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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Molecular composition of biogenic secondary organic aerosols using ultrahigh resolution mass spectrometry: comparing laboratory and field studies" *by* I. Kourtchev et al.

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We would like to thank Referee #2 for his/her helpful comments and suggestions. All of the comments and suggestions have been considered. Point by point responses to these comments are listed below.

Referee #2 comments:

1) P29605 L1-15: Have the authors thought potential importance of OH reactions in

BVOC ozonolysis? In addition to lower SOA yields of beta-pinene and isoprene ozonolysis, both the VOC might act as OH radical scavengers that influence the final SOA yields. Perhaps the authors can add a sentence or two about the importance of OH radical formation in ozonolysis and its potential impact on the SOA yields here.

Authors Response: We agree with the referee that OH reactions are very important in the BVOC ozonolysis. However, in the present study we used an OH scavenger (i.e., cyclohexane) in all our ozonolysis experiments; therefore, we expect that all OH radicals formed from the reaction of BVOCs with ozone should be efficiently removed.

2) P29607 L3 and elsewhere: I wonder why the authors present only two decimal places for SOA compounds. I presume the authors have assigned these compounds based on the m/z values with four or more decimal values. Could the authors provide m/z values used for the chemical formulae assignment instead of these 'less accurate' m/z values?

Authors Response: We agree with the referee's remark. The assignments were done within 1 ppm accuracy. The m/z values with two decimal units in the text were shown for simplicity. As suggested, these values have been extended to four decimal units in the text.

3) P29608 L4: I believe this dimeric compound is also reported by Müller et al., 2009 as a peroxyhemiacetal compound. L. Müller, M. C. Reinnig, H. Hayen, T. Hoffmann, Characterization of oligomeric compounds in secondary organic aerosol using liquid chromatography coupled to electrospray ionization Fourier transform ion cyclotron resonance mass spectrometry, Rapid Communications in Mass Spectrometry, Vol. 23, Issue 7, 971-979, 2009

Authors Response: We thank the referee for this reference. We added the following sentence to the text and included the reference to the reference list:' It is worth mentioning that the HMW compound at m/z 357 has been previously identified in SOA produced from the ozonolysis of α-pinene and attributed to a hydroxyperoxyhemiacetal

(Müller et al., 2009) and pinyl-diaterpenylic ester (Kristensen et al., 2013)' (p. 29608, line 7).

4) P29610 L20-29611 L10: Such highly oxidized compounds are observed in both the laboratory generated SOA and ambient aerosols at Hyytiälä. The authors may want to add the following reference here. M. Ehn, E. Kleist, H. Junninen, T. Petäjä, G. Lönn, S. Schobesberger, M. Dal Maso, A. Trimborn, M. Kulmala, D. R. Worsnop, A. Wahner, J. Wildt, and Th. F. Mentel, Gas phase formation of extremely oxidized pinene reaction products in chamber and ambient air, Atmos. Chem. Phys., 12, 5113-5127, 2012

Authors Response: We added the following sentence to the text and included the-suggested reference to the reference list: 'It should be mentioned that highly oxidised multifunctional molecules have been previously observed in both ambient air (Hyytiälä) and chamber experiments of α- and β-pinene ozonolysis.' (p. 29611, line 11).

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 29593, 2013.