THE APPLICATION OF U-Pb GEOCHRONOLOGY TO TITANITE BY SHRIMP

Kei Sato – Instituto de Geociências/USP, *Miguel Angelo Stipp Basei* – Instituto de Geociências/USP, *Colombo Celso Gaeta Tassinari* – Instituto de Geociências/USP, *Oswaldo Siga Jr.* – Instituto de Geociências/USP, *Artur Takashi Onoe* – Instituto de Geociências/USP.

Many large titanite crystals were collected from Khan copper mine, Namibia – Africa, with intention of establishing a reference in the $^{206}Pb/^{238}U$ ratio to normalize unknown titanites. Previous analyses from three distinct authors shown the following results: $^{207}Pb/^{206}Pb$ age of 518 ± 2 Ma and 522.3 ± 2.3 Ma by TIMS and Concordia age of 516.9 Ma by LA-ICP-MS. For this experiment the standard BLR1 (1047 Ma) was tested. SHRIMP IIe analytical techniques were: a) Primary Beam: Kohler aperture = 120 μm, spot size = 30 μm, O_2 beam density around 5-6 nA and raster time = 2 minutes plus 0.30 minutes of burning time; b) Secondary beam: source slit = 80 μm, mass resolution are > 5000 (1%) with residuals less than 0.025 and no energy filter; c) Acquisition table: Khan standard is utilized for the uranium concentration calibration (584 ppm) and also $^{206}Pb/^{238}U$ reference age (518 Ma); d) Acquisition and data processing: SHRIMP IIe use software LabView 8.5 with SHRIMP program SW version 2.1. Calibration method is based by LN(Pb/U) vs Ln(UO/U) and common lead correction is done by ^{204}Pb. For data reduction software is based on SQUID 1.06

Results and Discussion:

Khan titanite: The range of total common ^{206}Pb is among 0.6 and 4%. The total radiogenic Pb is between 35 and 62 ppm, the $^{232}Th/^{238}U$ ratio ranged from 0.97 to 2.3 and U concentration varied among 350 and 558 ppm.

BLR1 titanite standard analyzed by SHRIMP IIe and with reference Khan (518 Ma) used to normalization of $^{206}Pb/^{238}U$ presented following results: The concordia age is of 1043 ± 9 Ma (MSWD=0.01) and $^{206}Pb/^{238}U$ average age equal 1048 ± 19 Ma (MSWD=0.8). Therefore this result is very close to the true value (1047 Ma).