Proposal of the standard sample for sulfur isotope analysis of carbonate-associated sulfate

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Sulfur isotope ratios in seawater sulfate respond to changes in fluxes and processes in the global sulfur cycle. For the reconstruction of seawater d34S through time, the d34S values of carbonate-associated sulfate (CAS) in limestones or dolostones have been used recently (e.g., Kampschulte and Strauss 2004).

Although several methods have been proposed to extract CAS from carbonate rocks (e.g., Hurtgen et al 2002), it is unclear which methods are the most reliable to isolate CAS. As we do not have any common materials that we can use at the standard sample for CAS isotope analysis, we cannot estimate the yields of CAS only from the reported data. In this study, we propose a standard sample for CAS isotope analysis and compare the yields of CAS obtained by the reported methods.

Reference:

Hurtgen W. T., Arthur M. A., Suits N. S. and Kaufman A. J. (2002) The sulfur isotopic composition of Neoproterozoic seawater sulfate: implications for a snowball Earth? Earth Planet. Sci. Lett. 203, 413-429.

Kampschulte A. and Strauss H. (2004) The sulfur isotopic evolution of Phanerozoic seawater based on the analysis of structurally substituted sulfate in carbonates. Chem. Geol. 204,255-286.