Atmos. Chem. Phys. Discuss., 5, S1327–S1329, 2005
www.atmos-chem-phys.org/acpd/5/S1327/
European Geosciences Union

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Combustion characteristics of water-insoluble elemental and organic carbon in size selected ambient aerosol particles" *by* K. Wittmaack

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Received and published: 22 June 2005

The positive comments of referee #2 (R2) on the originality and the quality of my paper are very much appreciated. I hope that the novel approach that I have described for an advanced characterisation of EC and OC will encourage other groups to look for means of improving the standard thermo-optical techniques.

Turning to the specific comments and suggestions for changes, I have to start with a little error on the side of R2, probably a Freudian error. In my study the aerosol matter was not sampled on a filter, as stated by R2, but on aluminium foils in an impactor. If one aims at a better understanding of the combustion characteristics of carbona-

ceous matter, investigations on size selected samples are indispensable. As pointed out in my paper, previously reported results on EC and OC related almost exclusively to particulate matter with aerodynamic diameters less than 2.5 or 10 μm (PM2.5 or PM10, respectively). The mixture of carbonaceous matter contained in these samples severely aggravates interpretation of the measured thermograms. Taking further into account that in my work the water soluble matter - including water soluble organic carbon - was removed prior to thermal treatment, the requested "discussion of the consequences (of my observations) for the interpretation of (common) thermograms" is only possible in rather general terms. In the revised manuscript I will add some ideas concerning future experiments that might be useful in trying to relate characteristic features in thermograms to the presence of certain types of carbonaceous matter, notably of OC.

Response to Specific Comments

Concerning the reduced combustion artefacts due the removal of inorganic water soluble matter, I will make reference to some results which substantiate the assumption. Unpublished work at GSF on PM2.5 has shown that many transition-element metals are contained in compounds that feature a significant or even high water solubility (Fe: about 40% on average; Zn: $>$ 80%).

As to the requested changes in Fig. 1, I assume that R2 is asking me to change the quoted masses per stage to mass concentrations, MC. To account indirectly for this request, I will add the volume of sampled air in the figure caption. Just in case that R2 might be asking for an inversion of the data to obtain dMC/dlogD (where D is the aerodynamic particle diameter), such an evaluation does not make sense because the width of the sampling intervals was rather large (ratio r of consecutive cut diameters 3.5, i.e. log(r) = 0.54). This is the reason why the distribution of as-sampled aerosol matter in Fig. 1 appears featureless and broad.

The term "Low-resolution" in the caption of Fig. 4 may be somewhat misleading and will

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be changed to “Large-area”. On purpose the images were selected to show the surface morphology for a fairly large area. High-resolution, small-area images are presented in Fig. 3.

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 2247, 2005.