

## IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet V.A1.36 HI36

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This data sheet last evaluated: March 2008; last change in preferred values: March 2008.

### BrCl + ice

#### Experimental data

Parameter	Temp./K	Reference	Technique/ Comments
<i>Experimental uptake coefficients: <math>\gamma</math></i>			
$\gamma_0 \ll 0.01$	190-205	Allanic et al., 2000	Knud-MS (a)
$\gamma_0 = 0.045$ (HCl doped ice)	200		
$\gamma_0 = 0.35$ (HBr doped ice)	200		
$= 0.60$ (HBr doped ice)	190		

#### Comments

- (a) Vapour deposited ice film, approx. 75 nm thick. No measurable uptake observed on pure ice. Uptake was observed on ice doped with  $\sim 3 \times 10^{15} \text{ cm}^{-2}$  HCl and HBr, and in the latter case Br<sub>2</sub> production was observed.

#### Preferred Values

Parameter	Value	T/K
$\gamma_0$	$< 1 \times 10^{-3}$	190-210
<i>Reliability</i>		
$\Delta \log (\gamma_0)$	$\pm 0.3$	190-210

#### Comments on Preferred Values

The recommended value of the uptake coefficient is based on results of the only reported study. They suggest a very weak interaction between BrCl and ice surface, but there is insufficient information to establish partition coefficient. In the same study conducted with HCl and HBr doped ice, uptake was observed with reaction to form Br<sub>2</sub> with adsorbed HBr. Proposed uptake mechanism involves initial formation X-BrCl intermediate (X = Cl<sup>-</sup> or Br<sup>-</sup>).

#### References

Allanic, A., Oppliger, R., Van den Bergh, H., and Rossi, M. J., *Z.Phys.Chemie*, **214**(11) 1479-1500. 2000.