Paper Number: 2621

Tight reservoir of Lucaogou formation in Jimusar sag, Junggar basin

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The petroleum industry has advanced to a new stage at which conventional and unconventional resources receive equal attention since the implementation of the large-scale development of unconventional oil and gas resources was represented by tight oil and gas, shale gas, heavy oil, and oil sands. The Jimusar sag, which is located in the eastern uplift of the Junggar basin, is a dustpan-like sag. Low lying from east to west, the sag has an area of 1278 km^2, and the angle of the gentle structure in the main exploration region is 3°–5°. The Lucaogou formation is widely distributed across the entire sag, with its depth varying from 200m to 300m. The source bed can be as thick as 200 m, and the favorable area can be as large as 800 km^2, with an average TOC of 5.2% and a chloroform bitumen “A” content of 0.73%. The reservoir is mainly a set of mixtites mixed with terrigenous clastics and carbonates. The main lithology is dolomitized salt, and the reservoir is of low porosity and low permeability. It is continuously and stably distributed and therefore provides favorable conditions for the formation of a tight oil reservoir. As it is recognized that tight oil reservoirs are difficult to develop, the development of fractures can have absolute control over the reservoir capacity. According to cores and FMI materials, it has been revealed that the overall brittleness of the sand–clastic dolomite, dolomitic sandstone, and microcrystalline dolomite is favorable for the development of fractures.