IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet ROO_3

This data sheet updated: 12th November 2002.

$HOCH_2CH_2O_2 + NO \rightarrow HOCH_2CH_2O + NO_2$

Rate coefficient data

k/cm^3 molecule^{-1} s^{-1}	Temp./K	Reference	Technique/ Comments
Absolute Rate Coefficients			
$(9 \pm 4) \times 10^{-12}$	298	Becker, Geiger and Wiesen, 1991[1]	PLP-LIF (a)

Comments

(a) Pulsed laser photolysis of H_2O_2 in the presence of C_2H_4-O_2-NO mixtures at a total pressure of 1 bar [(760 ± 5) Torr]. Relative OH radical concentrations were determined as a function of time using LIF, and simulated by a mechanism consisting of 11 reactions, of which k of above reaction was the most sensitive.

(b)

Preferred Values

$k = 9 \times 10^{-12}$ cm^3 molecule^{-1} s^{-1} at 298 K.

Reliability

$\Delta \log k = \pm 0.5$ at 298 K.

Comments on Preferred Values

The rate coefficient reported by Becker *et al.*,[1] which is recommended, is consistent with the rate coefficients of the reactions of other peroxy radicals with NO. Independent confirmation is needed to reduce the error limits. The hydroxy-alkoxy product has been shown to be formed with sufficient internal energy that prompt dissociation can take place as well as thermal decomposition and reaction with O_2 of the collisionally stabilised radical.[2,3]

References

1 K. H. Becker, H. Geiger, and P. Wiesen, Chem. Phys. Lett. **184**, 256 (1991).

2 J.J. Orlando, G.S. Tyndall, M. Bilde, C. Feronato, T.J. Wallington, L. Vereecken and J. Peeters, J. Phys. Chem. A. **102**, 8116, (1998).

3 L. Vereecken, J. Peeters, J.J. Orlando, G.S. Tyndall, and C. Feronato, J. Phys. Chem. A. **103**, 4693, (1999).