IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet SOx55

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$CH_2SH + NO_2 \rightarrow$ products

Rate coefficient data

k/cm^3 molecule^{-1} s^{-1}	Temp./K	Reference	Technique/ Comments
Absolute Rate Coefficients			
$(3.8 \pm 1.0) \times 10^{-11}$	298	Anastasi et al., 1992	(a)
$(6.9 \pm 4) \times 10^{-11}$	298	Rahman et al., 1992	(b)

Comments

(a) Pulsed radiolysis of CH_3SH-O_2-SF_6 mixtures at 1 bar total pressure. CH_2SH and CH_3S radicals were generated by reactions of the radiolytically produced F atoms with CH_3SH, and [CH_2SH] was monitored by UV absorption over the wavelength range 220-380 nm.

(b) Fast flow discharge study. CH_2SH radicals were generated by the reaction of F atoms with CH_3SH and were monitored by MS. Source reactions were simulated to check consumption of F atoms. The total pressure was 3 mbar.

Preferred Values

$k = 4.4 \times 10^{-11}$ cm^3 molecule^{-1} s^{-1} at 298 K.

Reliability

$\Delta \log k = \pm 0.5$ at 298 K.

Comments on Preferred Values

The only two measurements (Anastasi et al., 1992; Rahman et al., 1992) of k differ substantially but because the error limits are large enough to encompass the two results it is difficult to know whether the difference is significant. In the same two studies the values obtained for $k(CH_2SH + O_2)$ differed to the same degree with much smaller error limits.

Until further studies are carried out, we recommend a weighted mean of the two values and substantial error limits.

References

Anastasi, C., Broomfield, M., Nielsen, O. J. and Pagsberg, P.: J. Phys. Chem. 96, 696, 1992.
Rahman, M. M., Becker, E., Wille, U. and Schindler, R. N.: Ber. Bunsenges. Phys. Chem. 96, 783, 1992.