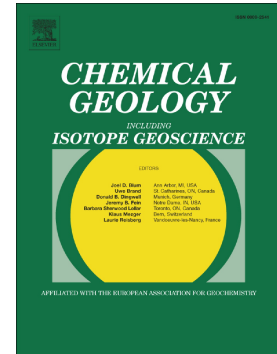


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# Fluid-mobile elements in serpentinites: constraints on serpentinitisation environments and element cycling in subduction zones

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## Abstract

Fluid-mobile element (FME) systematics in serpentinites are key to unravel the environments of mantle rock hydration, dehydration, and element recycling in subduction zones. Here we compile serpentinite geochemical data and, for the first time, report discriminative FME enrichment trends for mid ocean ridge vs. forearc serpentinitisation by applying alkali element-U ratios. Characteristic element fractionations are thereby governed by redox-dependent differential U mobility at mid ocean ridges and in forearcs, and by high Cs input in forearcs due to fluids equilibrated with sediments. Simple modelling reproduces the observed enrichment trends in serpentinites that range over several orders of magnitude. From these systematics, first constraints on potentially discriminative fractionation trends for unconventional fluid tracers such as B, As, and Sb can be deduced. Prominent W

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