

Interactive comment on “Organic and inorganic decomposition products from the thermal desorption of atmospheric particles” by B. J. Williams et al.

B. J. Williams et al.

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*A revised document (with Track Changes enabled) as well as corrected figures and supplemental figures has been provided to the editor.

Anonymous Referee #3

General comments:

This is a very comprehensive characterization study about thermal decomposition products seen in the analysis of ambient aerosols using a thermal desorption aerosol gas chromatograph (TAG) system. These products are interesting because they likely

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contain information about inorganic salts or polar organic compounds that are previously not included in data obtained with a TAG system. The authors compared ambient aerosol data obtained from a TAG system with AMS data, and observed good correlations for selected compounds such as oxygenated organic aerosol between the data obtained from these two systems. The paper shows the potential of the TAG system nicely through the comprehensive characterization, and I hope that the system becomes as popular as the AMS so that we see more highly time resolved yet chemically speciated data from different geographical locations. The manuscript is well written and it meets the scope of the journal. I have only minor technical comments, mostly about figures that I want the authors to address in the final version of the manuscript.

Author Response: The authors thank the reviewer for their comments and address further questions below.

Technical comments:

1) Figure 2: The resolution of the text in the figure is too low and fonts are jagged. Please provide a higher resolution figure.

Author Response: The figure text does not appear jagged in the document that we see online (perhaps the editor can confirm?), however the authors will be sure to check on the figure resolution in the final document and will work with AMT to ensure high quality images.

2) Figure S2: Can the authors provide the figure in color?

Author Response: Yes, this figure (S2) is provided in color in the final documents.

3) Figures 3, 4, 5, 6, 7, and 8: The authors use lower case letters in the text or caption to designate panels in the figure but upper case letters are used in the figure. Please use consistent letter case.

Author Response: We had originally submitted everything with upper case. AMT changed figure captions to lower case as appears to be the preferred designation.

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We have changed to lower case throughout figures and in the text.

4) Figure 5(B): It is hard to discuss about the quality of calibration curves that are constructed from only three (or four) standard points but it seems to me that a quadratic equation fits better for the calibration curve for ammonium nitrate. Can the authors add two more points (say 2500 ng and 5000 ng) so that the calibration curve is indeed quadratic? I am raising this issue because a three point calibration curve is not appropriate at all to discuss about quantitative quality of the method.

Author Response: Unfortunately we are not able to conduct further “pure component” injections for these inorganic standards due to coating damages as mentioned in the text. For future application, as mentioned in the text, we will mix organic and inorganic standards into a complex standard to prevent coating damage (this seems to explain why we don’t damage our cell during ambient sampling). At that stage we will be able to perform a more complete analysis of responses. We are careful to not imply these rough calibrations can be used for actual calibration as they stand. Additional comments on these calibrations are addressed in our responses to Reviewer #2. We have added the following statement in section 5 text:

“It is also possible that a non-linear calibration curve may ultimately better define the instrument response to sulfate and nitrate, but due to instrument damage caused by injecting these standards there are limited data points available to determine the full response.”

5) Figure S5: Please remove a line connecting the periods with missing data points.

Author Response: The line has been removed from the figure.

6) P13396L5: Did the HR-ToF-AMS measure up to PM1 or PM0.9?

Author Response: There is a transmission curve that falls off at approximately PM1. The AMS is typically characterized as having a PM1 size limitation, although there are slight differences amongst instruments, in general, they behave similar to a PM1

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cyclone.

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 13377, 2015.

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