

Interactive comment on “Importance of SOA formation of α -pinene, limonene and *m*-cresol comparing day-and night-time radical chemistry” by Anke Mutzel et al.

Anonymous Referee #2

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General comments:

This is a potentially interesting study describing the influence of RH and oxidants on the SOA formation potential of some of most important VOCs. My major concern with this manuscript is that the discussion is unclear and does not provide enough analysis or evidence. Unfortunately, some parts of the manuscript are hard to follow, and this does not help the clarity of the discussion. Nevertheless, the chamber experiments and sample analysis are done well, and the data can be potentially useful to other SOA experimentalists and modelers. The manuscript may be suitable for publication after improving its clarity, and addressing specific comments below.

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Specific comments:

Please use abbreviation consistently. It improves the readability of the manuscript greatly. E.g. RH and relative humidity.

L23 In average -> On average

L127: Please give the name of an IC-CD model and manufacturer.

L150: Please provide a reason for changing the chromatographic condition.

L186: Do the authors mean “The values obtained in this study did not agree with previously reported values because OH sources are different”?

L239: This should be 3.2. Please change all the section numbers accordingly.

Line 262: I am not too sure what the authors mean here by “a decreasing consumption when RH increases”. Do the authors mean “a decreasing consumption of VOC when RH increases”? If so, this seems to contradict what Figures 1 and 2 (limonene/NO₃) shows. Please clarify this sentence.

L307: NPOM should be described in line 73.

L315: It may well be that higher molecular weight compounds do not ionize well in negative ESI, and they aren't present in the LC/MS data. Just in case, do the authors have signals for them in LC/MS data?

L346: α -pinene/OH -> α -pinene/OH

L346-347: Why do high peroxide fractions contradict the small SOA yields? Please provide the reason for this explanation.

L376 Biogenic SOA marker compounds and Figure 6: Does the discussion take the water content of SOA? If not, it makes more sense to discuss data in terms of carbon mass fraction of marker compounds in OC to eliminate the effect of water content.

L865 Figure 4 Caption: non-purgeable organic material (OM) -> non-purgeable organic

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material (NPOM).

L415: Do the authors mean pinonic acid was detected in comparable fractions in both NO₃ and OH oxidation of α -pinene? If so where do these 20-25% come from? For the 75%RH experiments, α -pinene/OH experiment shows much lower pinonic acid fraction. Can the authors clarify this?

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2019-1066>, 2020.