

Sulphur isotopic investigation of dissolved and solid sulphur phases in fluids, mineral precipitates, sediments and rock samples from the Mid-Atlantic Ridge

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Mid-ocean ridges and associated hydrothermal vent systems represent a unique scenario in which the interaction of hydrosphere, lithosphere and biosphere and the related element cycling can be studied. Sulphur participates in inorganic and microbially driven processes at these vent sites. Investigations of the sulphur isotopic composition have provided important information in respect to the various pathways of sulphur. Principal end-members for the sulphur cycle at hydrothermal vent settings are ambient seawater sulphate (^{34}S at +21 ‰) and sulphur from mid-ocean ridge basalt (MORB ^{34}S at +0 ‰). However, the isotopic characterization of diverse forms of sulphur in fluids, hydrothermal precipitates, altered mafic and ultramafic rocks as well as in the associated vent fauna and quantification of fractionations will eventually contribute to a full understanding of the sulphur cycling involved.

The ultimate research objective is a qualitative and quantitative understanding of the sulphur cycling at the Mid-Atlantic Ridge. An important aspect is the long-term monitoring of the hydrothermal activities, revealing temporal changes in physico-chemical conditions of the vents, related changes in the chemical and isotopic composition of the vent fluids and respective changes of the ecosystem.