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Investigation of mineralogy and geothermometry of quartz and tourmaline veins at the Baghu area, southeast of Damghan

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Abstract: The Baghuo gold mine (Kuhzar) is located about 100 km S-SE of Damghan. The area is part of Torud- Chahshirin volcano- plutonic belt. The hosts of quartz – tourmaline veins are mainly granite, granodiorite and volcanic rocks such as andesite and dacite. Mineralization occurs as a copper- gold bearing silica vein. Quartz, pyrite, chalcopyrite, gold, hematite, malachite, azurite, covellite and Fe- hydroxides ore are main constituents of mineralized veins. Gold grains with <50 μm in diameter commonly occurr within quartz grains. Based on petrography studies, six types of fluid inclusions in quartz were distinguished: (1) monophase liquid inclusions; (2) monophase vapor inclusions (3) two- phase inclusions of liquid-rich; (4) two- phase inclusions of vapor-rich; (5) three- phase halite-bearing inclusions; (6) poly-phase inclusions. Fluid inclusion studies show homogenization temperatures ranging from 250 to 400 °C with salinities from 4 to 30 wt% equivalent NaCl. Data shows that the evolution of mineralizing fluid occurred at a depth of more than 600 m below the surface and pressure about 100 bar. Evidences suggest that Baghu area mineralization may have occurred at the epithermal condition related to a porphyry system.

Keywords: *quartz-tourmaline veins; fluid inclusions; goldmine; Baghuo; Damghan.*

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