2+M	0.100E+14	0.000	0.000	! NBS,ADJ
H/0.0/				
CH2 (S)+CH4=CH3+CH3	0.400E+14	0.000	0.000	! NBS
CH2 (S)+C2H6=CH3+C2H5	0.120E+15	0.000	0.000	! NBS
CH2 (S)+O2=CO+OH+H	0.300E+14	0.000	0.000	! NBS
CH2 (S)+H2=CH3+H	0.700E+14	0.000	0.000	! NBS
CH2 (S)+H=CH2+H	0.200E+15	0.000	0.000	! JAM
CH2 (S)+H2O=CH3+OH	1.000E+14	0.000	0.000	! Miller 1992
CH2 (S)+H2O=CH2+H2O	3.000E+13	0.000	0.000	! Miller 1992
CH2 (S)+C2H2=H2CCCH+H	1.800E+14	0.000	0.000	! Miller 1992
CH2 (S)+C2H2=CH2+C2H2	4.000E+13	0.000	0.000	! Miller 1992
CH2 (S)+O=CO+H+H	3.000E+13	0.000	0.000	! Miller 1992
CH2 (S)+OH=CH2O+H	3.000E+13	0.000	0.000	! Miller 1992
CH2 (S)+H=CH+H2	3.000E+13	0.000	0.000	! Miller 1992
CH2 (S)+CO2=CH2O+CO	3.000E+12	0.000	0.000	! Miller 1992
CH2 (S)+CH3=C2H4+H	2.000E+13	0.000	0.000	! Miller 1992
CH2 (S)+CH2CO=C2H4+CO	1.600E+14	0.000	0.000	! Miller 1992
C2H+O=CH+CO	0.500E+14	0.000	0.000	! BROWNE
C2H+OH=HCCO+H	0.200E+14	0.000	0.000	! JAM,12/22
C2H+OH=C2+H2O	4.000E+07	2.000	8000.000	! Miller 1992
C2+H2=C2H+H	4.000E+05	2.400	1000.000	! Miller 1992
C2+O2=CO+CO	5.000E+13	0.000	0.000	! Miller 1992

C2+OH=C2O+H	5.000E+13	0.000	0.000	! Miller 1992
CH2+CH2=C2H2+H2	3.200E+13	0.000	0.000	! Bowman 1991
CH2+HCCO=C2H3+CO	0.300E+14	0.000	0.000	! JAM,1/11/82
CH2+C2H2=H2CCCH+H	0.120E+14	0.000	6600.000	! BOHLAND ET AL,21ST
C4H2+OH=C3H2+HCO	0.666E+13	0.000	-410.000	! PERRY
C3H2+O2=HCO+HCCO	0.100E+14	0.000	0.000	! THORNE,ET AL
C3H2+O2=HCCO+CO+H	5.000E+13	0.000	0.000	! Miller 1992
C3H2+OH=C2H2+HCO	5.000E+13	0.000	0.000	! Miller 1992
C3H2+CH2=H2CCCCH+H	3.000E+13	0.000	0.000	! Miller 1992
H2C4O+H=C2H2+HCCO	5.000E+13	0.000	3000.000	! Miller 1992
H2C4O+OH=CH2CO+HCCO	1.000E+07	2.000	2000.000	! Miller 1992
H2CCCH+O2=CH2CO+HCO	0.300E+11	0.000	2868.000	! GUTMAN,21ST
H2CCCH+O=CH2O+C2H	0.200E+14	0.000	0.000	! JAM
H2CCCH+OH=C3H2+H2O	0.200E+14	0.000	0.000	! JAM
C2H2+C2H2=H2CCCCH+H	0.200E+13	0.000	45900.000	! MMSK
! Nitrogen and H and OH radical chemistry				
H2+O2=2OH	0.170E+14	0.000	47780.000	
O+OH=O2+H	0.400E+15	-0.500	0.000	! JAM 1986
O+H2=OH+H	1.500E+07	2.000	7550.000	! Bowman 1991
H+O2+M=HO2+M	0.361E+18	-0.720	0.000	! DIXON-LEWIS
H2O/18.6/ CO2/4.2/ H2/2.86/ CO/2.11/ N2/1.26/				
OH+HO2=H2O+O2	0.750E+13	0.000	0.000	! D-L
H+HO2=2OH	0.140E+15	0.000	1073.000	! D-L
O+HO2=O2+OH	0.140E+14	0.000	1073.000	! D-L
H+H+M=H2+M	0.100E+19	-1.000	0.000	! D-L
H2/0.0/ H2O/0.0/ CO2/0.0/				
H+H+H2=H2+H2	0.920E+17	-0.600	0.000	
H+H+H2O=H2+H2O	0.600E+20	-1.250	0.000	
H+H+CO2=H2+CO2	0.549E+21	-2.000	0.000	! D-L
H+O+M=OH+M	0.620E+17	-0.600	0.000	! D-L
H2O/5/				
H+HO2=H2+O2	0.125E+14	0.000	0.000	! D-L
HO2+HO2=H2O2+O2	0.200E+13	0.000	0.000	
H2O2+M=OH+OH+M	0.130E+18	0.000	45500.000	
H2O2+H=HO2+H2	0.160E+13	0.000	3800.000	
H2O2+OH=H2O+HO2	0.100E+14	0.000	1800.000	
CH+N2=HCN+N	0.300E+12	0.000	13600.000	! PG,JAM
CH2+N2=HCN+NH	0.100E+14	0.000	74000.000	! PG
H2CN+N=N2+CH2	0.200E+14	0.000	0.000	! JAM
H2CN+M=HCN+H+M	0.300E+15	0.000	22000.000	! JAM
C+NO=CN+O	2.000E+13	0.000	0.000	! Bowman 1991
C+NO=N+CO	2.800E+13	0.000	0.000	! Bowman 1991
CH+NO=HCN+O	0.110E+15	0.000	0.000	! BERMAN 82
CH2+NO=HCNO+H	0.139E+13	0.000	-1100.000	! VINCK\$DEB
CH3+NO=HCN+H2O	0.100E+12	0.000	15000.000	! JAM
CH3+NO=H2CN+OH	0.100E+12	0.000	15000.000	! JAM
HCCO+NO=HCNO+CO	0.200E+14	0.000	0.000	! JAM
CH2(S)+NO=HCN+OH	0.200E+14	0.000	0.000	! JAM
HCNO+H=HCN+OH	0.100E+15	0.000	12000.000	! PG
CH2+N=HCN+H	0.500E+14	0.000	0.000	! JAM
CH+N=CN+H	0.130E+14	0.000	0.000	! JAM
CO2+N=NO+CO	0.190E+12	0.000	3400.000	! CRC
HCCO+N=HCN+CO	0.500E+14	0.000	0.000	! JAM
CH3+N=H2CN+H	0.300E+14	0.000	0.000	! JAM
C2H3+N=HCN+CH2	0.200E+14	0.000	0.000	! JAM
H2CCCH+N=HCN+C2H2	0.100E+14	0.000	0.000	! JAM
HCN+OH=CN+H2O	0.145E+14	0.000	10929.000	! SZEKELY

OH+HCN=HOCN+H	0.585E+05	2.400	12500.000	!	MILLER\$MEL
OH+HCN=HNCO+H	0.198E-02	4.000	1000.000	!	MILLER\$MEL
OH+HCN=NH2+CO	0.783E-03	4.000	4000.000	!	MILLER\$MEL
HOCN+H=HNCO+H	0.100E+14	0.000	0.000	!	JAM
HCN+O=NCO+H	0.138E+05	2.640	4980.000	!	PERRY
HCN+O=NH+CO	0.345E+04	2.640	4980.000	!	PERRY
HCN+O=CN+OH	0.270E+10	1.580	29200.000	!	MILLER
CN+H2=HCN+H	0.295E+06	2.450	2237.000	!	WAGNER\$BAIR
CN+O=CO+N	3.000E+13	0.000	0.000	!	Bowman 1991
CN+O2=NCO+O	0.560E+13	0.000	0.000	!	LOUGE\$HANSON
CN+OH=NCO+H	0.600E+14	0.000	0.000	!	HAYNES
CN+HCN=C2N2+H	0.200E+14	0.000	0.000	!	STANFORD
CN+NO2=NCO+NO	0.300E+14	0.000	0.000	!	JAM
CN+N2O=NCO+N2	0.100E+14	0.000	0.000	!	JAM
C2N2+O=NCO+CN	0.457E+13	0.000	8880.000	!	STANFORD
C2N2+OH=HOCN+CN	0.186E+12	0.000	2900.000	!	PHILLIPS
HO2+NO=NO2+OH	0.211E+13	0.000	-479.000	!	HOWARD
NO2+H=NO+OH	0.350E+15	0.000	1500.000		
NO2+O=NO+O2	0.100E+14	0.000	600.000		
NO2+M=NO+O+M	0.110E+17	0.000	66000.000	!	PG
NCO+H=NH+CO	0.500E+14	0.000	0.000	!	JAM
NCO+O=NO+CO	0.200E+14	0.000	0.000	!	JAM
NCO+N=N2+CO	0.200E+14	0.000	0.000	!	JAM,LIF\$FRENK
NCO+OH=NO+CO+H	1.000E+13	0.000	0.000		
NCO+M=N+CO+M	0.310E+17	-0.500	48000.000	!	LOUGE\$HANSON
NCO+NO=N2O+CO	0.100E+14	0.000	-390.000	!	PERRY
NCO+H2=HNCO+H	0.858E+13	0.000	9000.000	!	PERRY,LOUGE
HNCO+H=NH2+CO	2.000E+13	0.000	3000.000	!	MERTENS,JAM
HNCO+M=NH+CO	1.140E+16	0.000	86000.000	!	M&B WSS
HNCO+NH=NH2+NCO	3.000E+13	0.000	23700.000	!	M&B WSS
HNCO+NH2=NH3+NCO	5.000E+12	0.000	6200.000	!	M&B WSS
OH+HNCO=NCO+H2O	2.650E+12	0.000	5540.000	!	M&B WSS
HNCO+O=HNO+CO	3.250E+12	0.000	10300.000	!	M&B WSS
NH+O=NO+H	5.500E+13	0.000	0.000	!	Bowman 1991
NH+O2=HNO+O	0.100E+14	0.000	12000.000	!	NH3 CST
NH+O2=NO+OH	0.760E+11	0.000	1530.000	!	HACK.ET AL
NH+NO=N2O+H	1.400E+14	0.000	12700.000	!	Bowman 1991
N2O+OH=N2+HO2	0.200E+13	0.000	10000.000	!	JAM,9/87
N2O+H=N2+OH	0.760E+14	0.000	15200.000	!	NH3 CST
N2O+M=N2+O+M	6.900E+23	-2.500	64760.000	!	Bowman 1991
N2O+O=N2+O2	0.100E+15	0.000	28200.000	!	PG
N2O+O=NO+NO	0.100E+15	0.000	28200.000	!	PG
NH+OH=HNO+H	1.000E+12	0.500	1987.000	!	Bowman 1991
NH+OH=N+H2O	5.000E+11	0.500	1987.000	!	Bowman 1991
NH+N=N2+H	6.300E+11	0.500	0.000	!	Bowman 1991
NH2+O=HNO+H	0.663E+15	-0.500	0.000		
NH2+O=NH+OH	0.675E+13	0.000	0.000		
NH2+OH=NH+H2O	0.400E+07	2.000	1000.000	!	JAM,9/87
NH2+H=NH+H2	0.692E+14	0.000	3650.000		
NH2+NO=NNH+OH	0.640E+16	-1.250	0.000		
NH2+NO=N2+H2O	0.620E+16	-1.250	0.000		
NH3+OH=NH2+H2O	0.204E+07	2.040	566.000	!	LOUGE
NH3+H=NH2+H2	0.636E+06	2.390	10171.000	!	MICHAEL
NH3+O=NH2+OH	0.210E+14	0.000	9000.000	!	PG
NNH=N2+H	0.100E+05	0.000	0.000	!	JAM,9/87
NNH+NO=N2+HNO	0.500E+14	0.000	0.000		
NNH+H=N2+H2	0.100E+15	0.000	0.000	!	JAM,9/87

NNH+OH=N2+H2O	0.500E+14	0.000	0.000	
NNH+NH2=N2+NH3	0.500E+14	0.000	0.000	
NNH+NH=N2+NH2	0.500E+14	0.000	0.000	
NNH+O=N2O+H	0.100E+15	0.000	0.000	
HNO+M=H+NO+M	0.150E+17	0.000	48680.000	! NH3 CST
H2O/10/ O2/2/ N2/2/ H2/2/				
HNO+OH=NO+H2O	0.360E+14	0.000	0.000	! NH3 CST
HNO+H=H2+NO	0.500E+13	0.000	0.000	! NH3 CST
HNO+NH2=NH3+NO	0.200E+14	0.000	1000.000	! NH3 CST
N+NO=N2+O	4.300E+13	0.000	1560.000	! Bowman 1991
! Additions from Dean, Hanson, and Bowman 1991				
NO+H=N+OH	2.600E+14	0.000	50410.000	! Bowman 1991
C3O2+M=C2O+CO+M	2.000E+16	0.000	63000.000	! Bowman 1991
C2O+M=C+CO+M	3.000E+16	0.000	72000.000	! Bowman 1991
C2H6+AR=CH3+CH3+AR	1.000E+19	0.000	68120.000	! Bowman 1991
CH4+AR=CH3+H+AR	2.000E+17	0.000	88400.000	! Bowman 1991
CH3+AR=CH2+H+AR	2.000E+16	0.000	90600.000	! Bowman 1991
CH3+AR=CH+H2+AR	5.000E+15	0.000	85000.000	! Bowman 1991
CH2+AR=CH+H+AR	4.000E+15	0.000	83000.000	! Bowman 1991
CH2+AR=C+H2+AR	1.300E+14	0.000	59000.000	! Bowman 1991
CH+AR=C+H+AR	1.900E+14	0.000	67000.000	! Bowman 1991
CH3+CH3=C2H4+H2	4.200E+14	0.000	19200.000	! Bowman 1991
CH+CH=C2H+H	1.500E+14	0.000	0.000	! Bowman 1991
CH+C=C2+H	2.000E+14	0.000	0.000	! Bowman 1991
CH+HCN=C2H2+N	1.000E+14	0.000	0.000	! Bowman 1991
NO+O=N+O2	3.800E+09	1.000	41370.000	! Bowman 1991
NO+M=N+O+M	4.000E+20	-1.500	150000.000	! Bowman 1991
O2+M=O+O+M	1.800E+18	-1.000	117570.000	! Bowman 1991
CN+NO=NCO+N	2.000E+13	0.000	41730.000	! Bowman 1991
CN+C=C2+N	5.000E+13	0.000	25830.000	! Bowman 1991
CN+M=C+N+M	2.500E+14	0.000	141077.000	! Bowman 1991
CN+CN=C2+N2	6.300E+11	0.000	0.000	! Bowman 1991
C+N2=CN+N	6.300E+13	0.000	46000.000	! Bowman 1991
NH+NO=N2+OH	3.200E+13	0.000	12700.000	! Bowman 1991
NH+O=N+OH	3.700E+13	0.000	0.000	! Bowman 1991
NH+M=N+H+M	2.700E+14	0.000	75506.000	! Bowman 1991
NH+NH=N2+H+H	5.100E+13	0.000	0.000	! Bowman 1991
N+H2=NH+H	1.600E+14	0.000	25130.000	! Bowman 1991
H2O+M=OH+H+M	8.600E+15	0.000	114245.000	! Bowman 1991
O+H2O=OH+OH	1.500E+10	1.140	17256.000	! Bowman 1991
H+H2O=OH+H2	4.600E+08	1.600	18570.000	! Bowman 1991
END				