

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

### **Anonymous Referee #1**

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Review of ACPD Paper “Strong spectral dependence of light absorption by organic carbon particles formed by propane combustion” by Schnaiter et al., 2006.

#### General comments:

This paper describes experiment to examine the (shortwave) spectral absorption of soot and soot-like aerosols. The experiments are run by varying the ratio of organic carbon (OC) to total carbon (TC) in aerosols produced by the combustion of propane. The aerosol optical properties are then measured, including the absorption coefficient. (The so-called “difference method” is used to measure absorption. This method is

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normally dangerous, but the authors are aware the method's limitations). One can then determine how the OC/TC ratio is related to the aerosol optical properties.

The topic covered by this paper is extremely important, and the paper makes a small, but important contribution to this area. It should be published in ACP with just a few very minor revisions. I cannot see any need for major revisions.

Specific Comments:

Here are some suggestions:

(1) Page 1845 (line 24 to the end of section 2). The text - describing Figure 3 - could be improved. For example, the text talks of two morphologically different particles types. But I cannot unambiguously identify these two types in Figure 3. I am assuming that category “a” particles (soot aggregates formed from very small individual particles) are not seen in this figure. Is this assumption correct? If so, it should be stated in the text that only category “b” particles are visible. Also, what is the grey structure to which the particles are attached? Is it the supporting matrix? (2) Page 1851 (line 26) - typo “whithin” should be “within”. More importantly, this section contains that statement (line 20), “Apart from this internal consistency, however, there are systematic deviations from the aerosol measurements in extinction and scattering”. The authors then go on to say that these “systematic deviations” (whatever these are!) are caused by problems in dealing with the forward scattering. I am thinking that this section is a little confusing, and could be improved by adding a few more sentences of prose. I get the general idea, but I don't understand the details (although lots of detail is not necessary here). (3) In Table 1, uncertainties are quoted for the single scattering albedo. How are these uncertainties found? Maybe a paragraph in the text could address this issue. I like it that the authors showed a single scattering albedo of 1.06 in this Table. (but noted that it is unphysical in the text). This illustrates that there are indeed uncertainties in the difference method. (4) Figures 7 and 8. Can an axis in “nm” be added to the tops of these figures? It would be a great convenience to the reader.

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