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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Organic acids as cloud condensation nuclei: Laboratory studies of highly soluble and insoluble species" *by* P. Pradeep Kumar et al.

Anonymous Referee #1

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GENERAL

I find this paper (Organic acids as cloud condensation nuclei: Laboratory studies of highly soluble and insoluble species by Kumar et al.) to be of high quality and of great interest to the atmospheric aerosol/chemistry community. It is well written, has adequate citations of previous literature, is timely, and for the most part, is clear and concise. The experiments described in this manuscript are well designed, and the data analysis is appropriate.

SPECIFIC

In the list of questions on pages 952 and 953 (particularly question 3), is it also possible

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that in a mixed system in which smaller soluble acids (oxalic, for example) and larger insoluble acids are present, the smaller soluble acids will be absorbed into the insoluble ones leading to activation of a second, separate phase (as opposed to just the soluble acid alone)?

On page 957, is it at all possible that any of the particles of interest activated yet stayed below the lower cutoff of the aerodynamic particle sizer (0.5 microns). I tend to doubt it, but did the authors attempt to confirm this in any way?

On page 961, it would be helpful if the authors discussed how exactly Equations 2 and 3 are altered when non-ideality is considered. This would clarify how the calculated diameter would change for the readers that are not part of the physical chemistry or aerosol communities.

On page 963, it would be extremely informative if more detail (at least some) were given on how the vanŠt Hoff factor for oxalic acid was calculated.

For organics, why was no activity corrected diameter calculated? On comparing Figures 5 and 9, the amount of scatter seems to be comparable and this correction was made for the inorganic salt shown in Figure 5. The routine UNIFAC could be used for such calculations.

It might be helpful (for visualization purposes) to rotate Figure 2 so that it is horizontal (since the flow is horizontal).

It should be noted in the caption of Figure 7 that the data shown is for the oxalic acid dihydrate.

TECHNICAL

An umlaut should be used in Kohler throughout the text.

Units of some equations would be helpful (particularly Equation 1)

On page 954, define SLM.

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Interactive Comment

On page 964, Figure 10 is cited before Figure 9. The order of the figures should be switched.

In the list of references, the Clegg et al. reference has some numbers in a chemical formula that need to be subscripted.

In Table 1, the a in the title should be superscripted. The word depending in footnote c is spelled incorrectly.

Interactive comment on Atmos. Chem. Phys. Discuss., 3, 949, 2003.