

Petrogenesis and geothermobarometry of mafic and ultramafic igneous rocks in ophiolitic complex of Eastern Birjand

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Abstract: The mafic and ultramafic igneous rocks of the ophiolitic complex in eastern Birjand (between Sulabest in southern part to north of Gazik in northern part) have been studied. According to plot of data on diagrams and the result of mineralogy and geochemistry, gabbros and some peridotites belong to cumulate series of spreading sea floor magma (MORB) where some peridotites are of metamorphic (tectonic) types. Magmatic series of igneous rocks are tholeiitic. Trace elemental patterns similarities on spider diagrams also confirming the relations of these rocks to Mg-rich basaltic magma of MORB type. Geothermobarometry results of some rocks, based on different calibrations, show temperatures of 944°C for gabbros to 1294°C for peridotites. Temperature pressure calculations based on Holland and Powell thermocalc method, indicate, rocks crystallization conditions of 748°C and 17.46 Kb for gabbros to 1282°C and 24.7-33.6Kb for peridotites. Most obtained temperatures, particularly the thermocalc ones, for crystallization conditions of these rocks from an initial Mg-rich magma, MORB type, in spreading sea floor seems to be reasonable.

Keywords: *Ophiolitic complex; mafic and ultramafic igneous rocks; cumulate series; geothermobarometry; Birjand.*

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