

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

Anonymous Referee #2

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General comments: The manuscript presents a year-long study of water-soluble organic compounds in aerosols in urban background air, and the results are supported by measurements of other relevant aerosol components. The results are interesting since very few studies have been published with such an extensive number of continuous measurements of WSOC. Generally the results are presented well, but in some sections the results on influence of biogenic SOA are over-interpreted. The manuscript is written fairly well, but grammar and style should be checked again by a native English-speaking person, e.g. to avoid errors with use of prepositions (examples: 7849 line 12: can be further divided to (should read in), line 21: a fossil fuel combustion sources(no plural)). It was surprising to discover that the paper has a companion paper in ACPD

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by some of the same authors about some of the measurements also presented here (S. Saarikoski et al. acpd, 7805-7846). The papers have separate data analysis, but they should at least state a reference to each other and describe the difference.

Introduction: The section presents the background within the area with references to a fair number of relevant papers, but the style and grammar of the presentation should generally be improved by e.g. using fewer brackets containing fewer words.

P7850 line 7-11: Please rephrase the sentence to give a more meaningful description of different techniques, preferably with some references. What is rotating extraction?

p7850 line 19-20: The papers referred to here do not form a basis for the argument that the boreal forest has been recognized as one of the most effective emitters of biogenic volatile compounds (BVOC). A more precise statement would be that this region has considerable emissions of BVOC.

line 21: should read :The paper presents

Experimental: Measuring OC is a difficult task due to possible artefacts from adsorption or loss of semivolatile components. Using impactors for sampling of OC may be especially problematic due to low pressures and possible higher loss of the most volatile components. This effect may be very difficult to quantify, so please at least describe possible problems related to this. This should also be reflected in the uncertainty of the analyses.

7851 line 15 Do the cut-off diameters refer to the 50% cut-off diameters? Please state.

line 19 what was the foils washed with?

7852 line 19-20 At what temperature and RH were the filters conditioned and for how long?

7853 | 3 “using the Millexr-LCR. Please state that this is a type of filter and remove THE.

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I 16 What does the NPOC method mean?

7854 I 4 Explain the acronym LC-MS.

Results and discussion 7855 I 3-5 Please clarify this sentence.

I 23- :Large variations in the particulate concentration levels were observed. Do you mean variations during the year or?

7857 paragraph I 3-12 This paragraph should be clarified, improved and shortened. I generally advice to exclude some of the eight (!) references to the paper of Tunved et al. in this paragraph I think one is enough.

7860 I23- residential wood combustion may be a locally important problem, but on a regional level this is probably not quantified enough to form a basis for the statement.

7862 line 7-8 please give the range of WSOC/OC measured by Frey et al.

I 9-10 Please describe in more detail the statement that the WSOC size distributions were clearly different since it is not so clear to me. How were the distributions normalized?

I 14-15 I assume that this refers to the normalized distributions and not the actual concentrations in Table 2, since the concentration of WSOC is smallest for the arctic air masses please correct.

I 15-20 It would be more correct to say that this MAY be caused by condensation of biogenic secondary aerosol.

7863 I 0-9 Please write that the data are not shown.

I 10- Figure 5 shows the WSPOM ratios not WSOC. Please correct throughout the paragraph.

7864 last paragraph. The data on biogenic influence are over-interpreted. Please modify the discussion to reflect the actual data in a more exact way. The results in-

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dicating an association with seasonal variation in biogenic emissions and probably also SOA formation, but since terpene oxidation products were not analysed it is only an indication.

7865 | 24- The statements concerning influence of biogenic VOC are much too strong compared with the results presented.

Table 1 The description is not precise. It seems that the table shows average concentrations for the different air masses, not criteria, which is somewhat confusing to the reader. Please clarify and add standard deviations to the average concentrations. If this is actually the criteria, I would like a description of how the numbers were selected.

Abstract: The abstract should of course be corrected according to the above recommendations.

p. 7848 | 9 gravimetric mass of what? PM1? or individual filters?

| 16 Describe shortly how the sources were identified.

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

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