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The Occurence of Prehnite in Uralitized Gabbros from Egypt

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With 1 figure

Schlüsselwörter
Ägypten
Petrologie
Gabbro
Prehnit

Metagabbro-diorite complexes, previously known as „epidiorites", are widely distributed in the basement complex of Egypt. The rocks of these complexes have intrusive relations with older gneisses, metasediments, metavolcanics and serpentinites. They were in turn intruded by grey granites and much later younger (pink) granites.

The present communication deals with the metagabbro-diorite complex of Wadi Mubarak—Gabal Atud area, in the central Eastern Desert of Egypt. The complex consists of an assortment of uralitized gabbros, hybrid rocks, metamorphosed gabbros and relics of the parent gabbros. Interaction between the original gabbro of the complex and later granitic emanations resulted in the production of a variety of hybrid rocks showing variable proportions of hornblende, plagioclase, biotite, chlorite and quartz. Contemporaneous with hybridization, the gabbros and the resultant hybrid rocks suffered a wholescale deuteric alteration and uralitization. This was followed by a low grade regional metamorphism in the greenschist facies, with the production of schistosity in certain places.

Prehnite is variably developed in the uralitized gabbros and uralitized hybrid rocks of W. Mubarak—G. Atud area, but is entirely absent from the schistose rocks. This represents the first recorded occurrence of prehnite in the metagabbro-diorite rocks of Egypt.

Prehnite is found to accur in the following forms:

1. Prehnite-chlorite and prehnite-biotite intergrowths.
2. Fine grained aggregates replacing the feldspars.
3. Small veinlets and irregular masses associated with other alteration products.

The first occurrence is the most common form of prehnite whereas the other two occurrences are less common. Biotite of the original gabbros and hybrid gabbros shows all stages of alteration to chlorite. This alteration was apparently accompanied by growth of prehnite in the form of lenticular layers interleaved with biotite-chlorite masses (occurrence 1) — Fig. 1.

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Magmatic origin of prehnite is hardly accepted in the light of the experiments of Coombs et al. (1959) and Liou (1971). The widespread occurrence of prehnite in the uralitized rocks and its absence from the schistose rocks indicate, therefore, its formation during post-magmatic alteration processes and its later breakdown during metamorphism. Prehnite does not appear to be replacing biotite and/or chlorite, since it forms lensoid masses which push aside and deform the biotite-chlorite lamellae (Fig. 1). However, for occurrences 2 & 3, prehnite seems to be replacing original

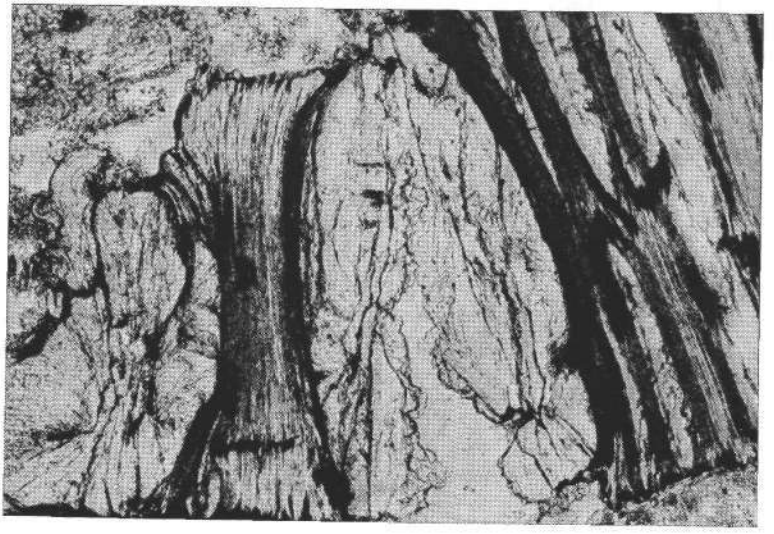

Fig. 1: Lenticular prehnite intergrown with biotite and chlorite

minerals. The process of prehnitization might be related to the process of uralitization in which the alteration of pyroxene to hornblende released the necessary Ca for the development of prehnite. The intimate association of prehnite with biotite-chlorite is explained by Moore (1975) as regarding the (0001) surfaces as providing suitable nucleation sites for the growth of prehnite during the hydration metamorphism.

References

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