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Petrography, mineralization and mineral explorations in the Zendan salt dome (Hara), Bandar Lengeh

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Introduction

The Zendan salt dome is located at 80 Km north of Bandar-Lengeh and 110 Km west of Bandar-Khamir cities in the Hormozgan province. Based on the structural geology of Iran, the Zendan salt dome is placed in the southeastern part of the Zagros zone (Stocklin, 1968). Important units in this area are Hormuz, Mishan, Aghajari and Bakhtiari formations with the Precambrian age (Alian and Bazamad, 2014). The Hormuz formation with the four members of H1, H2, H3, and H4 is the oldest formation (Ahmadzadeh Heravi et al., 1991). Basalt and diabase rocks are mostly rocks that are exposed in the Zendan salt dome. Magnetite and hematite iron mineralization happened in all the building rocks of salt dome, and is not a uniform mineralization. Iron mineralization contains hematite, spicularite, magnetite, goethite, and iron hydroxides. Magnetite-hematite-oligist layers (red soil) are the most iron mineralization in the Zendan salt dome, which are usually broken and scattered with gypsum layers (mostly anhydrite), respectively. Another form of iron mineralization is a mixture of hematite and magnetite (about 10 to 15%) in diabase rocks. Copper mineralization consists of pyrite and chalcopyrite minerals that are mostly in tuff and shale units. The presence of low immobile trace elements in the Zendan salt dome and type of alteration shows that maybe the origin of this iron is deposited from brine fluid. Therefore, this deposit can be classified into VMS deposits.

Materials and methods

We have taken 60 samples rocks from the Zendan salt dome, and then prepared 20 thin and polished sections. Petrographic studies were done and 9 samples were selected for analysis. These samples were sent to the Zarzma laboratory and the amount of FeO was determined by the wet chemical method and other amounts of oxides were determined by XRF. Six samples were analyzed for determining the major elements with the XRF method in the Binalood laboratory. Nine samples from vines mineralization were sent to the Zarzma laboratory and were analyzed with Inductively Coupled Plasma (ICP-OES). Two samples of igneous rocks were analyzed for determining major, minor and trace elements with ICP in Zarzma laboratory.

Discussion

Magmatic and evaporate fluids are sources of hydrothermal iron mineralization (Barton and Johnson, 2004). Sodic-calcic, semi sub deep pottasic, low silicific and sericitic alterations are related to magmatic fluids (Barton and Johnson, 2004). In the Zendan salt dome it seems that plutonic rocks prepared the source of temperature and made brine liquids evaporate and then moved the metals. Sodic alteration is one of the frequency alterations in the hydrothermal iron deposits related to high brain liquids (Arencibia and Clark, 1996). Immobile elements such as Ni, P and V show a high amount of magmatic iron deposit (Nystrom and Henriquiz, 1994). There is a

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significant relationship between the amount of Fe and the frequency elements. With an increase in the Fe content, the amount of TiO_2, K_2O, SiO_2 and Al_2O_3 oxides decrease and the amounts of Ni and Cr_2O_3 increase. Low immobile elements' contents and alteration type in the Zendan salt dome show the iron mineralization effect of brines fluids. On the other hand, this deposit can be classified into VMS deposits.

Results

Iron mineralization in Zendan salt dome is often magnetite, hematite, pyrite and chalcopyrite. Iron mineralization in the Zendan salt dome consists mostly of hematite, limonite and oligist (red soil) layers. They are usually found as scattered discontinuous layers and are alternated with gypsum layers. Hematite is the most abundant and dominant. There is a significant relationship between the amount of Fe and frequency elements. With increasing the Fe content, the amounts of TiO_2, K_2O, SiO_2 and Al_2O_3 oxides decrease and the amounts of Ni and Cr_2O_3 increase . Low immobile elements' contents and alteration type in the Zendan salt dome shows the iron mineralization effect on brines fluids. On the other hand, this deposit can be classified into the VMS deposits.

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