IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet SOx29

This data sheet last evaluated: 28th July 2007; no revision of preferred values.

$NO_3 + CS_2 \rightarrow$ products

Rate coefficient data

k/cm^3 molecule^{-1} s^{-1}	Temp./K	Reference	Technique/ Comments
Absolute Rate Coefficients			
$<4 \times 10^{-16}$	298	Burrows et al., 1985	MM-A
Relative Rate Coefficients			
$<1.1 \times 10^{-15}$	297 ± 2	Mac Leod et al., 1986	RR (a)

Comments

(a) NO_3 radicals were generated by thermal decomposition of N_2O_5 at atmospheric pressure of air. The decay rates of CS_2 and propene were monitored by FTIR absorption spectroscopy. The upper limit to the rate coefficient was obtained by use of a rate coefficient of $k(NO_3 + \text{propene}) = 9.4 \times 10^{-15}$ cm^3 molecule^{-1} s^{-1} at 297 K (IUPAC, 2007).

Preferred Values

$k < 4 \times 10^{-16}$ cm^3 molecule^{-1} s^{-1} at 298 K.

Comments on Preferred Values

The preferred value is based upon the absolute study of Burrows et al. (1985, which is consistent with the slightly higher upper limit derived by Mac Leod et al. (1986).

References

Burrows, J. P., Tyndall, G. S. and Moortgat, G. K.: J. Phys. Chem. 89, 4848, 1985.
IUPAC: http://iupac.pole-ether.fr, 2007.
Mac Leod, H., Aschmann, S. M., Atkinson, R., Tuazon, E. C., Sweetman, J. A., Winer, A. M. and Pitts Jr., J. N.: J. Geophys. Res. 91, 5338, 1986.