

## ***Interactive comment on “Internal mixing of the organic aerosol by gas phase diffusion of semivolatile organic compounds” by C. Marcolli et al.***

### **Anonymous Referee #2**

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This is a well written paper about a timely issue related to aerosol forcing of climate and should be published in ACP after consideration of the following two issues.

1. At several places in the paper, the authors suggest that internal mixing by gas phase diffusion of organics would lead to "an aerosol population in the lower troposphere that is predominantly liquid". This of course assumes that other substances are absent in the aerosols (especially ubiquitous nonrefractory components) and that particulate organic species do not precipitate solids in aerosols at low RH. As the former cannot be excluded and too little is currently known about the latter, the authors should consider to better qualify their above statement (abstract, conclusions).
2. The authors miss to quantify the relative importance of coagulation and gas phase

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diffusion in generating internally mixed aerosol particles. In the lower troposphere, at the relatively high (in the thousands per cc of air) concentrations of aerosol particles, coagulation scavenging between particles is a rapid process and certainly will lead to mixed particles within a day or so (near source regions) or a week (during transport away from sources and in the free troposphere). This aspect should at least be discussed more quantitatively, e.g., by comparing timescales of coagulation versus diffusion.

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Interactive comment on Atmos. Chem. Phys. Discuss., 4, 5789, 2004.

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