**Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet oClOx26**

Website: [http://iupac.pole-ether.fr](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](http://iupac.pole-ether.fr/).

This data sheet last evaluated: June 2014; last change in preferred values: November 2003

**Cl + CH2FCH2F (HFC-152)  HCl + CHFCH2F**

*H* = -4.6 kJ mol-1

**Rate coefficient data**

|  |  |  |  |
| --- | --- | --- | --- |
| *k*/cm3 molecule-1 s-1  | Temp./K | Reference | Technique/ Comments |
| *Relative Rate Coefficients* |  |  |  |
| 2.8 x 10-11 exp(-1065/*T*) | 280-360 | Yano and Tschuikow-Roux, 1986 | RR (a) |  |
| 7.8 x 10-13 | 298 |  |  |  |
| (6.6  0.2) x 10-13 | 296 | Wallington et al., 1994 | RR (b) |  |
| (6.5  0.4) x 10-13 | 296 |  | RR (c) |  |

**Comments**

(a) Cl atoms were generated by the photolysis of Cl2. Product yield ratios were measured by GC and the measured rate coefficient ratio *k*(Cl+CH2FCH2F)/*k*(Cl+C2H6) = 0.333 exp(-965)/T was placed on an absolute basis using *k*(Cl + C2H6) = 8.1 x 10-11 exp(-100/*T*) cm3 molecule-1 s-1 (Atkinson et al., 2006).

(b) Cl atoms were generated by the photolysis of Cl2 in presence of CH2FCH2F-CH4 in air at 930 mbar total pressure. Loss of reactants was monitored by FTIR. The measured rate coefficient ratio *k*(Cl + CH2FCH2F)/*k*(Cl + CH4) = (6.60  0.16) was placed on an absolute basis using *k*(Cl + CH4) = 1.0 x 10-13 cm3 molecule-1 s-1 (Atkinson et al., 2006).

1. Cl atoms were generated by the photolysis of Cl2 in presence of CH2FCH2F-CH3Cl mixtures in air at 930 mbar total pressure. Loss of reactants was monitored by FTIR. The measured rate coefficient ratio *k*(Cl + CH2FCH2F)/*k*(Cl + CH3Cl) = (1.36  0.07) was placed on an absolute basis using *k*(Cl + CH3Cl) = 4.8 x 10-13 cm3 molecule-1 s-1 (Atkinson et al., 2006).

**Preferred Values**

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Value** | ***T*/K** |
|  |  |  |
| *k* /cm3 molecule-1 s-1 | 7.0 x 10-13 | 298 |
| *k* /cm3 molecule-1 s-1 | 2.5 x 10-11 exp(-1065/*T*) | 280-360 |

*Reliability*

|  |  |  |
| --- | --- | --- |
|  log *k*  | ± 0.2 | 298 |
| Δ(*E*/*R*)  | ± 400 |  |

*Comments on Preferred Values*

The recommended value at 298 K is an average of the rate constants obtained by the relative rate studies of Yano and Tschuikow-Roux, (1986) and Wallington et al. (1994). The expression for the temperature dependence is taken from Yano and Tschuikow-Roux, (1986), modified to reproduce the recommended value at 298 K.

**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 Subcommittee for Gas Kinetic Data Evaluation, [http://iupac.pole-ether.fr](http://iupac.pole-ether.fr/).

Wallington, T. J., Hurley, M. D., Ball, J. C., Ellermann, T., Nielsen, O. J. and Sehested, J.: J. Phys. Chem. ,98, 5435, 1994.

Yano, T. and Tschuikow-Roux, E.: J. Photochem., 32, 25, 1986.

