Hydrocarbon Accumulation Laws of the 1st and 2nd Members of the Baikouquan Formation of Aihu 2 Well Area in the Northwestern Margin of the Junggar Basin

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Abstract: The Mahu sag, which has been discovered to have a billion-ton-scale super-large oil field, is the focus of exploration and development in the Junggar Basin in recent years. The Aihu 2 well area in Mabei is located in a local nasal convex structural belt of the Mabei area on the northwestern margin of the Junggar Basin. The work area is about 639km^2. The distribution of oil and gas in the research area is complex. The production of oil and gas in the areas that owns the advantages of structure and sand body development is relatively low. Based on the study of basic accumulation conditions of the study area, and according to the core, logging, Seismic data and Organic geochemical analysis, this paper summarizes the hydrocarbon accumulation laws of the 1st and 2nd members of Baikouquan formation of the Aihu 2 well area in Mabei. The results show that，through the comparative analysis of hydrocarbon source rock evaluation and oil source, the oil source of the Aihu 2 well area is mainly from the Lower Permian Fengcheng Formation source rocks, followed by the Lower Permian Jiamuhe Formation source rocks(Huang et al.,2016). The sedimentary facies of the 1st and 2nd members of the Baikouquan formation are dominated by fan deltas, and low-porosity and low-permeability reservoirs dominated by subaqueous distributary channels and braided distributary channel sand bodies are developed (Zhang et al., 2018; Li et al., 2016). The distribution of reservoir sand bodies is controlled by sedimentary facies (Xiao et al., 2019). According to the results of Seismic interpretations, there are 4 grade II-level faults and 19 grade III-level faults; the traps are controlled by faults and sedimentary facies, and mainly composed of tectonic-lithologic traps. (Chen et al.,2018); hydrocarbon migration is dominated by vertical migration. The current oil and gas distribution is closely related to the formation time and matching relationships of each accumulation factor. There are two oil and gas charging events in the late Triassic and the late Jurassic, which are the key events to the formation of oil reservoirs. In summary, the II-level faults communicate with the vertical migration of hydrocarbon sources, the III-level faults control traps, and the underwater distributary channel sand bodies constitute the main reservoir. The high-amplitude nasal convex structural belt at the low-lying structure is the dominant area of oil and gas accumulation.

Key words: Junggar Basin, Mahu sag, Baikouquan Formation, hydrocarbon accumulation conditions

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