

## The Subis Limestone: Cement type and paradiagenesis

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Subis Limestone consists of basal deep marine limestones and shallow marine reef limestones. The limestone body forms a localized isolated patch reef developed on a shoaling clastic bank.

As in modern reef sediments, the bulk of the carbonate sediments were composed of metastable aragonite and Mg-calcite. Diagenetic changes into various type of stable calcites, occurred at an early stage in the diagenetic history under surface-related physico-chemical conditions. A variety of diagenetic processes and products have been recognized including early marine cementation, meteoric cementation, neomorphism and deep burial cementation. These diagenetic processes are closely related to depositional environment and are characteristic of certain limestone facies. Basically, deep marine facies underwent extensive marine cementation and late burial fracturing, whilst shallow marine facies were affected by marine and minor meteoric diagenesis. Later stage of diagenesis which took place in a deeper burial environment have tightly cemented the sediments and plugged all the remaining pore spaces with late stage calcite cements.

Investigation of the textures and geochemical analyses of the core material suggest the following sequence and products of diagenetic processes:

1) Early marine diagenesis.

This process involved micritization and early marine cementation that was dominated by the formation of fibrous/bladed circumgranular and circumvoid rim cements.

2) Fresh water stabilization.

This process occurred in the shallow marine facies. This involved stabilization of carbonate including dissolution of metastable grains and precipitation of stable calcite cements.

3) Deeper burial diagenesis.

This process took place in a deeper subsurface environment. The diagenetic process was dominated by compaction, infilling of the remaining porosity by sparry calcite, saddle dolomite and poikilotopic calcite, and neomorphism of micrite. The entire process took place in reducing and iron-rich connate water.

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