

# ***Interactive comment on “Chemical oxidative potential of secondary organic aerosol (SOA) generated from the photooxidation of biogenic and anthropogenic volatile organic compounds” by Wing Y. Tuet et al.***

## **Anonymous Referee #2**

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This paper describes a very detailed study on the dependence of the intrinsic redox potential of secondary organic aerosol on the identity of the precursor and the formation pathway. It takes into advantage the ability of chamber studies to generate SOA under well defined conditions and to characterize the aerosols in state of the art analytical methods. In general, the study finds that the intrinsic oxidative potential of biogenic SOA (especially isoprene SOA) is probably lower than that of aromatic, anthropogenic precursors, and that overall it is lower than most ambient aerosols from combustion or cooking sources. The study also suggests that hydroxyperoxides may play a smaller role than previously assumed in determining the oxidative potential of SOA. Finally, it

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seems that the humidity may also play a role in determining the ability of aerosols to oxidize DTT. Since it is assumed that the oxidative potential of aerosols is a dominant factor in their ability to induce adverse health effects, this study tries to infer from this detailed study on the potential health effects of SOA. Since the study uses only an acellular assay, it is hard to say what would be the health effects of the SOA, but it does serve an important role in paving a new and comprehensive way to conduct a comparative study on the oxidative potential of different SOA types, and how it depends on the formation conditions and pathways. As such, I think that the paper is important and very interesting. There is still a long way to go from this study to understand the health effects of secondary organic aerosols, but the systematic approach taken here is important and insightful. Overall, the study is well planned and conducted. It is very detailed and provides wealth of information. It is a bit tedious to read and I would recommend to streamline it. Overall I would recommend to accept it as is, but would urge the authors to tone down inferences about the health effects and to make conclusions about the oxidative potential only. Other studies should complement this study in order to understand the health effects, which may not depend solely on the oxidative potential. An example is the sentence in the abstract, lines 22-24.

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