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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Photo-oxidation of pinonaldehyde at low NO_x: from chemistry to organic aerosol formation" *by* H. J. Chacon-Madrid et al.

Anonymous Referee #2

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The paper deals with SOA formation from pinonaldehyde, a stable product of the α-pinene oxidation, which can be achieved by a single attack of oxidant (first generation), but also as product of stable intermediate products. The SOA yields of pinonaldehyde at low NOX were compared to high NOX results, and to SOA yields of an aliphatic aldehyde and an aliphatic hydrocarbon, both with similar vapour pressure as pinonaldehyde. The higher yield of pinonaldehyde at high NOX compared to low NOX conditions was attributed to photolysis instability of products formed at low NOX. Aspects of NOX dependent chemistry of aldehydes are discussed. It is a neat little study, the findings are interesting and the paper is well written. Actually, there is not much to criticize, but at certain point felt left alone as I expected more results. As a consequence the

generalizations are based on a very limited data set. So I consider the presented study more as an interesting start than as ripe and comprehensive findings. If we could label the manuscript as “rapid communication” or “research letter”, it could be published in ACP under such heading without major changes.

In any case, I would like the authors to comment on the following issues:

p. 7734, line 7: What is the reason for that assumption of “no-interference”? Did you perform tests for interferences with your PTR-MS signal? How much could uncertainties in the chemical turnover of the reactant contribute to the total error of your SOA yields?

p. 7736, line 3ff and Figure 3: The systems pinonaldehyde/low NOX and tridecanal/high NOX level off with still several ug of COA present. Does this imply that the yield is constant for small COA = small turnovers? In the same direction: why does the yield of tridecanal at low NOX tends to increase with decreasing COA? What is the reason for the difficulties (“high degree of uncertainty and noise”) to determine yields at COA < 20 ug?

p. 7733, line 5ff: How important is the wall loss correction for the different chemical systems, e.g. if in one case vapours preferably condense onto the Teflon walls instead of deposited ammonium sulphate?

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 7727, 2012.