



Measurements of water-soluble organic compounds in fresh snow samples from various locations and altitudes

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Polar organic compounds, such as dicarboxylic acids and phenols, are important components of the organic aerosol fraction. It is known that the water-soluble compounds can enhance the formation of cloud condensation nuclei due to their hygroscopicity. How far these compounds also influence the formation of tropospheric ice nuclei is not known yet. Highly soluble compounds decrease the freezing temperature of water, but organic surfactant might on the other hand initiate nucleation of sub-cooled water droplets. In order to identify organic compounds, which could act as ice nuclei, the content of polar organics in of freshly fallen snow was measured at various altitudes. Samples of fresh snow were collected in winter 2005/2006 in Switzerland at Saas Fee (altitudes from 1800 to 3300 m) and at the Jungfraujoeh during CLACE 5. The melted snow samples were pre-concentrated by solid phase extraction and then analysed by liquid chromatography-mass spectrometry (LC-MS-TOF). The identified acids comprise a series of linear dicarboxylic acids, monocarboxylic acids as well as biogenic acids. Furthermore, phenols and aromatic acids have been determined. From the concentrations of these compounds at the different altitudes and locations the possible influence on ice formation processes will be discussed.