Isotopic dating of Neoproterozoic crustal growth in the Usambara Mountains of Northeastern Tanzania: evidence for coeval crust formation in the Mozambique Belt and the Arabian–Nubian Shield

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Abstract
Granulite-facies orthogneisses of andesitic to dacitic composition in the Usambara Mountains of north eastern Tanzania yield a Sm–Nd whole rock isochron age of 815±58 Ma and an initial ε(Nd) value of 4.1. This age is interpreted as dating Sm–Nd fractionation during extraction from the mantle and immediate subsequent crystallisation of the granulite protolith during an event of regional calc-alkaline magmatism in the area. Isotopic and geochemical characteristics of the rocks are consistent with a convergent margin setting for the magmatism with minimal contamination by older continental crust. The isotopic data from the Usambara Mountains demonstrate that Neoproterozoic crust formation in the Arabian–Nubian Shield and parts of the Mozambique Belt was broadly contemporaneous.

Keywords
Mozambique Belt;
Tanzania;
Sm–Nd geochronology;
Crust formation;
Granulites