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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Oligomer formation during gas-phase ozonolysis of small alkenes and enol ethers: new evidence for the central role of the Criegee Intermediate as oligomer chain unit" *by* A. Sadezky et al.

Anonymous Referee #2

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The manuscript by Sadezky et al. is a detailed study of the chemical composition of SOA formed in laboratory experiments from a series of alkenes using accurate mass and MSMS mass spectrometry. The search to identify the structure and formation pathways of oligomers in SOA is an important current topic in atmospheric chemistry and the manuscript should be published after minor revisions listed below in detail.

Results are carefully discussed and described in great detail, which might make the paper hard to read.

I have difficulties to follow the argument made several times in the manuscript that the oligomerization starts in the gas phase. The arguments why condensed phase oligomerization in the SOA particle is excluded should be discussed.

ESI is always prone to form non-covalent complexes with other components in the solution. This is especially critical if no chromatographic separation is applied as here. Did the authors check for possible formation non-covalent complexes formed in the ion source? In the experimental section it is mentioned that the declustering potential was set between 0-30V (p. 14047, line 12). If the declustering potential was varied non-covalent complexes could possibly be detected. Similarly, varying the collision energy during MSMS experiments might give hints to distinguish covalent and non-covalent bonds.

Reinhardt et al. (Anal. Chem. 2007; 79(11); 4074-4082; DOI: 10.1021/ac062425v) recently presented several data treatment tools to analyze high resolution FT-ICR-MS data of SOA particles. Would the data presented here profit from these analyses techniques? Reinhardt et al. identified exclusively Na adducts in their alpha-pinene SOA. Such adducts are excluded here. I would like to join the argument of Reviewer 1 to check the possibility of Na-adducts, which should only affect the X and Y units described in the manuscript but not the discussion about the repetitive units.

Table 3. It seems not necessary to list several possible elemental compositions with way to high relative mass errors. This makes table 3 unnecessary large.

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 14041, 2007.

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Interactive Comment