

SULFUR ISOTOPES AS PROXY SIGNAL FOR EARTH'S BIOGEOCHEMICAL EVOLUTION

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Sulfur represents a key element on earth as it participates in geologically and biologically driven processes. Characteristic changes in the isotopic composition of oxidized and reduced sulfur-bearing phases in sedimentary rocks can be utilized to characterize these processes, with quantification through subsequent geochemical modeling.

The sulfur isotopic composition of seawater witnessed substantial secular variations during the past 800 Ma as evident, e.g., from a new, high-resolution temporal isotope record, based on the analysis of structurally substituted sulfate in stratigraphically well constrained biogenic carbonates.

Similarly, discrete biological and environmental signals are reflected in the isotopic composition of reduced sedimentary sulfur (sulfides and organic bound sulfur), indicating changes in the type and availability of organic matter through time and/or the availability of sulfate, e.g., at the site of bacterial sulfate reduction.