IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet SOx46

This data sheet updated: 20th November 2001.

$SO + NO_2 \rightarrow SO_2 + NO$

$\Delta H^\circ = -244.5$ kJ·mol^{-1}

Rate coefficient data

k/cm^3 molecule^{-1} s^{-1}	Temp./K	Reference	Technique/ Comments
Absolute Rate Coefficients			
$(1.37 \pm 0.07) \times 10^{-11}$	210-363	Brunning and Stief, 1986	DF-MS

Preferred Values

$k = 1.4 \times 10^{-11}$ cm^3 molecule^{-1} s^{-1}, independent of temperature over the range 210-360 K.

Reliability

$\Delta \log k = \pm 0.1$ at 298 K.

$\Delta(E/R) = \pm 100$ K.

Comments on Preferred Values

The measurements of Brunning and Stief (1986) are the only available temperature dependent study of the rate coefficient, and indicate no measurable change in the rate coefficient k over the temperature range 210-363 K. This finding is the basis for our present recommendation for the rate coefficient, which agrees with three previous studies performed at ambient temperature (Clyne and MacRobert, 1980; Black et al., 1982; Clyne et al., 1966).

References

Black, G., Sharpless, R. L. and Slanger, T. G.: Chem. Phys. Lett. 90, 55, 1982.
Brunning, J. and Stief, L. J.: J. Chem. Phys. 84, 4371, 1986.
Clyne, M. A. A. and MacRobert, A. J.: Int. J. Chem. Kinet. 12, 79, 1980.
Clyne, M. A. A., Halstead, C. J. and Thrush, B. A.: Proc. Roy. Soc. London, Ser. A 295, 355, 1966.