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Comment

Interactive comment on “Joint effect of organic acids and inorganic salts on cloud droplet activation” by M. Frosch et al.

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We have measured mixed dicarboxylic acid and ammonium solution surface tensions with a view to following the impact of predictive surface tension models on cloud activation predictions (Booth et al., 2009). We found that varying the surface tension predictions used had a bigger impact (on the predicted ambient saturation ratios at which mixed particles activate into cloud droplets) than changing the organic to inorganic mass ratios. We believe that studies such as Frosch et al., are critical in providing data necessary for constraining our models of surface tension effects. Especially compounds such as pinonic acid.

The authors note that NRFA and cis-pinonic acid are important due to a significant surface tension reduction in the concentration ranges relevant for activation. They see

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a smaller surface tension reduction in these compounds when mixed with an inorganic fraction, as one would intuitively expect. This result is at odds with those of Kiss et al., (2005) and Shulman et al., (1996), and our own measurements. The authors suggest this is due to the difference concentrations of inorganics between the measurements. I would agree with this and also refer the authors to the work of Tuckermann (2007) who see the behaviour between inorganics enhancing and suppressing surface tension reduction switch once the concentration of organic is at a certain concentration.

References

Booth et al., PCCP, 11, 8021-8028, 2009

Tuckermann, Atmos Environ, 41, 625-6275, 2007

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