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Experimental Study on Stress Sensitivity Considering Different Fractures and Water Content in Shale Reservoir

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Large-scale fracture network and fracturing fluid retention in shale reservoir will inevitably affect the stress sensitivity. We focused on different areas of shale gas flow, and design several stress sensitivity tests of matrix, unsupported fracture, supported fracture and water-bearing fracture cores. The influence of different types of fractures and fracture water content on permeability is clarified. Further more, a characterization model describing the change of permeability with stress is established. The result shows: The stress sensitivity of different areas varies greatly. The loss of conductivity of support fracture is small under high stress conditions. But the loss rate of unsupported fracture permeability under the effect of effective stress is up to 97%, and the permeability recovery rate after stress recovery is less than 20%. Permeability decreases by 3-4 orders of magnitude after micro-fracture water cut, which is more sensitive to stress change. The research support the optimization of fluid filling intensity and flowback system of shale gas wells.

Participation

In-Person

References

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