

Mineral chemistry and temperature condition investigations of the Sarvian Iron ore deposit (Markazi province, Delijan city).

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Abstract: The Sarvian magnetitic skarn deposit has been formed due to the granodiorite injection into the oligomiocene limestones. It is a calcic skarn deposit with dominated exoskarn section. Garnet and pyroxene are two coupled indicator minerals that have been formed by Mg-Si-Fe-bearing fluid remained from magma crystallization. These minerals are observed extensively in the metasomatic haloes in the country rocks and could be used to determine the conditions of temperature and pressure that have been governed on skarnization. It is revealed from microprobe analysis that the garnets in the Sarvian deposit are of the grossular-andradite type that are enriched in Fe & Ca, and depleted in Mg & Mn. These garnets show a sharp zoning structure. The distributions of MnO, CaO, Al₂O₃ and FeO in the zoned garnets indicate that from the core to rim, their composition changes gradually from grossular to andradite. The composition of the garnets and pyroxenes in the Sarvian ore deposit is compatible with the Fe-skarn deposits. Pyroxenes in the Sarvian ore deposit are of Ca-riched diopsid-hedenbergite type. During the prograde stage in which the anhydrous minerals such as garnets and pyroxenes were formed, the temperatures are comparable with albite-epidote and hornblende-hornfelse facieses. According to the temperatures of the garnet-clinopyroxene minerals formation, the temperatures of prograde stage have been determined between 370-500 °C. On the other hand, the results of fluid inclusion studies on quartz grains obtained from mineralized veins suggest that the temperatures during the iron mineralization in the retrograde stage of skarnization have been 400-380 °C.

Keywords: *skarn; Sarvian; garnet; pyroxene; fluid inclusion.*

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