

Dedolomitization of the Jubaila dolomites and dolomitic limestones in central Saudi Arabia.

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The Jubaila formation (Upper Jurassic) in central Saudi Arabia has been divided to lower, middle and upper parts purely on lithologic grounds. Each part consists of a major lower unit of lime mudstone and a minor upper unit of lime grainstone. This persistent change in the limestone facies is interpreted as a reflection of repeated shoaling up in the depositional shelf environment. It is a normal marine carbonate sequence that varies in thickness from 85 – 126 m.

About 49 % of the examined samples of the Jubaila formation dolomites and dolomitic limestones are dedolomitized as it is indicated from the presence of partially or completely calcitized dolomite crystals, the total pseudomorphing of dolomite by calcite and the occurrence of rhombohedral zones of iron oxides which point out to the position of former dolomite crystals in the new fabric of crystalline calcite (dedolomite).

Dedolomitization also occurs in various textural forms which include composite calcite rhombohedra, zonal dedolomitization, regeneration of pre-dolomitization fabric of the limestone , and coarsely crystalline calcite mosaics with or without ferric oxide rhombic zones. Rhombohedral pores commonly occur in intimate association with dolomite, possibly resulting from the leaching of calcitized dolomite rhombohedra. The regional dedolomitization was most likely brought about by calcium sulphate solutions reacting with dolomites. The source of sulphate solutions is the dissolved anhydrite deposits of the Arab – Hith Form Formations, some time before their erosion, and it takes place at or near an exposed surface.