



Effects of post-depositional processes on the Upper Devonian carbonate rocks in the Kuh-e-Kaftari section, western Central Iran

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A succession of early Frasnian to late Famennian (Upper Devonian), referred to them as Bahram Formation, in the Kuh-e-Kaftari section (western Central Iran) is mainly composed of shallow water carbonates, thick siliciclastics and with interbeds of shale. Petrographic studies along with major, trace and isotopic analysis on matrix, cement and dolomite samples were used to identify different cement types, dolomite types, primary mineralogy, as well as interpreting diagenetic processes and environments. Several cement types in grainstone microfacies, including bladed, blocky, equant and syntaxial, were identified.

The dolomites can be divided into four different types using oxygen and carbon isotopes, elemental and microscopic analysis. Type 1 has the lowest Mg/Ca, highest Sr and highest oxygen and carbon isotope values while type 4 has highest Mg/Ca, lowest Sr and lowest oxygen and carbon isotope values.

Petrographic evidences, elemental and isotope studies revealed that aragonite was the primary carbonate mineral formed during deposition of carbonate rocks. Variations of Sr/Ca and oxygen isotope values versus Mn suggested that diagenetic alteration occurred in an open system in the Upper Devonian carbonate rocks.

Temperature has been calculated based on the oxygen isotope value of the least altered sample. The temperature for early shallow burial fluid was about 35 °C.

Variations in oxygen and carbon isotope values revealed that carbonate of the Bahram Formation have been affected by deep burial diagenetic environment.