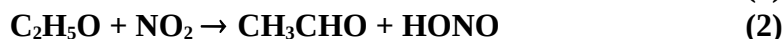


IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet II.A5.117 RO_18

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. The citation for this data sheet is: IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation, <http://iupac.pole-ether.fr>.

This data sheet last evaluated: 4th June 2009. Last change in preferred values: 12th June 2003.



$$\Delta H^\circ(1) = -171.7 \text{ kJ}\cdot\text{mol}^{-1}$$

$$\Delta H^\circ(2) = -263.0 \text{ kJ}\cdot\text{mol}^{-1}$$

High-pressure rate coefficients Rate coefficient data

$k_{\infty 1}/\text{cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$	Temp./K	Reference	Technique/ Comments
<i>Absolute Rate Coefficients</i>			
$(2.8 \pm 0.3) \times 10^{-11}$	295	Frost and Smith, 1990 ¹	PLP-LIF (a)

Comments

- (a) The same rate coefficients were measured in the presence of 2 mbar or 130 mbar of He.
- (b) Based on the measurements of ref. 1.
- (c) See Comments on Preferred Values.

Preferred Values

$k_{\infty 1} = 2.8 \times 10^{-11} \text{ cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$, independent of temperature over the range 200 K to 300 K.

Reliability

$\Delta \log k_{\infty 1} = \pm 0.3$ at 298 K.

$\Delta n = \pm 0.5$.

Comments on Preferred Values

The value of $k_{\infty 1}$ is based on the data of Frost and Smith,¹ being consistent with values for related reactions such as $\text{RO} + \text{NO} + \text{M} \rightarrow \text{RONO} + \text{M}$ (with $\text{M} = \text{CH}_3, \text{C}_2\text{H}_5,$ and $i\text{-C}_3\text{H}_7$) or $\text{CH}_3\text{O} + \text{NO}_2 + \text{M} \rightarrow \text{CH}_3\text{ONO}_2 + \text{M}$. Reaction (2) appears to be of minor importance, with a rate coefficient ratio of $k_2/k_1 = 0.1 \pm 0.01$ at ~ 450 K being cited by Batt.²

References

- ¹ M. J. Frost and I. W. M. Smith, J. Chem. Soc. Faraday Trans. **86**, 1751 (1990).
- ² L. Batt, Int. Rev. Phys. Chem. **6**, 53 (1987).