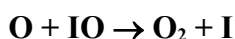


IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet iIOx2

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.



$$\Delta H^\circ = -258 \text{ kJ}\cdot\text{mol}^{-1}$$

Rate coefficient data

$k/\text{cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$	Temp./K	Reference	Technique/ Comments
<i>Absolute Rate Coefficients</i>			
$(1.2 \pm 0.5) \times 10^{-10}$	298	Laszo et al., 1995	PLP-AS (a)
$(1.5 \pm 0.7) \times 10^{-10}$	298	Payne et al., 1998	DF-MS (b)
$(1.35 \pm 0.15) \times 10^{-10}$	296	Canosa-Mas et al., 1999	DF-RF (c)

Comments

- O(³P) atoms were produced by pulsed laser photolysis of N₂O at 193 nm in the presence of I₂, at total pressures of ~260 mbar of N₂. The I₂ concentrations used were comparable to those of O(³P) atoms. The I₂ and IO radical concentrations were monitored simultaneously by absorption spectroscopy at 530 nm and at 340 nm to 435 nm, respectively, and values of *k* were derived by modeling the I₂ and IO radical time-concentration profiles.
- IO radical concentrations were monitored by MS in the presence of a large excess of O(³P) atoms. The total pressure was ~1.3 mbar of He.
- IO radical concentrations in the presence of a large excess of O(³P) atoms were monitored by conversion to I atoms by reaction with excess NO; the I atoms were observed by RF at 170-200 nm. The total pressure was ~2.5 mbar of He.

Preferred Values

$$k = 1.4 \times 10^{-10} \text{ cm}^3 \text{ molecule}^{-1} \text{ s}^{-1} \text{ at } 298 \text{ K.}$$

Reliability

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

Comments on Preferred Values

Prior to the three studies cited in the table (Laszlo et al., 1995; Payne et al., 1998; Canosa-Mas et al., 1999), only estimates of the rate coefficient for this reaction were available. The preferred value is the mean of the rate coefficients obtained by Laszlo et al. (1995), Payne et al. (1998) and Canosa-Mas et al. (1999), which are in good agreement and were obtained using quite different experimental techniques. The value of the rate coefficient is large,

approaching the gas kinetic collisional value and suggesting a near zero temperature dependence of k .

References

- Canosa-Mas, C. E., Flugge, M. L., Shah, D., Vipond, A. and Wayne, R. P.: J. Atmos. Chem. 34, 153, 1999.
- Laszlo, B., Kurylo, M. J. and Huie, R. E.: J. Phys. Chem. 99, 11701, 1995.
- Payne, W. A., Thorne Jr., R. P., Nesbitt, F. C. and Stief, L. J.: J. Phys. Chem. A 102, 6247, 1998.