Development of a Successful Scenario of Hot Water Enhanced Oil Recovery Method for Oil Shale

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Abstract (300 words limit)

Statement of the Problem: Thermal enhanced oil recovery (EOR) methods potentially could be very efficient for development of oil shales. However, the success of oil recovery is highly dependent on selection of an optimal well treatment scenario. A slight change in the technological parameters could result in a significant increase or decrease in oil production due to specifics of a kinetic model of organic matter transformation in oil shales.

The aim of the present research is to investigate the influence of each of the following technological parameters on oil recovery during a huff-and-puff hot water treatment of an oil shale region: start of the injection, pressure of an injection stage, duration of an injection stage, duration of a soaking stage, pressure and duration of a production stage, and temperature of the water. Reservoir simulation was applied to accomplish the task. The variation of the listed parameters allowed to develop an optimal hot water treatment scenario for a given oil shale field using a detailed kinetic model of organic matter transformation.

Conclusion & Significance: Selection of an optimal EOR scenario using numerical simulation is of the first importance for development of the EOR equipment requirements. In the present study it was observed that each of the investigated parameters noticeably affects oil production.

Recent Publications (minimum 5)

Mukhina E.D., Askarova A.G., Kalacheva D.Yu. et al. Hydrocarbon saturation for an unconventional reservoir in details, OnePetro, 2019, 196743

Afanasev P., Tsyshkova A., Mukhina E. et al. Compositions of anionic and non-ionic surfactants within a hybrid EOR technology for shale oil reservoirs, OnePetro, 2019, 196759

Mukhina E.D., Cheremisin A.N., Khakimova L.A. et al. Enhanced Oil Recovery Technique Selection for Oil Shales Based on Numerical Simulation, Journal of Petroleum Science and Engineering, 2020

Turakhanov A., Tsyshkova A., Mukhina E. et al., Cyclic subcritical water injection: in-situ hydrocarbon generation from oil shale, Energy & Fuels, 2020

Shilov E.D., Dorhjie D.B., Mukhina E.D. et al. Experimental and Numerical Studies of Rich Gas Huff-n-Puff Injection in Shale, Journal of Petroleum Science and Engineering, 2020



Biography (150 words limit)

Elena Mukhina is a research scientist at Center for Hydrocarbon Recovery, Skolkovo Institute of Science and Technology. She holds a PhD in Energy Technology from KTH Royal Institute of Technology. She studied hydrocarbon geology at Bayerisches Geoinstitut and Gubkin Russian State University of Oil and Gas. Her main research interests are EOR technologies, unconventional oil reserves, PVT fluid studies and hydraulic and non-hydraulic fracturing.

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Notes/Comments: