

GEOCHEMISTRY OF THE NANNA PEGMATITE, NARSAARSUUP QUAAVA, SOUTH GREENLAND

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The Nanna pegmatite is located near Narssârssuk on a plateau between the Igaliko and the Tunugdliarfik fiord. The Nanna pegmatite is a small lens-shaped body in the border zone of the huge Igaliko nepheline syenite complex. The pegmatite forms a lens like body and is surrounded by a ~20 cm wide leashing zone in the nepheline syenite. The pegmatite is less than 10 m long and slightly more than 50 cm wide, towards the north it ends fairly abruptly, towards the south it is thinning more gradually. The dipping is about 45° to the east.

The pegmatite is zoned with a fine grained border zone, definitely best developed in the visible top part. In the top part of the pegmatite this border zone is up to 10 cm wide and is dominated by aegirine and catapleiite and minor feldspar.

The central and main part of the pegmatite consists of sodalite (variety hackmanite), natrolite, some analcime, platy crystals of feldspar, some aegirine prisms, needle shaped astrophyllite, and onion-shell-like aggregates of curved catapleiite crystals. Other minerals identified, mainly from the core zone, are calcio-ancylite, fluorite, galena, gibbsite, leucophane, micheelsenite, polythionite, todorokite and widespread the rare mineral nafertisite (PETERSEN *et al.*, 1999).

Most of the main elements in relation to the nepheline syenite are depleted, only Na and P are en-

riched up to 2 times, Mn more than 10 times. Very high enrichment of all volatile elements can be found in the pegmatite like F, Cl, S, CO₂ and H₂O with enrichment factors up to 10. Also Li is 10 times enriched in both, the border and core zones. Be increase from few ppm in the nepheline syenite up to 370 ppm Be in the core area and is mainly incorporated in the hackmanite. Further, the incompatible elements (Y, Nb, Ta, Zr, Hf, Th, and the REE) are also highly enriched in the pegmatite with varying factors up to 300. Especially the border zone contains up to 18 wt% trace elements, the core area only 4.6 wt%. The LREE elements are in the core zone ~100 times enriched, in the border zone up to 160 times. In contrast the HREE are less enriched, up to 20 times in the core zone, but generally higher in the rim zone. They are incorporated into the rare minerals.

The leashing zone in the surrounding nepheline syenite shows only a moderate increase of the volatile elements and almost no enrichment in the incompatible elements.

Reference

PETERSEN, O.V., JOHNSEN, O., CHRISTIANSEN, C.C., ROBINSON, G.W. & NIEDERMAYR, G. (1999): Neues Jahrbuch für Mineralogie – Monatshefte, 1999: 303–310.