

DOLOMITISATION HISTORY OF THE SETUL LIMESTONE, NORTHWEST PENINSULAR MALAYSIA

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The Setul Limestone in Northwest Peninsular Malaysia is composed essentially of micritic carbonates rich in pellets, peloids and subordinate fossil remains. Early micritization of the allochemical constituents is fairly extensive and affected mainly crinoid plates, algal fragments and oolites. These carbonates have undergone 3 phases of dolomitization. Dolomite crystals formed from the respective phases have characteristic features. The earliest dolomites are very fine-grained with orangish-red cathodoluminescence. In contrast, the second generation dolomites are several times larger, euhedral, and exhibit zoning, with brownish to opaque-rich cores and clear outer zones. CL of these dolomites pick out at least 3 major zones. The third generation dolomites are composed of large euhedral saddle dolomites, the smaller variety is generally unzoned while the coarser one is zoned. The occurrence of the earliest dolomites in the limestone is pervasive, affecting both allochems and orthochems. The formation of these dolomites is very early and is interpreted to have occurred before the formation of marine calcite cement that lithified the rocks. The formation of the second generation dolomites took place before the limestones have suffered subaerial diagenesis and before the formation of stylolites in the rocks. The occurrence of these dolomites in allochems and orthochems favour the interpretation that they were recrystallized from the earliest fine-grained dolomites. The distribution of saddle dolomites is restricted mainly to late fractures, secondary vugs and stylolites, and must have formed in deep burial conditions. The 3 types of dolomites in the Setul Limestone have also undergone various degrees of dedolomitization. Phases of dedolomitization is related to subaerial diagenesis and to the migration of silica-saturated fluids through the limestones.