Recent Results from different Aerosol chemical Characterisation Field Experiments: Budgets and Processes

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In this presentation results from aerosol characterisation experiments ((a) the ACE-2 campaign in 1997 in Sagres (Portugal), (b) the Melpitz Intensive (MINT, 1997) and (c) the recent (1999/2000) campaigns within the AFS-Project "Stadtaerosol" and some first results from the 1999 INDOEX campaign), performed under participation of the IfT chemistry group will be described. Aerosol sampling at the different campaign sites as well as at the IfT research station in Melpitz will be outlined. The main analytical techniques capable for the chemical analysis of very small masses as obtained in tropospheric size-resolved aerosol sampling and their interplay will be presented.

Main findings from size-resolved sampling and analysis of particles are presented. Aerosol chemical analysis here refers to determination of mass, organic carbon (OC) and elemental carbon (EC) contents, anions, cations, and water content (presently either measured by HTDMA or calculated). Organic carbon is further discriminated by complementary techniques, i.e. mainly capillary electrophoresis for soluble organics and Curie-point-pyrolysis–GC/MS (CPP-GC/MS)) for alkanes, polycyclic aromatics (PAH) and fatty acids.

The connection to air mass history as described by back trajectories will be discussed. Some findings will be interpreted in terms of possible processes leading to some organic aerosol constituents, also assisted by current multiphase modelling activities. A summarizing outlook will be given.