Study of Au±Cu mineralization of Jalambadan area (NW Sabzavar) based on mineralogy of alteration and mineralization zones, and geochemistry

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Abstract: Jalambadan mineralization is located in northwest of Sabzevar, Khorasan Razavi Province, and in the southwestern Quchan-Sabzevar magmatic arc. Geology of the area consists of Eocene andesitic to trachyandesitic volcanic rocks, which are intruded by monzodioritic to dioritic subvolcanic units. Mineralization occurs in intrusive rocks and surrounded volcanic units as disseminated. Pyrite is the main primary mineral and malachite, hematite, goethite, and limonite are the secondary minerals. Well alteration developed in this area and the mineralogy of them consist of quartz, sericite, kaolinite, chloride, epidote, and calcite. Gold anomaly is between 0.018 to up to 2 ppm and copper content is maximum 509 ppm, especially at eastern half of the area. Monzodioritic to dioritic intrusive rocks had major role in mineralization. The texture of intrusions is porphyry and plagioclase, pyroxene, and hornblende are the common minerals. Geochemically, the intrusions are calc-alkaline I-type granitoids, which are formed in subduction zone from partial melting (7 to 15%) of spinel lherzolite. Based on tectonic setting, geology, type and development of alteration and mineralization, and geochemical anomaly, Jalmbadan occurrence is porphyry Au±Cu mineralization.

Keywords: Alteration; porphyry Au±Cu; I-type granitoid; Subduction zone; Quchan-Sabzevar magmatic arc.

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