

IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation
Data Sheet HI37; V.A1.37

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This datasheet last evaluated: January 2014; last change in preferred values: January 2009

BrO + ice → products

Experimental data

<i>Parameter</i>	Temp./K	Reference	Technique/ Comments
<i>Uptake coefficients: γ</i> $(1.0 \pm 0.4) \times 10^{-4}$	213	Abbatt, 1996	CWFT-RF (c)

Comments

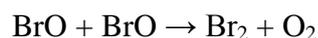
- (c) Coated wall flow tube at 1.3 mbar total pressure of He coupled to a resonance fluorescence (RF) detector. The ice film was prepared by coating a Pyrex tube with water followed by freezing. BrO was generated from the reaction $\text{Br} + \text{O}_3$. Br atoms were produced by microwave discharge of Br_2 in He. For detection, BrO was reacted with NO and Br atoms detected by resonance fluorescence. The BrO pressures used in this work were in the range of 9×10^{-8} to 9×10^{-7} mbar, and the uptake coefficient reported in the table did not vary within this pressure range. Br_2 was observed as product in amounts consistent with the BrO loss.

Preferred Values

Parameter	Value	T/K
γ	$< 1 \times 10^{-4}$	200 – 220
<i>Reliability</i>		
$\Delta \log(\gamma)$	undetermined	

Comments on Preferred Values

In absence of scavengers, such as sulphite, the main fate of BrO on the ice surface is likely to be the surface recombination reaction:



The absence of a BrO concentration dependence in the only available study is suggested by the authors to be due to a saturating surface coverage of BrO, even at the relatively low pressures of the experiments, which is the reason for recommending the γ value obtained under these conditions as an upper limit. In the absence of a measured value for K_{linC} , no surface reaction rate constant can be recommended.

References

Abbatt, J. P. D.: *Geophys. Res. Lett.*, 23, 1681-1684, 1996.