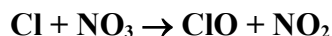


IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet iClOx16

Website: <http://iupac.pole-ether.fr>. See website for latest evaluated data. Datasheets can be downloaded for personal use only and must not be retransmitted or disseminated either electronically or in hardcopy without explicit written permission.

This datasheet updated: 23th July 2003.



$$\Delta H^\circ = -60.2 \text{ kJ}\cdot\text{mol}^{-1}$$

Rate coefficient data

$k/\text{cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$	Temp./K	Reference	Technique/ Comments
<i>Absolute Rate Coefficients</i>			
$(2.6 \pm 0.5) \times 10^{-11}$	298	Mellouki, Le Bras, and Poulet, 1987 ¹	DF-EPR/MS
$(2.26 \pm 0.17) \times 10^{-11}$	298	Becker <i>et al.</i> , 1991 ²	DF-MS

Preferred Values

$k = 2.4 \times 10^{-11} \text{ cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$, independent of temperature over the range 200 K to 300 K.

Reliability

$\Delta \log k = \pm 0.2$ at 298 K.

$\Delta(E/R) = \pm 400$ K.

Comments on Preferred Values

The preferred value at room temperature is based on the studies of Mellouki *et al.*¹ and Becker *et al.*² The results of these direct absolute rate studies are preferred over those of earlier relative rate studies,³⁻⁵ in which NO_3 was monitored in the photolysis of $\text{Cl}_2\text{-ClONO}_2\text{-N}_2$ mixtures. The agreement among these earlier studies³⁻⁵ is not good and probably arises from complications in the chemistry of the systems used. This radical-radical reaction is expected to have a negligible temperature dependence, which is consistent with the results of Cox *et al.*⁵ over the temperature range 278 K to 338 K.

References

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- ³ R. A. Cox, R. A. Barton, E. Ljungstrom, and D. W. Stocker, *Chem. Phys. Lett.* **108**, 228 (1984).
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- ⁵ R. A. Cox, M. Fowles, D. Moulton, and R. P. Wayne, *J. Phys. Chem.* **91**, 3361 (1987).