

MULTI-PHASE DOLOMITIZATION AND RECRYSTALLIZATION OF MIDDLE TRIASSIC SHALLOW MARINE-PERITIDAL CARBONATES OF SOUTHWEST HUNGARY

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ABSTRACT

Dolomitization of limestone can occur by a number of processes and in a variety of diagenetic environments. Such processes are inferred from the geochemistry of dolomites. However, if the rock is recrystallized, the original geochemical parameters may be reset. The working hypothesis of the proposed study is that the textural, geochemical and crystallographic characteristics of recrystallized dolomites may not indicate the 'original' dolomitization process, but only permit interpretation of subsequent alteration. Dolomitized carbonates represent a large portion of the hydrocarbon reservoirs of the world; therefore, understanding how diagenetic processes affect these geobodies is crucial. Dolomite recrystallization processes are not well understood and are frequently ignored. This may lead to erroneous interpretations and predictions with regard to reservoir quality. Middle Triassic shallow marine-peritidal carbonates of SW Hungary provide a suitable succession to study the formation and alteration of various dolomite types. The main objectives of the study are to discriminate and characterize local dolomitization processes and dolomite recrystallization event(s), and to develop systematic criteria for recognizing recrystallization applicable to dolomite reservoirs worldwide. In the proposed research dolomite textures will be investigated using standard and cathodoluminescence microscopy. The diagenetic fluids will be characterized using fluid inclusion microthermometry, quantitative elemental analysis, stable (oxygen and carbon), radiogenic (strontium), and clumped isotope geochemistry. Crystallographic characteristics of the dolomites will be determined using Rietveld refinement of conventional and synchrotron x-ray, and neutron diffraction data. Understanding how petrographic, crystallographic and geochemical proxies co-vary will enable us to establish a system of criteria for recognizing recrystallization.

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