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Fluid charging and hydrocarbon accumulation in the sweet spot, Ordos Basin, China

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Although significant progress has been made in the tight gas exploration and development, there is still a limited understanding of the fluid charging and hydrocarbon accumulation in the sweet spot. In this study, a novel method is proposed to generate the stochastically constructed porous media which represents the transition region between tight surrounding sandstone and sweet spot. Based on the constructed porous media, the fluid charging and hydrocarbon accumulation processes of the tight reservoir are simulated by the lattice Boltzmann method (LBM). The numerical simulation results show that, although a piston-like pattern can be observed in field-scale simulation or laboratory experiments, at the micro-scale, due to the inherent heterogeneity of the porous media, the fluid charging pattern tends to be fingering-like. The existence of the transition region between tight surrounding sandstone and sweet spot becomes a water-bearing gas layer or even gas-bearing water layer at the top/bottom of the gas layers (sweet spot). The existence of fractures is favorable for hydrocarbon charging into the reservoir rocks, but not for the hydrocarbon accumulation due to the gas escaping through the fractures. Combined with well logging interpretation results, three typical water bodies (isolated water body, water body at the top, or bottom of the gas layer) are identified from the view of fluid charging and hydrocarbon accumulation.

Time Block Preference

Time Block A (09:00-12:00 CET)

References

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