Atmos. Chem. Phys. Discuss.,
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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Enhanced growth rate of atmospheric particles from sulfuric acid" *by* Dominik Stolzenburg et al.

Anonymous Referee #2

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l 77. " A Debye-type permanent .... " is introduced here but not referenced and not explained. l 122 also.

l 98. " unmeasureable " does not seem to be the correct word here, suggesting that in principle no one is able to do such a measurement.

l 110. One would like to see the pH2SO4 from E-AIM as a reference point here...

l 111. monomer to dimer ratio: is it shown in this paper? Is there a reference?

l 119. Assuming both the monomer and cluster attain bulk composition and densities ?

l 137. the line is 1.45 times the lower line. Yet this does not seem to be a fit as there are 7 pts that are clearly below the line and only two pts that are clearly above

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the line (negative and positive are different?) Please explain. Also, dipole moments, polarizabilities for theory? It might be useful to have a table somewhere listing all the molecular and cluster parameters that are relevant (a few select clusters.)

l 138. barely influenced? This phrase should be replaced by an actual number/upper limit.

l 146. Earlier papers have suggested that the Hamaker effect depends mostly on comparative sizes, not on the absolute size.

l 153. Too strongly worded: both could be biased or the underlying measurements or assumptions could be wrong.

l 157. The effect of ions is most here? Possible bias then in the GRs for 1.8 to 3.2 nm ?

l 162. Should state that in principle, their ought to be a humidity dependence...

l 185. Too strong. A clear demonstration of no effect due to NH3-stabilization needs to be put in the context of binary evaporation rates (e.g. E-AIM): do these clusters even need a base to avoid significant evaporation? On the other hand, there may be a low-level diamine or some other strong nucleator, which I think has not been ruled out for the warm CLOUD experiments. Furthermore, the systematic uncertainty in SA leads to a factor of ∼two error bars...

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