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The Hybrid Magma and Mingling in the SW of Daryache-ye-Namak (Aran, Central Iran Zone)

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This area is located in Central Iran zone. The Eocene volcanism in this area is related to the orogeny activities in middle Alpine. The tectonic activities in central Iran indicate most movement in this time. There is some magma mixing evidences in this area. According to basic definitions of some petrologists, mixed magmas that are blended to form a homogeneous composition are termed mixed or hybrid magmas, whereas the term mingling or commingling is used if the magmas are mixed physically, but heterogeneities like banding or enclaves inclusions are present in rocks.

The evidences are including of existence three different glasses (acidic, basic and hybrid glasses) in the matrix of brecciated lavas, plagioclases and pyroxenes with sieve texture, and absorption and corrosion in their rims, existence of basic micropillows in acidic matrix, and mafic minerals with opaque rims. There are some mingling evidences in this area which are result of mixing of hot basic magma into co-magmatic and differentiated acidic magma in the magma chamber. Mingling criteria are: occurrence of disequilibrium textures such as sieved or dusty plagioclase, occurrences of sieved and normal plagioclases in the same sample, reaction rims on mafic minerals, occurrence of heterogeneous plagioclase core and rim compositions, oscillatory zoning in crystals, and of normally and reversely zoned crystals in the same sample.

The geochemistry data also confirm magma mixing in this area. The basic rocks belong to alkaline series, whereas the intermediate and acidic magmas are subalkaline.

They show bimodality in this region.