



Organic aerosols in Switzerland: field and smog chamber measurements

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The Aerodyne aerosol mass spectrometer (AMS) delivers online, quantitative size resolved chemical composition of the non-refractory submicron aerosol fraction. Over the past year, the AMS has been extensively used to characterise the chemical and physical properties of the organic fraction of atmospheric aerosols in various locations in Switzerland. The measurement sites were dominated by different sources of primary as well as secondary organic aerosols and included an urban site, a motorway site and a site dominated by domestic wood burning. In addition, measurements of secondary organic aerosols formed from the photooxidation of anthropogenic and biogenic precursors at the PSI smog chamber were performed. Results show that organics represent a major fraction (up to 90%) of the measured submicron ambient aerosol mass at these locations. Organics emitted from traffic sources show a distinct bi-modal size distribution, where hydrocarbons dominate the composition of particles in the small mode. On the other hand, organics emitted from wood burning sources exhibit a mono-modal distribution with a peak around 300 nm. The composition of these particles appears to be dominated by highly oxidised organic compounds containing poly acids and carbonyl-containing molecules. Mass fragments such as m/z 60 and 73 may be used as markers for wood burning emissions. This paper aims to provide an overview of the mass concentrations, size distributions and the diurnal patterns of the measured organic aerosols and characterise their hydrocarbon-like and the oxygenated fractions. A comparison of the mass spectral patterns of the ambient oxygenated organic aerosols and the smog chamber aerosols will be presented and discussed.