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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 #1

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General: There are problems with the scientific reasoning behind this contribution. It is very unlikely that substantial amounts of isoprene will undergo phase transfer due to its very hydrophobic nature even if a reactive sink will be active such as a fast OH(aq)- isoprene reaction. I think that much more carbon will be transferred from the gas phase into the atmospheric aqueous phase because of uptake of the degradation products such as MVK and MACR. The study is interesting because of the kinetics results and the split of identified products but maybe it would better be published in a more specialized journal where kinetic and mechanistic questions can be discussed. Apparently, the carbon-balance based on the classical isoprene products is far from closed but other products significantly contributing were not identified. There are many unclear passages. The language of the manuscript needs to be checked. As a bottomline, the manuscript should be re-written. A possible significance of this work must be identified

and justified. I would like to recommend to reject this contribution because of missing demonstrated relevance for atmospheric systems and suggest to the authors to submit it to another journal after strong revision.

Details Page 8518, line 1: The solubilities of MVK and MACR are much higher than the one of isoprene, so where is the atmospheric relevance ? Refenceing to these investigations is not useful. Page 8518, line 22: 'Due to the. . .' – Sentences like this are not needed in a scientific contribution. It is known that liquid water is different from gas phase water. The rest of the paragraph is not necessary. Page 8522, line 22: It is good to see that the authors tried to build a box model for isoprene aqueous phase chemistry but, again, is that needed really ? When the model is coupled to the gas phase, which fraction of isoprene is being transferred to aqueous particles ? Demonstrate a potential significance of this work ! Apparently, in the construction of the mechanism, many estimates have been used. Are these all valid ? The comparison of measure against model concentration-time profiles are surprisingly good (Fig. 4, 6 and 8) . What are the main sensitivities of the modeled curves in the aqueous phase mechanism ?

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