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Research on the Recovery Mechanism of the Coupling of Injection and Production Recovery Technology at High Water Cut Stage

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In the middle-high permeability sandstone reservoir with strong heterogeneity and low permeability reservoir, invalid recycling of the injected water is formed along the natural high permeability belt and interwell fracture at high water cut stage, which results in reduction of reservoir recovery degree. According to the field tests, the reservoir recovery degree can be improved by coupling between injection and production. However, mechanism research on coupling between injection and production is rare at present. This study conducted mechanism research in terms of capillary inhibition and streamline field, and established numerical model. This model can describe inhibition and absorptive percolation phenomena caused by capillary force and additional channeling flow phenomena caused by elastic force. At last, effects evaluation was implemented combining field tests in Sheng Li oil field, coupling between injection and production may increase recovery efficiency about over 1% in water-wet oil reservoirs. At the same time, reasonable coupling cycle and ratio of injection and production is provided for reference in different types of reservoir.

References

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