

Investigation on mineralogy, geochemistry characteristics and Sr-Nd isotopic analysis for volcanic rocks and dikes covered by Miocene sedimentary sequences in the Sker area, NE Baft city in Kerman Province (Urumieh-Dokhtar zone)

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Abstract: Study area is located in Kerman Province and NE Baft city near to Rabor town. This section is in the structural division of Iran classified as Urumieh-Dokhtar magmatic belt which in Kerman area is called- Dahaj-Sarduieh belt that extended parallel to Urumieh-Dokhtar magmatic belt. These rocks comprise of andesite, andesite-basalt, dacite and rarely basalt and trachy-andesite with Eocene age that are associated with ignimbrite and pyroclastic flows. Studied volcanic units and intermediate dikes are covered by sedimentary sequences with N-S and E-W trend. Major minerals in these dikes are plagioclase (as major phenocryst) hornblende and Cpx and common minor minerals are biotite, quartz and opaque. Dominant texture in these rocks is porphyry, however many evidence such as corrosion of plagioclase, sericitization and disequilibrium texture observed. Based on major and minor element geochemical data, these rocks belong to calc-alkaline series and have metalumine trend. According to isotopic analysis and isochrones diagram, age of 45.7 Ma is obtained for study rocks. Based on these diagrams, $^{86}\text{Sr}/^{87}\text{Sr}$ ratio for these units is varied between 0.704759 to 0.705561 and value of $^{144}\text{Nd}/^{143}\text{Nd}$ is between 0.512711 – 0.512823 and ϵNd ranges from 1.68 to 3.82. This data shows a depleted mantle origin for dikes parent magma. Also variation of isotopic ratio in study units in NE Baft revealed an obvious upper crust assimilation which is associated with fractionation crystallization in an open system. Negative Eu anomaly and LREE enrichment more than HREEs and high value of LIL element relate to HFSEs bearing with negative anomaly of Ti, Nb and P demonstrate a subduction of Arabian oceanic crust beneath the Central Iran plate in active continental margin as a major tectonic setting for genesis of study area rocks. According to geochemical and isotopic analysis, these volcanic rocks probably formed from partial melting of mantle wedge that was associated with fluid and sediment derived from oceanic subducting crust that enriched from REEs.

Keywords: volcanic arc; Baft city; calc alkaline trend; subduction zone; assimilation process; Sr-Nd isotopes; Urumieh-Dokhtar belt.

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