

# **Zircon U-Pb and Biotite Rb-Sr Dating of the Wami River Granulites, Eastern Granulites, Tanzania; Evidence for Approximately 715 Ma Old Granulite-Facies Metamorphism and Final Pan-African Cooling Approximately 475 Ma Ago**

## **Author(s)**

Makenya A. H. Maboko, N.A.I.M. Boelrijk, H.N.A. Priem, E.A.Th. Verdurmen

## **Abstract**

A U-Pb investigation of suites of zircons from five granulites in the Wami River area, Tanzania, yields a 17-points discordia with upper and lower intercepts at  $714\text{--}49\text{+}36$  Ma and  $538\text{--}35\text{+}49$  Ma, respectively. These systematics are interpreted to indicate an age of approximately 715 Ma (Pan African) for the M1 granulite-facies metamorphism, whereas the lower intercept is related to a stage in the uplift and cooling following the M2 amphibolite-facies retrogradation (elsewhere dated at approximately 650 Ma). Three of the granulites contain minor amounts of an inherited, > 1600 Ma old zircon component, probably derived from the igneous precursors of the granulites. A suite of zircons from the adjacent biotite gneisses may signal a provenance age of approximately 2600 Ma (Tanzania craton?), but the U-Pb systematics do not clearly reflect the amphibolite-facies metamorphism (correlated with the M2 partial retrogradation of the granulites) that transformed the sedimentary sequences into gneisses (any petrographic record of a possible older metamorphic influence being absent). Biotite/whole-rock pairs from the same samples yield Rb-Sr ages between about 470 and 485 Ma for the granulites and about 458 Ma for the gneiss. They are interpreted as 'cooling ages' and set an age between about 485 and 460 Ma to the final cooling of the crust through the closure temperature of biotite to Rb-Sr. The subsequent granulite-facies and amphibolite-facies events and their chronology are fitted in the continent—continent collision model for the evolution of the Mozambique belt advocated by the first author.