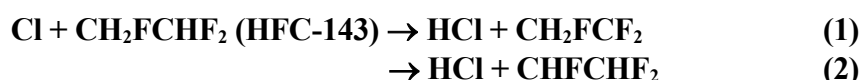


IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet on ClO_x28

Website: <http://iupac.pole-ether.fr>. See website for latest evaluated data. Data sheets can be downloaded for personal use only and must not be retransmitted or disseminated either electronically or in hardcopy without explicit written permission. The citation for this data sheet is: 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., 9, 4141, 2008; IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation, <http://iupac.pole-ether.fr>.

This data sheet last evaluated: June 2015; last change in preferred values: April 2004.



$$\Delta H^\circ(1) = 2.2 \text{ kJ mol}^{-1}$$

$$\Delta H^\circ(2) = 0.0 \text{ kJ mol}^{-1}$$

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

$k/\text{cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$	Temp./K	Reference	Technique/ Comments
<i>Relative Rate Coefficients</i>			
$k_1 = 3.3 \times 10^{-12} \exp(-1450/T)$	281-368	Tschuikow-Roux et al., 1985	RR (a)
$k_1 = 2.5 \times 10^{-14}$	298		
$k_2 = 4.6 \times 10^{-12} \exp(-1560/T)$	281-368		
$k_2 = 2.5 \times 10^{-14}$	298		

Comments

- (a) Cl atoms were generated by the photolysis of Cl₂. Product yield ratios were measured by GC and the derived rate coefficient ratios of $k_1/k(\text{Cl}+\text{CH}_4) = 0.50 \exp(206/T)$ and for $k_2/k(\text{Cl}+\text{CH}_4) = 0.70 \exp(315/T)$ were placed on an absolute basis using $k(\text{Cl} + \text{CH}_4) = 6.6 \times 10^{-12} \exp(-1240/T) \text{ cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$ (Atkinson et al. 2006).

Preferred Values

Parameter	Value	T/K
$k_1 / \text{cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$	2.5×10^{-14}	298
$k_1 / \text{cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$	$3.3 \times 10^{-12} \exp(-1450/T)$	280-370
$k_2 / \text{cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$	2.5×10^{-14}	298
$k_2 / \text{cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$	$4.6 \times 10^{-12} \exp(-1560/T)$	280-370
<i>Reliability</i>		
$\Delta \log k_1$	± 0.5	298
$\Delta \log k_2$	± 0.5	298
$\Delta(E_1/R)$	± 500	
$\Delta(E_2/R)$	± 500	

Comments on Preferred Values

The recommended values are based on the results of the single determination of this rate constant by Tschuikow-Roux et al. (1985).

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>

Tschuikow-Roux, E., Yano, T. and Niedzielski, J.: J. Chem. Phys., 82, 65, 1985.

