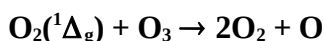


IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet Ox8

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 retransmitted or disseminated either electronically or in hardcopy without explicit written permission.

This data sheet updated: 2nd October 2001.



$$\Delta H^\circ = 12.2 \text{ kJ}\cdot\text{mol}^{-1}$$

Rate coefficient data

$k/\text{cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$	Temp./K	Reference	Technique/ Comments
<i>Absolute Rate Coefficients</i>			
$4.5 \times 10^{-11} \exp(-2830/T)$	283-321	Findlay and Snelling, 1971 ¹	F-CL (a)
3.4×10^{-15}	298		
$6.0 \times 10^{-11} \exp(-2850/T)$	296-360	Becker, Groth and Schurath, 1972 ²	S-CL (b)
4.2×10^{-15}	298		

Comments

- (a) $\text{O}_2(^1\Delta_g)$ produced by photolysis of O_3 at 253.7 nm.
(b) $\text{O}_2(^1\Delta_g)$ produced by a microwave discharge of O_2 and flowed into the large static reaction vessel.

Preferred Values

$$k = 3.8 \times 10^{-15} \text{ cm}^3 \text{ molecule}^{-1} \text{ s}^{-1} \text{ at } 298 \text{ K.}$$

$$k = 5.2 \times 10^{-11} \exp(-2840/T) \text{ cm}^3 \text{ molecule}^{-1} \text{ s}^{-1} \text{ over the temperature range } 280\text{-}360 \text{ K.}$$

Reliability

$$\Delta \log k = \pm 0.10 \text{ at } 298 \text{ K.}$$

$$\Delta(E/R) = \pm 500 \text{ K.}$$

Comments on Preferred Values

The preferred values are mean values from the studies listed.^{1,2} While the data of Clark *et al.*³ are in good agreement with these studies^{1,2} for the room temperature value, their temperature coefficient is substantially lower. In view of the consistency of the results from Findlay and Snelling¹ and Becker *et al.*,² which were obtained by two completely different techniques, we favour their temperature coefficient over that from ref. 5.

References

- ¹ F. D. Findlay and D. R. Snelling, *J. Chem. Phys.* **54**, 2750 (1971).
- ² K. H. Becker, W. Groth, and U. Schurath, *Chem. Phys. Lett.* **14**, 489 (1972).
- ³ I. D. Clark, I. T. N. Jones, and R. P. Wayne, *Proc. Roy. Soc. London A* **317**, 407 (1970).