

A NEW BARITE OCCURRENCE AT EL FAWAKHIR AREA, EASTERN DESERT, EGYPT

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ABSTRACT

A new barite occurrence in El Fawakhir area of the central Eastern Desert is to be reported for the first time. This barite occurs in the form of veins occupying a shear zone emplaced along the contact aureole between El Fawakhir granite mass and the surrounding metamorphic rocks. The studied barite is well crystalline forming crystal aggregates and is almost pure with minor calcite content. It is proposed that there may be a genetic relationship between barite formation and the enclosing granitoid rocks.

INTRODUCTION

This new occurrence of barite mineralization lies approximately at the intersection of longitude 33° 38' E and latitude 26° 02' N, in the central Eastern Desert of Egypt. It is located at about four kilometers to the northeast of El Fawakhir Gold Mine along Qift-Qusseir road. It has a distance of about 90 km due west from Qusseir on the Red Sea, and also about 90 km due east from Qift on the River Nile.

Although the surrounding area has been the center of successive exploration and mining activities since the Ancient Egyptians, particularly for gold, yet no barite mineralization had been recorded or mentioned in any of the various published works on this area.

On the other hand, on reviewing the available literature on the Egyptian mineral deposits including those devoted for barite, again no mention was found concerning barites from El Fawakhir area. Thus, SADEK [1953] reported several thin veins of barite in the granitic rocks south of Kab El Gallaba, south Eastern Desert. SABET and ZAATOUT [1955] recorded some barite veins filling the fissures in Gebel El Bakriya pink granite mass in El Barramiya area.

EL SHAZLY [1957] referred to the rarity of barite veins in the Eastern Desert of Egypt, and he classified them among the true hydrothermal fissure veins. MOHARRAM [1959] mentioned some barite deposits in the Eastern Desert and Bahariya Oasis. NAKHLA and EL HINNAWI [1960] studied some important barite occurrences in both the Eastern and Western Deserts. SAID [1962] emphasised the presence of some barite occurrences in east Aswan area and other localities in the Eastern Desert. EL SOKKARY [1963] reported the presence of barite mineralization in association with the Carboniferous dolomites and accompanying Fe—Mn ores of west central Sinai.

AWAD [1967] in an M. Sc. thesis studied the geology and mineralogy of some barite and celestite occurrences in Egypt with special emphasis on barites from east Aswan, Bahariya and celestite from Mokattam. More recently, MOHARRAM *et al.* [1970] on their study on some mineral deposits from Egypt reviewed the status of Egyptian barites.

The present paper presents the new occurrence of barite mineralization recorded to the first time in this area of the central Eastern Desert of Egypt. The study concerns mainly with the mode of occurrence, field relations between the mineralization and the surrounding country rocks, radiometric studies as natural tracers beside some mineralogical investigations of the ore samples representing this occurrence, irrespective of its economic potentialities.

FIELD OCCURRENCE

The barite occurrence at El Fawakhir locality is found to be generally connected with highly metamorphosed rocks along the north-eastern marginal zone of El Fawakhir granite mass. The mineralization occurs filling a shear zone within the contact aureole between the older serpentinite rocks and the hybrid rocks of highly granitized metavolcanics and epidiorites which are intensely effected by the younger granitic intrusion.

The found occurrence of barite mineralization is not continuously exposed on the surface, but it has been followed along the mentioned shear zone with some irregular and discontinuous manifestations on the surface, while the vein itself can be followed at shallow depths. The barite occurrence forms a main vein of about 20—30 cm width and extends for more than 300 m in a general trend of N20°—25° W—S20°—25° E dipping moderately 35°—50° to the south west. Other minor and very thin veins are occasionally found within the shear zone which attains a thickness ranging from 50 to 100 cm. However, detailed field investigations and some prospecting works are needed to explore other occurrences in the surrounding area, as well as to follow the extension of the present occurrence and to evaluate it.

Field measurements of radioactivity were carried out by means of a scintillometer on the barites as well as on the surrounding rock units which gave the following results: serpentines gave from 5—7 $\mu\text{R/h}$, epidiorite — granitized metavolcanics 10—15 $\mu\text{R/h}$, pink granites 20—25 $\mu\text{R/h}$, younger acid dykes 40—50 $\mu\text{R/h}$, while the shear zone including the barite veins gave a range of 12—15 $\mu\text{R/h}$. It is seen that the range of radioactivity of the shear zone including the barites is similar to that of the granitized rocks, a matter which may indicate a genetic relation between barite formation and the process of granitization in this area. Moreover, the presence of barites filling fissures and cracks in a shear zone may point towards a hydrothermal phase following the emplacement of granite.

MINERALOGY

This barite of El Fawakhir occurrence is of whitish coloration, sometimes with yellowish stainings, and looks opaque in hand specimens. It includes two main varieties, one hard and the other is friable. It is generally well crystalline and the crystals form aggregates with a tabular habit, sometimes massive. Individual crystals have average dimensions of 2—4 cm, while in certain cases they can reach about 10 cm, finer sizes are present also. Cleavage traces are perfect in one direction.

With respect to specific gravity, twelve determinations are made on different samples. The determined specific gravity of the studied barite samples ranges from 4.32 to 4.37 with an average of 4.34. This average is close to the specific gravity of the standard barite which ranges between 4.3 and 4.6 [DANA, 1949] indicating the almost pure nature of the studied barite. The hard variety seems to show a slightly higher specific gravity of 4.36 relative to the friable variety which shows a somewhat lesser value of 4.32. This lower value of specific gravity is attributed mainly to the presence of some fractures and alternation earthy material.

Calcite is present as minor impurity associated with barite, nevertheless its distribution is not quite homogenous. Fluorescence test with an ultraviolet lamp on the studied samples of barite did not reveal any characteristic fluorescence. No fluorite is associated with this type of barite.

CONCLUSIONS

The present communication deals with a new discovery of barite veins in El Fawakhir area of the central Eastern Desert. This barite is associated with granitic rocks and in this way is to be added to the growing list comprising the association of barite with granitic rocks in the Eastern Desert, *e. g.* Gebel El Hudi area, Gebel El Bakriya, Wadi Hamash and others. CLARKE [1959] reported a case in which barite vein cuts through a dyke of aegite diorite. International association of barite veins with granites are mentioned in some detail in DEER *et al.* [1962]. However, the problem of association of barite veins with granitic masses needs further investigation as to the origin and mode of formation of these barites. Mineralogically, El Fawakhir barite can be considered as a pure variety with minor calcite as gangue.

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