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Mineralization study on Iron deposits from Dehbid area, Fars province, South Iran: Geochemical and mineralogical data

mohamadali rajabzadeh (1) and soqra rasti (2)

(1) Assistant Professor of department earth science shiraz university, shiraz, iran (rajabzad@geology.susc.ac.ir), (2) MSc student of department earth science shiraz university, shiraz, iran (azam.rasti@yahoo.com)

The Dehbid iron deposits are located at about 176 Km northeast of Shiraz (the capital of Fars province), in the northeast Zagros orogenic belt, Sanandaj-Sirjan zone. The deposits are hosted by metasedimentary rocks of late Paleozoic (Permian) and silicified dolomite of early Mesozoic (Teriass). In the Dehbid area mineralization is lithologically and structurally controlled. The mineralized zones appear as veins with maximum 15m width and 200m length within silicified brown dolomite trending northwest-southeast parallel to Zagros orogenic belt. The contact between ores and host rocks is distinctive. Mineralogical studies show that the ores are dominated by magnetite. Hematite, goethite, specularite and martite occurred as minor phases. Gangue minerals include quartz, dolomite and minor feldspar. Rare sulfides (generally pyrite and chalcopyrite) are also present. Fe_2O_3in mineralized rocks varies between 38 to 73 wt% and mineralogical analyses indicate that Co and Ni substitute for Fe^{+2} in magnetite lattice. Co/Ni ratio is used as genetic indicator for iron deposits. Chemical data on 16 ore samples of Dehbid iron rocks show the average 23.4 and 15.6 ppm for Co and Ni respectively. Co/Ni ratio decreases during magma differentiation and the hydrothermal iron deposits show the Co/Ni ratios (0.2-7). In the study area the ratio ranges 0.17 to 5.3 with on average 3.6 that characterizes hydrothermal origin of magnetite. The P_2O_5 content is also typically low that supports the hydrothermal origin of mineralization; it increases from mineralized zones (2.6-233 ppm) to host rocks (30-974 ppm). The high MnO content in some samples of ore minerals also reflects that Mn^{+2} is substitutive for Fe^{+2} in magnetite. The Cu content in ores varies from 9-4380 ppm. The high K_2O and relatively Na_2O contents in the samples just near the ores - host rocks contact show an immature potassic alteration which indicated by minor K-feldespar in the altered zones. Temperature and pressure diminutions have a significant role in precipitation of magnetite in these veins.

Keywords: magnetite, Dehbid, hydrothermal, iron deposits.