Petrology, geochemistry and petrogenesis of Malek Siah Kuh igneous complex (north of Zahedan) With a view to the tectonomagmatic position of the region

M. Javan Khoshkholq¹, M. A. Arian*¹, M. Razmara², H. Sheikhi Karizaki¹

¹- Department of Geology, Faculty of Science, North Tehran Branch, Islamic Azad University, Tehran, Iran
²- Department of Geology, Faculty of Science, Ferdowsi university of Mashhad, Mashhad, Iran
(Received: 24/8/2019, in revised form: 8/12/2019)

Abstract: The Malek Siah Kuh igneous complex is located about 35 km north of Zahedan and among the villages of Lar down, Qarqoruk and Horamak. According to the results of rock naming diagrams, the volcanic rocks of Malek Siah Kuh complex have a combination of basaltic andesitic and trachyandesitic and its plutonic rocks show a combination of granodiorite and diorite. Using field studies and lithological studies, it was possible to prepare a lithological map of the area. The most important minerals in the igneous rocks of the region are plagioclase, amphibole, clinopyroxene, quartz and alkali feldspar. In terms of magmatic series, the igneous rocks of the region show the characteristics of sub-alkaline from calc-alkaline to shoshonitic. Most of the rocks in the area are enriched with LILE and LREE and depleted of HFSE and HREE. These properties of depletion and enrichment in the above elements in the rocks of the region are compatible with the geodynamic environment including subduction zone magmatism. The intrusive masses show the characteristics of type I, metaaluminous and magnesian granites and Cordillera type granites. Determining the characteristics of the origin of the mother magma based on the rare and rare earth elements of the samples of the region shows that these rocks are obtained from partial melting of a mantle of origin with the composition of lherzolite spinel. The studied masses are located in the tectonic environment diagrams in the arc range of the continental active margin type with normal arc characteristics.

Keywords: Differentiation; Subduction Zone; Malek siah kuh Complex; Assimilation.