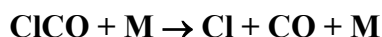


IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet iClOx13

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: 9th March 2005.



$$\Delta H^\circ = 32.6 \text{ kJ}\cdot\text{mol}^{-1}$$

Low-pressure rate coefficients Rate coefficient data

k_0/s^{-1}	Temp./K	Reference	Technique/ Comments
<i>Absolute Rate Coefficients</i>			
$4.1 \times 10^{-10} \exp[-(2960 \pm 160)/T]$ [N ₂]	185-260	Nicovich, Kreutter, and Wine, 1990	PLP-RF (a)

Comments

- (a) Pulsed laser photolysis of $\text{Cl}_2\text{-CO-M}$ ($\text{M} = \text{N}_2, \text{CO}, \text{Ar}$ and CO_2) mixtures at 355 nm. The pressure was 19-267 mbar. By second- and third-law analyses of the temperature dependence of the equilibrium constant, a value of $\Delta H^\circ(298 \text{ K}) = (32.2 \pm 2.5) \text{ kJ mol}^{-1}$ was derived. The relative collision efficiencies were $\beta_c(\text{CO}_2) : \beta_c(\text{CO/N}_2) : \beta_c(\text{Ar}) = 3.2 : 1.0 : 0.8$.

Preferred Values

$$k_0 = 2.0 \times 10^{-14} [\text{N}_2] \text{ s}^{-1} \text{ at } 298 \text{ K.}$$

$$k_0 = 4.1 \times 10^{-10} \exp(-2960/T) [\text{N}_2] \text{ s}^{-1} \text{ over the temperature range } 180\text{-}300 \text{ K.}$$

Reliability

$$\Delta \log k_0 = \pm 0.4 \text{ at } 298 \text{ K.}$$

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

Comments on Preferred Values

The preferred rate coefficients are based on the study of Nicovich et al. (1990).

References

Nicovich, J. M., Kreutter, K. D. and Wine, P. H.: J. Chem. Phys., 92, 3539, 1990.