

## **The Types and Forming Conditions of Tight oils in LCG Formation, JMSR sag, Junggar basin, China**

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A great deal of tight oil which accumulated in two sandstone layers was discovered in LCG shale riched formation of Permian system in JMSR sag, Junggar basin. The research on the similarities and differences of oils in two zones is vital to forecast the favorable area and the characteristics of oils. Following conclusions are obtained by systematic sampling and analysis of outcrops, cores and oils. (1) LCG formation is divided into 6 layers. Sandstones are mainly distributed in L1 and L4 and high organic abundance lacustrine type II shale rocks are mainly distributed in L2 and L5 which average TOC are 7.2% and 9.3% respectively. The sedimentary period of LCG formation was high productivity, climate changed from hot to warm, water salinity from saline to brackish and water deepen with time. Due to the slightly different sedimentary environment, the characteristics of shale rocks between L2 and L5 are slightly different like group composition from DCM extraction, GC and GC-MS of saturate from DCM extraction. (2) The differences of two layer shale rocks resulted in the differences of characteristics of tight oils in L1 and L4. First, The averages of oil characteristics like density, wax content, freezing point and viscosity in L1 and L4 are 0.88g/cm<sup>3</sup>, 13.12%, 21.18 °C and 54.69mpa.s at 50 °C and 0.91g/cm<sup>3</sup>, 4.02%, 1.14 °C and 116.9mpa.s at 50 °C respectively. In plane, the trend of change of oil density which decreases with depth increase from east to west in L4 is accordance with maturity of shale rocks. while, it is totally different from that in L1. Second, saturate contents of oils in L1 which are mostly higher than 55% are higher than those of in L4. Also, the phytane and gammacerane of oil in L1 are lower than those of in L4. The above characteristics of oils in L1 and L4 are similar to those of shale rocks in L2 and L5 respectively. Third, the maturity of oil in L1 is higher than nearby source rocks maturity and that of in L4 is similar with it. (3) oils in L1 and L4 are two accumulation systems which are sourced from L2 and L5 respectively and different in sedimentary, geochemistry and accumulation models which are lateral off-site accumulation in L1 and in-situ accumulation in L4