

IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet V.A4.11 HSTD11

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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: January 2009; last change in preferred values: January 2009.



Experimental data

<i>Parameter</i>	Temp./K	Reference	Technique/ Comments
<i>Uptake coefficients: γ</i>			
1×10^{-4} ($P_{\text{HCl}} = 2-8 \times 10^{-7}$ Torr)	200 - 220	Zhang et al., 1995	CWFT-MS (a)

Comments

- (a) Sulphuric acid monohydrate was generated by freezing a liquid film (≈ 0.1 mm thick, ≈ 85 wt. %). The surface was doped with $[\text{HCl}] = 2-8 \times 10^{-7}$ Torr. The geometric surface area was used to calculate the uptake coefficient. Experiments were conducted with $[\text{N}_2\text{O}_5]$ at $\approx 2-7 \times 10^{-7}$ Torr which was ionised by electron impact or CIMS. No enhancement in the uptake coefficient compared to the hydrolysis values (on pure SAM) were observed and a conservative upper limit of 10^{-4} was obtained for γ .

Preferred Values

Parameter	Value	T/K
γ	$< 10^{-4}$	200 – 220 K

Comments on Preferred Value

The low (net) uptake coefficient measured for reaction of N_2O_5 with HCl is consistent with the low water activity associated with the SAM surfaces, which results in low coverage by HCl.

References

Zhang, R. Y., Leu, M. T. and Keyser, L. F.: Geophys. Res. Lett. 22, 1493-1496, 1995.