

***Interactive comment on “Non-equilibrium interplay between gas-particle partitioning and multiphase chemical reactions of semi-volatile compounds: mechanistic insights and practical implications for atmospheric modeling of PAHs” by Jake Wilson et al.***

**Anonymous Referee #1**

Received and published: 24 November 2020

This is a very well-written paper. The fundamental concepts of kinetic gas-particle partitioning due to adsorption-desorption processes and surface-chemical reactions are well presented.

The Atmospheric Implications section lists the challenges in terms of application of this conceptual picture to secondary organic aerosols (SOA). I agree that such a simple picture is not directly applicable to SOA where absorptive partitioning, particle-phase

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state, and diffusion limitations vary in the atmosphere.

It would be interesting to see how humidity and aerosol water affect the interplay between gas-particle partitioning and chemical reactions in addition to temperature for SOA in future studies.

I recommend acceptance of this paper.

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Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2020-1000>, 2020.

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