

JPL 05-X
Chemical Kinetics and Photochemical Data for Use in Atmospheric Studies
Evaluation No. 15

Tables for use in WMO Ozone Assessment – Not for General Distribution

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Table 0. Equilibrium Constants

Reaction	A/cm ³ molecule ⁻¹	B/°K	K _{eq} (298 K)	f(298 K) ^a	g	Note
HO + NO ₂ → HOONO	3.9×10 ⁻²⁷	10125	2.2×10 ⁻¹²	2	-400	1
HO ₂ + NO ₂ → HO ₂ NO ₂	2.1×10 ⁻²⁷	10900	1.6×10 ⁻¹¹	1.3	100	2
NO + NO ₂ → N ₂ O ₃	3.3×10 ⁻²⁷	4667	2.1×10 ⁻²⁰	2	100	3
NO ₂ + NO ₂ → N ₂ O ₄	5.9×10 ⁻²⁹	6643	2.8×10 ⁻¹⁹	1.4	100	4
NO ₂ + NO ₃ → N ₂ O ₅	2.7×10 ⁻²⁷	11000	2.9×10 ⁻¹¹	1.2	100	5
CH ₃ O ₂ + NO ₂ → CH ₃ O ₂ NO ₂	9.5×10 ⁻²⁹	11234	2.2×10 ⁻¹²	1.3	500	6
CH ₃ C(O)O ₂ + NO ₂ → CH ₃ C(O)O ₂ NO ₂	9.0×10 ⁻²⁹	14000	2.3×10 ⁻⁸	1.2	200	7
CH ₃ CH ₂ C(O)O ₂ + NO ₂ → CH ₃ CH ₂ C(O)O ₂ NO ₂	9.0×10 ⁻²⁹	14000	2.3×10 ⁻⁸	10	800	8
CH ₃ C(O)CH ₂ + O ₂ → CH ₃ C(O)CH ₂ O ₂	7×10 ⁻²⁷	13000	6×10 ⁻⁸	10	800	9
F + O ₂ → FOO	4.5×10 ⁻²⁵	6118	3.7×10 ⁻¹⁶	1.5	300	10
Cl + O ₂ → ClOO	6.6×10 ⁻²⁵	2502	2.9×10 ⁻²¹	1.7	100	11
Cl + CO → ClCO	3.5×10 ⁻²⁵	3730	9.6×10 ⁻²⁰	1.2	200	12
ClO + O ₂ → ClO·O ₂	2.9×10 ⁻²⁶	<3700	<7.2×10 ⁻²¹			13
ClO + ClO → Cl ₂ O ₂	9.3×10 ⁻²⁸	8835	7.0×10 ⁻¹⁵	1.2	300	14
ClO + OClO → Cl ₂ O ₃	1.6×10 ⁻²⁷	7155	4.3×10 ⁻¹⁷	1.3	300	15
OCLO + NO ₃ → O ₂ ClONO ₂	6.6×10 ⁻²⁹	3971	4.0×10 ⁻²³	5.5	500	16
OH + CS ₂ → CS ₂ OH	4.5×10 ⁻²⁵	5140	1.4×10 ⁻¹⁷	1.4	300	17
CH ₃ S + O ₂ → CH ₃ SO ₂	1.8×10 ⁻²⁷	5545	2.2×10 ⁻¹⁹	1.4	300	18
Cl + CS ₂ → Cl---CS ₂	1.8×10 ⁻²⁵	4982	3.3×10 ⁻¹⁸	1.3	150	19
Br+CH ₃ SCH ₃ →Br---(CH ₃) ₂ S	3.4×10 ⁻²⁵	3021	4.6×10 ⁻¹⁵	1.2	100	20

K/cm³ molecule⁻¹ = A exp (B/T) [200 < T/K < 300]

a f(298 K) is the uncertainty factor at 298 K, and g is a measure of the uncertainty in the quantity B. To calculate the uncertainty at temperatures other than 298 K, use the expression:

$$f(T) = f(298\text{ K}) \exp \left[g \left(\frac{1}{T} - \frac{1}{298} \right) \right]$$

Shaded areas indicate changes or additions since JPL 02-25.