Atmos. Chem. Phys. Discuss., 12, C4425–C4426, 2012
www.atmos-chem-phys-discuss.net/12/C4425/2012/


Atmospheric Chemistry and Physics Discussions

# *Interactive comment on* "Surface/bulk partitioning and acid/base speciation of aqueous decanoate: direct observations and atmospheric implications" *by* N. L. Prisle et al.

**Anonymous Referee #2**

Received and published: 8 July 2012

In this paper the authors use X-ray photoelectron spectroscopy combined with synchrotron radiation to probe the behaviour of organic surfactant sodium decanoate at the vapour-liquid interface. Directly observing the distribution of surfactant compounds in a solution is a very interesting capability and could help to resolve a long standing issue about the true effect of surfactants in atmospheric aerosol.

The paper presents the general area in a well balanced manner and results presented are seemingly caveated enough given the danger of extrapolating from proxy systems to atmospheric impact. I think the paper is appropriate for readership in this area. Whilst I do not have minor specific comments, as the paper is quite small, i do have



a few observations which should be addressed before publication. I think the paper would benefit from some additional presentation of detail.

Page 12456. The authors chose Sodium decanoate based partially on 'sufficiently high water solubility'. Can the authors comment on what range of solubilites this technique might be restricted to?

It would be nice to see the corresponding NMR data which dosnt appear anywhere in the manuscript. Whilst the authors discuss these 'supporting' measurements it is difficult to ascertain just how helpful they were.

Would it not be possible to attempt prediction of the distribution of material between the bulk and surface layer in this system? This would help the reader take some qualiattive understanding on how 'bad' our predictions might be, even without a detailed thermodynamic model. The authors reference papers in which similar calculations are peformed. If these calculations cannot be made the reasons must be stated. That would be an unfortunate problem as presently we are left with measuring the potential effect of bulk/srface partitioning indirectly through single particle measurements.

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Interactive comment on Atmos. Chem. Phys. Discuss., 12, 12453, 2012.