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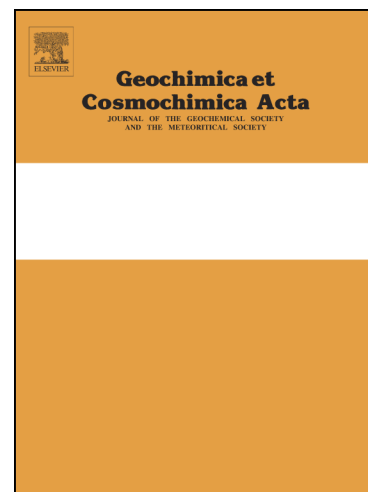
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Stable and radiogenic strontium isotope fractionation during hydrothermal seawater-basalt interaction

Martin Voigt^{a,*}, Christopher R. Pearce^b, Andre Baldermann^c, Eric H. Oelkers^{a,d}

^a Géosciences Environnement Toulouse (GET) - CNRS, 14 avenue Édouard Belin, 31400 Toulouse, France (*corresponding author at: Institute of Earth Sciences, University of Iceland, Sturlugötu 7, 101 Reykjavík, Iceland. *E-mail address*: martinvoigt@hi.is)

^b National Oceanography Centre Southampton, University of Southampton Waterfront Campus, European Way, Southampton SO14 3ZH, United Kingdom

^c Institute of Applied Geosciences & NaWi Graz GeoCenter, Graz University of Technology, Rechbauerstr. 12, 8010 Graz, Austria

^d Earth Sciences, UCL, Gower Street, London, WC1E 6BT, United Kingdom

Abstract

The fluid-rock interactions occurring in hydrothermal systems at or near mid-oceanic ridges (MOR) were studied experimentally by reacting crystalline and glassy basalt with seawater at 250 and 290 °C while monitoring the liquid phase Sr isotopic evolution ($^{87}\text{Sr}/^{86}\text{Sr}$ and $\delta^{88/86}\text{Sr}$). The results indicate that seawater Sr was incorporated into anhydrite during the early stages of seawater-basalt interaction. Liquid $^{87}\text{Sr}/^{86}\text{Sr}$ values trend towards the basaltic signature as non-stoichiometric basalt dissolution became the dominant process. This suggests that the interplay between fast Sr incorporation into secondary sulfates versus slow and continuous Sr liberation due to basalt dissolution at intermediate temperatures could partly explain previously identified discrepancies between MOR heat budget constraints and the

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