Communs geol. Surv. S.W. Africa/Namibia, **2**, (1986), 55-56

A NOTE ON AN OCCURRENCE OF SCAPOLITE IN THE NORTHERN ZONE OF THE DAMARA OROGEN

by

R. Swart

1. INTRODUCTION

Scapolite is a common mineral in high-temperature skarn deposits in which it has formed during contact metamorphism of carbonate rocks. It is, however, rare in low grade, regionally metamorphosed rocks, in which it has been described from meta-evaporite sequences (Hietanen, 1967; Ramsay and Davidson, 1970; Behr *et al*., 1983). Manby (1983) described scapolite occurrences from greenschist facies limestones and metapelites but did not specify the depositional environment of the host rocks.

In this report an occurrence of scapolite in the turbiditic Okonguarri Formation of the Northern Zone of the Damara Orogen is described (see Fig. 1 for locality). The depositional environment of the host rock and the petrographic characteristics of the scapolite differ from the previously described occurrences of this mineral.

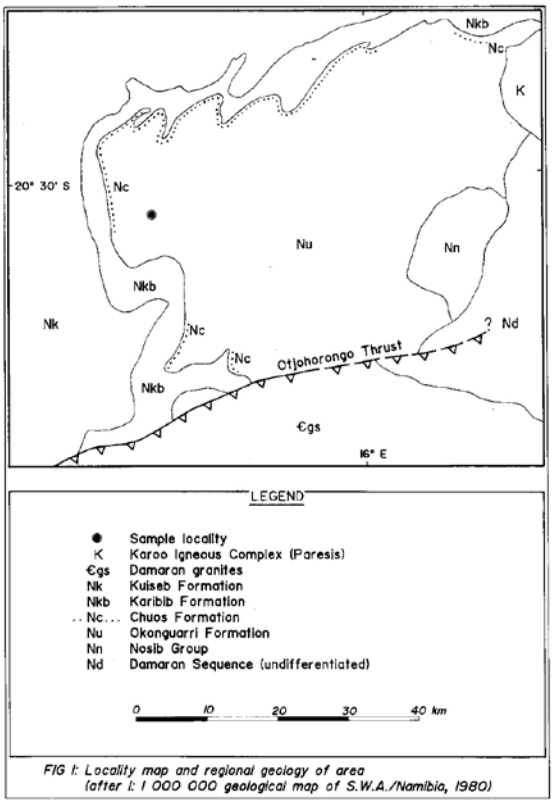

FIG 1: Locality map and regional geology of area (after 1: 1 000 000 geological map of S.W.A./Namibia, 1980)

2. DEPOSITIONAL ENVIRONMENT OF THE HOST ROCK

The Okonguarri Formation is a sequence of alternating metapelites, quartzites, metagreywackes and marbles that were deposited in one of three early grabens of the Damara Orogen (Martin, 1983; Porada, 1983). The presence of graded sedimentary units and incomplete Bouma sequences suggests that these deposits were laid down as turbidites (Porada and Wittig, 1983). These authors also argued that the siliceous deposits were derived from the east while the carbonates were derived from the north. Proximal siliceous and proximal carbonate beds are however found adjacent to each other, suggesting that they had similar source areas. This is supported by the fact that many of the beds are mixed carbonate-siliceous units which would not be the case if the carbonate and siliceous material had different source areas.

The Okonguarri succession overlies the Nosib Group (Miller *et al*., 1983), and is itself overlain by the Khomas Subgroup (see Fig. 1). The grade of metamorphism in the area is lower greenschist. Sedimentary structures are well preserved at some localities. Only one major phase of deformation is recognised, which has given rise to NNE-SSW trending folds.

3. PETROGRAPHY

The scapolite in the Okonguarri Formation occurs as porphyroblasts in calcite - quartz - biotite - dolomite ± chlorite bearing schists. The porphyroblasts have no preferred orientation and cut across the bedding. The scapolite crystals are dark blue when fresh, but weather to a light grey colour. They vary from being anidiomorphic to idiomorphic, with the former crystals being larger (up to 2 cm) than the latter (0,4 cm). Growth of the scapolite grains postdated the crystallisation of the matrix. Radial aggregates of crystals are also found. The 100 cleavage is prominent in the idiomorphic porphyroblasts. Many of the crystals are poikolitic. All the porphyroblasts are surrounded by a 0,25 mm wide calcite-rich, biotite-free zone.

4. COMPARISON WITH SCAPOLITE FROM OTHER LOCALITIES

The samples described by Manby (1983) differ significantly from those found in the Okonguarri Formation

in a number of aspects. Firstly, the scapolites described by Manby do not cross the bedding, and are concentrated in specific layers. They were therefore interpreted by him as the product of an isochemical reaction. Secondly many inclusions have a preferred orientation, displaying a curved relict foliation. Thirdly the scapolite crystals are surrounded by a biotite-rich rim, rather than a calcite-rich rim.

Behr *et al*. (1983) found dolomite to be a common accessory mineral in the scapolite-bearing rocks of the Duruchaus Formation at the southern margin of the Damara Orogen. Dolomite is, however, rare in the Okonguarri Formation. Ramsay and Davidson (1970) described hypidiomorphic grains of scapolite from metapelites randomly to lepidoblastically orientated and interpreted these as being the products of isochemical metamorphism.

5. REFERENCES

Behr, H.-J., Ahrendt, H., Martin, H., Porada, H., Rohrs, J. and Weber, K. 1983. Sedimentology and mineralogy of Upper Proterozoic playa-lake deposits in the Damara Orogen, p. 577-610, *In*: Martin, H. and Eder, F.W. (Eds), *Intracontinental Fold Belts*. Springer Verlag, Berlin, 945 pp.

Hietanen, A. 1967. Scapolite in the Belt Series in the St. Joe - Clearwater region, Idaho. *Geol. Soc. Am. spec. Paper*, **86**, 56 pp.

Manby, G.M. 1983. Primary scapolite from the Forland Complex of Prins Karl Forland, Svalbard. *Min. Mag*., **47**, 89-93.

Martin, H. 1983. Overview of the geosynclinal, structural and metamorphic development of the intracontinental branch of the Damara Orogen, p. 473-502. *In*: Martin, H. and Eder, F.W. (Eds), *Intracontinental Fold Belts*. Springer Verlag, Berlin, 945 pp.

Miller, R. McG., Freyer, E.E. and Hälbich, I.W. 1983. A turbidite succession equivalent to the entire Swakop group. *Spec. Publ. geol. Soc. S. Afr*., **11**, 65-71.

Porada, H. 1983. Geodynamic model for the geosynclinal development of the Damara Orogen, NamibialSouth West Africa, p. 503-542. *In*: Martin, H. and Eder, F.W. (Eds), *Intracontinental Fold Belts*. Springer Verlag, Berlin, 945 pp.

Porada, H. and Wittig, R. 1983. Turbidites in the Damara Orogen, p. 543-576. *In*: Martin, H. and Eder, F.W., (Eds), *Intracontinental Fold Belts*. Springer Verlag, Berlin, 945 pp.

Ramsay, C.R. and Davidson, L.R. 1970. The origin of the scapolite in the regionally metamorphosed rocks of Mary Kathleen, Queensland, Australia. *Contr. Miner. Petrol*., **25**, 41-51.