Stable Sr Isotopes in Seawater

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The combined determination of *stable* (mass dependent isotopic fractionation) and *radiogenic* isotopic variation of seawater Sr has great potential for determining more accurate input and output rates of Sr to/from the ocean and deciphering changes in the rate and source of weathered material to the ocean caused by tectonic or climatic changes, to constrain sedimentation and dissolution (sinks) and to describe the relation and feedbacks of such changes to the global C cycle.

We utilize marine (pelagic) barite as a recorder of seawater *stable* and *radiogenic* Sr-isotope ratios ($^{88}Sr^{86}Sr$ and $^{87}Sr/^{86}Sr$) to shed light on the oceanic Sr cycle and its relation to earth's climate and tectonic history. Barite separated form Holocene sediments from cores collected at various location and water depths indicate that *stable* Sr isotopes in modern marine barite have a constant isotopic offset (fractionation) from seawater. Moreover, the effect of various environmental conditions (temperature, salinity, biological productivity, etc.) has little impact on the isotopic offset relative to seawater. The barite from core top sediments is 0.15 ± 0.014 permil depleted relative to seawater.

A high resolution (<0.5Ma) *stable* Sr isotope record for the past 40 Ma will be presented. Preliminary results indicate fluctuations of > 0.15 permil (significantly larger that the analytical error of 0.02 permil). Changes in the *stable* Sr record seem to correspond to major climate events and do not correlate with changes in the slope of the *radiogenic* Sr-isotope curve.