

Fingerprinting the origin of soapstone/steatite from the Nuuk-region (southern West-Greenland)

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Soapstone was mined and traded by the Saqqaq, Dorset, Thule, Norse, and Moravian cultures living in Greenland through time. We collected soapstone from outcrops around Nuuk, which hold Greenland's best quality of soapstone, and analysed their whole-rock geochemistry, Sm-Nd and Rb-Sr isotopes for fingerprinting for geological and archaeological purposes. Fieldwork showed that the quality of soapstone in the Nuuk-region varies widely; however, a correlation exists with the age and metamorphic history of the rocks.

Soapstone in the Nuuk-region is derived from Archaean ultramafic rocks and yield high Mg, Cr, Ni and low Fe, V, K concentrations; they are depleted in Ca. Soapstone from Nuuk have very high Rb and average to low Sr concentrations compared to other Archaean ultramafic rocks, leading to very high and irregular $^{87}\text{Rb}/^{86}\text{Sr}$ and $^{87}\text{Sr}/^{86}\text{Sr}$ ratios. A very poorly constrained Rb-Sr model age for unmetasomatised samples from Nuuk gives 2.99 Ga. Samples from Nuuk, both affected and unaffected by metasomatism to soapstone give a $^{147}\text{Sm}/^{144}\text{Nd}$ model age of 2.95 Ga. The best quality soapstone occurs in the area with Eo-Archaean gneisses and the precursor rocks for soapstone in the Nuuk area might have formed at or been tectono-metamorphically overprinted at ca. 2.95 Ga, which is an uncommonly old age for soapstone. Soapstone and hence archaeological artefacts created from this soapstone may likely be fingerprinted as derived from Nuuk.

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