

Interactive comment on “Experimental investigation of homogeneous freezing of sulphuric acid particles in the aerosol chamber AIDA” by O.Möhler et al.

Anonymous Referee #1

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General Comments:

This paper is well written and should contribute significantly to the understanding of ice nucleation in the upper troposphere. In addition, this paper should help resolve some of the current discrepancies in the literature on ice nucleation in aqueous solutions. In my opinion, this paper falls within the top 10% of this field.

Minor comments:

Page 1440, line 3-4: Did the Lyman-alpha hygrometer and the chilled mirror hygrometer agree under static T and p conditions?

Page 1441, line 10-20: The aerosol water content was calculated from the filter sul-

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phuric acid data assuming equilibrium composition of the sulphuric acid aerosol. However, in the companion paper the authors showed that large particles are not always in equilibrium because of kinetic constraints. Some where in this paragraph the authors may want to indicate that large particles were not always in equilibrium with the vapor due to kinetic constraints, but the assumption of equilibrium did not significantly affect the calculation of the ice saturation ratio because the aerosol only contained a minor fraction of total water at the nucleation threshold.

Page 1443, line 7: The authors indicate that the ice particles completely evaporate at S_{ice} less than or equal to 1. Should this be changed to ice particles completely evaporate at S_{ice} less than 1?

Page 1450, line 19-20. I suggest an alternative phrase in place of the liquid water activity of ice at the same temperature. For example, the following sounds better: the activity of water in a solution in equilibrium with ice at the same temperature.

A FTIR spectrometer is shown in Figure 1. Did the authors monitor ice formation with the FTIR spectrometer? It would be interesting to compare results obtained with the FTIR spectrometer and the results obtained with the other techniques, since FTIR spectroscopy has been used in several previous measurements of ice nucleation.

Interactive comment on Atmos. Chem. Phys. Discuss., 2, 1429, 2002.

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