Geophysical Research Abstracts, Vol. 9, 08337, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-08337

Carbonaceous mixed phase aerosols: the coating of soot with Levoglucosan

T. F. Mentel (1), A. Kiendler-Scharr (1), R. Tillmann (1), A. Kiselev (2), H. Wex (2), F. Stratmann (2), T. Hennig (2), J. Schneider (3) and S. Walter (3)

(1) Research Centre Juelich, ICG-2: Troposphere, 52425 Juelich, (2) Institute for Tropospheric Research, Department of Physics, Permoser Str. 15, 04318 Leipzig, (3) Max Planck Inst. for Chemistry, Particle Chemistry Department, Joh.-J.-Becher-Weg 27, 55128 Mainz

Combustion of biomass generates carbonaceous aerosols which contain black carbon and organic components. Levoglucosan has been detected in such aerosols and is utilized as a tracer for biomass burning. Levoglucosan is a glucose derivative, thus contributes to the water soluble mass of biomass burning aerosols. We investigated the coating of soot by levoglucosan and its impact on size, shape and hygroscopic properties of the particles at LACIS during the LExNO (2005) campaign. Soot particles were generated by a sparc generator, size selected by a DMA, and coated with levoglucosan vapor. The amount of condensed levoglucosan, thus the water soluble mass was monitored using aerosol mass spectrometry (MS-mode of Aerodyne Research AMS). In some cases the soot was compacted before the coating process by pretreating with propanol. The vacuum aerodynamic diameter dvae for the compacted soot increased with increasing levoglucosan mass, whereas dvae in the case of non-compacted soot remained approximately constant, independent of the condensed amount of Levoglucosan. This effect of compaction and coating on the aerodynamic diameter of soot was confirmed by two independent measurements of dvae by a Low Pressure Impactor and the particle ToF-mode of the AMS. Obviously, Levoglucosan fills mainly the voids of the non-compacted soot. In both cases the growth factors and critical supersaturations (inversely) of the particles scale with the amount Levoglucosan.