

**Geopressure Regime and Its Effect to Hydrocarbon Migration and Accumulation: A Case Study of Nanpu Depression Bohai Bay Basin, China**  
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Geopressure regime makes a great affect on hydrocarbon migration and accumulation in sedimentary basins, fluid compartment are generally considered as an independent unit of hydrocarbon migration and accumulation. Based on well logging data and measured pressure, three superimposed geopressure systems were identified in Paleogene in Nanpu depression, Bohai bay basin, China. The upper one is being hydrostatic, and the other two are being overpressured which formed two fluid compartments. They are existed in the depression scale and showed clearly on the inversion section of formation pressure. Pressure simulation showed that pressure seals were developed within Paleogene in the top of two compartments. Some geological and geochemistry evident suggested that geopressure regime makes great effect to hydrocarbon migration and accumulation. Two successions of source rock were found in Nanpu depression by means of intensive TOC and pyrolysis analysis. One (Es34+5 formation) developed in the lower compartment, and the other (Es1 formation) in the upper compartment. Hydrocarbon generating kinetics simulation, according to the experimental kinetic parameters, suggest that oil kitchen developing in the lower compartment was mature within later Oligocene and over-mature within Miocene, but oil kitchen in the upper compartment was mature until now. Oil family correlation and maturity detection with biomarkers showed that the oil in the lower compartment came from algae and being over-mature, but most of the oil in the upper compartment derived from plant and being lower mature. It is indicated that hydrocarbon generated from the lower compartment barely migrated upward through the pressure seal. So we confirmed that compartments in Nanpu depression were two unconnected independent petroleum migration and accumulation systems, hydrocarbon was sealed inside of compartment and there were different oil kitchens and migration and accumulation processes in the two compartments.