**Atmospheric
Chemistry
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Discussions**

Interactive
Comment

Interactive comment on "Size distributions, sources and source areas of water-soluble organic carbonin urban background air" *by* H. Timonen et al.

Anonymous Referee #1

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The size distributions of water-soluble organic carbon (WSOC), inorganic ions and gravimetric mass of particulate matter over one year presented here are datasets rare and valuable for understanding aerosol occurrence and impacts in the troposphere. This paper is complementary to the one by Saarikoski et al in the same journal is more chemistry than physics oriented paper and deserves to be cited by this one and vice versa.

I will agree with the two other reviewers that although the database is worth publication in ACP, the interpretation and discussion of the results is not at the same level with the data. Improvements in order to better justify he conclusions will be of large benefit for

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Interactive Discussion

Discussion Paper

the manuscript before publication in ACP. The use of English has also to be improved and typos detectable by careful reading have to be corrected.

Precisely:

1. The use of a fixed mass to carbon ratio of 1.6 (p 7848, l 11) to convert WSOC to WSPOM may be critical for the discussion of results. This ratio has been reported in literature to vary from 1.4+-0.2 for fresh primary aerosol (for instance samples collected in Asia and the Caribbean; Russell, Environ. Sci. Technol., 37, 2982-2987, 2003), up to 2.1ś0.2 for non-urban aged aerosol (for instance Turpin and Lim, Aerosol Sci. Technol., 35, 602-610, 2001). Thus higher ratios are related to atmospheric processing. How is this counted in the present study? What is the uncertainty that the adopted fixed ratio introduces to the results of this study? In particular with regard to the importance of WSPOM with regard to inorganic ions in the PM mass.

2. p7851, l 21: Blank controls are mentioned without indications on the detected levels. How large is the applied corrections compared to the measured concentrations?

3. p 7855, l 15-19: Provide number of samples used for this analysis.

4. p. 7858, l27. The large WSPOM/ions-ratios observed in the coarse mode (Figure 3) need to be explained to increase confidence to the experimental results.

5. p. 7859, l 10: Please, explain how the mean WSOC/OC ratios are calculated? Do the authors calculate the average of the individual ratios? Also clarify how Table 2 is derived why WSOC/OC (PM1) does not have standard deviation?

6. p. 7860, section 3.5.1 this part can and has to be linked to the Saarikoski et al. ACPD, 2008 paper that provides information on the source apportionment procedure applied by the authors for organic carbon.

7. p. 7861, l 2-8: Table 1 presents criteria or observed average levels? Why elemental carbon or nss- potassium have not been used in this procedure?

8. p. 7861, l27 and p7862 l 4: Provide the numbers for max and min ratios and explain how they are derived.

9. To avoid miss-understanding in the captions of Figures 1, 3, 5, 6 and 7, where WSPOM is used, the adopted factor 1.6 has to be mentioned since this affects the results presented in the figures.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 7847, 2008.