On the half-life of ^{32}Si – Reconciling a major discrepancy by usage of high-resolution ^{10}Be data to correct for temporal variations in ^{32}Si deposition rates

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Currently, the half-life of ^{32}Si is not accurately known. Half-lives derived from measurements of artificial samples range from 101 to 172 yr. In addition, half-life determinations from independently-dated depth profiles yielded longer half-lives of mostly more than 250 yr [1], with the exception of a varved lake sediment from Sweden which yielded 178 yr [2]. The presented work shows that taking into account changes in the ^{32}Si production rate derived from ^{10}Be data of polar ice-cores leads to shorter half-lives for depth profiles and resolves the discrepancy with the artificial samples. The four results with the smallest relative uncertainty of the half-life, reflecting high-quality fits, range from 105 to 149 yr, with an unweighted average of 119 yr and a standard deviation of the mean of 21yr. We suggest using ^{10}Be from the same depth profile to correct for temporal variations in the deposition rate of ^{32}Si if ^{32}Si is used for dating purposes or to use independent dating in addition if the goal is to derive the half-life of ^{32}Si.

[1] Clausen (1973) *J. Glaciol.* **12**, 411-416. [2] Nijampurkar *et al.* (1998) *EPSL* **163**, 191-196.

Analysis of black carbon molecular markers by two chromatographic methods (GC-FID and HPLC-DAD)

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The analysis of benzenepolycarboxylic acids (BPCA) as a quantitative measure for black carbon (BC) in soil and sediment samples is a well-established method [1, 2]. Briefly, the oxidation of polycondensated BC molecules forms eight molecular markers, which can be assigned to BC, and which subsequently can be quantified by GC-FID (gas chromatography with flame ionization detector). Recently this method has been refined for BC quantification in seawater samples measuring BPCA on HPLC-DAD (High performance liquid chromatography with diode array detector) [3]. However, a systematic comparison of both analytical techniques is lacking but would be essential to the calculation of global BC budgets. Here we present data for the systematic comparison of the two BPCA quantification methods.

We prepared chars under well-defined laboratory conditions. Chestnut hardwood chips and rice straw were pyrolysed at temperatures between 200 and 1000°C under constant N_2 stream. The BC contents of the chars have been analysed using the BPCA extraction method followed by either GC-FID or HPLC-DAD quantification.

Experiments under way will show if both methods will detect the identical BC contents in chars formed at different temperatures and from different precursor biomass.

[1] Brodowski *et al.* (2005) *Org. Geochem*. **36**, 1299-1310.
[2] Glaser *et al.* (1998) *Org. Geochem*. **29**, 811-819.
[3] Dittmar (2008) *Org. Geochem*. **39**, 396-407.