

Juvenile plutonic episode (2.15-2.13 Ga) in the Mineiro belt, Southern São Francisco Craton: Geochronological and geochemical evidences

WILSON TEIXEIRA¹, CIRO A. ÁVILA²,
 EVERTON M. BONGIOLO³, MARIA H. M. HOLLANDA¹,
 NATALI BARBOSA⁴ AND FABIANA F. VASCONCELOS⁵

¹Instituto de Geociências, USP, wteixeir@usp.br;
 holland@usp.br

²Museu Nacional, UFRJ, avila@mn.ufrj.br

³Instituto de Geociências, UFRJ, ebongio@geologia.ufrj.br

⁴PhD program; Instituto de Geociências, USP, natali@usp.br

⁵Ms program, Instituto de Geociências, UFRJ,
 fma3003@globocom

The Mineiro belt is dominated by diachronic variation of granitoid rocks akin to accretionary arcs (2.36-2.00 Ga). We present new and compiled data (U-Pb-Hf zircon, Nd-Sr and geochemistry) for the Ritópolis batholith (RB) compared to the Alto Maranhão batholith (AMB) for addressing their tectonic role in the crustal growth. RB rocks preserve local igneous banding, show tonalitic to granitic compositions, and contain xenoliths of amphibolite, gabbro and diorite. Coeval granitic dikes crosscut the 2128±2 Ma Brumano diorite. Two U-Pb zircon crystallization ages are 2149±10 and 2123±33 Ma. Hence the build-up of the RB probably lasted ca. 26 m.y. These two samples yield ⁸⁷Sr/⁸⁶Sr_(2.1Ga) ratios ≤0.703. Two ε_{Hf(t)} values (concordant analyses) for the 2.15 Ga sample are positive (+1.0; +2.4) and the Hf zircon TDM model ages are 2.5 and 2.6 Ga. Previous Sm-Nd TDM ages are: 3.6 to 2.5 Ga; the ε_{Nd}(2.1Ga) values are: (-3.2 to -7.7); and ⁸⁷Sr/⁸⁶Sr (2.1Ga) are: 0.761 - 0.732. RB discloses peraluminous to slightly metaluminous signatures. The distinguished gaps between the high- and low K₂O samples may be explained by coeval rocks derived from coupled but distinct magma sources. The high K₂O group yields strong negative Eu anomalies that are consistent with evolved calc-alkaline rocks; this group shows low fractionated patterns in spider diagram with enriched ratios in less incompatible elements (Nd, Sm, Dy, Y, Yb, Lu). We conclude the RB was formed in a continental arc, though a Paleoproterozoic juvenile source is envisaged. AMB is a high-Al TTG suite (2.12-2.13 Ga) with commingled dioritic enclaves. The samples display slightly negative to positive Eu anomalies. The ε_{Nd}(2.1Ga) values (-1.0; +0.9) and Sm-Nd T_{DM} ages (2.4-2.3 Ga) indicate the AMB formed in an oceanic arc through derivation from a Paleoproterozoic metasomatised, tholeiitic source. These batholiths (RB and AMB) mark the ultimate accretionary stage of the Mineiro belt.