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Micro-pore Characteristics and Reservoir State of "Three Low" Reservoirs in Jiangsu Oilfield

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The reserves of "three low" reservoirs in E1f2 layer of Jiangsu Oilfield are up to 63%, while the physical properties of the target block vary greatly, the microscopic pore structure is complex, and the occurrence state of oil and water is unknown. In view of the above problems, this paper starts from two aspects of reservoir understanding and percolation mechanism. Using the experimental methods of constant velocity mercury injection, NMR and low permeability core physics simulation system, the microscopic pore structure and the occurrence state of oil and water of the target block were studied, the difficulty degree of reservoir development was evaluated, and the development proposals of energy supplement were put forward as well. The results show that the reservoir permeability of the target block that requires technical tackling is $0.5 \times 10^{-3} \mu\text{m}^2 \sim 2 \times 10^{-3} \mu\text{m}^2$, and when the reservoir permeability is less than $0.5 \times 10^{-3} \mu\text{m}^2$, the throats less than $1 \mu\text{m}$ are dominant and the water flooding is difficult to develop. Furthermore, the co-permeable point of more than 50% water saturation proves that the reservoir is hydrophilic, the water phase permeability of less than 0.2 under the residual oil state indicates that water injection is difficult to develop. The development suggestions are that advanced water injection should be adopted in the early stage to establish an effective water flooding displacement system, and it is recommended to use moderate water injection to maintain high imbibition efficiency in the later period, so as to improve the enhanced oil recovery of reservoirs.

References

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