Geochemistry and petrology of analcime-bearing trachy-andesite, Ardeha area, north of Bozghush, NW Iran

A.A. Kamali, A. Ameri, H. Pirooj*, A. Jahangiri, B. Mahmoud Salehi

Department of geology, faculty of natural sciences, Tabriz University, Tabriz-Iran.

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Abstract: The studied volcanic rocks are located in south of Sarab at the northern part of the Bozghoush mountain. The rocks are megaporphyry andesite flows and trachy andesite basalt lavas associated with tuff. In the northern part of the study area these rocks are covered with younger sediments of Quaternary age. These rocks are containing phenocrysts of analcime, olivine, pyroxene and plagioclase. The major textures of these rocks are porphyry with intersertal matrix. According to whole rock analysis of the study area, rocks they are trachy andesite and tephr-phenolite. Also these rocks are high potassic to shoshonitic nature with peraluminous character. Based on textural evidence analcime seems to be primary and formed directly from magma. The rocks of north Bozghoush shows a pronounced enrichment in LILE (Rb, Ba, Tb, U, k). Enrichment of incompatible elements of k and Rb and negative anomaly of Ti and Nb in these rocks are comparable with melts of lower crust. The spider diagrams and REE patterns show that the rocks of the study area are formed from the same source. Enrichment of incompatible elements can be related to mantle metasomatism or contamination of continental crust. In this regards negative anomaly of Ta, Nb and Tb (TNT) and also with respect of eventual Neo-Thetys subduction in this area and most probably enrichment of incompatible elements indicates effects of subduction on mantle sources. According to REE investigation most probably the main source of these rocks were phlogopite-bearing garnet lherzolite, with partial melting rate of 4-6 percent, at a pressure of 30-35 Kb and the depth of 90-100 Km.

Keywords: Bozghush; trachy-andesitse; analcime; shoshonitic; garnet lherzolite.