THE PETROLOGY OF THE BASALTS OF THE DORDABIS FORMATION, IN THE VICINITY OF DORDABIS IN CENTRAL S.W.A./NAMIBIA *

by

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ABSTRACT

The late Proterozoic volcanic and sedimentary sequence in the Dordabis area, SWA/Namibia, has been named the Dordabis Formation and subdivided, on the basis of field, petrological and petrographic evidence, into the Opdam and Bitterwater Members.

Relict phases including augite and minor plagioclase only occur in the Bitterwater metalavas, as recrystallisation is complete in the Opdam metalavas. The composition of the relict feldspars ranges from labradorite in the ophitic basalts to oligoclase in the blastoporphyritic metalavas. The feldspars in the Opdam Member are albitic in composition (An content 0,0 to 1,7). Epidote compositions are typical of those occurring in metabasic rocks. Samples with high-iron whole-rock compositions are accompanied by high concentrations of Fe^{3+} in concomitant epidotes.

Sixty-three samples were analysed, using X-ray fluorescence spectrometry to determine concentrations of major and 16 trace elements. Although greenschist facies metamorphism, metasomatism and shearing have produced scatter in the more mobile element concentrations, variation trends in other elements closely resemble modelled low-pressure fractional crystallisation trends. The Dordabis metalavas are petrologically classified as sub-alkaline, tholeiitic continental basalts. Low K/Rb ratios and low ratios of less incompatible to more incompatible elements probably reflect a source that has either been metasomatically enriched or that has undergone little previous partial melting. Overlapping whole-rock variation trends indicate that the generally more evolved Opdam and primitive tholeiitic Bitterwater lavas are cogenetic.

A comparison of the Dordabis Formation with the Sinclair Sequence and the Koras Group shows that their ages, petrology, petrography, associated sedimentary suites and depositional environments are similar. It is concluded that they may possibly be coeval equivalents.

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