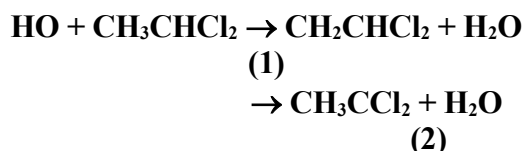


## IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation - Data Sheet oClOx88; VII.A2.3

Datasheets 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 the preferred values in this data sheet is: IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation, <http://iupac.pole-ether.fr>.

This datasheet last evaluated: June 2014; last change in preferred values: June 2009.



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

$k/\text{cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$	$T/\text{K}$	Reference	Technique/ Comments
<i>Absolute Rate Coefficients</i>			
$(2.6 \pm 0.6) \times 10^{-13}$	296	Howard and Evenson (1976)	DF-LMR (a)
$(8.29 \pm 0.36) \times 10^{-14} (T/300)^{2.67} \exp(387 \pm 18)/T$	294-800	Jiang et al. (1992)	PLP-LIF (b)
$(2.82 \pm 0.14) \times 10^{-13}$	294		

### Comments

- (a) HO radicals were generated by the reaction of H atoms with NO<sub>2</sub> in 0.1-1.0 kPa (0.7-7 Torr) of helium diluent.
- (b) HO radicals were produced by the 193 nm photolysis of N<sub>2</sub>O to give O(<sup>1</sup>D) atoms in the presence of H<sub>2</sub>O vapor in 740 ± 10 Torr (986 ± 13 mbar) of helium diluent.

### Preferred Values

Parameter	Value	$T/\text{K}$
$k / \text{cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$	$2.7 \times 10^{-13}$	298
$k / \text{cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$	$2.0 \times 10^{-12} \exp(-596/T)$	290-370
<i>Reliability</i>		
$\Delta \log k$	0.1	298
$\Delta E/R$	± 300	

### Comments on Preferred Values

The rate coefficients of Howard and Evenson (1976) and Jiang et al. (1992) at room temperature are in excellent agreement. Fitting the three parameter equation  $k = CT^2 \exp(-D/T)$  to the data from Howard and Evenson (1976) and Jiang et al. (1992) gives  $k = 2.49 \times 10^{-18} T^2 \exp(64/T) \text{ cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$ . Centering this expression at 330 K with  $A = C e^2 T^2$  and  $B = D + 2T$  gives  $k = 2.00 \times 10^{-12} \exp(-596/T) \text{ cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$ .

### References

- Howard, C. J., and Evenson, K. M.: J. Chem. Phys., 64, 4303, 1976.
- Jiang, Z., Taylor, P.H., and Dellinger, B.: J. Phys. Chem., 96, 8964, 1992.

