

IN SITU THIN SECTION U-Pb ANALYSES USING LASER ABLATION MC-ICP-MS. PRELIMINARY RESULTS ON METAMORPHIC TITANITE FROM THE NEOPROTEROZOIC URUANA META-SYENITE, BRASÍLIA BELT, BRAZIL

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ABSTRACT: The Brasília Belt was formed comprising part of the Tocantins Province, that represents a large orogen of N-S direction developed in the Neoproterozoic Pan-African/Brasiliano cycle (Almeida et al., 1981) and it was formed by the convergence and posterior collusion of Amazonian Craton (northwest), San Francisco-Congo Craton (east) and Paranapanema Craton (south). A laser ablation–multiple collector–inductively coupled plasma mass spectrometry (LA–MC–ICP–MS NEPTUNE) analytical protocol has been used to date accessory minerals at high spatial resolution using standard petrographic thin sections. We analyzed metamorphic titanites from the Uruana meta-syenite of Neoproterozoic age (615+/-3 Ma) located in the central portion of the Brasília belt. The meta-syenite exhibits a high green schist metamorphic paragenesis with epidote, actinolite, titanite, biotite and plagioclase. Titanites grains are subhedral to euhedral and rotated along prominent foliation. Standardization and normalization factors for the $^{206}\text{Pb}/^{238}\text{U}$ and $^{207}\text{Pb}/^{206}\text{Pb}$ values were calculated based on external mineral standards, Temora and GJ zircons and in-house standard of titanite. For instrumental mass bias correction and external reproducibility GJ and Temora zircons standards have been used, respectively. To control the potential matrix effect during analytical session analyses of in-house standard of titanite have been performed. An adapted mount with 5 mm of diameter and <2 mm of thickness containing GJ, Temora and titanite standards have been prepared and fixed directly on the thin section. In this way we could perform all the analyses without open the sample chamber and without interrupting the carrier gas flux. The relatively large size (>200 microns) of titanite grains and the employment of backscattering images obtained by Scanning Electron Microscope permitted to use the laser in raster ablation mode on homogeneous portion of the crystals. The obtained data were recalculated using an in-house Excel spreadsheet and the results plotted using Isoplot software. Four titanite grains with abundant common Pb defined on the Tera-Wasserburg diagram a lower intercept age of 538+/-20 Ma that represents a metamorphic event, approximately 60Ma younger than the syenite crystallization age of the (615+/-3 Ma) and the main peak of the Brasiliano metamorphism ~610 Ma). This analytical protocol represents an important tool because permits to analyze accessory minerals with a textural control furnishing an additional constrain for the characterization of a metamorphic event.

KEY WORDS: U-Pb, URUANA, TITANITE.