GEOLOGICAL AND PETROLOGICAL ASPECTS OF GRENVILLIAN A-TYPE TOPAZ GRANITES OF THE BOM FUTURO TIN-MINE, RONDÔNIA, BRAZIL

W. B. Leite Júnior [1], R. C. B. Oliveira [1], B. L. Payolla [2], J. S. Bettencourt [3]
[1] *Institute of Geosciences and Exacts Sciences, University of São Paulo State, Brazil (wleite@rc.unesp.br)*
[2] *Centrais Elétricas do Norte do Brasil S.A. (bruno@eln.gov.br)*
[3] *Institute of Geosciences, University of São Paulo, Brazil (jsbetten@usp.br)*

Grenville age granitic rocks at the northern part of the Rondônia state, southwestern margin of the Amazonian craton, have been characterized as rapakivi granites and included in two suites: (1) 1.08-1.07 Ga Santa Clara Intrusive Suite; and (2) 1.00-0.97 Ga Younger Granites of Rondônia Suite. Both suites are composed of several early- and late-stage intrusions emplaced in older metamorphic rocks (1.75-1.50 Ga). The late-stage intrusions are volumetrically minor and comprise two compositional rock associations: (1) metaluminous to peralkaline association; and (2) peraluminous association. The topaz granites of the Bom Futuro mine belong to the peraluminous association of the Younger Granites of Rondônia Suite. At the Bom Futuro mine, the topaz granites occur apparently as subvertical radial dykes and low to medium outward dipping ring dykes, both related to a central plug-like intrusion in the Bom Futuro hill. They are spatially associated with two intrusive/explosive (?) breccia pipes, topaz rhyolite porphyry (similar to ongonite), subvolcanic intermediate rocks, and topaz rock (similar to topazite) dykes, and tin-mineralized pegmatite and quartz veins. They are pink or light gray in color, and show porphyritic texture with quartz and microcline phenocrysts (1.0 to 5.0 mm in length) in a fine-grained groundmass composed mainly of albite, quartz, microcline, topaz, and zinnwaldite. The topaz granites occur also at the adjacent Palanqueta hill, composing the apical part of an epizonal granitic stock, besides biotite granites, and tin-mineralized greisen bodies. The main topaz granite facies are pink to pinkish light gray, and the texture varies from equigranular to porphyritic with or without miarolitic cavities. These facies are composed dominantly by albite (36-49%), microcline (20-29%), quartz (22-36%), zinnwaldite (< 5%), and topaz (< 1%). Geochemically, the Palanqueta topaz granites show higher contents of SiO_2 (74.54-77.37 %), Na_2O (3.86-5.70 %), Rb (334-892 ppm), Ga (40-47 ppm), Nb (42-84 ppm), Ta (22-70 ppm), Sn (2-47 ppm), Hf (3-11 ppm) and U (4-18 ppm), and lower of TiO_2 (0.01-0.06 %), FeO_T (0.16-1.20 %), Mn (0.00-0.02 %), MgO (0.01-0.02 %), CaO (0.09-0.50 %), K_2O (3.54-4.68 %), P_2O_5 (0.01-0.03 %), Ba (2-22 ppm), Sr (2-9 ppm) e Zr (19-83 ppm) than common Ca-poor granites. In comparison with Bom Futuro topaz granites, these are mainly depleted in SiO_2 (71.34-71.97 %) and enriched in Al_2O_3 (16.45-17.27 %), Na_2O (5.47-6.77 %), Rb (960-1280 ppm), Ba (53-406 ppm), Sr (42-75 ppm), and Ta (89-251 ppm). The magmatic differentiation of the Palanqueta topaz granites appears to have taken place within a deeper level magma chamber, with successive magma batches emplaced into the present level of exposure, as well as the Bom Futuro topaz granites and rhyolites. The changes of some major and trace elements and their ratios suggest the following magmatic evolutionary trend for the Palanqueta topaz granites: equigranular granite → porphyritic granite → microgranite → granite porphyry. The most distinct feature is the decrease in REE and Al_2O_3 contents, and La_N/Yb_N and Zr/Hf ratios, as well as the increase in Na_2O/K_2O ratios, compared by the increase in SiO_2 contents. Preliminary data indicate that Bom Futuro topaz granites and rhyolites do not follow this geochemical trend.

Acknowledgments: Finep/PADCT III, Fundunesp and Coopersanta.

Symposium on magmatism, crustal evolution, and metallogenesis of the Amazonian craton, 2006, Belém. Abstracts.