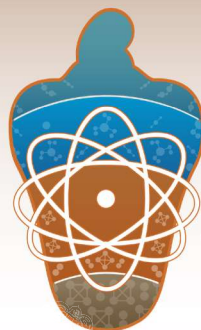


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JUVENILE ARC EVOLUTION OF SÃO GABRIEL TERRANE, SOUTHERN BRAZIL: CONSTRAINTS ON GEOCHEMISTRY AND U-Pb GEOCHRONOLOGY

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The São Gabriel Terrane, located at west of Dom Feliciano Belt, is the only crustal segment in southern Brazil composed of juvenile Tonian rocks. It comprises associations of magmatic arc and passive margin settings, as well as accretionary prism associations and mafic-ultramafic complexes, forming the most preserved ophiolitic remnant of West Gondwana. Rocks related to the São Gabriel Arc encompass the partial preservation of both the volcanic portion, represented by metadacites, metandesites, and metatuffs of Bossoroca Complex, and the plutonic portion of arc magmatism, predominantly tonalitic/trondhjemitic gneisses with granodiorites and subordinate mafic terms associated with Cambaí Complex. The late-orogenic and post-collisional magmatism is represented by the granitoids of the Lagoa da Meia Lua Suite, which intrude the Cambaí Complex. U-Pb analyses by SHRIMP and LA-ICP-MS on zircon grains from orthogneisses indicate crystallization ages between 750 and 720 Ma and peak metamorphism at 710-700 Ma, while the metavolcanic of Bossoroca Complex present U-Pb ages between 780 and 750 Ma. The youngest Lagoa da Meia Lua Suite exhibit crystallization ages of 698-688 Ma. The arc-related rocks display low to medium-K calc-alkaline affinity, with predominance of intermediate terms. The trace element content shows relative enrichment in LILE (e.g., Ba, Sr, Rb) compared to HFSE (e.g., Zr, Y). The low-mobility trace element pattern exhibits negative anomalies of Nb, Nd, and Ti, a geochemical fingerprint of subduction zones. There is a slight enrichment in light REE, a low positive anomaly of Eu (Eu/Eu* up to 1.72), and enrichment factors relative to the chondrite, with $(La/Yb)_N$ ratios ranging from 1.33 to 40.39. The negative correlation of FeO, CaO, Al₂O₃, MgO, and TiO₂ in relation to SiO₂ enrichment, suggests that the main process of this arc-type magmatism was fractional crystallization of subduction-related basaltic melts, combined with assimilation of crustal components, resulting in intra suites compositional evolution of the São Gabriel Arc. The characterization of the São Gabriel Arc magmatism helps elucidate the events associated with the prelude to the Neoproterozoic orogenies of southern Brazil. The evolution model of the São Gabriel Terrane in the context of the West Gondwana supercontinent tectonics involves the crystallization of pristine mantle magmas alongside partially contaminated continental magmas, with accretion of arc-related units during a Cryogenian collisional event associated with the closure of the Charrua ocean, located between the Rio de La Plata craton and the Nico Pérez Terrane.

KEYWORDS: NEOPROTEROZOIC ARC, U-Pb GEOCHRONOLOGY, WEST GONDWANA

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