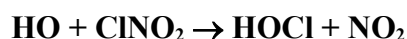


IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet iClOx26

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.



$$\Delta H^\circ = -94 \text{ kJ}\cdot\text{mol}^{-1}$$

Rate coefficient data

$k/\text{cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$	Temp./K	Reference	Technique/ Comments
<i>Absolute Rate Coefficients</i>			
$(3.5 \pm 0.7) \times 10^{-14}$	298	Ganske <i>et al.</i> , 1991 ¹	DF-RF (a)
$2.4 \times 10^{-12} \exp[-(1250 \pm 155)/T]$	259-348	Ganske <i>et al.</i> , 1992 ¹	DF-RF/MS (a)
$(3.6 \pm 0.2) \times 10^{-14}$	298		

Comments

- (a) Flow tube at 1.35 mbar. HO formed from H + NO₂ and detected by resonance fluorescence. Product analysis using mass spectrometry revealed HOCl to be the sole chlorine-containing product.

Preferred Values

$$k = 3.6 \times 10^{-14} \text{ cm}^3 \text{ molecule}^{-1} \text{ s}^{-1} \text{ at } 298 \text{ K.}$$

$$k = 2.4 \times 10^{-12} \exp(-1250/T) \text{ cm}^3 \text{ molecule}^{-1} \text{ s}^{-1} \text{ over the temperature range } 260 \text{ K to } 350 \text{ K.}$$

Reliability

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

$$\Delta(E/R) = \pm 300 \text{ K.}$$

Comments on Preferred Values

The preferred values are based on the results of the temperature-dependent study of Ganske *et al.*² Mass spectrometric measurements^{1,2} showed HOCl to be the sole chlorine-containing product, with no evidence for production of HONO₂ or Cl₂, thereby showing that the only reaction pathway is that yielding HOCl + NO₂.

References

- ¹ J. A. Ganske, M. J. Ezell, H. N. Berko, and B. J. Finlayson-Pitts, *Chem. Phys. Lett.* **179**, 204 (1991).
- ² J. A. Ganske, H. N. Berko, M. J. Ezell, and B. J. Finlayson-Pitts, *J. Phys. Chem.* **96**, 2568 (1992).