Geophysical Research Abstracts,
Vol. 11, EGU2009-291-5, 2009
EGU General Assembly 2009

Metasomatic- hydrothermal processes in the Qatruyeh area, Iran: Mineralogy and trace elements geochemistry of metasedimentary rock-hosted iron indices

M.A. Rajabzadeh and S. Asadi

Shiraz University, Sciences, Earth Sciences, Shiraz, Islamic Republic Of Iran (geosinaa@gmail.com)

The Qatruyeh iron indices are located at about 40 Km northeast of Neyriz, in the eastern edge of the HP-LT Sanandaj-Sirjan metamorphic belt, Zagros Mountain. Qatruyeh indices are contained within the metasedimentary rocks of the Late Proterozoic- early Paleozoic, which consists predominantly of dolomitic limestone, greenschist and quartzite. Field investigations, mineralogical studies and XRD analyses indicate that orebodies are dominated by magnetite. The structures of orebodies are mainly formed as thin layers and massive, which are located between dolomitic limestones and greenschists. Tourmaline, muscovite, chlorite, talc, martite, specularite, goethite, limonite, pyrite and chalcopyrite are present as minor minerals. The area has experienced two different stages of metasomatic- hydrothermal alterations. The iron ores were formed during the metasomatic- hydrothermal processes. Those processes are: (1) Na-Ca alteration and (2) mineralization (Oxidation-Sulfidation). The first stage of alteration follows the attainment of peak regional metamorphic condition (187$\pm$ 2.6 Ma based on zircon SHRIMP U- Pb). This alteration is accompanied with Low-grade magnetite ores formation (50 % Fe2O3t), replacement textures, gradual transformation between layered ores and host rock. Wet chemistry analyses on magnetite shows that Na-Ca alteration caused increasing Cr and Cu as transition metals and Ni, Co and V were depleted. Metasedimentary rock-hosted iron deposits indicate that Na-Ca alteration increase Cu, Ni, Cr, Co, Zn as immobile elements and Na-Fe, whereas the LILE (Pb, Sr) were depleted. The formation of paragonite-tourmaline is also occurs as a part of iron deposition process in the stage. The second stage of metasomatic- hydrothermal alteration is accompanied with widespread veins and veinlets of High-grade magnetite (75 % Fe2O3t) - hematite-Quartz. Mineralization took place along host rock fractures with passage of saline, hot and oxidized aqueous fluids. Paragonite altered to muscovite in the host-rocks and ores in the stage. Sulfide replacement is generally occurred as a late stage phase.