

## **Petro-structural and geochemical characterization of the mineralization of the El-Gir deposit (Bou Azzer-El Graâra inlier, Central Anti-Atlas, Morocco)**

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The El-Gir sector is located in the western end of the Bou Azzer El Graâra inlier in the Moroccan central Anti-Atlas and precisely in the northwestern edge of the Bou-Frokh serpentinite massif.

From the lithostratigraphic point of view, the El-Gir sector is made up of Lower (PII) and Middle (PII-III) Neoproterozoic lands, namely: serpentinites, quartzic diorites, green rocks, which are covered in unconformity by Late Neoproterozoic (PIII) lavas facies. In addition to the quartz-carbonated and quartzous structures sits the mineralization.

Structurally, the work area reveals brittle tectonics and ductile tectonics that are related to pan-African orogenic phases; B<sub>1</sub>: characterized by flow schistosity at the level of serpentinites, B<sub>2</sub>: marked by fracture schistosity at the level of green rocks (dacites), and finally the late-pan-African phase responsible for the emplacement of the quartzo-carbonated structure oriented ~N5°, seat of the mineralization with a variable dip.

Microscopic examination of the facies has made it possible to specify the nature and the texture of the rocks and shows the existence of serpentinites of meshed and reticulated texture, quartz diorites, green rocks (dacites) and PIII lavas which are andesites and ignimbritic andesites.

The metallographic study of mineralization revealed a paragenesis composed of löllingite and chalcopyrite as primary minerals, covellite as a secondary stage, malachite, azurite and hematite as oxidation minerals.

Geochemical analyses of the samples showed a polymetallic character of the mineralization, of which cobalt (0.19%), arsenic (3.12%), iron (3.36%) and copper (2.9%) are the major constituents.

The geochemical maps made, allowed us to highlight several mineralized zones: (1) a zone mineralized in Co (löllingite), it is the SE contact of the quartzo-carbonate case with the serpentinites, (2) a copper mineralized zone, this is a PIII lavas intraluminal shear corridor PIII and serpentinite located in the center of the study area, (3) a hematite mineralized zone represented by intra-green rock quartz veins (dacite).

**Key words:** Cobalt, Cartography, El-Gir deposit, Bou Azzer El Graâra inlier, Central Anti-Atlas