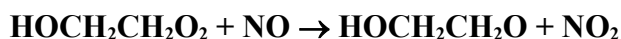


IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet ROO_3

Website: <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.

This data sheet updated: 12th November 2002.



Rate coefficient data

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

Comments

- (a) Pulsed laser photolysis of H₂O₂ in the presence of C₂H₄-O₂-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

$k = 9 \times 10^{-12} \text{ cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$ 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 O₂ 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).