Gold-sulfide mineralization and microthermometry in quartz veins/veinlets in the Gharehchay area, south of Tikmehdash, East-Azarbaidjan province

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Abstract: The gold-bearing prospect area at Gharehchay is located in about 2 km south of Tikmehdash, East-Azarbaidjan, NW Iran. The host rocks of the gold-bearing quartz veins/veinlets are principally Eocene andesites and upper Eocene-Oligocene felsic intrusive body (granite to alkali granite). Wall rocks alteration haloes developed around the veins/veinlets are mainly of silicic, phyllic, phyllic-argillic, and propylitic types. The sulfide and gold mineralization in the study area occurred as vein/veinlet, stockwork, and open-space filling. The hypogene opaque minerals are chiefly pyrite, chalcopyrite, and gold which were overprinted by supergene mineral assemblages like Fe-oxides/hydroxides (goethite, jarosite, and hematite), copper carbonates (malachite and azurite), and secondary copper sulfides (covellite and chalcocite). The quartz crystals within the veins/veinlets show typically brecciated, crustification, comb, and vuggy textures. Based upon the microthermometric analyses, the Th and salinity values of the studied fluid inclusions vary from 200ºC to 340ºC and from 6.2 to 11.7 wt% NaCl eq., respectively. The fluid inclusion data along with the presence of hydrothermal breccias in the quartz veins/veinlets show that both boiling and simple cooling were the important factors in precipitation of sulfide and gold minerals at Gharehchay. Both sulfide and chloride complexing ligands played significant role in transporting of the ore metals. According to the data obtained from fluid inclusions, mineralogy, and textures of the ore and gangue minerals in the quartz veins/veinlets, the sulfide and gold mineralization at Gharehchay can be reckoned as low-sulfidation epithermal type.

Keywords: Gold-sulfide mineralization; Quartz veins/veinlets; Low-sulfidation; Microthermometry; Epithermal; Tikmehdash.

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