

Diagenesis and Reservoir Quality of the Upper Paleocene Succession, Western Dahra Platform, Sirt Basin, Libya

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The Selandian/Thanetian succession in the western Sirt Basin, Libya is mainly composed of carbonates with lesser amounts of shale. They were deposited on a platform-homoclinal ramp with inner, mid and outer ramp facies each with distinctive microfacies, ranging from mud-supported to grain-dominated carbonates. Two phases of dissolution, near-surface and burial, affected the late Paleocene succession. Marine and meteoric cements are minor, but early dolomite is locally developed. Burial compaction is widespread, associated with calcite and dolomite cements. The average $\delta^{13}\text{C}$ values in the Dahra and Zelten/Harash Formations are 2.3‰ and 3.2‰ respectively. Both show no significant change up through the section, which suggests a stable carbon isotope composition of seawater through Selandian/Thanetian time, with little latter diagenetic alteration through organic matter decomposition. On the other hand, the $\delta^{18}\text{O}$ data show more negative values than most signatures reported for the Paleocene; this is largely the result of meteoric water influx and/or burial cementation-neomorphism under increasing temperature this is supported by fluid-inclusion results. The best porosity is recorded in grainstones of the Dahra Formation, whereas the Zelten and Harash Formations have much lower porosity. The highest porosity is developed in bioclastic foraminiferal grainstone, bioclastic foraminiferal packstone-packstone/grainstone facies and less important, foraminiferal num mulitic packstone. The porosity evolution in the Selandian/Thanetian succession is controlled by original depositional texture and subsequent diagenesis.

Biography:

Dr. Ibrahim Elkanouni received his BSc in geology from University of Tripoli, Libya in 1988 and MSc in petrography and sedimentology from the University of Manchester, UK in 2000, and PhD in Carbonate sedimentology and Sequence stratigraphy from Durham University, UK in 2014. He has 28 years of experience which covers carbonate petrography, sedimentology and sequence stratigraphy.