Qualification of an online device for the measurement of the oxidative potential of atmospheric particulate matter

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Revision Notes – 2nd round

Dear Pr. Francis Pope,

Thank you for giving us the opportunity to submit a second revised draft of our manuscript "Qualification of an online device for the measurement of the oxidative potential of atmospheric particulate matter" to Atmospheric Measurement Techniques. We appreciate the time and efforts that you and the reviewers have dedicated to providing us with valuable feedback on our first revised manuscript. We have been able to incorporate changes to reflect the two comments provided by the reviewers.

These changes are denoted in red in the new manuscript, and reported here on a smaller font size. Here is a point-by-point response (in bold) to reviewers' comments and concerns (in italics).

We hope that these revisions and clarifications satisfactorily address the reviewers' concerns.

Sincerely, Albane Barbero on behalf of all co-authors

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Referee #1(Kalberer Markus) comments: *Note: referee #1 will be referred to here as RC1.*

1. *Answer 13/14/15: Figure 3, Collection efficiency up to 5µm particles. I am still not convinced that you can determine a reliable collection efficiency with a particle concentration of 0.1p/cc. Errors in Fig 3 (red data) are similar for 50-100 nm and > 1µm particles. Maybe data above 1um should/could be deleted?*

   Answer: Factually speaking, we agree with RC1. Indeed, at these operating rates in the gas stream, we have very few particles larger than 1µm, but there are still some. To satisfy RC1, we removed the values above 1µm in Fig.3 as suggested.

2. *Answer 19: I do not quite agree that ozone does not affect the analysis results, looking at Fig. S2a. I think Fig. S2a shows that a sudden O3 increase (orange line) causes in increase of* OP^{AA} *by ca. 2pmol/min (10/11, 13/11, 15/11). Although I agree that this effect is not observed on 7/11. Is 2pmol/min a significant number for ambient measurements? If not, my concern would not be relevant. If 2pmol/min is a large number for ambient data, maybe the added sentence in the revised version for this answer could be modified that also the cross sensitivity of ozone needs further investigation.*

   Answer: We still slightly disagree with RC1. As previously stated, the sudden increase in O_3 does not have a significant impact on AA consumption, as shown in Figure S2a and also noted by reviewer 1 (particularly on 7/11). We have previously changed Figure S2 by adding Figure S2b, which shows the insignificance of O_3 concentration on the AA signal. For this experiment, an increase or decrease of 2 pmol/min does not seem significant as it is within the noise range. However, as suggested by RC1, it is important to note that further research on the impact of O_3 would be welcome (e.g. atmospheric studies during O_3 peak pollution or otherwise). We therefore modified the following sentence in the manuscript.

   "Other atmospheric oxidants, including more water-soluble inorganic and organic gaseous compounds, could also contribute to AA or DTT depletion, and further investigations are required to evaluate their role in the overall oxidative potential of the gas phase, as well as to assess the possible cross-sensitivity to ozone."