# IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet V.A4.3 HSTD3



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: April 2008; last change in preferred values: April 2008.

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## HBr + SAT

### Experimental data

| *Parameter* | Temp./K | Reference | Technique/ Comments |
|---|---|---|---|
| *Experimental uptake coefficients: $\gamma$, $\gamma_0$* | | | |
| $\gamma_{ss}$ = 0.25 (10% $H_2SO_4$, frozen) | 190 | Seisel and Rossi, 1997 | Knud-MS (a) |
| = 0.18 (60% $H_2SO_4$, frozen) | 190 | | |
| < 1 x $10^{-4}$ (95% $H_2SO_4$, frozen) | 220 | | |
| *Partition coefficients: K(cm)* | | | |
| No reversible adsorption | | | |

### Comments

(a) HBr [(2-8) x $10^{11}$ molecule $cm^{-3}$]. Uptake of pure HBr on frozen bulk aqueous solutions of defined [$H_2SO_4$]. No saturation effects observed.

### Preferred Values

| **Parameter** | **Value** | **T/K** |
|---|---|---|
| $\gamma_{ss}$ | 0.18 | 190 |
| *Reliability* | | |
| $\Delta\log(\gamma_{ss})$ | 0.3 | |

*Comments on Preferred Values*

There appears to be only one experimental study of HBr interaction with specifically prepared $H_2SO_4$-hydrate surfaces at temperatures and concentrations corresponding to hydrate thermodynamically stability regions. Under these conditions uptake is continuous and irreversible. There is a strong decrease of $\gamma$ with increasing concentration of $H_2SO_4$ in frozen as well as in liquid supercooled $H_2SO_4$-$H_2O$ mixtures.

### References

Seisel, S. and Rossi, M.J.: Ber. Bunsenges. Phys. Chem. 101, 943 (1997).