Petrogenesis of pillow lavas based on mineralogical and geochemical data in the eastern part of Sabzevar ophiolite

Z. Rezaei¹, M. Noghreyan*¹, E. Saccani²

1- Department of Geology, Faculty of Sciences, University of Isfahan, Isfahan, Iran
2- Department of Physics and Earth Sciences, University of Ferrara, Ferrara, Italy
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Abstract: Sabzevar ophiolitic pillow lavas contain variolitic, porphyritic with microlitic matrix, intersertal and amygdaloidal textures and include plagioclase, clinopyroxene (augite-diopside), olivine, amphibole (magnesiohastingsite) and opaque minerals. The chemical composition of clinopyroxenes show a calc-alkaline magmatic series and a tectonic environment within plate alkaline basalts. Geochemically, these rocks are divided into two groups. Group 1 is basically calc-alkaline andesite with low TiO₂ and group 2 is alkali basalt with high TiO₂. N-MORB normalized trace elements diagram shows that group 1 is enriched in Th, U, La and depletion in Ta, Nb, Ti and group 2 is enriched in Th, Ta and Nb. Calc-alkaline rocks have produced in a subducted tectonic environment by a continental crust and erupted southwards on the Turan plate. In contrast, alkaline rocks formed within plate oceanic and then tectonically accreted in the forearc setting.

Keywords: Sabzevar ophiolite; pillow lava; mineral chemistry; Mesozoic; northeast Iran.

*Corresponding Author: Tel-fax: 03137932152, Email: moussanoghreyan@yahoo.com