IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet IV.A2.80 oClOx6

This data sheet last evaluated: June 2015; last change in preferred values: November 2003.

$O(^1D) + CH_2ClCF_2Cl$ (HCFC-132b) $\rightarrow O(^3P) + CH_2ClCF_2Cl$ (1)
$\rightarrow$ other products (2)

$\Delta H°(1) = -190$ kJ mol^{-1}

Rate coefficient data ($k = k_1 + k_2$)

k/cm^3 molecule^{-1} s^{-1}	Temp./K	Reference	Technique/ Comments
Relative Rate Coefficients $k_2 = (1.6 \pm 0.6) \times 10^{-10}$	297	Green and Wayne, 1976	RR (a)

Comments

(a) $O(^1D)$ produced by photolysis of NO_2 at 229 nm. $\Delta(CH_3CF_3)/\Delta(N_2O)$ monitored by IR absorption spectroscopy. Measured rate coefficient ratio of $k_2/k(O(^1D) + N_2O) = 1.4 \pm 0.3$ is placed on an absolute basis using $k(O(^1D) + N_2O) = 1.16 \times 10^{-10}$ cm^3 molecule^{-1} s^{-1} (Atkinson et al., 2008). The cited rate coefficient refers to chemical reaction only and does not include physical quenching.

Preferred Values

Parameter	Value	T/K
k /cm^3 molecule^{-1} s^{-1}	1.6×10^{-10}	298
Reliability		
$\Delta \log k$	± 0.5	298

Comments on Preferred Values

The preferred value of k_2 is derived from the relative rate results reported by Green and Wayne (1976) in the only published study of this reaction. It should be noted that this rate coefficient refers to chemical reaction only and does not include physical quenching of $O(^1D)$.

References

Atkinson, R., Baulch, D. L., Cox, R. A., Crowley, J. N., Hampson, R. F., Hynes, R. G., Jenkin, M. E., Rossi, M. J., Troe, J., and Wallington, T. J.: Atmos. Chem. Phys., 8, 4141, 2008; IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation, http://iupac.pole-ether.fr.

Green, R. G. and Wayne, R. P.: J. Photochem., 6, 371, 1976.