

POST-COLLISIONAL MULTISTAGE MAGMATISM IN THE RIBEIRA MOBILE BELT: GEOCHEMICAL AND ISOTOPIC STUDY OF THE VÁRZEA ALEGRE INTRUSIVE COMPLEX (VAIC), ES, BRAZIL

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The VAIC is a late- to post-collisional intrusion with two distinct domains: 1) an inner core with gabbro, diorite, megaporphyritic granite and sphene-quartz syenite and 2) an irregular outer ring of older charnockitic rocks. The enclosing rocks are high-grade gneisses (amphibolite to granulite facies). Field and petrographic evidence of mingling was found along the contacts between the gabbro/diorite and the megaporphyritic granite. Geochemical data from basic to intermediate lithotypes from the inner core indicate their origin from an enriched mantle with high LREE, Ba and Sr-contents. Similar chemical signatures are typical for comparable plutons from this region. In the charnockitic rocks, more expressive incompatible elements contents, including HFSE, were detected, suggesting an heterogeneous mixing of crustal and mantelic magmas. Rb-Sr data from the megaporphyritic granite provided an age of 508 ± 12 Ma with initial ratio of 0,7084. Based on U-Pb systematics in zircons, similar neighbouring charnockites were dated from 520 to 535 Ma. This data corroborates field evidence of a relative short time gap between both intrusions. Sm-Nd TDM model age of 1.3 Ga for the gabbroic and 1.67 Ga for the charnockitic rocks further supports their differences in sources, while ENd values grading from -11 and -14 support the geochemical conclusions of an important crustal component in the generation of these magmas. The thickening and melting of a dehydrated crust generated the charnockitic rocks. The progressive underplating of basic magma increased the coeval intrusion of enriched mantelic derivatives and crustal melts.