

## Petrography, geochemistry and diagenetic history of the Sefidar Dolomite Member (Upper Trias) in Fars region, south Iran

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Received: 2018/5/22 Accepted: 2018/11/18

### Abstract

Sefidar Dolomite Member (SDM) is one of the Triassic (Norian) lithostratigraphic units in the Zagros Basin that crops out in a few areas in southern Iran. This member consists of medium to thick-bedded, dark brown colored dolomites which form a distinct, feature-forming horizon on the top of the Khaneh Kat Formation (High Zagros carbonates) and Dashtak Formation (evaporite-carbonate facies of the folded Zagros). This paper is a study of the mineralogy, geochemistry and diagenetic history of the SDM outcrops in Kuh-e-Surmeh and Khaneh Kat anticlines in Fars region with a thickness of 30 and 20m respectively. Petrographic features and geochemical evidences of the studied sections indicated that the SDM dolomites were subjected to a complex diagenetic history, resulting to three different dolomite-rock textures including microcrystalline, medium-crystalline and baroque. In the first stage, microcrystalline dolomites were formed in the tidal zone (especially Sabkha) of an eperic platform affected by evaporation and condensation of brines under normal temperature (25-35°C), near surface conditions. Increasing the size and stoichiometry and changes in geochemistry of moderate and coarse-crystalline dolomites suggest the role of diagenetic processes associated with burial, including recrystallization in shallow to deep-subsurface environments. These dolomites are the products of changes in a diagenetic system at a depth of 1 to 3 kilometers inside the earth and at temperatures of 54 to 108°C. Comparison of the changes in the amounts of some minor elements of the SDM including reduction of iron and manganese, and the increase of strontium in samples of Khaneh Kat section indicated the flow of dolomitization fluids from south to north. The major faults of the region such as Mountain Front Fault and High Zagros Fault (HZF) while controlling the geometry of the sedimentary basin, have played a major role in determining the direction of flow and the pathway of the transfer of dolomitization fluids. Despite the significant difference between the facies and the Triassic sedimentary sequences in different sub-areas of Zagros, the SDM has a wide areal extent and can be traced to Lurestan and across the Persian Gulf into Saudi Arabia with similar rock facies. This subject suggests significant changes in the geology of the southern continental shelf of the Neothetys Ocean, especially in the continuity of the basin and stablishing of the same sedimentary conditions in the areas in both sides of the HZF in the middle of the Late Triassic.

**Keywords:** Sefidar Dolomite, Triassic of Zagros, petrology, geochemistry, diagenesis