

Interactive comment on “An On-line Monitor of the Oxidative Capacity of Aerosols (o-MOCA)” by Arantzazu Eiguren-Fernandez et al.

Anonymous Referee #1

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General comments

This manuscript brings a very useful (and expected!) device for atmospheric community and there is no doubt with the relevance of the subject matter to the journal AMT. The manuscript is written in a very clear way and the methodology addresses all the expected points with regards to protocol, step of validation etc.. The introduction is well presented and points out with clarity the aims of the study. Authors have done a very good job and I would recommend for publication it after some minor revisions :

“specific comments”

*L 37: “the mechanisms that lead to those effects are not understood” => to be adjusted the mechanisms that lead to those effects are not completely understood “, since a consensus exists concerning one key parameter that drives the PM toxicity as you

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mentioned it after : it is attributed to their carrying or inducing reactive oxygen species in the lung, at the origin of oxidative stress leading to biological effects.

*L67 “Additionally, this assay has the ability distinguish between the contribution of metals and of organics to the overall oxidative capacity”. = > a ref is needed. As a user and in charge of OP assays development in my lab, I found that OP AA has a greater ability to distinguish metals from organic contribution to the overall OP that DTT.

*L 68 I would suggest to complete with more inflammatory markers: The acceptance of this assay is based on several studies that showed a high correlation between the DTT assay and more specific biological markers of oxidative stress such as Heme-oxygenase 1 (HO-1) and inflammatory markers such as interleukins (IL-6, IL-8) (Li et al., 2003;Steenhof et al., 2011;Jiang et al., 2016) and GM-CSF (Granulocyte macrophage colony-stimulating factor) (Hussain et al. 2009; Uzu et al. 2011).

Hussain S, Boland S, Baeza-Squiban A, Hamel R, Thomassen LCJ, Martens JA, et al. 2009. Oxidative stress and proinflammatory effects of carbon black and titanium dioxide nanoparticles: Role of particle surface area and internalized amount. *Toxicology* 260:142-149.

Uzu G, Sauvain J-J, Baeza-Squiban A, Riediker M, Sanchez Sandoval Hohl M, Val S, et al. 2011. In vitro assessment of the pulmonary toxicity and gastric availability of lead-rich particles from a lead recycling plant. *Environmental Science & Technology* 45:7888-7895.

*I 146: I would recommend to do a pre-treatment of Phosphate buffer with chelex before mixing it with DTT , it's allow a better LOD.

*L 225 “fixed wavelength UV-VIS detector.” Which wavelength exactly? 412 nm? Need to be specified.

* paragraph 3.2.4. S : very good idea, and absolutely compulsory to run an OP online device if runned with DTT.

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*I 299 : This value is slightly lower than previous limits of detection reported in the literature for the DTT assay (Charrier and Anastasio, 2012;Fang et al., 2014) => 2 times lower than Fang et al, well done, you could simply write “This value is lower” , because 2 times lower is significant!

*I 308 “As no standards have been established for DTT consumption rate equivalence”. Yet, it does exist but it’s true that’s not very well established. Some researchers found an equivalence between DTT consumption and H₂O₂ formation rate could be useful since H₂O₂ exposure is regulated in occupational environments.)

*L 345 , Figure 6 To strengthen your experiment and validation of methodology, I would recommend sampling aerosols on filters in parallel to your o-Moca acquisition so as to confront your results. In fact, your parallel previous test with reference compounds is ok, but results could be different when in contact with real PM!

“technical comments”

*L 129 a point is needed to end the sentence.

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