

Reaction: N₂+M=2N+M

Third body (M):	Park's Book				Park 1993				Park 1994				Park 2001			
	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T ₀ [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T ₀ [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T ₀ [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T ₀ [K]
N	(T T ₀) ^{1/2}	3.00E+22	-1.60E+00	1.13E+05	(T T ₀) ^{1/2}	3.00E+22	-1.60E+00	1.13E+05	(T T ₀) ^{1/2}	3.00E+22	-1.60E+00	1.13E+05	(T T ₀) ^{1/2}	3.00E+22	-1.60E+00	1.13E+05
O	(T T ₀) ^{1/2}	3.00E+22	-1.60E+00	1.13E+05	(T T ₀) ^{1/2}	3.00E+22	-1.60E+00	1.13E+05	(T T ₀) ^{1/2}	3.00E+22	-1.60E+00	1.13E+05	(T T ₀) ^{1/2}	3.00E+22	-1.60E+00	1.13E+05
N ₂	(T T ₀) ^{1/2}	7.00E+21	-1.60E+00	1.13E+05	(T T ₀) ^{1/2}	7.00E+21	-1.60E+00	1.13E+05	(T T ₀) ^{1/2}	7.00E+21	-1.60E+00	1.13E+05	(T T ₀) ^{1/2}	7.00E+21	-1.60E+00	1.13E+05
O ₂	(T T ₀) ^{1/2}	7.00E+21	-1.60E+00	1.13E+05	(T T ₀) ^{1/2}	7.00E+21	-1.60E+00	1.13E+05	(T T ₀) ^{1/2}	7.00E+21	-1.60E+00	1.13E+05	(T T ₀) ^{1/2}	7.00E+21	-1.60E+00	1.13E+05
NO	(T T ₀) ^{1/2}	7.00E+21	-1.60E+00	1.13E+05	(T T ₀) ^{1/2}	7.00E+21	-1.60E+00	1.13E+05	(T T ₀) ^{1/2}	7.00E+21	-1.60E+00	1.13E+05	(T T ₀) ^{1/2}	7.00E+21	-1.60E+00	1.13E+05
N*	(T T ₀) ^{1/2}	n.c.	n.c.	n.c.	(T T ₀) ^{1/2}	3.00E+22	-1.60E+00	1.13E+05	n.c.	n.c.	n.c.	n.c.	(T T ₀) ^{1/2}	7.00E+21	-1.60E+00	1.13E+05
O*	(T T ₀) ^{1/2}	n.c.	n.c.	n.c.	(T T ₀) ^{1/2}	3.00E+22	-1.60E+00	1.13E+05	n.c.	n.c.	n.c.	n.c.	(T T ₀) ^{1/2}	7.00E+21	-1.60E+00	1.13E+05
N ₂ *	(T T ₀) ^{1/2}	n.c.	n.c.	n.c.	(T T ₀) ^{1/2}	7.00E+21	-1.60E+00	1.13E+05	n.c.	n.c.	n.c.	n.c.	(T T ₀) ^{1/2}	7.00E+21	-1.60E+00	1.13E+05
O ₂ *	(T T ₀) ^{1/2}	n.c.	n.c.	n.c.	(T T ₀) ^{1/2}	7.00E+21	-1.60E+00	1.13E+05	n.c.	n.c.	n.c.	n.c.	(T T ₀) ^{1/2}	7.00E+21	-1.60E+00	1.13E+05
NO*	(T T ₀) ^{1/2}	n.c.	n.c.	n.c.	(T T ₀) ^{1/2}	7.00E+21	-1.60E+00	1.13E+05	n.c.	n.c.	n.c.	n.c.	(T T ₀) ^{1/2}	7.00E+21	-1.60E+00	1.13E+05
e ⁻	T ₀	3.00E+24	-1.60E+00	1.13E+05	(T T ₀) ^{1/2}	1.20E+25	-1.60E+00	1.13E+05	(T T ₀) ^{1/2}	1.20E+25	--	--	T ₀	3.00E+24	-1.60E+00	1.13E+05

note: Only the coefficients in case of N and N2 as third bodies were explicitly evaluated. The ones for O, O2 and NO are referred to in the book as "estimated".

n.c.: third body not considered in the reaction mechanism

n.c.: third body not considered in the reaction mechanism

Third body (M):	Park's Book				Park 1993				Park 1994				Park 2001			
	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]
N	(T T _g) ^{1/2}	1.00E+22	-1.50E+00	5.95E+04	(T T _g) ^{1/2}	1.00E+22	-1.50E+00	5.95E+04	(T T _g) ^{1/2}	1.00E+22	-1.50E+00	5.98E+04	(T T _g) ^{1/2}	1.00E+22	-1.50E+00	5.94E+04
O	(T T _g) ^{1/2}	1.00E+22	-1.50E+00	5.95E+04	(T T _g) ^{1/2}	1.00E+22	-1.50E+00	5.95E+04	(T T _g) ^{1/2}	1.00E+22	-1.50E+00	5.98E+04	(T T _g) ^{1/2}	1.00E+22	-1.50E+00	5.94E+04
N ₂	(T T _g) ^{1/2}	2.00E+21	-1.50E+00	5.95E+04	(T T _g) ^{1/2}	2.00E+21	-1.50E+00	5.95E+04	(T T _g) ^{1/2}	2.00E+21	-1.50E+00	5.98E+04	(T T _g) ^{1/2}	2.00E+21	-1.50E+00	5.94E+04
O ₂	(T T _g) ^{1/2}	2.00E+21	-1.50E+00	5.95E+04	(T T _g) ^{1/2}	2.00E+21	-1.50E+00	5.95E+04	(T T _g) ^{1/2}	2.00E+21	-1.50E+00	5.98E+04	(T T _g) ^{1/2}	2.00E+21	-1.50E+00	5.94E+04
NO	(T T _g) ^{1/2}	2.00E+21	-1.50E+00	5.95E+04	(T T _g) ^{1/2}	2.00E+21	-1.50E+00	5.95E+04	(T T _g) ^{1/2}	2.00E+21	-1.50E+00	5.98E+04	(T T _g) ^{1/2}	2.00E+21	-1.50E+00	5.94E+04
N*	n.c.	n.c.	n.c.	n.c.	(T T _g) ^{1/2}	1.00E+22	-1.50E+00	5.95E+04	n.c.	n.c.	n.c.	n.c.	(T T _g) ^{1/2}	2.00E+21	-1.50E+00	5.94E+04
O*	n.c.	n.c.	n.c.	n.c.	(T T _g) ^{1/2}	1.00E+22	-1.50E+00	5.95E+04	n.c.	n.c.	n.c.	n.c.	(T T _g) ^{1/2}	2.00E+21	-1.50E+00	5.94E+04
N ₂ *	n.c.	n.c.	n.c.	n.c.	(T T _g) ^{1/2}	2.00E+21	-1.50E+00	5.95E+04	n.c.	n.c.	n.c.	n.c.	(T T _g) ^{1/2}	2.00E+21	-1.50E+00	5.94E+04
O ₂ *	n.c.	n.c.	n.c.	n.c.	(T T _g) ^{1/2}	2.00E+21	-1.50E+00	5.95E+04	n.c.	n.c.	n.c.	n.c.	(T T _g) ^{1/2}	n.c.	n.c.	n.c.
NO*	n.c.	n.c.	n.c.	n.c.	(T T _g) ^{1/2}	2.00E+21	-1.50E+00	5.95E+04	n.c.	n.c.	n.c.	n.c.	(T T _g) ^{1/2}	2.00E+21	-1.50E+00	5.94E+04
e	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.

note: Only the coefficients in case of N, N₂, O and O₂ as third bodies were explicitly evaluated. The one for NO is referred to in the book as "estimated".

n.c.: third body not considered in the reaction mechanism

n.c.: third body not considered in the reaction mechanism

n.c.: third body not considered in the reaction mechanism

Reaction: NO+M=N+O+M	Park's Book				Park 1993				Park 1994				Park 2001			
	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T ₀ [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T ₀ [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T ₀ [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T ₀ [K]
N	(T/T ₀) ^{3/2}	1.10E+17	0.00E+00	7.55E+04	(T/T ₀) ^{3/2}	1.10E+17	0.00E+00	7.55E+04	(T/T ₀) ^{3/2}	1.10E+17	0.00E+00	7.55E+04	n.c.	n.c.	n.c.	n.c.
O	(T/T ₀) ^{3/2}	1.10E+17	0.00E+00	7.55E+04	(T/T ₀) ^{3/2}	1.10E+17	0.00E+00	7.55E+04	(T/T ₀) ^{3/2}	1.10E+17	0.00E+00	7.55E+04	n.c.	n.c.	n.c.	n.c.
N ₂	(T/T ₀) ^{3/2}	5.00E+15	0.00E+00	7.55E+04	(T/T ₀) ^{3/2}	5.00E+15	0.00E+00	7.55E+04	(T/T ₀) ^{3/2}	5.00E+15	0.00E+00	7.55E+04	n.c.	n.c.	n.c.	n.c.
O ₂	(T/T ₀) ^{3/2}	5.00E+15	0.00E+00	7.55E+04	(T/T ₀) ^{3/2}	5.00E+15	0.00E+00	7.55E+04	(T/T ₀) ^{3/2}	5.00E+15	0.00E+00	7.55E+04	n.c.	n.c.	n.c.	n.c.
NO	(T/T ₀) ^{3/2}	1.10E+17	0.00E+00	7.55E+04	(T/T ₀) ^{3/2}	1.10E+17	0.00E+00	7.55E+04	(T/T ₀) ^{3/2}	1.10E+17	0.00E+00	7.55E+04	n.c.	n.c.	n.c.	n.c.
N ⁺	n.c.	n.c.	n.c.	n.c.	(T/T ₀) ^{3/2}	1.10E+17	0.00E+00	7.55E+04	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.
O ⁺	n.c.	n.c.	n.c.	n.c.	(T/T ₀) ^{3/2}	1.10E+17	0.00E+00	7.55E+04	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.
N ₂ ⁺	n.c.	n.c.	n.c.	n.c.	(T/T ₀) ^{3/2}	5.00E+15	0.00E+00	7.55E+04	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.
O ₂ ⁺	n.c.	n.c.	n.c.	n.c.	(T/T ₀) ^{3/2}	5.00E+15	0.00E+00	7.55E+04	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.
NO ⁺	n.c.	n.c.	n.c.	n.c.	(T/T ₀) ^{3/2}	5.00E+15	0.00E+00	7.55E+04	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.
e ⁻	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.

note: Only the coefficients in case of NO as third bodies was explicitly evaluated. The ones for O and N are referred to in the book as "estimated" and are considered equal to the one for NO.

The lack of data on the reaction rates involving N2 and O2 as third bodies is pointed out in the book where is said that they should be considered unknown at present. The listed reaction rates are taken from the work of Koshi et al., where it was suggested to use 1/22 of the value of the reaction involving NO.

n.c.: third body not considered in the reaction mechanism

n.c.: third body not considered in the reaction mechanism



Reaction: O+e=O++e+e-

Park's Book				Park 1993				Park 1994				Park 2001							
Control temperature [K]:		C [cm ³ mole ⁻¹ s ⁻¹]	N	T ₀ [K]	Control temperature [K]:		C [cm ³ mole ⁻¹ s ⁻¹]	N	T ₀ [K]	Control temperature [K]:		C [cm ³ mole ⁻¹ s ⁻¹]	N	T ₀ [K]	Control temperature [K]:		C [cm ³ mole ⁻¹ s ⁻¹]	N	T ₀ [K]
T ₀	3.90E+33	-3.78E+00	1.59E+05	T ₀	3.90E+33	-3.78E+00	1.59E+05	T ₀	3.90E+33	-3.78E+00	1.59E+05	T ₀	3.90E+33	-3.78E+00	1.59E+05	T ₀	3.90E+33	-3.78E+00	1.59E+05

N+e=N++e-

Reaction: N+e=N++e-

Park's Book				Park 1993				Park 1994				Park 2001			
Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _e [K]	Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _e [K]	Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _e [K]	Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _e [K]
T _e	2.50E+33	-3.82E+00	1.68E+05	T _e	2.50E+34	-3.82E+00	1.69E+05	n.c.	n.c.	n.c.	n.c.	T _e	2.50E+34	-3.82E+00	1.68E+05



Reaction: N+O=NO++e-

Park's Book				Park 1993				Park 1994				Park 2001			
Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]	Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]	Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]	Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]
(T T _g) ^{1/2}	5.30E+12	0.00E+00	3.19E+04	T	8.80E+08	1.00E+00	3.19E+04	T	8.80E+08	1.00E+00	3.19E+04	T	5.30E+12	0.00E+00	3.19E+04



Reaction: O+O=O2++e-

Park's Book				Park 1993				Park 1994				Park 2001			
Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]
(T T _g) ^{1/2}	1.12E+13	0.00E+00	8.06E+04	T	7.10E+02	2.70E+00	8.06E+04	T	7.10E+02	2.70E+00	8.06E+04	n.c	n.c	n.c	n.c

N+N=N2++e-

Reaction: N+N=N₂⁺⁺+e-

Park's Book				Park 1993				Park 1994				Park 2001			
Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]	Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]	Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]	Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]
(T T _g) ^{1/2}	2.04E+13	0.00E+00	6.75E+04	T	4.40E+07	1.50E+00	6.75E+04	n.c.	n.c.	n.c.	n.c.	T	4.40E+07	1.50E+00	6.75E+04



Reaction: NO+O=O₂+N

Park's Book				Park 1993				Park 1994				Park 2001			
Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]	Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]	Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]	Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]
(T _g) ^{1/2}	8.40E+12	0.00E+00	1.94E+04	T	8.40E+12	0.00E+00	1.95E+04	T	8.40E+12	0.00E+00	1.95E+04	T	8.40E+12	0.00E+00	1.94E+04



Reaction: NO+O=O+N

Park's Book				Park 1993				Park 1994				Park 2001			
Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]
T	1.00E+13	5.00E-01	7.72E+04	T	1.00E+12	5.00E-01	7.72E+04	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.

O2++N=N++O2

Reaction: O₂⁺+N=N⁺+O₂

Park's Book				Park 1993				Park 1994				Park 2001			
Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]	Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]	Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]	Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]
T	8.70E+13	1.40E-01	2.86E+04	T	8.70E+13	1.40E-01	2.86E+04	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.



Reaction: NO+O \rightleftharpoons N+O₂

Park's Book				Park 1993				Park 1994				Park 2001				
Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	
T	1.40E+05	1.90E+00	1.53E+04	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.



Reaction: O₂⁺+N₂=N₂⁺+O₂

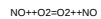
Park's Book				Park 1993				Park 1994				Park 2001			
Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]
T	9.90E+12	0.00E+00	4.07E+04	T	9.90E+12	0.00E+00	4.07E+04	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.



Reaction: NO++N=O++N₂

Park's Book				Park 1993			Park 1994			Park 2001					
Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]
T	3.40E+13	-1.08E+00	1.28E+04	T	3.40E+13	-1.08E+00	1.28E+04	T	3.40E+13	-1.08E+00	1.28E+04	n.c.	n.c.	n.c.	n.c.

In the book's reaction rate table T_g is used. However, since this value should have been evaluated as those of the other reactions involving ions, it is likely that the use of T_g is a typo.



Reaction: NO+O₂=O₂+NO

Park's Book				Park 1993				Park 1994				Park 2001			
Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]
T	2.40E+13	4.10E-01	3.26E+04	T	2.40E+13	4.10E-01	3.26E+04	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.



Reaction: NO+O=O2+N

Park's Book				Park 1993				Park 1994				Park 2001			
Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]	Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]	Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]	Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]
T	7.20E+12	2.90E-01	4.86E+04	T	7.20E+12	2.90E-01	4.86E+04	T	7.20E+12	2.90E-01	4.86E+04	n.c.	n.c.	n.c.	n.c.



Reaction: O++N₂=N₂⁺+O

Park's Book				Park 1993				Park 1994				Park 2001			
Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]	Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]	Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]	Control temperature [K]: C [cm ³ mole ⁻¹ s ⁻¹]		N	T _g [K]
T	9.00E+11	3.60E-01	2.28E+04	T	9.10E+11	3.60E-01	2.28E+04	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.



Reaction: NO+N=N₂+O

Park's Book				Park 1993				Park 1994				Park 2001			
Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]	Control temperature [K]:	C [cm ³ mole ⁻¹ s ⁻¹]	N	T _g [K]
T	7.20E+13	0.00E+00	3.55E+04	T	7.20E+13	0.00E+00	3.55E+04	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.