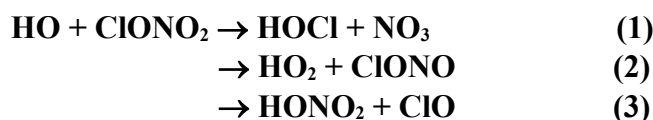


IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet iClOx27

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

This data sheet updated: 23th July 2003.



$$\Delta H^\circ(1) = -64 \text{ kJ}\cdot\text{mol}^{-1}$$

$$\Delta H^\circ(2) = 10 \text{ kJ}\cdot\text{mol}^{-1}$$

$$\Delta H^\circ(3) = -93.6 \text{ kJ}\cdot\text{mol}^{-1}$$

Rate coefficient data ($k = k_1 + k_2 + k_3$)

$k/\text{cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$	Temp./K	Reference	Technique/ Comments
<i>Absolute Rate Coefficients</i>			
$(3.7 \pm 0.2) \times 10^{-13}$	245	Ravishankara <i>et al.</i> , 1977 ¹	FP-RF
$1.19 \times 10^{-12} \exp[-(333 \pm 22)/T]$	246-387	Zahniser, Chang, and Kaufman, 1977 ²	DF-RF
$(3.93 \pm 0.11) \times 10^{-13}$	295		

Preferred Values

$$k = 4.0 \times 10^{-13} \text{ cm}^3 \text{ molecule}^{-1} \text{ s}^{-1} \text{ at } 298 \text{ K.}$$

$$k = 1.2 \times 10^{-12} \exp(-330/T) \text{ cm}^3 \text{ molecule}^{-1} \text{ s}^{-1} \text{ over the temperature range } 240 \text{ K to } 390 \text{ K.}$$

Reliability

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

$$\Delta(E/R) = \pm 200 \text{ K.}$$

Comments on Preferred Values

The results of the only two reported studies of Ravishankara *et al.*¹ and Zahniser *et al.*² are in good agreement at 245 K (within 25%), considering the difficulties associated with handling ClONO₂. The preferred value is based on the temperature-dependent study of Zahniser *et al.*² Neither study reported any data concerning the reaction products.

References

- ¹ A. R. Ravishankara, D. D. Davis, G. Smith, G. Tesi, and J. Spencer, *Geophys. Res. Lett.* **4**, 7 (1977).
- ² M. S. Zahniser, J. S. Chang, and F. Kaufman, *J. Chem. Phys.* **67**, 997 (1977).