

GEOCHEMISTRY AND ND ISOTOPES OF THE PALEOPROTEROZOIC TIN-BEARING GRANITES FROM PITINGA, AMAZONIAN CRATON, BRAZIL

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The Pitinga region is the largest tin-producer in Brazil. The tin mineralization is related to a stock of subsolvus albite granite, a cassiterite-bearing rock with very high contents of F and high Nb, Zr, U, Th, Zn, REE, Li, and Rb. The albite granite shows a magmatic peralkaline cryolite-bearing core facies that is wrapped by a late autometasomatic peraluminous fluorite-bearing border facies. It is part of the Madeira granite (U/Pb age of 1834 Ma), composed also by metaluminous hornblende-monzogranites and peraluminous biotite-granites. The Europa pluton, a peralkaline, hypersolvus riebeckite granite, occurs to the northwest of the Madeira pluton. Two samples from Europa and five from Madeira granites were analyzed for Nd isotopes. The two peralkaline samples from Europa granite show $^{147}\text{Sm}/^{144}\text{Nd}$ of ~ 0.14 , initial (at 1834 Ma) ϵ_{Nd} values of $\sim +0.5$, and TDM model ages of ~ 2.19 Ga. The Madeira granite shows unusual heterogeneous Nd isotopic compositions with $^{147}\text{Sm}/^{144}\text{Nd}$ of ~ 0.11 (monzogranites) to 0.36 (border facies of the albite granite), ϵ_{Nd} (at 1834 Ma) of -3.5 to $+2.5$ and TDM model ages of 2.00 to 2.19 Ga. The low-Sm/Nd in the samples from Europa and Madeira granites are indicative of Paleoproterozoic protoliths. The large variation in the ϵ_{Nd} values of Madeira (six epsilon units) is partly due to the low ϵ_{Nd} value obtained in the metasomatized border facies of the albite granite. Even excluding this sample, ϵ_{Nd} values are quite variable, suggesting an open-system magmatic evolution and strong interaction with fluids during the crystallization of the albite granite.