IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet oRClOx48

This data sheet updated: 27th January 2006.

$$CH_3O_2 + CCl_3O_2 \rightarrow CH_3O + CCl_3O + O_2 \quad (1)$$
$$\rightarrow CH_2O + CCl_3OH + O_2 \quad (2)$$

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

k/cm^3 molecule^{-1} s^{-1}	Temp./K	Reference	Technique/ Comments
Absolute Rate Coefficients			
(6.6 ± 1.0) x 10^{-12}	298	Catoire et al., 1996	FP-UVA (a)

Comments

(a) Flash photolysis of CCl_4 in the presence of CH_4-O_2-N_2 mixtures at a total pressure of 1013 mbar. Decays in transient absorption signals (with contributions from CCl_3O_2 and CH_3O_2) were recorded in the wavelength range 220 nm to 250 nm. k derived from simulations of the decay traces using an eight reaction mechanism, and with the assumption that k_1/k and k_2/k are the averages of the corresponding ratios for the self-reactions of CH_3O_2 and CCl_3O_2.

Preferred Values

$k = 6.6 \times 10^{-12}$ cm^3 molecule^{-1} s^{-1} at 298 K.

Reliability

$\Delta \log k = \pm 0.3$ at 298 K.

Comments on Preferred Values

The preferred rate coefficient is based on the sole kinetics study of Catoire et al. (1996). While the value of the rate coefficient appears reasonable, independent verification is required to reduce the recommended error limits.

References

Catoire, V., Lesclaux, R., Schneider, W. F. and Wallington, T. J.: J. Phys. Chem. 100, 14356, 1996.