

Interactive comment on “Online atmospheric pressure chemical ionization ion trap mass spectrometry (APCI-IT-MSⁿ) for measuring organic acids in concentrated bulk aerosol – a laboratory and field study” by A. L. Vogel et al.

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The authors thank the referee #3 for thorough reading and improving the manuscript by constructive comments. The manuscript will be revised based on the referee's comments as follows:

Comment: Results from the laboratory study of aerosols formed by ozonolysis of alpha-pinene presented in figure 4 shows that the amount of dimers is about an order of

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magnitude higher than the amount of monomers. Alpha-pinene ozonolysis products have been intensively studied, but to the best of my knowledge dimers were lower or equal to the amount of monomers (see for example fig.7 in (Hoffmann et al., 2002), or Fig. 3. (Geddes et al., 2010)). Authors should discuss in more detailed why their result is different. It seems that it is not due to the application of the concentration step, since this ratio is about the same when the concentration is on and off. Is it because of the particular ionization technique used? In another words were higher dimer signals observed during the calibration with pinic and pinonic acid? It also can be due to tuning of the ion trap mass spectrometer to the specific m/z 215. If this is the case then the calibration coefficient received with pinic and pinonic acids cannot be applied to the whole mass range of 150-500 Da without corrections. Were such high ratios found in the field measurements?

Reply: When the aerosol in the flow reaction chamber is in equilibrium and the aerosol is sampled directly into the MS, the amount of monomers is indeed higher than the amount of dimers (Fig. 4, minute 10). At minute 11, this ratio is upside down. We think that this is due to losses of semi-volatile material in the saturator. For a more detailed discussion of these observations and how the manuscript was revised, please have a look at the reply to comment 2 by referee #1. Higher dimer signals during the calibration with pinic and pinonic acid were not observed. In the field measurements, the base peak was on m/z 183. An upcoming paper will show different mass spectra of the HUMPPA campaign in the ACP 2011 special issue "Summertime boreal forest atmospheric chemistry and physics (HUMPPA-COPEC 2010)".

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