

## IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet VI.A1.14 HET\_H2OL\_14

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This data sheet evaluated: 15<sup>th</sup> January 2009; last change in preferred values: 15<sup>th</sup> January 2009.



### Experimental data

Parameter	[X]/ M	Temp./K	Reference	Technique/ Comments
<i>Uptake coefficients: <math>\gamma, \gamma_{ss}, \gamma_0</math></i>				
$5.8 \times 10^{-3}$	H <sub>2</sub> O film	273-293	Scheer et al, 1997	WWFT/DT-FTIR/IC
$1.2 \times 10^{-2}$	H <sub>2</sub> O droplets			(a)
$1.2 \times 10^{-2}$	1M NaOH(aq)			

### Comments

- (a) The uptake kinetics has been measured using the two complementary techniques of the wetted-wall flow-tube at atmospheric and reduced (89-90 mbar) pressure and the droplet train technique, with combined FTIR and HPLC detection. A slight negative temperature dependence of  $\gamma$  in the range indicated was observed. The rate of uptake of ClNO on aqueous NaCl (up to 1M) and HCl (up to 1 M) was the same as on pure water. The hydrolysis products were HONO and HCl, detected as NO<sub>2</sub><sup>-</sup> and Cl<sup>-</sup> in solution.

### Preferred Values

Parameter	Value	T/K
$\gamma$	0.01	273-293
<i>Reliability</i> $\Delta \log(\alpha)$	$\pm 0.5$	298

### Comments on Preferred Values

The recommendation accepts the value of Scheer et al.(1997). The results show that ClNO is reactive towards liquid water surfaces. The products are HCl and HONO; HONO was released to the gas phase, but the efficiency depended on the droplet acidity.

### References

Scheer, V., Frenzel, A., Behnke, W., Zetzsch, C., Magi, L., George, Ch. and Mirabel, Ph.: J. Phys. Chem. A, 101, 9359 (1997).