

ARCHEAN CRUSTAL GROWTH OF THE IMATACA COMPLEX, AMAZONIAN CRATON: EVIDENCE FROM U-Pb, Sm-Nd AND Rb-Sr GEOCHRONOLOGY

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The Archean Imataca Complex (IC), NW Amazonian Craton, forms a ENE-trending, fault-bounded block adjacent to the Paleoproterozoic Maroni-Itacaiúnas magmatic arc (2.2 – 2.0 Ga). The IC rocks are complexly deformed, exhibiting elongated and symmetrical domes and thrusts combined with isoclinal folds. Transcurrent faults are also important, like the Guri Fault System, a zone of multiple faulting, shearing and mylonitization, along the southeastern edge of the IC. The IC is mainly composed of medium- to high-grade quartz-feldspathic paragneiss, and exhibits extensive mortar, augen, flaser and mylonitic textures. Calc-alkaline gneiss and granitoid rocks of igneous protolith are also present in the IC, as well as dolomitic marbles, orthopyroxene and magnetite quartzites, and BIFs.

This paper reports zircon U-Pb SHRIMP, Sm-Nd and Rb-Sr isotopic data of different IC rocks in order to investigate their age and geological evolution within the tectonic framework of the Amazonian Craton.

The sample of a felsic component of banded garnet-bearing granulites yielded a weighted mean ²⁰⁷Pb/²⁰⁶Pb date of 3229 ± 39 Ma (MSWD = 5.2). A sample of the La Ceiba migmatite gave a ²⁰⁴Pb corrected weighted mean ²⁰⁷Pb/²⁰⁶Pb date of 2787 ± 22 Ma (MSWD = 1.9). Sm-Nd whole rock isotopic mapping of the IC yielded ages mostly between 3.23 – 3.00 Ga and 2.90 – 2.80 Ga, in close agreement with the zircon U-Pb ages, supporting the juvenile nature of the crust, which is associated with two major mantle-differentiation events.

As a whole, the isotopic inferences in conjunction with the recognized polyphase tectonic framework of the Archean crust (e.g., faults, mylonites, folding, juvenile accretion vs. crustal reworking) demonstrate that the IC is an allochthonous block which was juxtaposed to the Maroni-Itacaiúnas belt during the Late Paleoproterozoic.