

Mineralogy, geochemistry and petrogenesis of protolith of amphibolites from the North east of Yan-Cheshmeh, South east of Zayandeh-rud lake

S.M. Hosseini¹, A. Davoudian Dehkordi*¹, N. Shabanian Borojeni¹, H. Azizi²

1- Faculty of Natural Resources and Earth Sciences, Shahrekord University, Shahrekord, Iran

2- Mining Department, Faculty of Engineering, University of Kurdistan, Sanandaj, Iran

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Abstract: Amphibolite rocks with mylonitic texture exposed in the NE of Yan-Cheshmeh village (SE of Zayandeh-Rud Lake). Mineralogy of rocks include amphibole, plagioclase, quartz, rutile, clinozoisite, chlorite, titanite, biotite and opaque. Amphiboles are seen as fish. Basic igneous rocks are protolith of the amphibolites that have subalkaline nature. Ni (299-370 ppm), Cr (1169-1900 ppm) and SiO₂ (44.91-49.20 %Wt) contents highly resemble to unfractionation magmas. Chondrite normalized REE patterns exhibit pronounced LREE enrichment relative to HREE without Eu anomaly. Low TiO₂, Zr, P₂O₅ and Nb/Y contents with enrichment of LREE and negative Nb anomaly are pronounced characters of continental flood tholeiitic basalt within plate magmatism. Tholeiitic affinities, low values of alkali elements, high MgO, FeO, Cr and Ni contents suggest high partial melting in an extensional setting of continental within-plate with rapid decrease in pressure, resulting in high rate of partial melting and quick uplift which are effective factors for the formation of basaltic protolith of the amphibolites.

Keywords: Geochemistry; within-plate basalts; amphibolite; Yan Cheshmeh.

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*Corresponding author, Tel: 09131812808, Fax: (038)32324423, Email: alireza.davoudian@gmail.com