IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet ROO_36

This data sheet last evaluated: September 2009; last change in preferred values: September 2009.

$HOCH_2O_2 + NO \rightarrow HOCH_2O + NO_2$

Rate coefficient data

k/cm^3 molecule^{-1} s^{-1}	Temp./K	Reference	Technique/ Comments
Absolute Rate Coefficients			
5.6×10^{-12}	298	Veyret et al., 1982	FP-AS (a)

Comments

(a) Flash photolysis of HCHO-NO_2-O_2-N_2 mixtures. The progress of the reaction was followed by time-resolved measurements of the chain formation of NO_2 through absorption at 514.5 nm. The value of k was extracted from simulations of the absorption profiles, using a detailed chemical mechanism, with the values of a number of other rate coefficients optimised simultaneously. The mechanism and parameters were further validated through simulations of HCOOH reported in other studies.

Preferred Values

Parameter	Value	T/K
k/cm^3 molecule^{-1} s^{-1}	5.6×10^{-12}	298
Reliability		
$\Delta \log k$	± 0.3	298

Comments on Preferred Values

The preferred value of k is based on the results of the only study of the reaction. The wide reliability limits reflect that k was extracted from simulation of a complex system with limited observational constraints. However, it is noted that the value is comparable with those recommended for the reactions of NO with the structurally-similar radicals CH_3O_2 and $HOCH_2CH_2O_2$. Independent confirmatory studies are required, as are measurements as a function of temperature.

References

Veyret, B., Rayez, J-C. and Lesclaux, R.: J. Phys. Chem., 86, 3424, 1982.