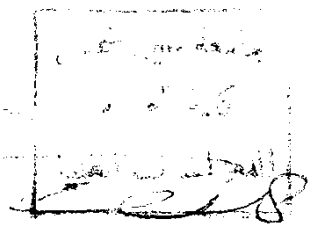
MINERALOGY AND GEOCHEMISTRY OF SOME MINERALIZED ROCKS IN WADI EL - GEMAL , EASTERN DESERT , EGYPT .

رسائل



A THESIS

Submitted to

552.4

The Faculty of Science .

Ain Shams University

for

The Degree of Doctor of Philosophy in Geology

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M . Phil . (Leeds Univ .)

1986

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ABSTRACT

The present study is an investigation of the acid type mineralization encountered in the psammitic gneiss, which is the basal unit of the metamorphic rock succession in Wadi Abu-Rsuheid. South Eastern Desert, Egypt. The schist series and horblende gneiss are also studied.

The psammitic gneiss is diveded into two zones; the upper one is mineralized and the lower is non-mineralized . The major mineral constituents in both types are more or less similaer, being quartz and feldspar. The accessory minerals in the mineralized type are much more abundant and include zircon, columbite, cassiterite, thorite, zinnwaldite and some sulphides.

Concerning, the chemical composition, the average oxides in both zones are very close, although some variability is shown in the upper zone. In addition, the mineralized rocks are enriched in Zr, Nb, Sn, Pb, Cu and Li and depleted in Ti in comparison to the lower part of the psammitic gneiss.

A proposed model for the mineralization suggests a chemical squeezing and pushing out of H_2O and other fugitives from the deep seated gneisses and their moving upwards by convection associated with orogenic and metamorphic phases. The nature of the original sediments, being argillaceous towards the top, acted as damming the volatiles, then gas pressure increased in the upper zone, leading to fracturing, soaking, and neomineralization.

Evaluation of the economic minerals, proved that the upper 50-meter zone is enriched with columbite-tantatite, zircon, thorite-thorogummite, cassiterite , zinnwaldite, fluorite and sulphide minerals and can be exploited, besides the placer deposits around the mineralized rock.

The schists in the studied area were differentiated into two series, one lies between the psammitic gneiss (below) and the hornblende gneiss (above). The second is a continuation of the distal melange of Wadi Ghadir. In the first type fragments of oceanic crust are present. On the other hand, hornblende gneiss represents the metamorphosed gabbroic/basaltic rocks.

The geological history can be explained as follow :

1- The psammitic gneiss formed on a continental margin or mature island arc.
2- The schist of Abu-Rusheid represents part of a metamorphosed melange body thrusted over the psammitic gneiss.
3- The hornblende gneiss represents part of a dismembered and metamorphosed ophiolite suite, thrusted over the schists.

Obduction of the oceanic crust on the contintental margin took place from East to West, then the first melange body occurred (schist of Abu Rusheid). This old melange has interfingers of the

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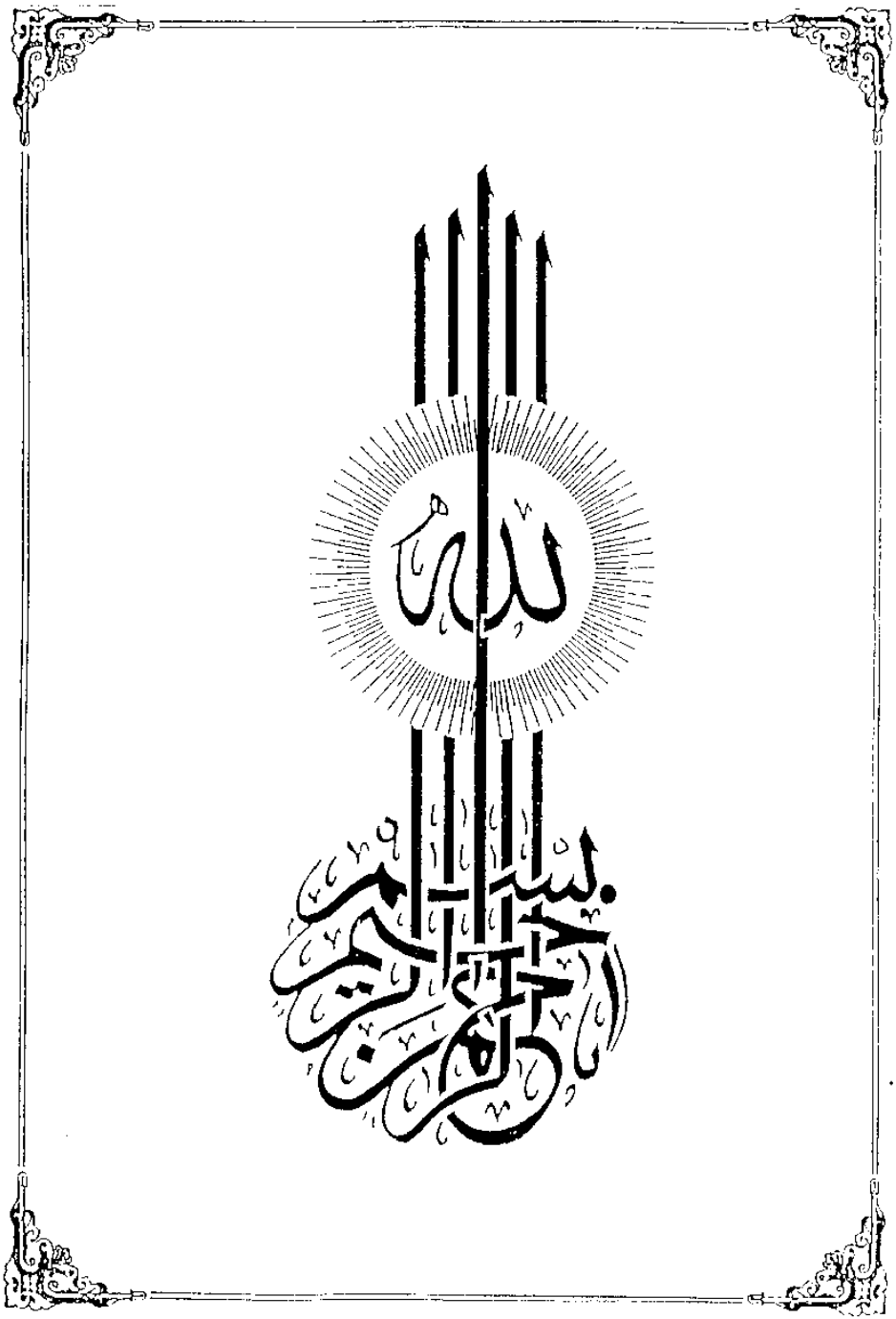

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oceanic crust represented by serpentinite bodics in the Eastern side of Wadi Sikait and around Wadi Abu Rusheid. The layered gabbro is represented by hornblende gneiss. This old convergence cycle was followed by reopening of the sea and a new cycle of convergence led to the formation of a new melange ophiolite complex which is now represented by a second group of schists at Ghadir area.

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