Small xenoliths of probable eclogite have been found in some of the carbonatite-lamprophyres. One of these is seen in thin-section to be a medium- to coarse-grained rock consisting of garnet, very pale green pyroxene, brown hornblende and plagioclase. Precise mineral determinations have not yet been made but reasons for thinking the rock is eclogitic are a) it has a xenomorphic granular texture quite different from that of the surrounding hornblende gneisses or amphibolites, b) brown hornblende indicates a high temperature of formation and is not otherwise found in rocks of this area, except significantly as phenocrysts in the carbonatite-lamprophyres. Whilst plagioclase is not a typical constituent of eclogites it does commonly occur in rocks of this type.

THE RELATIONSHIP BETWEEN RELIC PILLOW STRUCTURES AND ZONED CALC-SILICATE SKARNS, AND THE SIGNIFICANCE OF TALC BALLS IN GNEISSES SOUTH OF FREDERIKSHÅB

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Amphibolite bands within the pre-Ketilidian gneisses on the island of Igaussaq and the adjacent mainland contain in places clearly recognizable epidotic relic pillow structures, together with probable meta-keratophyre layers and a meta-agglomerate horizon. Zoned calc-silicate skarn bodies have developed from the pillow structures in areas of more intense folding and granitization. In these areas the amphibolites have become agmatitic, and the pillows have suffered more thorough recrystallization and metamorphic differentiation to give zoned bodies consisting of calcite, garnet, diopside, epidote and hornblende.

The amphibolites also contain abundant metamorphosed ultrabasic lenses which were presumably intrusions of the geosynclinal phase, more or less disrupted during the subsequent folding. These now consist predominantly of tremolite, anthophyllite and diopside, but locally talc balls with anthophyllite and actinolite rims occur. The talc cores are foliated from which it may be deduced that the talc is of syn-tectonic crystallization, whilst the amphibole

rims show a radiating post-tectonic crystallization structure. Therefore it seems likely that the talc developed in an early phase (M1) of syn-tectonic metamorphism of either greenschist facies or the andalusite-cordierite-muscovite subfacies of the cordierite-amphibolite facies of Abukuma-type metamorphism (Winkler, 1965, p.102). The latter is a possibility since further south-east, cordierite-bearing regional metamorphic rocks are present. The general grade of metamorphism at Igaussaq is undoubtedly almandine-amphibolite facies, and the anthophyllite rims could have developed during this main phase of metamorphism (M2). There is abundant evidence that M2 was syn- to post-tectonic, and the radiating structure of the rims can perhaps be explained by assuming that anthophyllite was particularly sensitive to recrystallization in the post-tectonic phase. The outermost rim of the talc balls generally consists of actinolite which may have developed in a final phase of incipient greenschist facies metamorphism (M3), probably related to the retreat of the metamorphic front. The ubiquitous, though minor, development of late chlorite in the region may have a similar origin. The rims are of approximately constant thickness (about 10 cm) regardless of the size of the ball (up to 5 x 4 x 4 m), and very small balls consist entirely of the rim minerals, the talc having been eliminated by reacting with the surrounding rock. The balls resemble those described by Read (1934) from the Shetland Islands, though the interpretation suggested here is different from that given by Read.

References

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