

## **Sedimentary, Diagenesis and Evaluation of High Quality Reservoir of Coarse Clastic Rocks in Nearshore Deep Waters in the Dongying Sag; Bohai Bay Basin**

**Authors :** Kouassi Louis Kra

**Abstract :** The nearshore deep-water gravity flow deposits in the Northern steep slope of Dongying depression, Bohai Bay basin, have been acknowledged as important reservoirs in the rift lacustrine basin. These deep strata term as coarse clastic sediment, deposit at the root of the slope have complex depositional processes and involve wide diagenetic events which made high-quality reservoir prediction to be complex. Based on the integrated study of seismic interpretation, sedimentary analysis, petrography, cores samples, wireline logging data, 3D seismic and lithological data, the reservoir formation mechanism deciphered. The Geoframe software was used to analyze 3-D seismic data to interpret the stratigraphy and build a sequence stratigraphic framework. Thin section identification, point counts were performed to assess the reservoir characteristics. The software PetroMod 1D of Schlumberger was utilized for the simulation of burial history. CL and SEM analysis were performed to reveal diagenesis sequences. Backscattered electron (BSE) images were recorded for definition of the textural relationships between diagenetic phases. The result showed that the nearshore steep slope deposits mainly consist of conglomerate, gravel sandstone, pebbly sandstone and fine sandstone interbedded with mudstone. The reservoir is characterized by low-porosity and ultra-low permeability. The diagenesis reactions include compaction, precipitation of calcite, dolomite, kaolinite, quartz cement and dissolution of feldspars and rock fragment. The main types of reservoir space are primary intergranular pores, residual intergranular pores, intergranular dissolved pores, intergranular dissolved pores, and fractures. There are three obvious anomalous high-porosity zones in the reservoir. Overpressure and early hydrocarbon filling are the main reason for abnormal secondary pores development. Sedimentary facies control the formation of high-quality reservoir, oil and gas filling preserves secondary pores from late carbonate cementation.

**Keywords :** Bohai Bay, Dongying Sag, deep strata, formation mechanism, high-quality reservoir

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