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Experimental and simulation study on enhanced oil recovery of sandstone reservoir in high water cut stage

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Sandstone reservoir has good porosity and permeability, which is one of the main oil and gas reservoirs and the focus of oil and gas resources development. Water injection development is the main way of sandstone reservoir development, but with the continuous increase of development time, the water cut of the reservoir is increasing, a large number of reservoirs are in the high water cut stage, and the efficiency of water injection development is decreasing. Therefore, it is very important to master the formation and distribution characteristics of remaining oil in high water cut reservoir and its producing mechanism for the further development. In this paper, the remaining oil in the core pores of the high water cut stage is visualized on the micron scale by CT scanning, and the oil-water flow simulation and the remaining oil production simulation are carried out based on the digital core technology. The results show that the distribution of remaining oil in high permeability reservoirs is less but more dispersed, and the remaining oil in low permeability cores is more connected. The remaining oil content of high viscosity crude oil reservoir is high. By reducing the interfacial tension, the water phase can invade more pores to achieve the effect of remaining oil production. This study is helpful to guide the high water cut sandstone reservoir to take measures to further improve the recovery rate and realize the further development of the reservoir.

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