Petrography, mineral chemistry and geochemistry of hornblenditic autholiths and hornblenditic xenoliths from volcanic alkaline rocks from North West of Marand (NW Iran)

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Abstract: Alkaline volcanic rocks of the northwest of Marand with Plio-Quaternary age are located in the northern part of Urumieh-Dokhtar Magmatic Arc. These rocks have a distinct enrichment in LILE and LREE and depletion in HFSE (such as Ta and Nb) and high Ba/Ta and Ba/Nb ratios, which are among the characteristics of subduction zones. The majority of hornblenditic autholiths and hornblenditic xenoliths are placed inside the trachy andesite rocks and the trachy basaltic andesite rocks. These autholiths and xenoliths, which have a cumulate texture, are classified into two groups based on the amount of plagioclase mineral. In Group 1, the amount of plagioclase is less than 10% and contains amphibole and biotite as the main minerals. Considering, contents of Cr and Ni, REE trend shape and the chemical composition of minerals, it seems that the origin of magma for group 1 (hornblenditic autholiths) is the same as magma of host volcanic rocks. In Group 2, the amount of plagioclase is more than 20% and contains amphibole, plagioclase and biotite as the main minerals. The combination of minerals of group 2 are not similar to group 1. Considering, combination of minerals, REE trend shape and contents of REE and contents of incompatible trace elements, it seems that the magma of group 2 (hornblenditic xenoliths) is derived from the mantle metasomatized with less enriched than group 1.

Keywords: Trachy andesite; autholith; xenolith; hornblendite; north west of Maran.