The Sarhlef and Bir N'has Pb-Zn veins, Central Jebilet, Morocco: mineralogy and ore fluid comparison

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The Sarhlef and Bir N'has Pb-Zn veins are located approximately at 35 kilometers north of Marrakesh city in the central part of the Jebilet Paleozoic massif, Morocco. The distance between the two deposits is around 12 km. The Sarhlef and Bir N'Has veins have metric extension, their general orientation is E-W and their infillings are dominated by quartz ± carbonates (Huvelin, 1977) [1].

The mineralogical study has shown two deposition stages:

- Stage 1 is characterized at Sarhlef by feathery quartz, siderite and microcrystalline quartz, containing small amounts of arsenopyrite and pyrite while only feathery quartz and sphalerite deposited during stage 1 at Bir N'Has,.

- Stage 2 is characterized by the deposition of dolomite-calcite and barite assemblage followed by sphalerite (Ge content around 370 ppm) and then chalcopyrite, galena (Sb: 3600 ppm) and ankerite at Sarhlef. Mosaic quartz, ankerite, chalcopyrite and galena (1400 ppm Sb) deposited during stage 2 at Bir N'Has. Thus, Sarhlef shows a richer mineral paragenesis and is characterized by the presence of abundant barite which is not recognized at Bir N'Has.

Fluids associated with galena-chalcopyrite mineralization at Sarhlef and Bir N'Has are brines with salinities from 19 to 23 wt % eq. NaCl and Th from 80 to 200°C (mode: 110-120°C). Sphalerite which crystallized before galena-chalcopyrite assemblage at Sarhlef and Bir N'Has is overprinted by Pb-Cu brines. Consequently, Zn ore fluid is not identified.

Similarities in vein orientation, mineralogical assemblages and ore brines suggest that the two deposits belong to the same hydrothermal mineralizing event characterized by the circulation of high salinity and low temperature brines. Huvelin (1977) [1] attributed Sarhlef, Bir N'Has and several other E-W base metal veins in the Central Jebilet to the same major event, in agreement with our conclusions. This major event corresponds to the pre-Atlasic to Atlasic extension related to the Central Atlantic opening (according to Huvelin, 1977 [1]), and associated fluid flows.

[1] Huvelin P. (1977): Notes Mém. Serv. Géol. Maroc, No 232 bis.