

THE GEOCHEMISTRY OF BASIC VOLCANICS OF THE DORDABIS FORMATION NE OF DORDABIS AND THEIR SIGNIFICANCE FOR CORRELATIONS WITHIN, AND EVOLUTION OF, THE REHOBOTH MAGMATIC ARC

Progress Report for 1982/1983

by

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1. INTRODUCTION

Gevers (1934) named the succession of quartzites, feldspathic sandstones, massive conglomeratic arkoses and sedimentary breccias around Dordabis, the Dordabis Series. He considered this series to be of Nama age and the basic volcanics in the series to be post Nama, pre-Karoo eruptive diabase. Schalk (pers. comm.) has found the succession to be pre-Damara in age and possibly equivalent to the Sinclair Sequence. These 'Dordabis Series' rocks have since been incorrectly included into the Marienhof Formation of the Rehoboth Sequence on the 1980 1:1 000 000 Geological Map of SWA/Namibia.

In this report, it is suggested that this succession be called the Dordabis Formation.

2. RESULTS

The Dordabis Formation consists of interbedded intermediate to basic lava flows, volcanic breccias, arkoses and quartzites. This study primarily concerns the volcanic rocks of this formation which have, on field and petrological evidence, been classified into two members, the Opdam Member and the Bitterwater Member.

The *Opdam Member* was studied at two parallel sections on the farms Opdam 284 and Dubis 273. It occurs at the base of the Dordabis Formation, overlying a conglomeratic layer at the top of the Marienhof Formation. The metalavas are mostly sheared, fine-grained and grey-green in colour. They can be recognized as lavas by the presence of amygdales and flow structures. Petrographic studies show that igneous textures are destroyed, and that a typical low-grade or greenschist facies metamorphic mineral assemblage of chlorite, opaques, plagioclase, leucoxene, sphene, \pm muscovite, \pm actinolite, \pm calcite, \pm clinozoisite and \pm quartz occurs. Some metalavas consist of up to 40 per cent nematoblastic actinolite, imparting a strong schistose fabric to the rock.

Poikiloblastic and porphyroblastic calcite and plagi-

oclase (0,5 - 3 mm) can occur in this member. In the poikiloblastic calcite-rich metabasalts, the calcite is preferentially weathered in the field, to give a brown 'pitted' outer surface.

The *Bitterwater Member* was sampled and studied on the farms Ibenstein 55, Autabib Süd 100, Dordabis 98, Zeshoek 104, Grasvlakte 338 and Bitterwater 109. It consists mostly of fine-grained, unshered, low-grade metamorphosed lavas, although medium-grained and aphanitic lavas also occur. Blastopoikilophitic and feldspar blastoporphyritic textures are characteristic relict igneous textures present in this member. The pyroxene in the blastophitic lavas is clinopyroxene which ranges in size from 1-10 mm. Feldspar has mostly altered to saussurite and the crypto-crystalline to microcrystalline groundmass around relict pyroxenes is often rich in opaques, chlorite, saussuritized feldspars, epidote, actinolite, leucoxene and clinozoisite.

Two types of blastoporphyritic lavas were noted in the field. The small-feldspar blastoporphyritic lavas are abundant, especially in the lower half of this member. Feldspar phenocrysts are usually tabular, subhedral to anhedral and range in size from 1-4 mm. The porphyritic plagioclase has almost all altered to cryptocrystalline saussurite. The groundmass consists of aphanitic plagioclase (mostly altered to saussurite), opaques, epidote, chlorite, \pm pyroxene, \pm actinolite, \pm quartz, \pm clinozoisite, \pm sphene and \pm calcite/magnesite.

The large-feldspar blastoporphyritic lavas occur near the top of the formation on Grasvlakte 338. Saussuritized plagioclase phenocrysts, set in a microcrystalline groundmass, make up about 50 per cent of the rock. The plagioclase phenocrysts are mostly subhedral, tabular and range in size from 2 mm to 1,5 mm, although the more lathshaped plagioclase reach 2,5 to 3,0 cm. The aphanitic groundmass is made up of chlorite, saussurite, epidote, opaques and leucoxene.

The volcanic breccias usually occur above the lava flows and often grade into quartzite layers. The breccias are non-stratified, unsorted and grade from volcanic clast-supported breccias, adjacent to the lava flows into

matrix-supported breccia adjacent to the quartzites.

trict in South West Africa. *Trans. geol. Soc. S. Afr.*,
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3. REFERENCES

Gevers, T. W. 1934. The geology of the Windhoek Dis-