

Interactive comment on “Improved measurement of carbonaceous aerosol in Beijing, China: intercomparison of sampling and thermal-optical analysis methods” by Y. Cheng et al.

Anonymous Referee #1

Received and published: 19 August 2010

This is a carefully conducted study of positive and negative sampling artefacts of OC and a valuable contribution to the discussion of how to sample carbonaceous aerosols with minimum artefacts, which is highly relevant in the atmospheric “Carbon community”. It should certainly be published after a few points are addressed.

The answer to the other questions in the Review guidelines is generally: “yes”, but I suggest a few changes (given in the order of appearance in the text). The MS should also be checked again for grammar and typos. e.g. Figt, 1990 should be Fitz, Weston et al. should be Watson et al., “light adsorption” changed to “light absorption” (occurs several times in the text) and in some cases, “form” should be “from”.

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A list of abbreviations would help to make the MS more easily accessible

The title is not quite appropriate. Of course the study was conducted in Beijing, but what is new in the study is the analysis of the artefact. I suggest changing the title to stress the artefacts, because these are more interesting to the scientific community. The thermal-optical analysis methods should stay in the title, too.

p. 15677: the semi-continuous OC/EC analyzer is not an in-situ instruments, as the particles are collected on a filter just as in all other filter-based methods. A true in-situ instrument would be a photoacoustic spectrometer, which measures the absorption properties of particles in their airborne state. The last sentence of the second paragraph on p.15677 could benefit from a little more explanation – it is not obvious why Chinese aerosols are so special.

p. 15679 lines 19/20: why does the instrument allow “more accurate and precise control ... of sample temperature”? Compared to what other instrument? There are also other commercial instruments that allow simultaneous recording of reflectance and transmittance.

p. 15681, lines 11/12: please give the first reference for Eatough’s work with the CIG /CIF.

p. 15681, last line: please check sentence.

p. 15684, discussion on “early split”: is there a reason why the early split is observed so frequently in China compared to other regions?

p. 15685, lines 22 till the end: Are there other indications for the presence of brown carbon than the discrepancy between the methods? Of course brown carbon would give large discrepancies between thermal methods, but I am not sure whether the discrepancy alone should be used to infer the presence of brown carbon. The statement in the abstract, however, is sufficiently cautious.

p. 15686, line 16: please clarify what is meant by “breakthrough sensitive to CIG filter”

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p. 15692: please differentiate more clearly between (sample or backup) filter and filter used as denuders

p. 15693 (and earlier text on this topic): oxidation of OC's during sampling: the possible oxidation of OCs on the filter during sampling is discussed, but could some oxidation also occur during the He-mode by oxygen-containing other aerosol material?

p. 15694, line 2/3: "inconclusive" seems too cautious. From the data shown in the MS, I think it would be justified to say that the CIG filter method should not be used in China.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 15671, 2010.