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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Strong spectral dependence of light absorption by organic carbon particles formed by propane combustion" *by* M. Schnaiter et al.

M. Schnaiter et al.

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We acknowledge the comments and suggestions for improvement of the paper. Since the Referees do not see any need for major revisions we decided to reply in a single document.

Answers to specific comments

1. We agree to the comments that the text describing Figure 3 should be improved. Thus, in the final manuscript we will extent the discussion of Figure 3. However, we think that both particle populations, i.e. soot aggregates composed of small ($\sim$ 30 nm) primary particles and larger ($\sim$ 120 nm) spherical particles, are clearly visible in the Figure. The latter are either attached to the soot aggregates or

appear individually. Some of these larger particles are already indicated by arrows in the Figure. The long grey structures visible in Figure 3 are bars of the supporting film.

2. The paragraph describing the systematic errors in the spectroscopic measurements of the impactor deposited samples (p. 1851, lines 22 to 29) will be improved in the final manuscript. The main point here is a partial compensation of the systematic errors in the scattering and transmission measurement due to the finite sizes of the transmission port and the sensitive area of the detector.

3. Uncertainties of the optical quantities, i.e. the single scattering albedo and the specific absorption cross section, given in Table 1 are mainly due to the uncertainties in the LOPES measurements and the mass determinations by the thermographic method. It was found that the systematic error in the nephelometer measurements is low and less than 5%. A paragraph which addresses this issue will be added to the final manuscript.

4. It is difficult to add an additional “nm’’-axis to the tops of Figs. 7 and 8. Moreover, an additional axis is not imperative since the UV-VIS data are already given in Fig. 6 on a “nm’’-scale.

5. The EC/OC measurement is routinely calibrated by injecting known doses of CO_2 into the system. This will be added to the final manuscript.

6. Our thermographic method does not correct for charring of OC. However, we have evidence from investigations with pure organic aerosols that charring of OC to EC is low and less than 10% by using the presented temperature protocol. Charring cannot completely ruled out but should not change the general trend observed in our experiments, namely a strong increase of the OC content in the aerosol with increasing C/O conditions in the flame. So, the main conclusions of

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the paper should not be affected by charring of a minor OC fraction to EC. This will be pointed out in the final manuscript.

7. We agree with Referee #2 that the identification of PAHs is desireable. That's why we have started now with analysing the CAST aerosol emissions for PAH content.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 1841, 2006.