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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

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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