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Dissolved organic carbon (DOC) in ice samples from non-temperated, polar and Alpine glaciers.

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In contrast to major inorganic species, for which detailed records are available from ice cores of non-temperated (cold) glaciers and ice sheets, the content and speciation of organic carbon compounds in such cores is not well known. Apart from methansulfonic and carboxylic acids, virtually no systematic ice core analyses of organic carbon species are available yet. Focussing on ^{14}C-dating of the organic ice matrix component, we developed an UV-oxydation based screening method for dissolved organic carbon (DOC), which was dedicated to low level ice core analyses at high depth resolution and adequatly minimized contamination risk. The DOC content constitutes a bulk quantity, which is crucial for research issues into englacial microbial activity, including also the unresolved problem of systematic or sporadic trace gase artefacts (i.e. CO_2, CH_4 and N_2O enhancements).

For all DOC analyses proper sample decontamination proved to be highly essential, especially for deep ice cores to be drilled in kerosene filled boreholes. Here even minor contamination remains may enhance the natural DOC level by several orders of magnitudes. Our analysis procedure is shown to allow DOC quantification in natural ice samples down to the lower ppb level at a detection efficency close to 90 %.

Samples for supplementing DOC analyses were selected from Holocene and Pleistocene sections of Greenland and Antarctic ice cores, accreted Vostok Lake ice, recent and pre-industrial Alpine ice as well as from cold miniature ice caps and cave ice sit-

uated at various Alpine sites. While recent high Alpine snow typically contains some 100 ppb DOC, pre-industrial values do not exceed 100 ppb, which is only slightly higher than the concurrent Greenland level. However, approaching the basal layer of Alpine ice bodies DOC is strongly increasing along with englacial CO_2, CH_4 and N_2O production. Mean DOC levels of meteoric ice of central Antartica are found to be less than 20 pbb with single values as low as a few pbb only, which appear to be quite comparable to what is seen in ice accreted from Vostok Lake water.