Ber. Inst. Erdwiss. K.-F.-Univ. Graz	ISSN 1608-8166	Band 9	Graz 2004

NEW AGE DATA FROM ANORTHOSITES FROM THE EASTERN GRANULITES IN THE MOZAMBIQUE BELT (TANZANIA)

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Within the Mozambique Belt of Central Tanzania three well constrained age domains are recorded. The oldest ages (ca. 2.6 Ga) occur within the Tanzania Craton; an age domain around 1.8 to 2 Ga marks the collisional event of the Usagaran Belt and the peak of the Pan-African orogenic activity was around 640 Ma. This event was responsible for the formation of the supercontinent Gondwana. Until now, only few data exist, that document the initial stage of the Pan-African orogeny, the rifting process and the break-up of Rodinia. Muhongo & Lenoir (1994) reported ca. 695 Ma old zircons from the Uluguru mountains that might document an early stage of Pan-African evolution. However, most of the investigated magmatic rocks from Central Tanzania preserved formation ages of ca. 1.8 Ga or even older ages. The geochemical signature of these rocks indicate an island arc tectonic setting. Within the Eastern Granulites (Pare, Uluguru and Mahenge mountains) anorthosites are exposed. These highly differentiated rocks, that might have formed in a different tectonic setting, have been chosen for U/Pb zircon geochronology (SIMS technique). For the results see the figure below. The anorthosites from Uluguru and Mahenge mountains include oval shaped, colourless zircon grains with some relics of magmatic oscillatory zoning in the core and a metamorphically grown rim. From the Uluguru mountains we dated two anorthosites and one cogenetic granitoid rock within the anorthosite body. The cores gave ages between 850-900 Ma, the rims ca. 650 Ma. The granitiod rock gave a similar age group (850-900 Ma) interpreted as emplacement age and shows the metamorphic overprint at ca. 650 Ma. Similar age groups have been obtained from two samples from the Mahenge Mountains with core ages around 800 Ma and rim ages around 640 Ma. Zircons from an anorthosite within the Pare mountains differ in zircon morphology and in ages. Idiomorphic, yellow to brownish zircons with oscillatory magmatic zoning and ilmenite inclusions gave Archean core ages (ca. 2.6 Ga). A narrow metamorphically grown rim was too small for in situ dating.

This study is supported by FWF-P15599 and the Swedish Museum of Natural History within the IHP Programme (HPRI-CT-2001-00125).

Reference

MUHONGO, S. & LENOIR, 1994. Pan-African granulite facies metamorphism in the Mozambique belt of Tanzania: U-Pb zircon geogronology. J. Geol. Soc. Lond. 151, 343-347.

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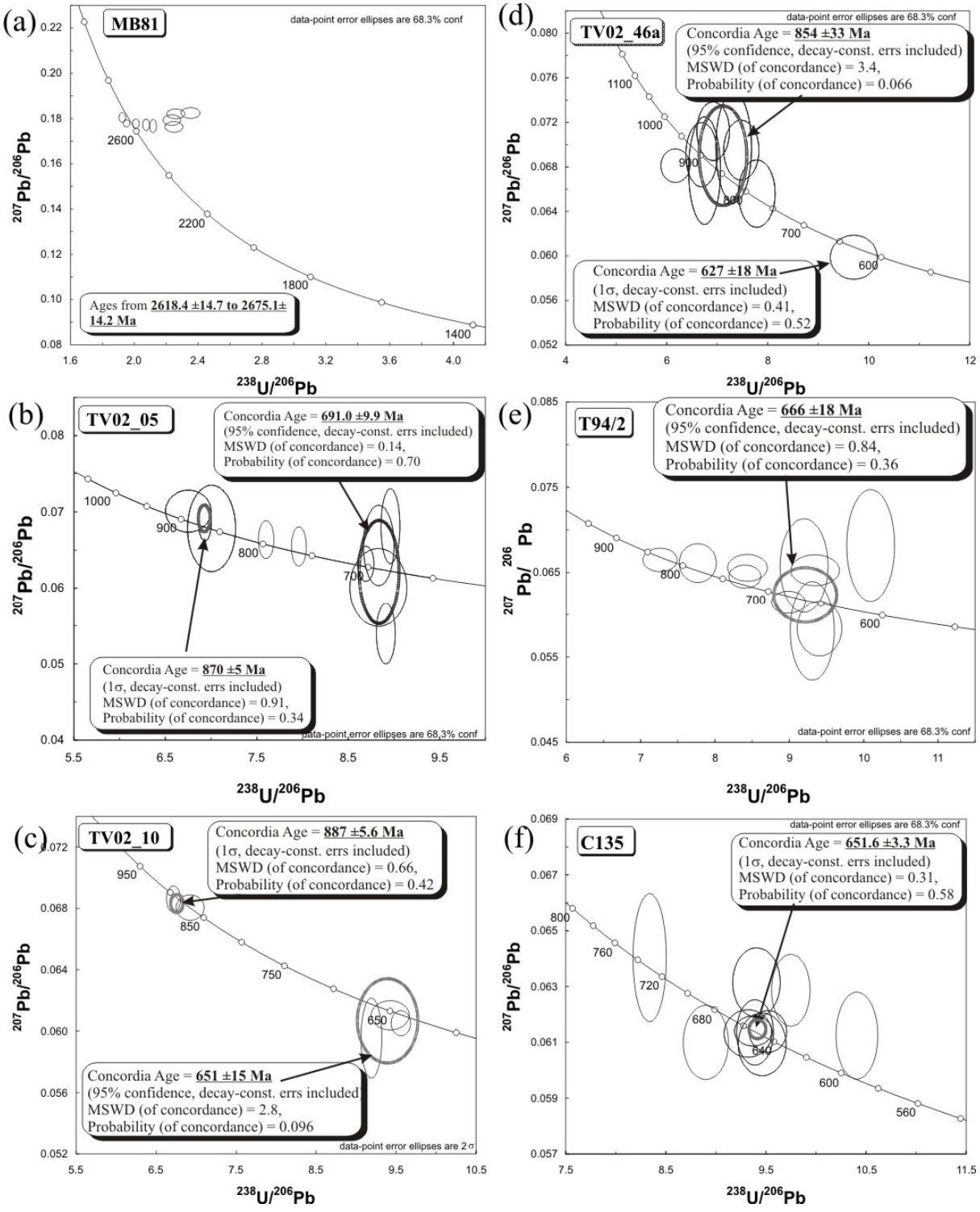

Figure: Results from SIMS age dating, shown as Tera-Wasserburg diagrams for the individual samples, indicated by the sample number in the upper left box. The samples were taken from:
(a) Anorthosite Pare Mountains, (b) and (c) Anorthosite Uluguru Mountains, (d) Granitoid rock associated with the anorthosite of the Uluguru Mountains (e) and (f) magmatic rocks from the Mahenge Mountains