



Aerosol Mass Spectrometric Measurements at CESAR-Tower in Cabauw, NL

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Intensive measurements of aerosol chemical composition were performed with an Aerodyne High Resolution Time-of-Flight Aerosol Mass Spectrometer (HR-ToF-AMS) at the Cabauw Experimental Site for Atmospheric Research (CESAR) in Cabauw, NL, in November 2011 and from May to July 2012. Additionally, an Aerosol Chemical Speciation Monitor (ACSM) was measuring from July 2012 to June 2013 as a part of the ACTRIS project. The CESAR site is a rural station representative for North-West Europe. Depending on prevailing wind direction, the condition can be either of maritime or continental character. The site is also influenced by local pollution or plumes from the surrounding cities.

As observed in previous campaigns at the site, nitrate and organics are major contributors to aerosol mass with their relative importance showing a seasonal dependence. Inorganic and organic aerosol composition data from the AMS are compared with Monitor for AeRosol and Gases (MARGA) and a Thermo-Desorption-Proton-Transfer-Mass-Spectrometer (TD-PTR-MS), respectively. Evaluating the inorganic ion balance, we observe periods in which observed NH_4^+ exceeds the NH_4^+ needed for inorganic anion neutralization. This is taken as indication for the presence of organic acids in the aerosol. For the first time, Positive Matrix Factorization (PMF) was used for analysing the aerosol organic fraction derived from the TD-PTR-MS. These and the PMF results from the HR-ToF-AMS show similarities in time trends of AMS and PTR-MS factors. That creates new possibilities to analyse PMF factors with mass spectra from two different ionization techniques. Main organic aerosol sources and the possibility to quantify organic acids based on AMS data in environments with high NH_3 are discussed.

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