Application of amphibole and feldspar chemistry in the petrogenetic study of the Middle Miocene granitoid complex, west of Kashan

M. Honarmand¹, N. Rashidnejad Omran¹, M. H. Emami², Gh. Nabatian³

¹- Department of Geology, Tarbiat Modares University, Tehran, Iran
²- Geological Survey of Iran, Tehran, Iran
³- Department of Geology, University of Zanjan, Zanjan, Iran

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Abstract: The Middle Miocene Niyasar granitoid complex is located in west of Kashan and in the Urumieh–Dokhtar magmatic belt. Based on petrographic studies, the Niyasar complex is composed of tonalite, quartz-diorite and diorite intrusive rocks. These rocks are mainly composed of quartz, plagioclase, amphibole, biotite and K-feldspar. The amphiboles belong to calcic group and vary in composition from magnesiohornblende to actinolite which is an indicative of I-type granitoids. The composition of plagioclase ranges from oligoclase to bytownite in the tonalites, albite to andesine in the quartz-diorite and oligoclase to bytownite in the diorites. Barometric studies exhibit that the hornblende pressure crystallization was 1-2 Kbar which is equivalent to 3.8-7.5 Km depth of crystallization. Hornblende-plagioclase and feldspar thermometry in the Niyasar complex show 706-756 °C as equilibrium temperature of minerals. Oxygen fugacity estimation, suggests that the Niyasar intrusive crystallized from highly oxidized magmas in a convergent boundary setting.

Keywords: mineral chemistry; geothermo-barometry; oxygen fugacity; granitoid; Middle Miocene; Kashan.

*Corresponding author, Tel.: (021) 82884411, Fax: (021) 82884435, E-mail: Rashid@modares.ac.ir