



A Preliminary Geological and Geochemical Study of the Sharebabak-Baft Ophiolites, South of Kahduiyeh, Central Iran.

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The Kahduiyeh tectonized Ophiolite of the northern part of Sharebabak-Baft Ophiolite belt is located in the southern margin of the central Iran micro-plate at 53° 45' to 54° 00' E latitude and 31° 00' to 31° 25' N longitude. The mantle sequence of this ophiolite comprised of lherzholite and cpx-bearing harzburgite that are highly serpentinized and are cut across with individual diabase and plagiogranite-tronjemite dikes and pods. The crustal section comprises extensively of high level isotropic and cumulate gabbro with the olivine gabbro, pyroxene gabbro and foliated hornblende-bearing gabbrodiorite compositions. There is no layered gabbro in the crustal sequence. This section is normally and not tectonically transitioned to the diabasic sheeted dikes complex on top of the sequence. These sheeted dikes are oriented in N-S direction with a couple of degrees of inclinations towards either the East or the West and are cut across with wherlitic dikes and intrusions, the small intrusions of quartz diorite to quartz monzodiorite, packets of pegmatitic gabbro, and individual diabase and tronjemite dikes. The microscopic studies of the scarce and fresh peridotites, show kink bands in olivine and deformed pyroxenes which is the characteristics of the mantle peridotites. The sporadic distribution of undeformed pyroxenes as well as the presence of the deformed minerals mentioned above and the crystallization of neoformed olivine in the rim and inside of the deformed orthopyroxenes probably indicates the effect of transiting fluids and their reactions with the primitive peridotites. The extrusive sequence comprises of chert and radiolarite with intercalation of pelagic limestones at base of sequence and hyaloclastic breccia, hyaloclastite, tuff, sheet flow and pillow lava on top of the sequence. In some cases, pelagic limestone and radiolarite have the Upper Cretaceous micro faunas. Rodingite and listvenite are among the metasomatic rocks of this tectonized assemblage. A few dislocated amphibolites and calc-silicate blocks are also exposed. The study of the chemical analysis of different rocks sampled from the crustal sequence as well as the study of chondrite and primitive mantle-normalized spider diagrams show depletion of Nb in all the analysis and depletion of Zr and Ti in some of the analysis. The REE pattern in tronjemite and quartz diorite is inclined. However, the REE pattern in other rock samples that are located in different levels is flat. In the tectonomagmatic diagrams, these rocks are often placed in the regions associated with the volcanic arcs and in some occasions they are plotted in the oceanic basin regions of the diagrams. The wide range of elemental ratios such as Ce/Pb (0.22-3.06), Ba/Th (40-1629), Th/Ta (0.5-9.4), Nb/Ta (2-16.6) could probably be explained by the different degrees of partial melting of the primitive mantle, the various effect of transiting fluids and their reaction with the down going slab in a supra-subduction system. The expose of wherlitic intrusions and the small intrusions of quartz diorite with the petrography and geochemical characters indicate that the Kahduiyeh tectonized Ophiolite display a consistent sequence of events during their formation and evolution, includes birth, youth and maturity stages which is a natural consequence of the Supra-subduction zones.

Keywords: Ophiolite, peridotite, isotope gabbro, crustal sequence, supra-subduction