

Elemental and Sr-Nd isotope geochemistry: implications on sources and processes for granulite formation of central Ribeira Fold Belt

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New elemental and Sr-Nd isotope geochemistry data on migmatites, granulites and orthogneisses obtained from the central segment of Ribeira Fold Belt (SE Brazil) indicate that they are LILE-enriched weakly peraluminous granodiorites. Harker correlation trends for TiO₂, Al₂O₃, Fe₂O₃^t, MgO, P₂O₅, Sr, Zr, Hf, Th, U, REE^t, LREE/HREE and La/Lu, as well as incompatible element trends of Th-Hf-La suggest that these rocks represent a co-genetic sequence. Similar REE patterns and juxtaposed isotopic values of $\epsilon_{\text{Nd}}^{575} = -5.4$ to -7.3 and $^{87}\text{Sr}/^{86}\text{Sr}_{575} = 0.706$ to 0.711 for granulites, orthogneisses and migmatites is consistent with hypothesis that these rocks evolved from a relatively homogeneous and enriched common crustal (meta-sedimentary) protolith. Results suggest that partial melting of meta-sediments formed migmatites and associated granitoid bodies, whereas long-term crustal slow cooling promoted further dehydration (re-melting) that led to development of widespread granulites.

Sm-Nd T_{DM} ages span from 2.0 to 1.5 Ga is consistent with Paleo- and Mesoproterozoic contributions to the sedimentary pile that was metamorphosed during the assembly of Gondwana. T_{DM} ages and paleogeographic proximity suggest that the São Francisco and West Congo Cratons are the most probable sources for these protoliths. Sm-Nd model ages and inherited zircon SHRIMP dating (Valladares et al., in press) concordance reveals that the protoliths were part of a juvenile crust formed 2.0 to 1.5 Ga ago, whereas the absence of Pan-African T_{DM} ages suggests zircon sedimentary reworking with U-Pb isotopic homogenization of older zircons. This means that during Pan-African times no significant new crust was added, which, combined with the new geochemical model for granulite formation in the studied area, contradicts poli-orogenic scenarios formerly proposed for the evolution of Ribeira Fold Belt.

FAPESP, POCA-PETROLOG (CEGUL, UI: 263; POCTI/FEDER) and SFRH/BD/17014/2004 FCT PhD scholarship co-financed by FEDER provided support for field and analytical work.

Valladares, C.S., Machado, N., Heilbron, M., Duarte, B.P., Gauthier, G., in press. Sedimentary provenance in the central Ribeira belt based on laser-ablation ICPMS $^{207}\text{Pb}/^{206}\text{Pb}$ zircon ages. *Gond. Res.*