

Interactive comment on “A method for measuring total aerosol oxidative potential (OP) with the dithiothreitol (DTT) assay and comparisons between an urban and roadside site of water-soluble and total OP” by Dong Gao et al.

Anonymous Referee #4

Received and published: 10 May 2017

Review for A method for measuring total aerosol oxidative potential (OP) with the dithiothreitol (DTT) assay and comparisons between an urban and roadside site of water-soluble and total OP by Dong Gao et al.

This manuscript describes a careful study further developing a technique previously published by the group. Different aerosol sampling and extraction methods are compared and first field data are presented to quantify aerosol bound OP. After addressing the points listed below, I recommend publication in AMT.

p.2, line 37: OP(total-DTT) is that the unfiltered methanol extract fraction? It might be

C1

best not to use undefined abbreviations in the abstract.

p. 2, line 40-41: This sentence is not clear to me. Was the same DTT analysis performed on Teflon filters? Please be more specific.

p. 3, line 62/63: It would be good to mention also a reference for the DCFH assay besides DTT and ascorbic acid.

p.8, line 167 – 169. I do not agree with the statement that sonication has no effect on radical formation. The paper cited, Miljevic demonstrates explicitly the opposite. Fig. 3 in that paper shows clearly that sonication strongly oxidises DTT! It is not clear to what section in the SI this sentence refers to. Fig. S3 or S5? In Fig S5 both axes are labelled that same. So it is not clear what Fig S5 is showing. This statement has to be worded much more carefully and the results presented and the potential effects of sonication have to be discussed critically by representing literature results correctly!

p. 10, line 223: I would strongly advice to call the “water-insoluble OP” “methanol-extracted OP” as this is highly misunderstanding. There are many organic compounds that are not water soluble but are also not soluble in methanol, such as many PAHs. By reconstituting the methanol extract again in water, it is likely that components which are not water soluble precipitate again and are thus not accessible to the DTT oxidation anymore. This potential artefact should be discussed.

p. 11, line 241-247: Filtration of quartz fibre filters usually results in significant disintegration of the filter and many loose quartz fibres in the extract. As these samples were not filtered, it should be described in more detail how this was dealt with and what potential artefacts this might have caused for the DTT analysis.

p. 11, line 252: Why was K-buffer used in method 3 but not in the other methods? Please explain this differences and potential consequences for the results.

p. 18, line 398: Please check all “WS-DTT” and “WI-DTT” super-scripts. It seems to me there are some typos.

C2

p. 19, Table 2: Was there any difference observed in the correlation between DTT values and total and water soluble metal concentrations?

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2017-70, 2017.