

Reworked old crust-derived shoshonitic magma: An example from northeastern Brazil

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The 572 Ma Guarany stock consists of magmatic epidote-bearing hornblende monzodiorite to biotite granite that intruded Paleoproterozoic orthogneisses of the Pernambuco–Alagoas domain, NE Brazil. Co-magmatic diorite enclaves and dikes are present throughout the pluton. The rock types are shoshonitic and display chemical and isotopic characteristics typical of crustal melts, such as enrichment in incompatible elements, high back-calculated initial $^{87}\text{Sr}/^{86}\text{Sr}$ ratios (avg. 0.71253), negative $\epsilon\text{Nd}(0.57\text{Ga})$ values (avg. -14.58), and high and variable (+8.3 to +11.1‰ $_{\text{VSMOW}}$) $\delta^{18}\text{O}$ (zircon) values. Amphibole chemistry and whole rock Zr, TiO_2 and P_2O_5 contents suggest that magma solidification at a pressure of 7 kbar and temperature ~900°C. Correlations between O-isotopes and whole-rock silica contents, and initial $^{87}\text{Sr}/^{86}\text{Sr}$ ratios with Sr concentrations suggest hybridization of a lower continental crust melt with continental crustal rocks, concomitantly with fractional crystallization. The parental magma was likely formed by partial melting of old (tDM = 2.0Ga) quartz-poor, mafic lower continental crustal rocks, in a post-collisional setting, probably triggered by underplating of mantle-derived mafic magma during period of relaxation after collision.