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# $\delta^{11}$B of post-collisional volcanic rocks in Armenia and the longevity of slab signatures

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Boron and boron isotopes have become a key tracer of slab components in the mantle below volcanic arcs. This is mostly due to a scarcity of boron in the mantle (<0.1 ppm) and its strong partitioning into fluids, with concomitant isotope fractionation during slab dehydration. We present the first boron concentration and $\delta^{11}$B values for young volcanic rocks formed in an active continent-continent collision zone- in this case from Armenia, a part of the Arabia-Eurasia collision zone. We combine this data with new boron data from a 40 Myr old syn-collisional alkaline igneous complex in Armenia, in order to trace the evolution of the slab signature in volcanic rocks following the end of subduction.

Post-collisional volcanic rocks formed in Armenia have a ubiquitous arc-type geochemistry. The lack of variation of $^{87}$Sr/$^{86}$Sr and $^{143}$Nd/$^{144}$Nd with $SiO_2$ suggests crustal contamination is unimportant and that these geochemical features reflect a subduction-modified mantle source.

The $\delta^{11}$B of post-collisional volcanic rocks ranges from -5 to 0‰ consistently heavier than MORB and OIB (-9 to -7.5‰), corroborating the observation from trace element geochemistry that the mantle source has been modified by subduction. The B/Nb ratios of 0.03 to 0.25 are much lower than those of primitive arc rocks (0.2-100), suggesting the slab signature is unusually depleted in the most fluid-mobile elements.

The limited variations in $^{87}$Sr/$^{86}$Sr (0.704-0.7049), $^{143}$Nd/$^{144}$Nd (0.51275-0.51286) and $\delta^{11}$B for post-collisional volcanic rocks in Armenia, and the similarity of these values to the 40 Myr syn-collisional samples suggest these volcanic rocks are continuously tapping the same long-lived mantle source. This means slab signatures can be preserved in the mantle for at least 40 Myr, and can survive the process of continental collision. The longevity and resilience of slab signatures could have implications for studies of subduction initiation, a process which is thought to preferentially occur along relic arcs.