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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Uptake and reaction of HOBr on frozen and dry NaCl / NaBr surfaces between 253 and 233 K" *by* J. W. Adams et al.

Anonymous Referee #2

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General comments

The manuscript presents significant new information on the mechanism of the HOBr reaction on frozen salt surfaces. It also demonstrates the importance of using low concentrations of gas-phase reactants when investigating surface reactions. I recommend that the manuscript be published after the referees have addressed the specific comments listed below.

Specific Comments

The manuscript would be improved if a section was included close to the beginning that at least speculates on the composition of the surfaces used in the experiments, since the surface composition is critical to the measurements. Indicate the different phases that can form. For example, speculate on the amount of each phase that can

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be present at the surface. Also, at the beginning, indicate the eutectic temperatures for the binary and ternary systems. Having this information at the beginning will make the manuscript easier to follow.

On page 8, a T3/2 temperature dependence was assumed. A reference to justify this assumption would be appropriate.

On page 13, the authors mention the possibility of a liquid layer on the ice surface. Are they referring to a "quasi-liquid layer" or are they referring to a bulk liquid layer?

Uptake coefficients were only reported/displayed as absolute values when kcor $<$ 4kobs (page 15). How did the authors decide on this criterion?

On page 17, the authors indicated that measurements were performed from 0 to 100 % relative humidity. It would be beneficial to include the deliquescence relative humidities of the solids.

The authors point out on page 20 that their measurements of the reaction probability of Cl2 at 233 K are in disagreement with the work by Huff and Abbatt (2000). Do the authors have an explanation for the discrepancy?

A reference for equation (iii) would be appropriate.

Interactive comment on Atmos. Chem. Phys. Discuss., 2, 109, 2002.

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Interactive Comment