

Interactive comment on “Variability of organic and elemental carbon, water soluble organic carbon, and isotopes in Hong Kong” by K. F. Ho et al.

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Received and published: 20 June 2006

General Comments

In the manuscript "Variability of organic and elemental carbon, water soluble organic carbon, and isotopes in Hong Kong", Ho et al. show measurements of carbonaceous particles during summer and winter at three stations in Hong Kong, representing road-side, urban- and regional-scale conditions. Monitoring results comprise OC and EC concentrations in PM₁₀ and PM_{2.5}, expanded by a set of WSOC determinations and a few measurements of d¹³C in OC and EC. In general, the authors observed higher average concentrations of all components in winter with the highest loads at the road-

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side and the lowest burden at the regional-scale site. OC/EC and WSOC/EC ratios were the highest at the regional-scale site, pointing to the influence of aged aerosols and SOA formation. $\delta^{13}\text{C}$ was seasonally and spatially uniform for EC, whereas ^{13}C was depleted in OC at the regional-scale site compared to the urban stations. This result is interpreted as an indication of the existence of biogenic sources outside of Hong Kong city.

This paper describes the status-quo of concentrations of carbonaceous particles at a typical Asian industrialized region and suggests main reasons for spatial and seasonal differences. This study contributes to the survey on air pollution in South-East Asia, which becomes a more and more important topic. The comparison of summer vs. winter as well as urban vs. rural conditions performed in this work allows a comprehensive view on the situation. Emphasis was laid upon the identification of sources with determinations of WSOC concentrations and $\delta^{13}\text{C}$ in OC and EC. Consequently, this paper addresses relevant scientific questions within the scope of ACP and I recommend it for publication.

Specific comments

1. Recent $\delta^{13}\text{C}$ studies should be mentioned in chapter 2.4 and compared to results of this work in chapter 4.3.

a) Huang et al., Atmospheric Environment 40 (2006) 2690-2705, report insignificant differences for $\delta^{13}\text{C}$ in OC between a tunnel and a forest site.

b) Szidat et al., Radiocarbon 46 (2004) 475-484, investigated urban summer aerosols with substantial impacts of biogenic SOA and stated that "a possible response of $\delta^{13}\text{C}$ to the influence of atmospheric processes could not be detected".

c) Further discussions with other studies are welcome.

2. The procedure of the CO_2 formation from OC and EC for $\delta^{13}\text{C}$ measurement (page 4584, lines 7-11) should be clarified. The described technique for OC ("no oxygen,

under vacuum") may evaporate OC, but cannot produce CO₂.

Technical corrections

3. One letter is missing in the caption of Figure 3, second line. Correct is: "given as fraction"

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 4579, 2006.

ACPD

6, S1261–S1263, 2006

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