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Researches on residual oil saturation and micro displacement mechanism after different oil displacement modes in tight oil reservoir

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In view of the present situation of low productivity and the difficulty of water injection development in the tight reservoir. In order to improve the development effect of tight reservoir, select cores with different permeability grade parallel samples, and carried out injection of simulated formation water, active water, CO₂ and N₂ physical simulation experiment. Combined with nuclear magnetic resonance technology investigates micro pore structure of tight oil cores, mobile fluid saturation, recovery ratio and residual oil distribution for different pores. Investigation have shown that for tight oil reservoir, most of the pores are sub-micro pore and micro-nano pore, the movable fluid is mainly stored in the pores of more than 1 μ m. Micro pores and sub-micro pores contribute most of the produced oil. The effect of active water flooding is slightly better than water flooding and active water could effectively drive oil out of the micro-nano hole. CO₂ and N₂ flooding effects is obviously better than the effects of conventional water flooding and active water flooding, and they have relatively good oil displacement effects at micro pores and sub-micro pores. The higher the permeability is, the better the CO₂ flooding effect is; the lower the permeability, the better the N₂ flooding effect.

References

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