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Mineral chemistry of intrusive rocks of the Gardaneh Ahovan rocks, NE Semnan.

M. KHANEHDAR-KOLVER^{1*}, M. REZAEI-KAHKHAEI¹

¹Department of Petrology and Economic Geology, Faculty of Earth Sciences, University of Shahrood of Technology, Shahrood, Iran (*correspondence: Petrom59@yahoo.com)

The Ahovan area located in 30km NW Semnan, Iran and is a part of Central Alborz structural zone. The area contains intrusive plutons with gabbro, diorite, monzodiorite, granodiorite and granite composition which intruded in volcanic rocks, marl and limestone. The volcanic rocks interbedded with sedimentary rocks which contain fossils from Eocene such as nummulite, Discocyclus, Asellina and Alveolinid. As the plutonic rocks cut the volcanic rocks, they should be younger than middle Eocene. Therefore EPMA data were applied in the present study for determining the precise name of minerals and the physical-chemistry conditions of the magma. The result of clinopyroxene microprobe data represent that they are diopside and augite in composition and crystallized from sub-alkaline magma in $T = 1100-1180$ °C and $P = <2$ to 4kbar. The clinopyroxene data from gabbro and granodiorite were plot below and above the $Fe^{3+}=0$ line, respectively, suggesting clinopyroxene from gabbro were crystallized in lower oxygen fugacity in compare with granodiorite. Based on Ti value in biotite, this mineral was crystallized in 850 °C. Amphibole from the study rocks are edenite and magnesiohastingsite and crystallized in high oxygen fugacity. Thus, the study rocks are related to convergent boundaries. Plagioclase ranged from oligoclase to bytownite in composition and two feldspar thermometers represents cessation of exchange and equilibrium of feldspars at $T = \sim 700$ °C.