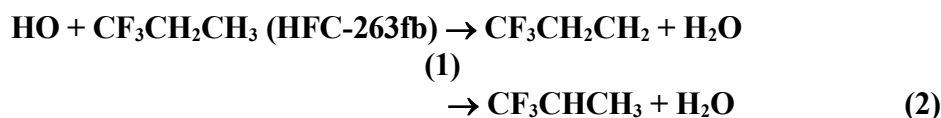


IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation - Data Sheet of FOx72; VII.A1.1

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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 2015; 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/K	Reference	Technique/ Comments
<i>Absolute Rate Coefficients</i>			
$(4.00 \pm 0.13) \times 10^{-14}$	295	Nelson et al. (1995)	DF-LIF (a)
$4.36 \times 10^{-12} \exp[-(1290 \pm 40)/T]$	238-373	Rajakumar et al. (2006)	PLP-LIF (b)
5.50×10^{-14}	297		

Comments

- (a) HO radicals produced via the H + NO₂ reaction. Experiments were performed in 1.1-2.0 Torr (1.5-2.7 mbar) of helium diluent.
- (b) HO radicals produced by 248 nm photolysis of H₂O₂. Experiments were performed in 50-210 Torr (67-280 mbar) of helium diluent. The value given at 297 K is the average of the four determinations reported.

Preferred Values

Parameter	Value	T/K
k	$4.9 \times 10^{-14} \text{ cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$	298
k	$3.7 \times 10^{-12} \exp(-1290/T) \text{ cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$	240-370
<i>Reliability</i>		
$\Delta \log k$	0.15	298
$\Delta E/R$	± 300	240-370

Comments on Preferred Values

The result from Nelson et al. (1995) lies approximately 25% below that from Rajakumar et al. (2006). Such a difference is likely within the combined uncertainties from the two studies. Adjusting the rate coefficients reported at 295 K by Nelson et al. (1995) and at 297 K by Rajakumar et al. (2006) using the temperature dependence reported by Rajakumar et al. (2006) and taking an average gives the preferred value of $k = 4.9 \times 10^{-14} \text{ cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$ at 298 K. The temperature dependence is taken from Rajakumar et al. (2006) with the pre-exponential A factor adjusted to be consistent with the recommended rate coefficient at 298 K.

References

Nelson Jr., D. D., Zahniser, M. S., Kolb, C. E., and Magid, H.: J. Phys. Chem., 99, 16301, 1995.
Rajakumar, B., Portmann, R.W., Burkholder, J. B., and Ravishankara, A. R.: J. Phys. Chem. A, 110, 6724, 2006.

