

The authors describe experimental findings from the ozonolysis of α -pinene, limonene and 3-carene from a flow through experiment conducted in the RH range of 3 – 90%. Runs have been carried out with the intention to study the RH-dependence of HOM formation of the terpenes and the resulting nucleation and particle growth. While HOM formation was found to be independent of RH, particle formation was clearly pushed back for rising RH. Some speculative explanations for that are presented.

From my perspective, very interesting is the new transverse ionization inlet with the curtain gas unit, which could be an alternative to the commonly used Boulder-type inlet, as well as the experimental fact that HOM formation is totally free of water effects. I think that the manuscript meets the criteria for ACP and should be published in this journal. Some minor points should be considered before final acceptance is recommended:

- 1) Line 78-80: The authors mean that the intra-molecular H-shift, or RO₂ isomerization, is characterized by a noticeable barrier making this unimolecular step clearly faster with rising temperature. I think it's not good to say "autoxidation" has a barrier. Autoxidation stands more for the whole process.
- 2) Line 85-86: The Boulder-type nitrate-CIMS by Eisele and Tanner does not suffer from a general problem with water vapour. Only in the case of relatively high RH in the reaction gas water cluster formation during gas expansion can disturb the analysis. Otherwise it works fine. That should be clearly stated at this point. Or have the authors other observations?
- 3) Line 90: In abstract a RH range of 3 – 90% is stated, and here 0 – 90%.
- 4) Line 114: It would be fine to have a table that compares parameters of the TI inlet with those of the commonly used boulder-type inlet, e.g. reaction times of the IMR, flows, HNO₃ concentrations, TIC, detection limits, an estimate of wall losses for RO₂s and closed-shell products, etc. Spectra of the same reaction gas recorded with both inlets would provide an impression how good the TI inlet works. Maybe the authors should think about a separate paper describing the TI inlet in detail. Could be important for the community.
- 5) Line 223: Can the authors derive HOM yields as a result of their experiments?
- 6) Line 228-229: Reaction of OH-derived RO₂ radicals, C₁₀H₁₇O_x, with HO₂ leads to H₁₈ products, ROOH.
- 7) Line 258: Figure S5 should be given in the main body along with Fig.8. From my perspective, total SOA mass is almost water-independent within the experimental errors in the whole RH range while particle number drops down by a factor of about two.
- 8) Line 319: Here, reagent ion dependent sensitivity for different product classes should be mentioned that could lead to different results for different reagent ions.