U-Pb, Nd-Sr and geochemical fingerprints of granitic magmatism inside the Paleoproterozoic Mineiro belt, Southern São Francisco Craton: Evidence from the Ritápolis batholith

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The Mineiro belt (2.45-2.00 Ga) was created through accretionary arcs, ocean closure and eventual continent-continent collision. We document the case of the Ritápolis batholith (RB) – for which the U-Pb and Nd-Sr signatures and geochemistry provide new insights for the evolution of this belt. Dikes of the RB truncate the rocks of the so-called Resende Costa (2.36-2.33 Ga) arc. RB rocks vary from equigranular (fine-medium to coarse grained) to porphyritic with fenocrystals of plagioclase and microcline, showing igneous banding and different types of xenoliths (amphibolite, diorite, gabbro). LA-ICPMS U-Pb zircon dates yielded a crystallization age of 2149 ± 10 Ma (MSWD = 0.8) whereas the analyses from metamorphic rims yielded a lower intercept age of 662 ± 65 Ma, in agreement with the petrographic evidence. Seven Sm-Nd T_{DM} ages fall between 3.5-3.6 and 3.1-3.3 Ga with -4.9 to -7.7 $\varepsilon_{Nd(t)}$ values, suggesting that Archean protholiths participated in magma genesis. The RB samples show calc-alkaline and peraluminous to light metaluminous signatures, although a few ones resemble trondhjemites. The observed gaps between the high- and low K_2O phases may be explained either by coeval rocks derived from different batches of at least two magma sources. High- and low K_2O phases show roughly similar chondrite-normalized REE patterns, but with peculiar features (e.g., strong negative Eu anomalies for the high K_2O group like evolved calc-alkaline rocks). This group also has low fractionated patterns in spider diagrams with enriched ratios when one considers the incompatible elements (e.g., Nd, Sm, Dy, Y, Yb and Lu). We conclude that the RB melts were derived in continental arc at 2150 Ma, placed opposite to the Serrinha intra-oceanic arc (2.23-2.20 Ga), as supported by geologic, isotopic and tectonic correlation.

Re-Os isotope and Platinum Group Element composition of Louisville Seamounts Chain, Pacific Ocean

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The Louisville Seamount Chain (LSC) is a ~4300 km-long hotspot trail believed to have been formed by passage of the oceanic lithosphere over a long-lived mantle upwelling in the south Pacific Ocean. Previous dredging on this hotspot chain recovered alkalic basalts that are fairly homogeneous in composition for the last 80 m.y. and geochemical data suggest affinity with the focal zone mantle end-member (FOZO) for the LSC. Recent IODP Expedition 330 recovered transitional to alkalic basalts from the ~50-77 Ma seamounts. This study aims to characterize the mantle source of the LSC in terms of Re-Os isotope and platinum group element (PGE) abundance and to gain knowledge on the temporal geochemical variation.

Our preliminary results from the older, ~65-77 Ma seamounts along the chain suggest that the Os isotopic composition (0.1270-0.1307) of the LSC basalts is close to estimates for the primitive upper mantle (PUM, 0.1262 [1] and 0.1296 [2]) and do not vary with the age of the seamounts sampled. This range of Os isotopic composition is similar to those of Rarotonga (0.124-0.139) and Samoan shield (0.1276-0.1313) basalts and tends to be lower than those of Cook-Austral (0.136-0.155) and Hawaiian shield (0.1283-0.1578) basalts. The PGE concentration in the LSC basalts are less fractionated than the Kilauea basalts but their Pt and Pd contents are much lower for the same range of MgO values. These differences in the relative abundances of the PGE may suggest low-degree melting of a mantle previously depleted of Pt and Pd for the source of the LSC.

[1] Meisel *et al*., 2001, GCA 65, 1311-1323. [2] Walker etal., 2002, GCA 66, 4187-4201.

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