NEW GOLD-BEARING OCCURRENCE IN THE MINING DISTRICT OF BOU AZZER, CENTRAL ANTI-ATLAS, MOROCCO

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The buttonhole of Bou Azzer-El Graara (central Anti-Atlas), is known for its various types of mineralizations, of which the most significant are the cobalt layer of Bou Azzer and the copper layer of Bleida. Recently, in collaboration with prospection partners led by the group ONA (Réminex Exploration, and CTT), we have found a gold bearing index located at South-East Aït Ahmane (F51 layer), enclosed in serpentinites of the lower PII.

The rocks hosting the mineralization are composed of listvénites, or of seams of calcite associated with tremolite, chlorite and quartz. The layering of the listvénites characteristic of the deposit reflects an alternation of slightly deformed clear calcite beds with dark beds rich in opaques and chlorite in strongly deformed calcite. The ore-bearing paragenesis consists of minerals of Au, Ni, Co, As, Cu and Fe. Trapping of the nobles metals occurred during two events. The earlier event is associated with the layering in the listvénites; the second occurred after the development of the layering and is associated with the brecciated facies or with calcite-filled fractures.

Two types of gold-bearing mineralizations were thus distinguished: (i) The first type is related to the ribboned facies of the listvénites and is associated with nickéline, rammelsbergite and annabergite. The latter phase results from from oxidation of nickéline and rammelsbergite. This oxidation released the gold in the annabergite. Various sulphides including chalcopyrite, covellite, sphalerite and pyrite are also associated with this first stage. (ii) The second type, found at the bottom and in the galleries, is associated with the brecciated facies that fills the faults oriented N120-60°NE. In this context, gold appears as free grains of electrum (with 20 to 30% Ag), 10 to 25 µm in diameter; the gangue, of a carbonated nature, consists of calcite, dolomite, actinote, chlorite and quartz. In this second type of mineralization, the gold is associated with a primarily cobaltiferous metal paragenesis composed of skutterudite, löllingite, safflorite, erythrite associated with tchalcopyrite, pyrite, hematite, and annabergite. Intense hydrothermal circulation has affected these zones which are rich in oxidation products.

The first type of gold, associated with annabergite and with primary metal phases (nickeline, rammelsbergite) within the ribboned carbonate, shows characteristics typical of primary phases; on the other hand the second type, which is present in the forms of sometimes globular losanges or rectangles, and is located near microfissures in the gangue, is regarded as secondary.

The frequent deterioration of nickeline and rammelsbergite gives rise to crystals of annabergite. The detection of this mineral on the ground is relatively simple thanks to its characteristic apple-green color. Because of this fact it could serve as an important prospecting tool for locating potential gold-bearing zones.