

***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 #3**

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This work described and explored the dynamic and non-equilibrium interplay of gas-particle partitioning and chemical losses of PAHs on soot particles by using a kinetic model. This is a nice work, and should be published in the ACP. I have two major comments. (1) The influence from the absorptive partitioning should be discussed in more detail since in many cases the absorption is more important than the adsorption in gas-particle partitioning for PAHs in the atmosphere; and (2) It would be helpful that the results obtained from their theoretical study can be evaluated by monitoring data.

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Technical corrections: Line 7: “to span seconds to hours” -> “to span from seconds to hours” Line 58: “SOA” -> “secondary organic aerosol (SOA)” Line 62: “secondary organic aerosol (SOA)” -> “SOA” Line 95: The authors should explain why cm<sup>3</sup> can be used as the unit of concentrations of PAH.

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