



Analyzing the enrichment regularity of hydrocarbon reservoirs in sequence stratigraphic framework of Tertiary: a case study on the Qikou sag in Huanghua depression, Bohai Bay Basin, Eastern China

huang chuanyan (1), wang hua (1), wu yongpin (2), chen shi (1), Wang jiahao (1), and Ren peigang (1)

(1) Key Laboratory of Tectonics and Petroleum Resources(China University of Geosciences) Ministry of Education, State Key Laboratory of Geological Processes and Mineral Resources, China University of Geosciences, Faculty of Earth Resources, Wuhan 430074, P R China, (2) PetroChina Dagang Oilfield Company, Tianjin 30028, P R China

Abstract: Hydrocarbon enrichment relates to definite geologic condition. The enrichment of reservoirs shows certain regularity in the basin sequence stratigraphic framework, generally associated with the unconformity interface or tectonic transformation surface, and show different enrichment regularity in different basin margins. However, enrichment regularity of different sags presents some differences. From the view of sequence stratigraphy, the paper analyzes the characteristic of hydrocarbon reservoirs enrichment in the sequence stratigraphic framework of Qikou sag in Huanghua depression, Bohai Bay Basin, Eastern China according to 1340 wells. The research shows that reservoirs enriched near the second order sequence interface or tectonic transformation surface in Qikou Sag. The closer to the second order sequence interface, the more enriched the hydrocarbon was. In the internal sequence, hydrocarbon reservoirs mainly enriched in lacustrine expanding system tract (EST) and low stand system tract (LST). However, each sequence presented some differences. Upper the second order sequence interface, hydrocarbon reservoirs mainly enriched in lacustrine expanding system tract and low stand system tract which were under the maximum flooding surface. Under the second order sequence interface, hydrocarbon reservoirs mainly enriched in high stand system tract (HST). On the plane, hydrocarbon reservoirs mainly congregated near steep slope zone which was controlled by sag marginal faults. The flexure slope break was the least hydrocarbon enrichment zone, but the exploration potential of lithologic reservoirs was huge. Hereby, the author proposed the thought that second order sequence interface (or tectonic transformation surface) + corresponding system tract in the third sequence + correlatable sag slope break types = favorable exploration zone. It is the three elements coupling controlled the favorable exploration zone. The author put forward some suggestions for next exploration of Qikou sag.

Key words: hydrocarbon reservoir, sequence stratigraphy, three elements coupling, Qikou sag in Huanghua Depression, Bohai Bay Basin, Eastern China