Dating Late Pan-African Cooling in the Uluguru Granulite Complex of Eastern Tanzania Using the 40Ar_39Ar Technique.

Author(s)

Makenya A. H. Maboko, Ian Mcdougall, P.K. Zeitler

Abstract

Age spectra measured by the 40Ar□39Ar technique on hornblende, muscovite and K-feldspar from the Uluguru granulite complex of Eastern Tanzania indicate that following granulite facies metamorphism at the terrane cooled slowly, reaching a temperature of about 630 Ma ago. Subsequent cooling was even slower, reaching temperatures of about 420 Ma ago. Assuming a simple relationship between cooling rate and thermal gradient, the cooling history translates into an uplift path characterized by a phase of rapid uplift soon after granulite facies metamorphism followed by a period of slow uplift which began about 630 Ma ago. Such a history is consistent with model thermal histories of crustal segments undergoing thermal relaxation and isostatically-driven uplift following tectonic thickening events.