Atmospheric Chemistry and Physics Discussions

Atmos. Chem. Phys. Discuss., referee comment RC2
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Comment on acp-2022-698

Anonymous Referee #2

Referee comment on "Impact of phase state and non-ideal mixing on equilibration timescales of secondary organic aerosol partitioning" by Meredith Schervish and Manabu Shiraiwa, Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2022-698-RC2, 2022

Excellent study of the interplay between thermodynamic non-ideality and mass transport limitations and how it affects partitioning and, subsequently, the characteristic equilibration time for particles.

The model is well-described and the simulations in Section 3 cover the limits that are of atmospheric interest. Minor point for this Section: The presentation in Fig. 2 is a bit confusing because it is unusual. It could be improved with the addition of some illustrations that qualitatively show the differences between the three situations.

Although I believe the manuscript can be published as is, my only major recommendation concerns Section 4. It would be extremely helpful if there was a more comprehensive summary of existing measurements (even from laboratory-based surrogates) so that the reader can get a better idea of what cases tend to dominate equilibration times in the atmosphere. This would be valuable for future work. The current examples that are provide seem to focus on what may (or perhaps may not) be exceptional cases.