Atmos. Chem. Phys. Discuss., 9, C9388–C9390, 2010
www.atmos-chem-phys-discuss.net/9/C9388/2010/


Atmospheric Chemistry and Physics Discussions



# *Interactive comment on* "Chirality and origin of atmospheric humic-like substances" *by* I. Salma et al.

**I. Salma et al.**

salma@chem.elte.hu

Received and published: 7 January 2010

The authors thank Referee #1 for his/her precious comments for further improving and clarifying the ACPD paper. We have considered all recommendations, and made the alterations according to our best. Our responses to the comments are as follows.

According to the Referee's recommendations, we extended the text by discussion of the sampling artifacts for WSOC and HULIS, and added two new references on these specific sample types.

A new column with the units was added to Table 1 according to the Referee's suggestion.

HULIS are extremely complex mixture of compounds, and we are aware of the limitations and weakness imposed by their operationally defined character. The isolation procedure applied was optimized to separate the fraction that exhibits the key spectral properties of HULIS, i.e., more than 90% of the fluorescence activity and 70% of the UV activity for humic and fulvic acids (Varga et al., 2001). There can indeed be some organic compounds that show up in the HULIS-containing eluent although their amount is limited with respect to HULIS or HULIS-C. Presence of inorganic salts in the eluent in a considerable amount was excluded by RFA (Kiss et al., 2002), ELSD (Emmenegger et al., 2007) and ICP-MS methods (Salma et al., 2007) for rural and urban HULIS earlier. We added now a brief discussion on this assumption as suggested by the Referee, and included some related citations.

We completely agree with the Referee, and the part questioned was reformulated to better express our original intention and to avoid misunderstanding on the source intensity.

Mean contributions of HULIS-C to WSOC were 35, 48, 63 and 76% for rural and urban environments, and for tropical biomass burning for daylight periods and nights, respectively. The data derived for the biomass burning show that HULIS-C is the major component of the WSOC. The sentence in question was rewritten to express this more clearly.

The absorbance curves in Figure 1 were normalized to HULIS-C concentration and optical path length to facilitate their comparison, and the text was also modified accordingly.

The O/C ratios for rural and urban HULIS are available but they were determined for different set of samples, and, therefore, showing these values in figure 1 would not be advantageous. Nevertheless, they were included now to the text and discussions. The interpretation of the WSOC/OC ratios for the samples are to be dealt with in a separate paper on corresponding aerosol water extracts and HULIS aqueous samples studied by LC-MS with photo diode array detection as next step of the research.



ACPD

9, C9388–C9390, 2010

By abundance we mean the relative concentration (e.g., mass fraction) of a species or compound to the total mass under consideration. We use the term similarly to the abundance of elements (in the Earth or in human body) or isotopic abundance of elements.

Abbreviation PA chemical fraction denotes macromolecular polycarboxylic chemical fraction of water soluble organic matter (Decesari et al., 2000). The abbreviation was explained in the Introduction together with some references for its more detailed determination.

All technical corrections were adopted.

References

Decesari, S., Facchini, M. C., Fuzzi, S., Tagliavini, E.: Characterisation of water-soluble organic compounds in atmospheric aerosol: a new approach, J. Geophys. Res., D105, 1481-1489, 2000. Emmenegger, C., Reinhardt, A., Hueglin, C., Zenobi, R., Kalberer, M.: Evaporative light scattering: A novel detection method for the quantitative analysis of humic-like substances in aerosols, Environ. Sci. Technol., 41, 2473–2478, 2007. Kiss, G., Varga, B., Galambos, I., Ganszky, I.: Characterization of water-soluble organic matter isolated from atmospheric fine aerosol, J. Geophys. Res., 107(D21), 8339, 2002. Salma, I., Ocskay, R., Chi, X., Maenhaut,W.: Sampling artefacts, concentrations and chemical composition of fine water-soluble organic carbon and humic-like substances in a continental urban atmospheric environment, Atmos. Environ., 41, 4106-4118, 2007. Varga, Z., Kiss, G., Hansson, H.-C.: Modelling the cloud condensation nucleus activity of organic acids on the basis of surface tension and osmolality measurements, Atmos. Chem. Phys., 7, 4601-4611, 2007.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 19939, 2009.



ACPD

9, C9388–C9390, 2010

Interactive Comment