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## ***Interactive comment on “Terpenylic acid and related compounds: precursors for dimers in secondary organic aerosol from the ozonolysis of $\vec{\alpha}$ - and $\vec{\beta}$ -pinene” by F. Yasmeen et al.***

### **Anonymous Referee #2**

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#### General comments

This paper describes a detailed LC-MS analysis of compounds in secondary organic aerosol formed in smog chamber experiments from alpha- and beta-pinene and in ambient rural samples. The paper identifies compounds that might be used as qualitative markers for terpene-SOA in ambient aerosol samples. The paper is generally well written, however the large amount of information in the supplementary file makes it rather difficult to read. I suggest moving some of the information into the main part of the paper.

#### Specific comments

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p.10869, line 26 The smog chamber SOA samples were generated in the presence of highly acidic seed. What is the pH of the seed particles? What is the influence of sulphuric acid on the chemistry proposed in the reaction schemes. Would the postulated dimers also form in more neutral conditions? This aspect should be considered throughout the manuscript.

p.10870, line 6 Filter samples were extracted with methanol. In a recent paper Bateman and co-workers (Environ. Sci. Technol. 2008, 42, 7341–7346) showed that extracting organic aerosols with methanol might lead to artefacts induced by the solvent (i.e. ester formation). At least a respective remark of caution should be added in the manuscript.

p.10872, line 18 It is difficult to follow the argument that interpreting the MS3 spectrum leads unambiguously to the identification of a dicarboxylic acid. Could the fragment  $m/z$  71 not be explained by a structure without a carboxylic functional group?

p.10874, line 25 Acid-catalyzed hydrolysis reactions are mentioned. Are these suggested due to the acidic seed particles used in the smog chamber experiments investigated here? Would they be similar important in SOA formed under other (less acidic) conditions?

p.10876, line 25 A rather vague reference is made to ambient samples. Could this be described in more detail?

p.10877, line 8 See comment above.

p.10877, line 27 It is argued that esterification reactions are important to generate higher molecular weight compounds in ambient aerosol. This main atmospheric conclusion should be discussed in more detail.

p.10878, line 3 Why were the dimmers only observed in the night time samples and not in the day time samples? This interesting finding should be commented.

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