

Contribution to the understanding of the youngest granites in Rondônia petrogenesis using U-Pb and Lu-Hf in zircon by LA-ICP-MS.

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The study of granitic rocks is important to understand the chemical evolution of continental crust. Their isotopic composition give information about their magmatic sources, if mantle, crust or a mixing of both. In the SW border of the Amazonian Craton, suites of rapakivi granites related with tin-polimetalic mineralizations emplaced within heterogeneous Proterozoic Crust. Zircons from twelve rocks from three granite intrusions: Massangana, São Carlos and Caritianas, representative of the Younger Granites of Rondônia have been studied by laser ablation inductively coupled plasma source mass spectrometry (LA-ICP-MS) to obtain U-Pb ages and Hf isotopic compositions. The samples from Massangana massif, show the greater range in age (between 1026 – 993 Ma) and initial $^{176}\text{Hf}/^{177}\text{Hf} = 0,2817-0,2823$. The ϵ_{Hf} values are both negative and positive (-6.2 to +3.4) to some samples, and only negative to others -14.1 to -1.6 which reflects the heterogeneous crust that they intruded. The T_{DM} age varying between 2.40 to 1.61 Ga also indicates that different sources (at least two crustal sources and a mantle one. The samples from São Carlos massif show U-Pb ages between 996 to 974 \pm 10 Ma and initial ϵ_{Hf} between -15 to +11, corresponding to a T_{DM} age range between 2.65 and 1.08 Ga. The Caritianas massif with U-Pb ages of 1001 and 999 Ma, show more initial ϵ_{Hf} positive values (13 zircon grains) than negative (6 zircon grains), different from the other massifs. The range of initial ϵ_{Hf} range is between -1.5 +8.2, corresponding to a magma source resided within (1.76 – 1.25 Ga). The great variation in the ϵ_{Hf} indicates heterogeneity of sources; the Massangana and São Carlos massifs represent dominantly crustal melts with a subordinate mantle contribution. The Caritianas massif, that shown more positive values to the ϵ_{Hf} parameter, seems to have had more mantle contribution than the other massifs studied here. The crustal sources could be the host rocks, Jamari Complex (1.76-1.65 Ga) Serra da Providência Suit (1.6-1.5 Ga) and another crust, older than the host rocks (T_{DM} between 2.65 to 1.81 Ga) not reported in the region.