

VELHO GUILHERME INTRUSIVE SUITE: PETROGENETIC ASPECTS AND ASSOCIATED MINERALIZATION

1TEIXEIRA, N. P., 2BETTENCOURT, J., 1 Centro de Geociências, Belém, Brasil,
2 Instituto de Geociências, São Paulo, Brasil.

Velho Guilherme Intrusive Suite. Pará, Brazil: petrogenetic aspects and associated mineralization 1TEIXEIRA, N. P., 2BETTENCOURT, J. S. 1Centro de Geociências, Belém, Brasil; 2Instituto de Geociências, São Paulo, Brasil. The Mesoproterozoic granitoid massifs of the Velho Guilherme Intrusive Suite, occur in the south Pará Tin Province, Brazil, are hosted by Archean rocks of the south Pará Granite-Greenstone Terrane and by reworked Archean Itacaiúnas Shear Belt basement sequences. Crystal fractionation was the main petrogenetic process which governed the granite magmatic evolution. The tin-bearing silica rich ($\text{SiO}_2 \geq 75\%$) high evolved granite intrusive phases are products of magmatic fractionation and interaction with volatile-rich (F, Cl) late to postmagmatic fluids. These were responsible for Sn^{2+} extraction from primary mineral phases, specially biotite, and partition of Sn^{2+} in favor of residual melts, under reducing conditions. At the latest magmatic stages Sn^{2+} was oxidized to Sn^{4+} which caused precipitation of cassiterite. Petrographic, mineral chemistry and geochemical data support an evolution of the granites mainly under low $f\text{O}_2$ ($\sim 10^{-18}$) magmatic conditions, which extended to the late to postmagmatic alteration stages, and indicate that they were emplaced in high crustal levels, with temperatures and pressures between 690 and 890°C and 0,8 and 4,0 kbar, respectively. Pb-Pb (~ 1) and Sm-Nd [$\sim \text{Nd}(t)$] isotopic data imply that granites composing the suite crystallized from a crustal source, as well as reflect a single-stage growth curve of their protoliths, which differentiated directly from the mantle at 3.2 Ga.