IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet oClOx35

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

$Cl + CHFClCF_3$ (HCFC-124) $\rightarrow HCl + CFClCF_3$

Rate coefficient data

k/cm^3 molecule^{-1} s^{-1}	Temp./K	Reference	Technique/ Comments
Absolute Rate Coefficients			
$1.16 \times 10^{-12} \exp[-(1800 \pm 150/T]$	276-376	Warren and Ravishankara, 1993	PLP-RF
$(2.62 \pm 0.50) \times 10^{-15}$	298		
Relative Rate Coefficients			
$(2.7 \pm 0.6) \times 10^{-15}$	298	Tuazon et al., 1992	RR (a)

Comments

(a) Cl atoms were generated by the photolysis of Cl_2. The decays of the reactant and reference organic were measured by FTIR spectroscopy. The measured rate coefficient was placed on an absolute basis by use of a rate coefficient of $k(Cl + CH_4) = 1.0 \times 10^{-13}$ cm^3 molecule^{-1} s^{-1} (Atkinson et al., 2006).

Preferred Values

Parameter	Value	T/K
k /cm^3 molecule^{-1} s^{-1}	2.7×10^{-15}	298
k /cm^3 molecule^{-1} s^{-1}	$1.1 \times 10^{-12} \exp(-1800/T)$	270-380
Reliability		
$\Delta \log k$	± 0.1	298
$\Delta(E/R)$	± 500	270-380

Comments on Preferred Values

The preferred value at 298 K is based on the results reported by Warren and Ravishankara (1993) and Tuazon et al. (1992), which are in good agreement. The recommended temperature dependence is that reported by Warren and Ravishankara (1993), the only study carried out over a range of temperatures.

References

Atkinson, R., Baulch, D. L., Cox, R. A., Crowley, J. N., Hampson, R. F., Hynes, R. G., Jenkin, M. E., Rossi, M. J., and Troe, J.: Atmos. Chem. Phys., 6, 3625, 2006; IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation, http://iupac.pole-ether.fr
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Warren, R. F. and Ravishankara, A. R.: Int. J. Chem. Kinet.. 25, 833, 1993.