

PRELIMINARY GEOCHRONOLOGICAL STUDY OF GRANULITES  
FROM THE SØR RONDANE MOUNTAINS, EAST  
ANTARCTICA—A COMPARISON OF Rb-Sr  
AND Sm-Nd AGES— (ABSTRACT)

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We report the preliminary results of whole-rock Rb-Sr and Sm-Nd isochrons dating on granulite-facies metamorphic rocks from Brattnipene, central Sør Rondane Mountains, East Antarctica.

*Samples:* Isotopic ratios of eight samples were measured with a MAT 261 mass spectrometer at the Institute for Study of the Earth's Interior, Okayama University. Four samples are enderbites consisting of Opx, Cpx, Hbl, Bt, Pl and Qtz with or without Grt and Kfs (mineral abbreviations after R. KRETZ: *Am. Mineral.*, **68**, 277, 1983). These rocks were collected within a hundred meters of each other. The other four samples are hornblende gneisses as follows: Bt-Hbl-Pl, Bt-Hbl-Kfs-Pl-Qtz, Cpx-Hbl-Pl-Qtz and Bt-Hbl-Pl-Qtz. Two of them have been slightly altered to form secondary epidote and/or bluish green hornblende. All samples crop out within 500 m. The peak metamorphic conditions of the enderbites were estimated from geothermobarometry to be 800°C and 7–8.5 kb (K. SHIRAISHI and S. KOJIMA: *Proc. NIPR Symp. Antarct. Geosci.*, **1**, 129, 1987). The hornblende gneisses were presumably metamorphosed under the same conditions.

*Rb-Sr data:* The <sup>87</sup>Rb/<sup>86</sup>Sr ratios for eight samples are low (0.02–0.15) and no meaningful isochron can be drawn due to the considerable scattering of the data. Four enderbites, however, define an isochron of 1167 ± 127 Ma with initial ratio 0.7040.

*Sm-Nd data:* The <sup>143</sup>Nd/<sup>144</sup>Nd vs. <sup>147</sup>Sm/<sup>144</sup>Nd ratios for all eight samples defined an isochron of 999 ± 164 Ma with an initial ratio of 0.51158. The calculated uncertainty is high because the spread of the <sup>147</sup>Sm/<sup>144</sup>Nd ratios is limited. T<sub>(DM)</sub> model ages ( $\epsilon_{Nd(0)} = +10$ ) range between 1150 and 1300 Ma.

Previous work has shown that the region was affected by a thermal event associated with plutonism about 500 Ma ago. This event may be the cause of the scatter in the Rb-Sr data. Nonetheless, four enderbites, which seem to be fresh under the microscope, yield a Rb-Sr isochron whose age is consistent with the Sm-Nd age within the uncertainties.

There are two possible explanations for the 1000 Ma ages: crust formation or metamorphism. We tentatively interpret the 1000 Ma could date granulite-facies regional metamorphism although the Sm-Nd isochron age has been thought to date a crust formation because of the immobility of rare earth elements during metamorphism. Resetting of Sm-Nd whole-rock isochrons may have been possible under the estimated conditions of granulite-facies metamorphism as discussed for the Napier Complex of Enderby Land (M. T. McCULLOCH and L. P. BLACK: *Earth Planet. Sci. Lett.*, **71**, 46, 1984).

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