Petrogenesis of Variscan ultrapotassic plutons, Bohemian Massif: Stable isotope evidence

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In the Moldanubian Zone, Viséan ultrapotassic (UK) plutons occur in a close association with felsic HP–HT granulites [1]. They are characterized by high mg#, contents of Cr, Ni, alkali metals, Th, U and Pb, paralleled by troughs in Ti–Nb–Ta and Sr [2]. The UK magmas likely originated from a lithospheric mantle segment strongly overprinted by deeply subducted felsic metaigneous crust [3]. During ascent/emplacement, the primary magmas interacted with the predominantly metasedimentary upper plate.

Stable isotope systems may provide a novel insight into the petrogenesis of UK magmas. *Magnesium* mostly shows a limited variation in δ^{26}Mg (−0.31 to −0.19‰, n=10), largely centered at the average mantle (–0.25‰; [4]). Disparate δ^{26}Mg values in a mafic enclave (0.01‰) and a Cpx-cumulate (–0.64‰) may reflect kinetic re-equilibration. In contrast, *oxygen* spans a less constrained range from mantle- to crustal-like values (δ^{18}O = 6.4–10.8‰, n=36). *Lithium* is in all cases lighter (δ^{7}Li from −2.0 to +1.9‰, n=33) than the average mantle (δ^{7}Li = 3.5‰; [5]) and rather resembles the range reported for the continental crust [5], manifested also by high Li contents. Cpx-cumulates have δ^{7}Li as low as −5.4‰, in part possibly due to post-crystallization diffusion [6].

Unlike Sr–Nd–Pb isotope compositions, severely modified by crustal contamination [2], stable isotope systems reflect the increasing affinity from Mg to O and Li to crustal melts, helping to recognize contributions from the depleted mantle, deeply subducted Saxothuringian crust and a relatively shallow Moldanubian contaminant to the Bohemian UK magmatic rocks.

Supported by the Czech Science Foundation (18-24378S).

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