



Late Cenozoic, syn-collision magmatism from the Turkish-Iranian plateau, Hamadan region, Iran

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We report new elemental and isotopic analyses of thirty-five Late Cenozoic lavas from the Hamadan region of southwest Iran, within the Turkish-Iranian plateau. The rocks are from cinder cones and more extensive flows that predate them. Most of the samples are alkalic, typically basanites, hawaiites and alkali basalts. There are also trachyandesites and rhyolites. All samples show pronounced enrichment in large ion lithophile elements (e.g. La typically 100 ppm) and $\text{La}/\text{Nb} > 1$. Crustal contamination is present in more evolved samples, but the high La/Nb values of basic samples ($\text{MgO} \sim 10\%$) suggests a subduction-modified mantle source. Low heavy rare earth element concentrations and steep spiderdiagrams indicate melting in the garnet stability field (> 80 km depth). Nd and Sr isotope data plot close to Bulk Silicate Earth values: this is similar to Quaternary alkali basalts from northwest Iran, but distinct from the more depleted source melting under Mount Ararat. The important aspect of the Hamadan volcanics is that they are erupted above lithosphere that is on the order of ~ 200 km thick, and therefore they sample lithosphere that was presumably thickened during the active Arabia-Eurasia collision. We suggest that this lithosphere inherited a subduction signature during its Late Precambrian formation, possibly modified during Mesozoic-early Cenozoic Tethyan subduction under southern Eurasia. The precise trigger for melting is enigmatic, as it occurs some 20-30 Myr after initial Arabia-Eurasia collision. Models applied elsewhere on this and other orogenic plateau commonly include lower lithosphere detachment and/or oceanic slab break-off. Both of these are problematic in an area of such thick lithosphere.