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Atmospheric Chemistry and Physics Discussions



# *Interactive comment on* "Hygroscopic growth and critical supersaturations for mixed aerosol particles of inorganic and organic compounds of atmospheric relevance" *by* B. Svenningsson et al.

**B. Svenningsson et al.**

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1) Thank you for letting us know about these interesting, new papers. We have made a comparison with their results and found a good agreement. This will be mentioned in discussion of the levoglucosan results and references will be made to the papers.

2) Thank you for bringing this interesting and important topic to discussion! The reaction 2NaCl + (NH4)2SO4 = Na2SO4 + 2HCl +2NH3 could be important and we will consider mentioning it in the paper. The experiments presented in this paper were not designed in such a way that a decrease in particle size over time would show up. In the paper we mention some other possible reasons for the deviation: other crystals

having lower density, low solubility, or a shape factor higher than 1 could be formed or the organic compounds could interact with the inorganics. However, with the presently available data (this paper and previous literature) we do not think that it is possible to draw any conclusions on the reason for the deviation from the ZSR model. It is our opinion that water activities and volatilities of aqueous solutions containing Na+, Cl-, NH4+, SO42-, and organics should be studied further and we would be very happy to continue this discussion with professor Chan.

3) The AIM model was used, as mentioned in the paper, and it showed that the inorganic mixture preferentially forms ammonium chloride and sodium sulphate together with some ammonium sulphate (and NOT ammonium sulphate and sodium chloride only). A problem is that there are several possible crystal structures for sodium sulphate, some of them with crystal water. They do also have different densities and to our knowledge there are no HTDMA data on sodium sulphate available to be used as input for the ZSR model. Again, it is not possible to draw any conclusions about reasons for the deviation from the ZSR model with the available data and we look forward to some interesting work!

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Interactive comment on Atmos. Chem. Phys. Discuss., 5, 2833, 2005.