

Interactive comment on “Redox activity of naphthalene secondary organic aerosol” by R. D. McWhinney et al.

Anonymous Referee #2

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Review for “Redox activity of naphthalene secondary organic aerosol by McWhinney et al.

The paper estimates the redox activity of SOA from naphthalene photo-oxidation and from two-stroke engine exhaust. The contribution of a number of quinones to the total observed redox activity is estimated. This carefully conducted and described study indicates that there is a substantial missing fraction of unknown redox active compounds present in organic aerosol particles. I only have one major comment: The authors argue convincingly (e.g., p. 9125) that with their experimental procedure it might be difficult to determine air-particle partitioning coefficients due to the non-equilibrium conditions in the chamber (i.e., the need to add dilution air during sampling). Would this not suggest that it does not make sense to calculate partitioning coefficients? Thus, the paper

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might be more concise without chapter 3.3 and 3.4

I suggest accepting this manuscript after consideration of a few minor points listed below.

p.9112, line 14ff: The chamber is described rather shortly. Is there a reference giving more details on the design and operation of the chamber?

p. 9113, line 4/5: PTRMS calibration is not clear. Did the calibration procedure assume that 100% of the injected naphthalene was present in the gas phase of the chamber, i.e., was it assumed that there were not transfer or wall losses? If yes, is this assumption justified?

p. 9115, line 15ff: Why was the recovery of the naphthaquinones for SOA and engine exhaust samples so different?

p. 9116, line 15: Please provide an original reference instead of citing a textbook.

p. 9117, line 12: It is mentioned that the SOA was composed mainly of “hydrocarbons and oxidized hydrocarbon fragments”. This statement should be explained in more detail and supported with data.

p. 9123, line 5: Please comment on the observed differences of the partitioning coefficient in this study and the model predictions.

p. 9124, last sentence: word missing in this sentence.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 9107, 2013.