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A U-PB AND RB-SR ISOTOPE STUDY OF A MIGMATITE AREA

SCORESBY SUND, EAST GREENLAND

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Abstract

A 2000 m thick massive granodioritic sheet and its migmatized metasedimentary cover, situated in the southern part of the East Greenland fold belt, have been chosen for a study of isotope systems in migmatites. Rb-Sr whole-rock and zircon U-Pb data obtained from various granitic and metasedimentary rock phases show a pronounced scatter indicative of complex open-system behaviour. The disturbances of these isotopic systems are believed to result from a polymetamorphic history of the area including a high-grade Caledonian event. The latter is dated by a Pb-Pb monazite age of 434 ± 5 m.y. as well as by a Rb-Sr mineral isochron age of 410 ± 8 m.y. A concordant U-Pb monazite age of 423 ± 4 m.y. marks the intrusion of post-kinematic granitic dikes.

The data scatter on a U-Pb concordia diagram resulting from conventionally separated zircon fractions of a complex migmatitic rock leads to ambiguous or even wrong age information. However, bulk zircon separates produce a linear data pattern and permit - in combination with U and Pb concentration data - to assign a Caledonian age to the migmatization.

The thesis is supplemented by a statistical investigation of mass spectrometer data.