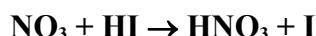


# IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet iIOx11

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This data sheet updated: 3<sup>rd</sup> February 2004.



$$\Delta H^\circ = -128.5 \text{ kJ}\cdot\text{mol}^{-1}$$

## Rate coefficient data

k/cm <sup>3</sup> molecule <sup>-1</sup> s <sup>-1</sup>	Temp./K	Reference	Technique/ Comments
<i>Absolute Rate Coefficients</i>			
1.3 x 10 <sup>-12</sup> exp[-(1830 ± 300)/T]	298-373	Lancar, Mellouki and Poulet, 1991 <sup>1</sup>	DF-EPR/MS (a)
(2.5 ± 0.8) x 10 <sup>-15</sup>	298		

## Comments

(a) NO<sub>3</sub> radicals were generated by the reaction of F atoms with HNO<sub>3</sub>. The rate coefficient was determined by measuring the decay rate of NO<sub>3</sub> radicals (by MS, correcting for the contribution of HNO<sub>3</sub> to the m/z = 62 ion signal) or by measuring the formation rate of I atoms (by EPR).

## Preferred Values

No recommendation.

### Comments on Preferred Values

Although the rate coefficients measured in the only study<sup>1</sup> of this reaction from the decay of NO<sub>3</sub> using MS and I atom production using EPR spectrometry were in agreement,<sup>1</sup> there is a serious potential for secondary chemistry occurring in the system leading to an overestimation of the rate coefficient for the elementary process. Lancar *et al.*<sup>1</sup> reported that the reaction of I + NO<sub>3</sub> → IO + NO<sub>2</sub> does not occur, while Chambers *et al.*<sup>2</sup> observed that the I + NO<sub>3</sub> reaction is rapid, with a measured rate coefficient of  $k(\text{I} + \text{NO}_3) = 4.5 \times 10^{-10} \text{ cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$  at 298 K, and that I atoms are regenerated from subsequent reactions of IO radicals. Until this uncertainty is resolved, no recommendation can be made.

## References

- <sup>1</sup> I. T. Lancar, A. Mellouki, and G. Poulet, Chem. Phys. Lett. **177**, 554 (1991).  
<sup>2</sup> R. M. Chambers, A. C. Heard, and R. P. Wayne, J. Phys. Chem. **96**, 3321 (1992).