



Fracture-filling hydrothermal dolomite in Tertiary limestones, UAE

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Dolomite can form a major fracture-filling mineral in fractured limestone and thereby induces substantial modifications to porosity and permeability of the rocks. Despite that several explanations, were advocated for the crystallization of the dolomite, the topic is still controversial and extensively debated. Among the interesting issues are whether the dolomitization occurs under elevated temperature and/or from solution that can be of meteoric, marine or hydrothermal sources. Occurrence of dolomite have been observed in the the limestone- dominated Rus Formation of Early Eocene (Ypresian, 50-53 Myr) age, located at the north-eastern UAE. The formation occupies the core of Jabal Hafit (average thickness of 180m) without an exposed base, but with an upper boundary that is unconformably underlies the Dammam Formation of Middle Eocene age. The rocks are heavily fractured and faulted by the effects of major orogenic movements in the region. Fracture-filling dolomite crystals of varying sizes partially build up a zone lining the fractures. The dolomite crystallization habit can be tightly packed rhombohedra to saddle type, which in all cases had reduced the fracture porosity. Oxygen isotopic data indicate a possible hydrothermal source for the dolomite which is also supported by the isotopic composition and occurrence of hydrothermal springs along the foothills of Jabal Hafit.