

IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet V.A1.9 HI9

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This data sheet last evaluated: May 2011; last change to preferred values May 2011.

NO₃ + ice

Experimental data

<i>Parameter</i>	Temp./K	Reference	Technique/ Comments
γ			
$< 1 \times 10^{-3}$	170-200	Fenter and Rossi, 1997	Knudsen-LIF (a)
$< 2 \times 10^{-4}$	233	Moise et al., 2002	CWFT-Abs (b)

Comments

- (a) Ice surface prepared by vapour deposition or freezing a liquid sample. The geometric surface area was used to calculate the uptake coefficient, γ . NO₃ was generated by thermal decomposition of N₂O₅ and detected following excitation at 662 nm. After correction for loss of NO₃ to the walls of the Knudsen reactor, no residual uptake to the ice surface was detectable, hence the upper limit to γ .
- (b) Ice surface prepared by freezing a liquid sample. NO₃ ($\sim 10^{12}$ molecule cm⁻³) was detected using multi-pass diode-laser absorption spectroscopy at 661.8 nm.

Preferred Values

Parameter	Value	T/K
γ	$< 2 \times 10^{-4}$	233
<i>Reliability</i>		
$\Delta \log \gamma$	0.5	233

Comments on Preferred Values

Although covering somewhat different temperature ranges, both studies indicate negligible interaction of NO₃ with the ice surfaces employed. The CWFT is better suited for measurement of small uptake coefficients and thus the upper limit obtained in this apparatus (at atmospherically more relevant temperatures) is preferred.

References

- Fenter, F. F., and Rossi, M. J.: J. Phys. Chem. A 101, 4110-4113, 1997.
Moise, T., Talukdar, R. K., Frost, G. J., Fox, R. W., and Rudich, Y.: J. Geophys. Res 107, D₂, 4014, doi: 10.1029/2001JD000334.