Dolomitization, Porosity Evolution and Diagenetic History Of Upper Jurassic Reefal Prograding Shelf Sediments, Agadir Basin,Western High Atlas Of Morocco

Brahim Ouajhain[1], Thilo Bechstaedt[2], Rainer Zuehlke[2], Hadou Jabour[3], Kamal Labbassi[1], and Mhamed El Mostaine[3]
[1] Marine Geology Laboratory, Faculty of Science, Dept. of Geology, El Jadida, Morocco
[2] Ruprecht-Karls-University, Geologisch-Palaeontologisches Institut, Heidelberg, Germany
[3] National Office of Hydrcarbon and Mines (ONHYM), 5 Av. Moulay Hassan, B.P.99, 10050, Rabat, Morocco

Upper Jurassic reefal dolostones of a prograding shelfal ramp of the Lalla Oujja Formation, Tidili locality, Imouzzar area, in the Agadir Basin represent an important and promising hydrocarbon reservoirs in western Morocco. Contrasting styles of dolomitization have been identified within the Tidili reefal dolomites . In different localities in the Immouzzer area from east to the west to the south-west (Witn'doun, Ankloute, Tizi Izouaren, Tidili, Aoussir, and Taghrate Ouankrime), these styles vary.

Partly, they seem to be directly related to the paleogeographic setting on ramp/basin transitions, partly to differing diagenetic regimes and essentially sea-level change. Petrographic studies (both TL and CL) reveal that dolomitization is the most important diagenetic feature of the Lalla Oujja Formation carbonates.

Dolomitization, six regionally correlative generations has affected all lithofacies to varying degrees and was the result of several diagenetic events. Sea-level changes and probably also tectonics played an important role in controlling dolomitization, modifying porosity evolution and determining reefal reservoir quality within reefal dolostones.

Diverese cements, pores, mineral assemblages, and diagenetic styles demonstrate several diagenetic processes operated in theTidili area. Microbial boundstones were extensively cemented by marine cements during marine diagenesis. Subsequent vug formation in these boundstones occurred during multiple dissolution phases as indicated by their occlusion by a variety of early marine and burial cements. Fracture cements formed later in the paragenetic sequence. Late diagenetic burial alteration (e.g., dissolution) positively impacts reservoir quality.