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Study on Microscopic Pore Structure Characteristics and Seepage Law for Fuyu Oil Layer in Qingxin Oilfield

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In view of the poor physical property of reservoir, the complicated microscopic pore structures and the difficulty of effective development in Fuyu Oilfield of Qingxin Oilfield, by comprehensively using constant pressure mercury intrusion, nuclear magnetic resonance (NMR) and physical simulation experiment system of oil-water displacement, the microscopic pore structure characteristics and two-phase percolation law of the reservoir were studied in depth. The results show that when the permeability of Fuyu oil layer in Qingxin Oilfield is less than $1 \times 10^{-3} \mu\text{m}^2$, the reservoir is dominated by the throats less than $1 \mu\text{m}$, and has a high starting pressure gradient, which is very difficult to build an effective driving pressure system. Moreover, under the same permeability condition, the injection capacity gradually decreases with the increase of injection multiplier. On the contrary, when the permeability of the reservoir is higher than $1 \times 10^{-3} \mu\text{m}^2$, the injection capacity increases with the increase of injection multiplier. In addition, Qingxin Oilfield has the characteristics of strong hydrophilicity and obvious imbibition. After stopping injection, the oil and water redistributes as the crude oil in the small pores is imbibed into the macropores.

References

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