

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

C. Marcolli et al.

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To 1) We add the case suggested by the reviewer to Figure 1.

To 2) For a direct comparison, the mode radius values of the initially lognormally distributed particle ensembles were chosen to equal the particle volume of the monodisperse case. For a mode radius of 0.1 micrometer, the particle volume of the polydisperse case is larger than the one for the monodisperse case. This leads to higher concentrations (in terms of moles per unit volume of air) of the semivolatile substance in the particle phase after equilibration. We will make this clearer in the manuscript.

To 3) The equilibration time constants are defined as the time needed to reach 63 %

(1 - e-1) of the end value. For the gas phase equilibration in case a/b, this is the case after 7 min as can be seen in Figure 1b. It is less obvious from Figure 1a due to the logarithmic scale of the y-axis.

To 4) Under the specific conditions described by Allen et al., all PAH are emitted in the same size mode. The observed differences in the size distribution must therefore be due to subsequent flux of PAH from the fine combustion-generated particles to the coarse particles. Particle size effects are therefore the same for all investigated PAH species. We will clarify this point in the text. Page 5798, we change on line 25 after “the fine particle fraction”: “They assumed that PAH are emitted in the gas phase or associated with fine particles and proposed slow mass transfer by vaporization and condensation to explain the observed PAH partitioning among particle size fractions whereby higher molecular weight PAH do not attain an equilibrium distribution among urban aerosols.”

To 5) Thank you for pointing out the typographic errors. We will correct them.

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

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