

PM 10, PM 2.5 and PM 1 particle ion and soot concentration measurements with filterpacks 1999 in Saxony (Germany)

A contribution to subproject AEROSOL

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For a period of one year (1999) weekly two parallel filter packs samples (PM 1 by a virtual impactor) were collected using Teflon-filters and quartz-filters at the IfT-research station Melpitz (Altitude 87 m, Latitude 51°32' N, Longitude 12°54' E) in the downstream plume of the Leipzig conurbation in Central Europe. Aerosol characterization for this area was performed to describe the influence on atmospheric chemistry (Heintzenberg et al. 1998). During a project included in the European Community LIFE-Programme, PM 10 as well as PM 2.5 aerosol has been characterized from 1995 continuously (Spindler et al. 1999). For 1999 the ion concentrations (analyzed by ion chromatography) in the PM 10, PM 2.5 and PM 1 fraction are presented. The samples were taken with the "Partisol 2000" Air Sampler (Rupprecht and Patashnik Co. Inc., Albany, New York, USA). The sampling schedule started every Tuesday at 12:00 CET. Additionally in 1999 for the PM 1 from a quartz filter the carbon fraction (organic carbon OC and elemental carbon EC) was determined with a thermographic method using a Ströhlein C-mat 5500 carbon analyzer.

The aerosol mass and ion concentration shows a different distribution to the fractions over the year. The maximum for the mass ratios (PM 10 - PM 2.5)/PM 2.5 and (PM 10 - PM 1)/PM 1 was observed in the summer and indicates relatively more coarse material with higher aerodynamic diameter during relatively dry periods. The mass of carbonaceous material in the PM 1 fraction is mostly around 20% of the total aerosol mass. The OC/EC ratio for shows variation from week to week. In a OC/EC scatter plot the part of secondary formed OC by adsorption and/or condensation on existing particle surfaces during the transport from the source to the measuring place is discussed.

References:

- Heintzenberg, J., Müller, K., Birmili, W., Spindler, G., Wiedensohler, A.; Journal geophysical Research **103D** (1998) 13125-13135
Spindler, G. Müller, K., Herrmann, H.; ESPR-Environ. Sci.& Pollut.Res. **6** (1999) 89-94
Turpin, B.J., Huntzicker, J.J., Larson, S.M., Cass, G.R.; Environ.Sci.Technol. **25** (1991) 1788-1793