

## ***Interactive comment on “Towards closing the gap between hygroscopic growth and activation for secondary organic aerosol: Part 1 – Evidence from measurements” by H. Wex et al.***

### **Anonymous Referee #1**

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In this manuscript measurement results on the hygroscopic properties of SOA are presented. Measurements were conducted in the LACIS facility allowing usage of very high ( up to 99.6%) relative humidities. Hygroscopic growth factors are presented as a function of water saturation ratio, and using  $\kappa$ -Köhler theory these values are compared to CCNc measured cloud droplet forming potential of SOA particles. As a result it was found that hygroscopic properties of SOA particles are dependent on the water activity in a way that  $\kappa$  increases in more dilute solutions. Results are mainly well presented, and I found this paper well written. I have only few comments that need to be addressed before publication in ACP.

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The main comment is the lacking discussion on the applicability of the presented results on atmospheric conditions. As shown in Duplissy et al (2008) paper, the mass of formed SOA might affect the properties of SOA. With small SOA masses hygroscopic growth factors and CCN activity agreed in their study. How does the results of this study compare on that?

Authors have chosen to present modelling results in the different paper. Personally I would have preferred one manuscript containing both measurements and modelling. As the current manuscript does not include any results of solubility or non-ideality, I would leave mentioning of those out of the abstract.

There are few typos, like “ACCNET” in acknowledgements, and “The Kelvin verus the Raoult term in the Kequation” in the reference list.

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Interactive comment on Atmos. Chem. Phys. Discuss., 9, 955, 2009.

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