

THE CROCIDOLITE DEPOSITS OF
THE NORTHERN CAPE PROVINCE

by

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ABSTRACT

The areal and stratigraphical distribution of crocidolite-bearing strata in the entire Asbestos Field of the Northern Cape Province is described. Crocidolite-bearing zones are restricted to definite stratigraphical horizons which can be correlated with one another over relatively long distances. There is a pronounced increase in the total thickness of the Banded Ironstone Substage, host to the crocidolite deposits of economic importance, from the northern to the southern portion of the Cape Asbestos Field. Owing to the over-all increase in the thickness of the beds the vertical distance between individual crocidolite-bearing zones increases considerably towards the south.

The development and concentration of crocidolite in the different zones differ laterally, but economically the most promising zones in the northern part of the Asbestos Field are found towards the upper portion of the Banded Ironstone Substage which constitutes the lowermost substage of the Lower Griquatown Stage. In the southern portion of the Asbestos Field commercial deposits of crocidolite are located in zones which are present near the base, towards the middle and near the top of the Banded Ironstone Substage, respectively.

Crocidolite deposits of economic significance are restricted to structurally deformed localities, but the intensity of folding in the southernmost portion of the region differs conspicuously from that in the northern portion. From investigations carried out in the field and in the laboratory the author concludes that the banded ironstone with which deposits of crocidolite are associated originated from the chemical precipitation and mechanical deposition of material derived from volcanic sources. Intercalations of pyroclastic material in the banded ironstone have been recognised for the first time. The material of which the bands are composed probably represents volcanic ash.

The relation between the folding and the distribution of crocidolite deposits is pointed out and it is concluded that the crocidolite was formed under regional metamorphic conditions which prevailed during the post-Matsap period of crustal deformation. It is suggested that the parent-material from which the crocidolite crystallized was originally present in the banded ironstone host-rock and that this material could have had an origin very similar to that constituting the layers of pyroclastic material. It is believed that crocidolite crystallized after the crystallization of the mass-fibre riebeckite; the riebeckite chiefly under the influence of load and the crocidolite under the correct tension conditions caused by directed pressure.

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