

Interactive comment on “Impact of aftertreatment devices on primary emissions and secondary organic aerosol formation potential from in-use diesel vehicles: results from smog chamber experiments” by R. Chirico et al.

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We thank the reviewer for his/her comments. For the revised version of the manuscript they were taken in consideration.

1) There is a mismatch in data presented and conclusion drawn, it is hard to see what is really important.

We revised the conclusions.

2) A wall loss correction, using EC as metric for wall losses is used (equation 2). This
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may be a bit problematic, when applying it to SOA, because the correction assumes that the losses occur from the beginning whereas SOA is formed during the irradiation in the smog chamber. This will not influence the main message of the manuscript, but may lead to an error which should be mentioned.

Our assumption is that the newly formed condensable species also condense/partition to those particles that are already lost to the wall. We make this assumption more clear in the text. If the particles at the wall were totally lost and were not interacting with the organics in the air at all, the calculated SOA after 5 hours would be roughly overestimated by 20%.

3) The remarks concerning the DOC-activity (lines 374-385) are a bit vague. Could perhaps the NO/NO_x ratio be used to quantify the DOC efficiency?

Usually T>250-300°C are needed to have a 40% oxidation of NO to NO₂ in the DOC (Karate et al. 2007). We don't know the exhaust temperature before the catalyst. What we know is that the exhaust temperature at the tailpipe was below 100°C. Looking at the NO/NO_x ratios we can see that NO_x was mostly made of NO (see table 1). We believe the exhaust temperature was too low to promote a significant NO oxidation in the DOC and the NO/NO_x ratios can't be used to quantify the DOC efficiency.

4) An impressive amount of data from the AMS measurements is given. A more profound data analysis and interpretation of these data would be wishful. why is the DOC very efficient in removing SOA, but not POA.

We added some discussion (mostly speculation) on this (Lines 545-553 in the revised manuscript) but an extended analysis of this effect is beyond the scope of this paper and would require more experiments devoted to this issue.

5) Table 1: units for BC, POA and SOA are missing

Units for BC, POA and SOA are now in Table 1.

6) Not much information is contained in Fig. 11; this Fig. could be removed and replaced
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by one or two sentences in the text.

Fig. 11 is now in the SI.

7) The information in Fig. 14 is mainly contained in Fig.13.

Fig. 14 was removed.

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