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Atmospheric Measurement Techniques Discussions

Interactive comment on "Production of highly oxygenated organic molecules (HOMs) from trace contaminants during isoprene oxidation" *by* Anne-Kathrin Bernhammer et al.

Anonymous Referee #3

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This paper describes issues arising from trace contaminants from monoterpenes during isoprene oxidation experiments at the CLOUD chamber. It is clear that to understand isoprene chemistry and its aerosol yield, no contaminants that have a much larger yield than isoprene itself can be present in the chamber, so preparations for the experiments have to be done with great care, particularly on such large scale and important experiments as the CLOUD measurements.

The paper describes that a monoterpene signal was detected using a PTR3 instrument; and it turned out that 2/3 of the signal were due to cluster formation in the PTR3 reaction chamber and 1/3 was an actual impurity in the CLOUD chamber due to

limonene and sylvestrene formation in the isoprene standard. This impurity could be removed using a cryotrap in the inlet for the chamber.

The first part of the impurity signal caused by the high pressure and long reaction times of the PTR3 are more of a curiosity of this specific instrument and could be easily avoided by using a different PTR-TOF instrument or by changing the conditions in the PTR3 to run closer to standard PTR-MS instruments.

The second part of the signal comes from a real impurity, monoterpenes produced in the isoprene standard. As expected, this impurity results in a large number of oxidation products during the ozonolysis and after removing most of the impurity using a cryotrap the additional oxidation products are significantly reduced.

This is the conclusion of this paper, but unfortunately the implications for past results or the interpretation of the isoprene oxidation processes are not discussed. This discussion would be the actual main interest to the scientific community. While the issues discussed here are very important for the measurements during the CLOUD experiments and they need to be discussed and resolved, they are not relevant to the wider scientific community. I simply do not think that this manuscript includes enough scientifically relevant information to warrant publication in AMT and I recommend rejecting the current manuscript without including a solid discussion about the implications on previous and future research on isoprene oxidation.

The manuscript is generally pretty well written. The only issue I want to mention is that it is not clear to well into the manuscript that the experiments seem to be run dynamically and not in a batch mode. This should be mentioned in the description of the CLOUD experiment early on in the manuscript. I had a few other minor comments, but those were all covered by the other reviewers.

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