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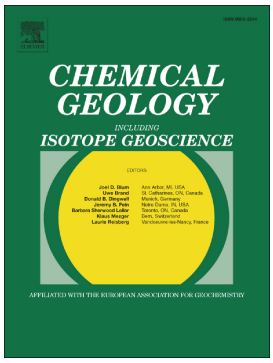

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A multiple sulfur isotope study through the volcanic section of the Troodos ophiolite

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Abstract

Multiple S isotope systematics ($\delta^{34}S$ and $\Delta^{33}S$) and high resolution in-situ S isotope measurements offer new perspectives on the study of biological and abiotic cycling of sulfur in hydrothermal systems. We applied these techniques to the Tethyian Troodos ophiolite (91 Ma) from Cyprus, one of the best-preserved remnants of oceanic crust in the world, using materials from deep drill cores and surface sampling. We focused on the volcanic section of the ophiolite, including the hydrothermal massive sulfide deposit at Agrokipia, which represents a fossil zone of high-temperature fluid upwelling, and the Akaki river section which displays a range of lower temperature alteration types.

The $\delta^{34}S$ and $\Delta^{33}S$ values of bulk and SIMS (secondary ion mass spectrometry) analyses from the Agrokipia sulfide deposits show that the sulfide minerals are largely derived from thermochemical reduction of entrained seawater sulfate and leached H_2S from the “root zone”