

Interactive comment on “Understanding the oxidants transition and SOA property in limonene ozonolysis: Role of different double bonds, radical chemistry, and water” by Yiwei Gong et al.

Anonymous Referee #1

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This paper deals with the production of peroxides and carbonyls in SOA through the ozonolysis of ozone. The language needs improving throughout and the paper also needs significant restructuring and shortening. I think if these edits were made, it would be much easier for the reader to appreciate the significance of the results. The figures are clear and give the reader a flavour, but the text needs substantial improvement.

The introduction is far too long. Also, significant quantities of introductory material appear in the results (lines 264-285 and 325-340). This material should all appear in the intro, which itself needs to be written more concisely. The authors should also try and use better paragraph structure in places and use shorter paragraphs in general.

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Another general point is that the methods do not provide enough detail. For each technique discussed, the authors should provide detection limits, precision and accuracy. Throughout, there is a tendency to talk about things being higher, lower or different. It would be better if such expressions were quantified where possible.

Finally, the experiments are carried out under conditions far removed from most ambient atmospheres, both in terms of concentrations of limonene and ozone, but also temperature (277K). Given this, I was missing a statement of the applicability of these results to real atmospheric conditions, or indeed as alluded to in the manuscript, indoor environments.

Specific comments:

1. I am not going to list every grammatical error, but I will mention a few here. I think that when the authors talk about 'SOA property' they mean SOA composition. This phrase should be replaced throughout with something more informative. Similarly, I am not clear what they mean by 'oxidants transition'. Again, clarification is needed.
2. 'Particulate unstable peroxides' is an awkward expression.
3. Line 64 - 'eaters' - esters?
4. Line 542: Assume these are Kp coefficients - should specify. I don't understand the explanation for the finding that Kp is much bigger than estimated, line 556 (and lines 579-580). The language needs to be improved. What impact could experimental conditions have (low T and high precursor concentrations).

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