

## Characterization of humic-like substances (HULIS) in size segregated atmospheric aerosol collected in different environments

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Humic-like substances (HULIS) constitute a considerable fraction (often the majority) of the water-soluble organic matter present in atmospheric aerosol. Consequently, this complex organic mixture significantly influences the physical and chemical properties of the aerosol particles as well as their biological effects. Several studies have dealt with the sources and characterisation of humic-like substances leading to considerable knowledge on their potential formation mechanism, elemental composition, molecular weight range, spectroscopic features, higrscopicity, CCN ability, etc. However, information on the size distribution of HULIS is very limited [1] although knowledge of this feature provides important information on possible sources and formation mechanisms in the atmosphere.

In this work humic-like substances isolated from aerosol particles of different size ranges were characterized. Aerosol samples were collected in the 0.0625-16  $\mu\text{m}$  size range with an 8-stage Berner impactor at a rural site (K-pusztá) in Hungary, an urban site (Zagreb) and a coastal site (Martinska) in Croatia. Humic-like substances were isolated from the aqueous extracts of each stage and their carbon content was determined by TOC analysis. The UV absorbance and fluorescence properties as well as the mass spectra of the constituents of the aqueous extracts and those of the isolated HULIS were studied. Approximately 90% of fluorescing compounds (EX=235nm/EM=410nm) were found in the 0.0625-1  $\mu\text{m}$  size range which indicated that humic-like substances occurred in the fine fraction. This was confirmed by the results of carbon analysis and mass spectrometric investigations: the mass spectrum of the organic matter isolated from the particles in the 0.0625-1  $\mu\text{m}$  size range resembled that of humic-like substances while the mass spectrum of the low amount of organic matter isolated from bigger particles differed significantly. Specific UV and fluorescent properties (normalized to carbon concentration) indicated that the chemical composition of particles within the 0.0625-1  $\mu\text{m}$  size range is diverse. UV absorbance, fluorescent properties and mass spectra of HULIS isolated from aerosol particles of different sizes will be discussed for aerosol samples collected at different sites.

[1] L. Peng, H. Xiao-Feng, H. Ling-Yan, Jian Z. Yu, *J. Aerosol Sci.* **2010**, 41 (1), 74-78.

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