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Atmospheric Chemistry and Physics Discussions

Interactive comment on "The kinetics and mechanism of an aqueous phase isoprene reaction with hydroxy radical" *by* D. Huang et al.

Anonymous Referee #2

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The manuscript describes an experimental study of aqueous isoprene oxidation together with a box model study. Although aqueous aerosol chemistry is of much current interest, the manuscript suffers from substantial shortcomings with respect to its atmospheric relevance.

From a fundamental kinetics point of view the work is quite interesting (for example the ratio of MVK/MACR and formation of glyoxal and methylglyoxal), however, a very important aspect missing in the manuscript is the fact that it does not show that the aqueous oxidation of isoprene is of atmospheric relevance and I believe that this is also not the case: Even with a cloud liquid water content of 1 g/m3 the Henry's law constant determines that many orders of magnitude more isoprene are in the gas-phase and are also oxidized in the gas-phase compared to the aqueous phase. Unless the authors

demonstrate that aqueous isoprene oxidation is of relevance in the atmosphere, which I believe it is not, the manuscript is not suitable for publication in ACP. I believe the publication should be submitted to a more specialized journal.

Some technical comments that the authors should consider:

- P1a and P1b should be shown

- P2a suggest a RO2+OH reaction, which appears very unlikely and I do not believe exists in MIM2. The text following the equation also discusses reaction of a peroxy radical with OH.

- Although it is mentioned that control experiments were undertaken they need to be discussed more.

- The discussion of determination of uncertainties in the experimental concentrations should be extended as should the discussion of uncertainties in determined rate constants.

- What is the uncertainty in modeled OH concentrations, which is central to the main point of the paper.

- How is acetic acid produced?

- In the supplement a table with reactions is given but it is not shown how MVKOOA etc. are formed.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 8515, 2011.