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Geochemistry and physico-chemical conditions of formation of Varcheh Gabbroic Pluton (Markazie Province)

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Abstract: Varcheh gabbroic pluton is located in Markazi Province and is part of the Sanandaj-Sirjan zone. This pluton is gabbro to monzo-gabbro of alkaline nature. Based on condrite normalized spider diagrams, the REE pattern displays enrichment of LREE (100 times) and HREE (10 times). In addition, based on primitive mantle normalized spider diagrams, they display enrichment of HFS elements (Zr, Ti, P). Absence of negative anomaly of Nb is due to alkaline nature. Behavior of Zr, Nb, Yb, La, and Sm elements show that the primary magma is derived from enriched mantle by the partial melting of 10%-15% of the spinel - garnet lherzolite, respectively. This magmatism can be related to deep faults and crustal thickening by the Neotethys subduction. The Plagioclase composition in gabbroic pluton is in the range of oligoclase to labradorite and clinopyroxene composition is mainly diopside. The clinopyroxene composition shows that they were crystallized from an alkaline magma. On the basis of geothermobarometry, crystallization-temperature of diopside is estimated to be about 1150°C to 1200 °C and crystallization-pressure for the diopside is between 3 - 7 kb.

Keywords: *plagioclase; clinopyeroxene; gabbro; alkaline; Varcheh; Sanandaj-Sirjan Zone.*

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