

calculated using $\delta^{18}\text{O}$ (quartz); values of $\delta^{18}\text{O}$ in zircon are interpreted to provide the best evidence of magmatic value. Oxygen isotope fractionation between natural zircon and magmatic epidote is opposite to that predicted from theoretical determinations, as in all analyzed samples $\delta^{18}\text{O}$ (epidote) < $\delta^{18}\text{O}$ (zircon). The systematic mineral-epidote fractionations suggest that epidote cooled in a closed system, and is magmatic in origin. — (*May 24, 2002*).

CHROMITITES ASSOCIATED WITH LAYERED COMPLEXES IN BRAZIL: TESTING "ONE-FIT-ALL" GENETIC MODELS

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Chromitites represent a special case of cumulate rock where chromite is the only cumulus phase. Formation of chromitites thus requires that phase relations of the appropriate system are somehow changed to allow the system to fall into the chromite stability field. Several "one-fit-all" models were proposed to explain the origin of chromite layers.

Mineral chemistry data were collected for three layered intrusions in Brazil; Bacuri Complex (Amapá), Ipuera-Medrado Sill (Bahia) and Niquelândia Complex (Goiás). They have distinct igneous stratigraphy, thus providing opportunity to look at chromitites formed in different environments.

At the Bacuri Complex, most of the chromite is concentrated in a single few meters-thick chromitite layer located at the base of the Ultramafic Zone (UZ) in direct contact with the underlying Lower Mafic Zone. Cryptic variation data is consistent with extensive fractionation within the UZ. The stratigraphic position of the main chromitite strongly supports a model for its origin associated with a major new influx of primitive magma, and mixing with more fractionated resident magma.

At the Niquelândia Complex, chromitites consist of several few centimeters-thick layers restricted to a 20 meters-thick horizon within an estimated 3 km-thick Ultramafic Zone. Detailed cryptic variation data indicate that the 20 meters-thick interval marks a slight reversal of the fractionation path. The data support a model for its origin associated with new influx of primitive magma, and mixing with slightly more fractionated resident magma.

At the Ipuera-Medrado Sill, a 5-8 meters-thick

massive chromitite layer (MCL) is hosted by a 200-300 meters-thick layered intrusion. The MCL is located at the transition from dynamic open system to mainly closed system magma chamber. The most primitive compositions are observed at the MCL. Cryptic variations are the opposite to what is expected as the result of a new influx of primitive magma. Re-Os and Sm-Nd data indicate strong crustal contamination suggesting that chromite crystallization was triggered by changes of physical conditions associated to crustal contamination.

The data indicate that the chromitite layers are always associated with major changes in the magmatic chamber. However, a single genetic model does not apply to the three examples investigated. — (*May 24, 2002*).

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FAST ENVIRONMENTAL IMPACT ASSESSMENT THROUGH ICP-MS: APPLICATION TO BIVALVES FROM A TROPICAL ESTUARY (PINA BAY, RECIFE, BRAZIL)

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The use of the semi-quantitative analysis in environmental impact assessment studies was evaluated through a comparative study using quantitative and semi-quantitative operational modes in ICP-MS. Twenty one elements, namely, ⁷Li, ¹¹B, ²⁷Al, ⁴⁸Ti, ⁵¹V, ⁵²Cr, ⁵⁵Mn, ⁵⁸Ni, ⁵⁹Co, ⁶³Cu, ⁶⁴Zn, ⁶⁹Ga, ⁸⁸Sr, ⁹⁰Zr, ⁹³Nb, ⁹⁸Mo, ¹¹⁴Cd, ¹⁸¹Ta, ¹³⁷Ba, ²⁰⁵Tl and ²⁰⁸Pb were analyzed in both methods. Sample digestion was performed in closed microwave Teflon vessel using nitric acid and hydrogen peroxide. The semi-quantitative analyses were performed using Rh as an internal standard and a solution containing Be, Ge, In and Re was used to calibrate the instrument. Accuracy studies for CRM samples, using the semi-quantitative mode analyses, evidenced that all the elements considered were within the certified range except for Cu and Pb that gave higher values than both certified values and quantitative mode analysis. In order to verify the applicability of the semi-quantitative method to