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Physical simulation experiment of different injected media huff and puff for tight porous media

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Different injected media huff and puff is a promising enhanced oil recovery approach in tight oil reservoirs, which can effectively supply formation energy and enhance the productivity of individual well. And there still exists many uncertainties of oil recovery mechanism in the process. In this study the experiment method of cyclic water injection and carbon dioxide huff and puff in tight porous media were established by high-pressure physical simulation system for large scale outcrops. Water, surfactant and carbon dioxide were employed on the physical simulation experiments, the corresponding development effectiveness and influence factors of different injected media huff and puff were analyzed, and the feasibility of carbon dioxide huff and puff after cyclic water injection was studied. The results show that the development effectiveness of carbon dioxide huff and puff is better than surfactant huff and puff, and cyclic water injection is the worst. Injection pore volume multiple is the important factors to effect development effectiveness, compared with water and surfactant, the injection ability of carbon dioxide is strongest, and carbon dioxide can effectively replenish formation energy. For different injection media, the higher the injection rate, the more pronounced the fingering phenomenon, the fluid can enter the model deep, and the better the effect. The dispersed phase of oil and water influence subsequent carbon dioxide injection. Oil component differentiation could occur after oil contacted with carbon dioxide, Aromatics in oil were extracted rapidly by carbon dioxide, and made component differentiation in the process of carbon dioxide huff and puff.

References

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