



## **Online IC-MS measurements of organic acids in aerosols and gas phase during ambient and wood stove fire studies**

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The composition of aerosols from wood burning is not yet identified well. Ion chromatography coupled to a mass spectrometer (IC-MS) was used to identify organic acids and other anionic compounds. Sampling of ambient air took place in Roveredo, Switzerland, a village in a mountain valley in December 2006. First results indicate that wood burning is the most important source of aerosols in this region. Next to this campaign, measurements at a wood stove with several types of wood took place.

Air was aspirated through the wet effluent diffusion denuder/aerosol collector (WEDD/AC), a homebuilt instrument for sampling water-soluble gas phase and aerosol compounds. The samples were then analyzed using ICMS in a quasi-continuous fashion. The MS (MSQ from Dionex) has a single quadrupole mass detector and uses the atmospheric pressure ionization (API) technique, which offers soft ionization resulting in little or no fragmentation. The API source operates using electrospray ionization (ESI).

In the furnace study high amounts of monoacids were found. Organic anions detected were the monoacids lactic, acetic, glyoxylic, formic, pyruvic and valeric acid, the unidentified mass-to-charge ratios 106 and 132, and the diacids maleic and oxalic acid as well as the inorganic anions chloride, sulfate, nitrite, nitrate. The signal at  $m/e$  42 is a nitrogenated acid or fragment. The contribution of the anions varied with temperature of the stove, temporal phase of the fire and the 5 types of wood which were birch, larch, white fir, oak and chestnut.

The data from ambient measurements show small amounts of monoacids and higher concentrations of di- or tricarboxylic acids. A diurnal cycle was observed, showing

highest concentrations between lunch and midnight in both gas- and aerosol phase. This data will be compared with other measurement performed simultaneously like AMS, EC/OC, PTR-MS, CO, NO<sub>x</sub>.