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Geochemistry and petrogenesis of The Hormuz Formation diabase rocks, Hormozgan province (south Iran)

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Abstract: The Hormuz Formation is a sequence of lithologically various evaporitic–volcanic rocks in salt domes where the volcanic rocks are dominantly acidic, generally with less than one third basic volcanics. It was formed in the Late Proterozoic (640–620 Ma)/Neoproterozoic–Early Cambrian, as a result of sub-basin rifting in the northern part of the Arabian plate, throughout most of the Persian Gulf Basin and the equivalent Ara salt in Oman. Diabase is the most common basic rock of the Hormuz Formation. In the field, the studied diabases are seen as stock-like outcrops and dykes which are extremely altered. These rocks contain plagioclase, pyroxene and less olivine as primary minerals which are transformed to various secondary minerals and the diabases primary textures are ophitic, porphyritic and microlitic flow. 22 samples of these diabases from 7 salt domes of southern Iran were analyzed by XRF and ICP-MS methods and then studied. On geochemical diagrams, these rocks plot in the field of tholeiitic basalts and mid-oceanic ridge basalts (MORB). According to values of major and rare elements, these diabases have undergone fractional crystallization within a magma chamber or en route to the surface. Due to REE pattern and values of these samples, the parental rock of the magma which produced them has experienced intermediate degrees of partial melting and these diabases have undergone low degrees of crustal contamination during magmatic evolution. According to values of rare elements ratios, they were probably generated from a depleted to transitional mantle source derived from a garnet-free, spinel peridotite source region. Therefore, the Hormuz Formation diabases are products of the Neoproterozoic to Early Cambrian rifting of the northern part of the Arabian plate. They have similar chemical compositions as Archean tholeiitic basalts and show all the features of a greenstone but whether or not they are on a Phanerozoic greenstone belt, needs further tectonic studies.

Keywords: *Hormuz Formation; diabase; Arabia plate.*

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