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Petrological and geochemical study of Plio-Quaternary volcanic and plutonic rocks in west of Nir (Ardabil Province)

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Abstract: The studied volcanic and pluton rocks are located in west of Nir city in the Ardebil Province and south of Sabalan volcano. Volcanic rocks in the studied area are display basaltic to trachy-andesite composition with microlitic porphyry texture. The main minerals of basalt to trachyandesite rocks are plagioclase, pyroxene and olivine. Bordering to volcanic units, pluton of microgabbroic to microdioritic is exposed. These rocks have a granular texture with essential minerals of plagioclase; pyroxene, olivine and biotite. Multi-element diagrams, normalized to chondrite and primitive mantle, indicates LREE and LILE enrichment and HREE and HFSE depletion such as Ti, Nb and Ta in the studies samples. Based on trace elements ratios diagrams La/Sm vs. La and Zr/Nb vs. La/Yb, parental magmas may have been generated from low degree partial melting of subcontinental mantle source with garnet-lherzolite composition. Post-collisional geotectonic environment of the studied samples and trace element geochemical evidence indicate that produced magma formed from a metasomatic mantle due to ancient subduction.

Keywords: *Plio-Quaternary basalt; Subduction; Metasomatism; Garnet-lherzolite; Ardabil province.*

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