Karsting mode and its features in YINGMAI-2 of North Tarim Basin, China

JIANG HUA, SUYUN HU, ZECHENG WANG AND RUIJU WANG

(PetroChina Research Institute of Petroleum Exploration & Development, Beijing 100083, China)

Distinctive heterogeneity of reservoir and its complex formation mechanism of marine carbonate rocks was focused in the fields of oil and gas exploration in China. Applying 3D seismic attributes, cores, imaging loggings and thin sections, etc, combined with fluid inclusions analysis and tectonic recovery techniques, reservoir characteristics and its formation mechanism were researched. It was concluded that it is not karst reservoir in YINGMAI-2 area, while it is reservoir controlled by faults. Reservoir space includes fracture and pore-fracture which was not or partly not filled with calcites. Furthermore, distribution of reservoir was controlled by faults. Through studying structure activities and fluid inclusion salinity, it was recognized that two types of fault-controlling karst happened, they were surface water karsting downward along faults and hydrothermal fluid upward along faults. The former was constructive for reservoir, while the latter was destructive. Based on the research, it was concluded that it was not enough to find karst crust type reservoir during oil and gas exploration, more types of reservoir should be concerned; fault-controlling karst could become prospecting fields.

Stability analysis on hydrocarbon secondary migration pathway

JIANG LIN[123]*, BAO DONGMEI[1], HONG FENG[123], HAO JIA-QING[12] AND FAN YANG[4]

[1]Research Institute of Petroleum Exploration & Development, CNPC, Beijing 100083, China jianglin01@petrochina.com.cn (*)

[2]State Key Laboratory of Enhanced Oil Recovery, Beijing 100083, China

[3]Key Laboratory of Basin Structure and Hydrocarbon Accumulation, CNPC, Beijing 100083, China

[4]School of Earth Sciences and Technology, China University of Petroleum (east China), Qingdao 26658, China

In order to accumulate in effective trap, hydrocarbon generated form source rocks has to go through a certain distance of secondary migration, therefore the process of hydrocarbon secondary migration has a great influence on hydrocarbon accumulation rate, eventually. The secondary migration process of crude oil can be divided into two types such as piston pattern and advantage pattern, the secondary migration of nature gas is an intermittent migration process composed by two basic migration ways of piston pattern and advantage pattern. The difference of secondary migration pattern leads to the differences of the migration pathway stability between crude oil and nature gas. The study used dye kerosene and nitrogen to conduct physical simulation experiment of secondary migration process respectively, discussing secondary migration pathway stability of crude oil and nature gas through way of more than once filling, and analysis its formation mechanism in view of the difference of physical characteristics of oil/gas/water and the relation of the difference between reservoir rock and oil/gas/water. The result indicates that the crude oil can change the rock wettability, and will not only alternate the free water located in the center of rock pores, but also replace the water adsorbed on the surface of porous rocks in secondary migration process. So crude oil could form a fairly stable migration pathway in the process of secondary migration, and its transport efficiency is higher. Natural gas can not change the wettability of porous rocks like crude oil does; natural gas form a relatively stable dynamic migration pathway in the process of secondary migration, the loss amount is larger while migrating.

www.minersoc.org
DOI:10.1180/minmag.2013.077.5.10