

Interactive comment on “The role of surfactants in Köhler theory reconsidered” by R. Sorjamaa et al.

Anonymous Referee #2

Received and published: 9 July 2004

This paper focuses on the role of surfactants on the water equilibrium vapor pressure of an aqueous droplet. The authors focus on the implications of considering a surface phase, on both the Kelvin and Raoult term; although not new, the effect on the Raoult term has been overlooked by the cloud physics community. This paper is thus very interesting, and should be published, provided that the following issues are addressed:

General comments

1. My primary issue is in the treatment of the Raoult term. It was not clear how the "Raoult" term is calculated. Is it from the bulk concentration of solute (after equilibration with the surface phase)? Or is it calculated from the surface phase concentrations? It seems that the latter should apply, since the surface phase is in equilibrium with the water vapor, and not the bulk. This should be made very clear, as it is the primary focus of this paper.

2. The authors lack comparisons with experimental data. Clearly the predicted

Full Screen / Esc

Print Version

Interactive Discussion

Discussion Paper

changes in equilibrium supersaturation can be measured; the authors should therefore seek literature data on measured CCN critical supersaturation that would support their theoretical calculations.

3. A discussion on the implications for cloud microphysics should be supported with cloud droplet number calculations; a simple parcel model calculation on droplet number change (with and without considering the surface phase) would suffice.

Specific comments:

1. Please provide a reference for equation 6.
2. The authors should discuss the possibility of the organics not completely dissociating (as opposed to what happens to SDS). Would the "buffering" capacity of partial dissociation affect partitioning?

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 2781, 2004.

[Full Screen / Esc](#)[Print Version](#)[Interactive Discussion](#)[Discussion Paper](#)