The textural observations in the granites of the Ivisârtoq region support the textural interpretations made by Hibbard (1979).

There are, as is to be expected, several problems. First, myrmekite in the deformed Nûk granites shows no evidence of deformation. However, the same problem would apply to a subsolidus model unless the myrmekite is envisaged as having developed several hundred million years after intrusion of the granites. Secondly, the question as to why extensive subsolidus recrystallisation has not taken place still exists. If it is assumed that the granites cooled slowly in the presence of fluids, metamorphic re-equilibration would be expected. Fluids can be seen to have been replacing narrow grain-boundary zones even after the development of perthite. However, only very limited areas were affected.

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Department of Geology,
The University,
Exeter EX4 4QE,
U.K.

A textural study of Archaean peridotites; Ujaragssuit nunât, Ivisârtoq region, southern West Greenland

Martin A. Crewe

Recent mapping of Ujaragssuit nunât by Chadwick & Crewe (1982) and Chadwick *et al.* (1983), following reconnaissance work by Allaart *et al.* (1977), has demonstrated the widespread occurrence of supracrustal lithologies. Ujaragssuit nunât is situated immediately to the north-west of Ivisârtoq, which has been described in some detail by Friend & Hall (1977) and Hall (1980, 1981). Friend & Hall (1977) noted that the Akilia association ultramafic rocks can be divided into two groups. The first group comprises those rocks rich

in olivine or its hydrous alteration products. Ultramafic rocks of the second group are olivine-free, being composed mainly of hornblende with or without clinopyroxene; these rocks are not considered further in this report. A similar division has been proposed for the ultramafic rocks of the Ivisârtoq Amphibolite Complex (Friend & Hall, 1977) which has been correlated with the Malene supracrustal rocks of the Godthåb region. A layered ultrabasic-gabbroic formation has also been reported from Ivisârtoq (Friend & Hall, 1977). In Ujaragssuit nunât no unequivocal evidence of a layered complex has been observed but the two-fold division of both the Akilia association and Malene ultramafic rocks is believed to be fundamental.

Ultramafic bodies are sometimes preserved in strips of supracrustal rocks where they are associated with abundant amphibolite or, more rarely, paragneisses. Contacts are generally concordant although Nutman *et al.* (1983) and Brewer *et al.* (this report) have reported ultramafic sheets cross-cutting other supracrustal rocks. Inclusions of ultramafic rock in orthogneisses have conformable contacts of indecipherable origin. Most of the ultramafic rocks in Ujaragssuit nunât are homogeneous but tectonic fabrics are locally well-developed.

Friend & Hughes (1978) recorded that in the Fiskenæsset region preservation of an anhydrous mineralogy (olivine, pyroxenes and spinels) is rare and only found in the cores of the larger ultramafic bodies that are preserved within extensive amphibolite outcrops. In Ujaragssuit nunât preservation of anhydrous minerals is generally good within the cores of even the smallest bodies, whether they are surrounded by amphibolites or by gneisses.

Petrography

Modal analysis of 44 samples reveals that both Malene and Akilia association ultramafic rocks contain little clinopyroxene. The dominant rock types are spinel-bearing harzburgite and spinel-bearing dunite (spinel rarely exceeds 5% in the mode); two samples are classified as lherzolites (Streckeisen, 1976). There is no evidence of preferential replacement of clinopyroxene compared with orthopyroxene. The major hydrous phases that are present are serpentine (optically determined to be antigorite), clino-amphiboles, talc and phlogopite; magnesite, anthophyllite and chlorite are minor constituents. Textural interpretation was found to be effective only where hydrous minerals make up less than 50% of the rock, a condition satisfied by 18 of the 25 Akilia association samples and 9 of the 19 Malene ultramafic rocks.

The average grain size of the Akilia association ultramafic rocks is 2–3 mm but significantly larger grains of both olivine and orthopyroxene are not uncommon. Olivine with undulose extinction is observed in some thin sections but the formation of sub-grains is very limited. Grain boundaries seen in thin section are usually curvilinear while rounded spinel inclusions in olivine are ubiquitous. Orthopyroxene often contains tiny blebs of spinel (fig. 30), a texture which has been attributed to exsolution (Mercier & Nicolas, 1975; Brown *et al.*, 1980). A very common feature in the harzburgites is the enclosing of rounded olivines by orthopyroxene (fig. 31).

Most samples of Malene ultramafic rocks preserve textures similar to those described above but some consist of a distinctive mosaic of polygonal grains (fig. 32). Garde *et al.* (1983) reported apparently similar textures from the Malene ultramafic rocks of the Isukasia area. The grain size of the Ujaragssuit nunât samples is 1 mm and there is little variation.

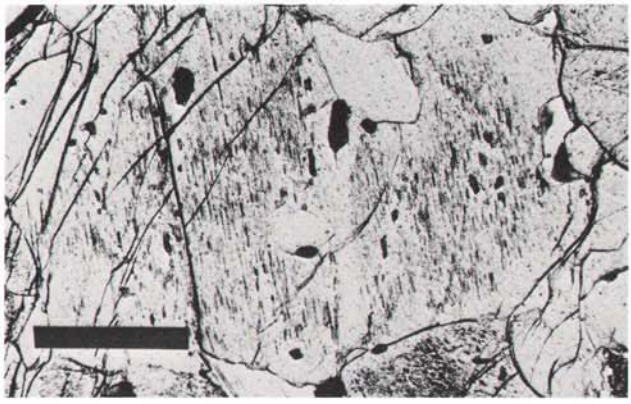

Fig. 30. Grain of orthopyroxene with fine blebs of spinel apparently due to exsolution. Scale bar is 0.2 mm long.

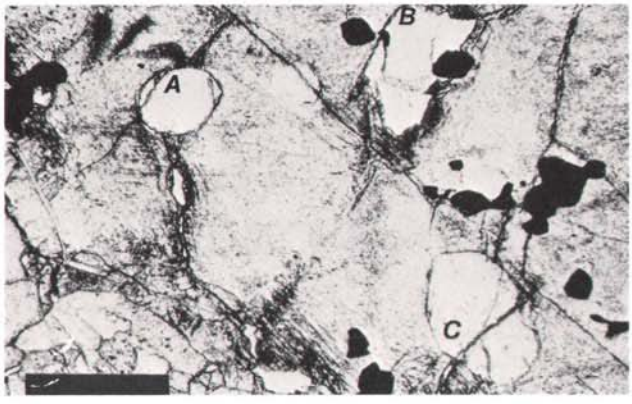

Fig. 31. Poikilitic orthopyroxene grain enclosing anhedral spinels and olivines. Olivine grains A and B are in optical continuity but grain C is not. Scale bar is 0.4 mm long.

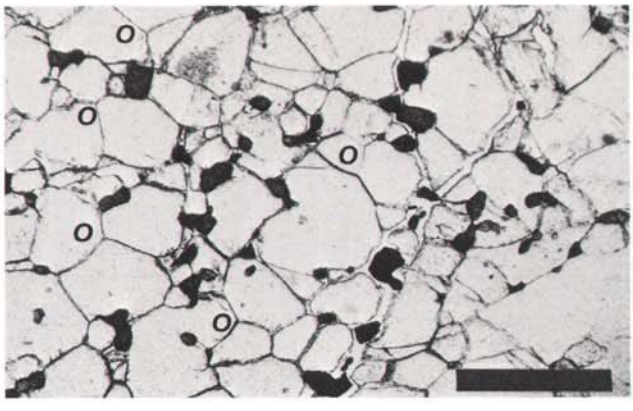

Fig. 32. Olivines and orthopyroxenes in equigranular texture with common 120° angles between grains (O). Brown spinel grains are usually located at grain boundaries. Scale bar is 0.4 mm long.

Rounded spinels are scattered throughout and are either included in olivine and orthopyroxene or located at grain boundaries.

Origin

The most striking feature of the ultramafic rocks described is their refractory nature: even high degrees of partial melting can not generate such olivine-rich rocks. Peridotites of this type are commonly formed by one of two processes: extreme fractionation of basic magma in a cumulate sequence or as mantle residua after extraction of partial melt(s).

The mosaic texture preserved in some samples of Malene ultramafic rocks is clearly of metamorphic origin. Similar textures have been reported from both mantle xenoliths and the basal portions of layered intrusions. The enclosing of rounded olivines by orthopyroxene is quite common in cumulate rocks but may also be a primary mantle texture (Rothstein, 1977). The differentiation between ultramafic rocks of cumulate and mantle origins is by no means simple.

Nicolas *et al.* (1980) attempted to distinguish mantle peridotites from deformed ultramafic cumulates. The colour and mode of occurrence of the spinel and the abundance of diopside were found to be the most useful diagnostic features. The ultramafic rocks considered here contain very little clinopyroxene and a brown spinel which is often associated with orthopyroxene. These features are those ascribed by Nicolas *et al.* (1980) to mantle peridotites.

Conclusions

It is tentatively concluded that both Malene and Akilia association olivine-rich ultramafic rocks originated as mantle residua after extraction of partial melt(s). This proposition is in accord with the findings of Friend & Hughes (1978). They envisaged a tectonic emplacement of the mantle rocks but the field evidence indicates that this is not always the case.

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Department of Geology,
The University,
Exeter EX4 4QE,
U.K.

An iron-formation in the Precambrian Tartoq Group, South-West Greenland

Peter W. Uitterdijk Appel

During the 1950s and early 1960s the Ivigtut area was mapped by the Geological Survey of Greenland (GGU), as part of GGUs systematic mapping programme. Detailed work was carried out on the two supracrustal units in the area, and the relative age relationship of the two units was established. The younger Ketilidian supracrustal rocks outcrop in the inland area, close to the Inland Ice, and the older Tartoq Group supracrustal rocks are found in and around Sermiligârssuk fjord. In the early 1970s Renzy Mines Ltd. conducted a mineral exploration programme in the area, during which arsenopyrite-pyrite mineralisations were found in the Tartoq Group supracrustals (Appel & Secher, 1984), and a banded iron-formation was discovered in the Ketilidian supracrustal rocks (Appel, 1974). During the 1983 field season two teams from GGU undertook field work in the area, as a result of which a banded iron-formation was discovered in the Tartoq Group supracrustal rocks.