

Ordovician hydrocarbon migration along the Tazhong No.10 fault belt in the Tazhong Uplift, Tarim Basin, northwest China

WEIBING SHEN^{1*}, JIANFA CHEN², YANGYANG WANG³

¹ Institute of Geology, Chinese Academy of Geological Sciences, China (correspondence: swb560316@126.com)

² China University of Petroleum, Beijing, China

³ Institute of Crustal Dynamics, China Earthquake Administration

The Ordovician hydrocarbon migration and accumulation of the Tazhong Uplift in the Tarim Basin, northwest China, is investigated from the perspective of geological and geochemical analysis. Geochemical parameters successfully analyzed include the oil and gas properties, Ts/(Ts+Tm) ratios, and carbon isotope ratios of gas. Results show anomaly parameter values are observed in the No.10 fault belt (10FB) and the No.1 fault belt (1FB). As the distance from the 10FB and 1FB increases, the parameter value anomalies weak gradually until then become disappeared in the north platform belt (NPB). This saddle-like distribution of parameters indicates the hydrocarbon is introduced into the Ordovician traps through 10FB and 1FB from the northern Manjiaer Depression and the uplift itself. This new conclusion is different from the conventional view to a large extent, which indicates that Ordovician hydrocarbon mainly derived from the Manjiaer Depression and the No.1 fault is the only NW-trending oil source fault. The viewpoint of 10FB as an additional hydrocarbon charge place is further supported by the evidence from the hydrocarbon charge intensity, structural framework, source rock distribution, and significantly improvement of the reservoir physical property (7~8 times at the 10FB). Based on this hydrocarbon charge and migration process and pattern, the main target for further exploration activities in the Ordovician of the Tazhong Uplift should be the SPB (south platform belt) and the south part of the 10FB, especially the south part of the 10FB.