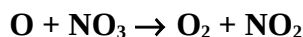


IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet NO_x4 I.A3.34

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$$\Delta H^\circ = -288.9 \text{ kJ mol}^{-1}$$

Rate coefficient data

$k / \text{cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$	Temp./K	Reference	Technique/ Comments
<i>Absolute Rate coefficients</i> (1.70 ± 0.6) × 10 ⁻¹¹	297	Canosa-Mas et al., 1989	DF-RF/A (a)

Comments

(a) [O(³P)] was monitored by RF and [NO₃] by absorption at 662 nm using $\sigma = 1.9 \times 10^{-17} \text{ cm}^2 \text{ molecule}^{-1}$. Excess of [NO₃] over [O] was not sufficient to give purely first order kinetics. Analysis of the data took account of this and of the possibility of other interfering reactions.

Preferred Values

$$k = 1.7 \times 10^{-11} \text{ cm}^3 \text{ molecule}^{-1} \text{ s}^{-1} \text{ at } 298 \text{ K.}$$

Reliability

$$\Delta \log k = \pm 0.3 \text{ at } 298 \text{ K.}$$

Comments on Preferred Values

The preferred value is that reported by Canosa-Mas et al. (1989), which is the only direct measurement of the rate coefficient. The earlier relative value of Graham and Johnston (1978) is consistent with the preferred value, taking into account the experimental uncertainties. The temperature dependence is probably near zero, by analogy with the reaction of O(³P) atoms with NO₂.

References

- Canosa-Mas, C. E., Carpenter, P. J., and Wayne, R. P.: J. Chem. Soc. Faraday Trans. 2 85, 697, 1989.
Graham R. A. and Johnston, H. S.: J. Phys. Chem. 82, 254, 1978.