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Mineralization related to Alvand pluton in the Hamadan, western Iran

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The Alvand (Hamadan) plutonic batholith is one of the largest plutonic bodies in the Sanandaj-Sirjan metamorphic belt. This complex is consist of mafic part (gabbro-diorite-tonalite), intermediate (granite-granodiorite porphyroids), and hololeucocratic granitoids. Previous studies have shown that S-type granite-granodiorites are mostly peraluminous and calc-alkaline; the gabbro-diorite-tonalite suite is mostly metaluminous and tholeiitic to calc-alkaline (Sepahi, 2008). High initial 87Sr-86Sr ratios (0.7081 to 0.7115), low epsilon Nd values (-1.0 to -3.3), and peraluminous character reflects a different origin for the granites, possibly crustal sources (Ghalamghash et al, 2007). Aplite-pegmatite dikes are intruded in granitoide rocks, metamorphic rocks and the contact of Alvand granite with metamorphic rocks. The contact of Alvand granite with metamorphic rocks is sharp.

By using heavy mineral studies on the alluvium of Alvand complex, it is recognized 28 minerals amongst Scheelite, Cassiterite, Ilmenite, Zircon and Garnet. Different geostatistical studies such as variant, bivariant and multivariant studies have been done on rough data of heavy minerals. They showed normal concentration of gold in studied rocks and low enrichment of tin and tungsten.

The index of the ore elements average, frequeney distribution criteria of elements, the ratio of elements index and multielements show that Alvand granite is barren. Mineralography studies did not recognized any tin and tungsten minerals. The grains of gold was recognized in some of the microscopic thin sections. Calcopyrotite is the most important ore mineral that is accompanied with oxides and iron carbonates.

The contacts of aplite-pegmatite dikes with granitoide rocks mostly are not prolific. For recognizing Scheelite, some samples of rocks studied by ultraviolet and few Scheelite is recognized in the samples. Some alteration zone observed in this area but they are not accompany with main mineralization. Although the expanded turmalinization has occurred but it is not seen any mineralization.

Unless some small part of Alvand complex (i.e. stibnite in the Faghireh area, Maniijou and Aliani, 2000) and based on the main geochemical index, Alvand granitod pluton is classified as a barren type granite.

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