Ore Geology and Minerals Chemistry Evidences on Genesis of the Muteh Gold Deposit (W. Iran)—A Intrusion Related Gold System

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Abstract
The Muteh gold deposit, located in the center of Sanandaj-Sirjan zone (SSZ), western Iran, is related to series of quartz and quartz–sulfide veins, lenses and veinlets, along a NW-SE trending shear zone, cutting the Neoproterozoic crystalline basement rocks. In the study area, numerous but small gold occurrences are generally related to auriferous quartz veins commonly associated with brittle–ductile shear zones and clearly postdating the greenschist-amphibolite facies regional metamorphism. Gold mineralization is closely associated with intense hydrothermal alteration along the ductile shear zones, with a typical greenschist facies alteration assemblage of quartz+ sericite+chlorite+albite and sulfidation-silicification alteration zone adjacent to orebody. Ore mineralogy includes pyrite, chalcopyrite and subordinate empléctite (Cu-Bi sulfide), arsenopyrite, pyrrhotite, bismuth, galena, spheleite and gold. Native gold occurs in the quartz veins and adjacent wallrocks as inclusions in second generation of pyrite and chalcopyrite and fracture fillings within or around euhedral to subhedral coarse pyrite. While most aforementioned characteristics of the genesis of Muteh mine are consistent with classification as an orogenic gold deposit, but the features such as genetic linkage between tectonic evolution of lithospheric mantle through upper crust with the tectono-magmatic history of Sanandaj-Sirjan zone (SSZ) accompanied with extensional structure setting, and possibly local intrusions emplaced during the late stages of the Zagros orogeny (late Cretaceous to Tertiary) and such evidences ore geology style, alteration assemblages and mineral chemistry characteristics probably indicate that the Muteh deposit can be favored as an intrusion-related gold deposit define by Hart et al., (2000) and Lang and Baker, (2001).