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Epithermal antimony mineralization at Arghash District: mineralogy, alteration and geochemistry

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Abstract: The Argash antimony ore deposit is located at south of Neyshabour and the eastern part of the Sabzevar zone. This deposit occurs within a sequence of Eocene-Oligocene volcanic-intrusion rocks. The mineralization occurs as open space filling, taking place as irregular veins, veinlets and hydrothermal breccias. The mineralogy of the veins is comparatively simple. The primary antimony-bearing mineral is stibnite. Other sulfides have been found in association with stibnite are pyrite, chalcopyrite and sphalerite. Quartz, illite, adularia, chlorite, epidote and kaolinite are the main hydrothermalg gangue minerals occurring around the veins. Hydrothermal alteration is zoned around the veins and consists of three major types including silicification within the immediate veins, argillic alteration enveloping the veins, and propylitic alteration distal to the veins. The intensity of silicification and argillic alteration decreases with depth and away from the veins. The evaluation of the geochemical data set based on multivariate statistical analyses indicates positive correlation between Zn, Ag, As and Sb and the same distribution pattern of these elements in the boreholes. The mineralogic, alteration and geochemical characteristics of the studied area and comparison with epithermal ore deposits indicate that the Arghash quartz-antimony veins represent an epithermal system of the low-sulfidation type. This data suggests that boiling and cooling were the main ore deposition processes in the area.

Keywords: *Epithermal; Alteration; Stibnite; Cooling; Boiling; Arghash.*

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