Geochemistry, petrogenesis and mineralization of Namen plutonic rocks, SW of Sabzevar zone

S.A. Mazhari¹, V. Mojtahedifar², A. Jafarian²

1. Department of Geology, Payame Noor University, 19395-4697 Tehran, Iran
2. Department of Geology, Islamic Azad University, Shahrood Branch, Iran

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Abstract: Namen pluton is located in the SW of Sabzevar Zone and is composed of three different phases include two granitoid units and a basic phase. Namen syeno-granites (SG unit) are high temperature magmas enriched in HFSE such as Ga, Nb, Ta and Zr; and classified as aluminous A-type granitoids. This magmatic phase has been generated by partial melting of felsic rocks. The main phase of Namen pluton (BG unit) contains assemblage of various granitoids (granodiorite, quartz monzodiorite, quartz diorite). This phase shows I-type granitoid characteristics and has been yielded by amphibolite melting in the lower crust. Mafic rocks consist of hornblende gabbros which have cumulative texture of amphibole and plagioclase. There are diffused and circular patches of magnetite ore in some sections of gabbroic occurrences. Magnetite-hosted hornblende gabbros (MHB) are enriched of V, Cr, Co, Cu, Zn and Ca and depleted from incompatible elements of LILE and HFSE relative to other gabbros (HB). The separation of volatile phases during the gabbroic magma evolution has led to the segregation of primary magma. Finally, the F- P and H₂O-S enriched parts of this fractionated magma have formed HB and MHB rocks, respectively.

Keywords: Geochemistry, petrology, magnetite, Namen pluton, Sabzevar zone

* Corresponding author, Tel: 05144642012, fax: 05144657531, Email: ali54894@yahoo.com