Abstract

Title: Characterization of Wettability Alteration For Different Enhanced Oil Recovery Methods in Naturally Fractured Carbonate Reservoir: Is it different from classical porous medium?

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I. Abstract Body (up to 250 words)

Hydrocarbon recovery from naturally fractured carbonate reservoirs which are generally oil-wet/mixed-wet is very less ranging from 2-10%. Wettability controls the relative distribution of fluids inside pores and plays a crucial role in reservoir fluid flow, making an impact on the recovery of hydrocarbons. Wettability is influenced by a number of factors such as saturation, pH, oil composition, asphaltenes presence in crude oil and the rock mineral. The mechanism behind the recovery of hydrocarbons from a fractured reservoir is different as compared to the conventional porous medium. The main reason behind this difference is the capillary pressure contrast between matrix and fracture which in turn influence interfacial tension and wettability. The differences deduced from this study conveys that wettability alteration through fractured carbonate reservoir needs special attention as the reasons behind the alteration is not same as that of the classical porous medium. In this context, an effort has been made to portray the fundamental differences associated with wettability alteration by carrying out a comprehensive comparative review between naturally fractured carbonate reservoir and conventional porous medium due to different Enhanced Oil Recovery (EOR) methods and delineating the physical processes behind it. From this study, it is concluded that wettability in carbonate reservoirs is mainly altered in case of thermally enhanced oil recovery methods, because the increase in reservoir temperature leads to reduction in adhesion tension, precipitation of asphaltenes on rock surface, change in properties of calcite mineral which makes the oil-wet/ mixed-wet carbonate reservoir to water wet/ strong water-wet reservoir.

II. Image:

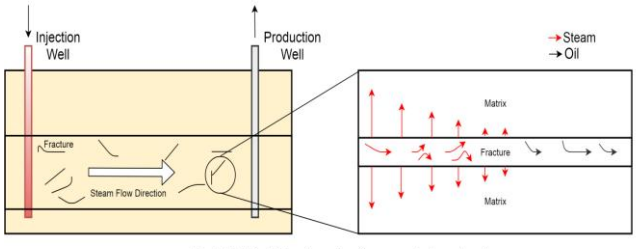


Fig 1. (a): Depicting steam flooding scenario in carbonate reservoir.

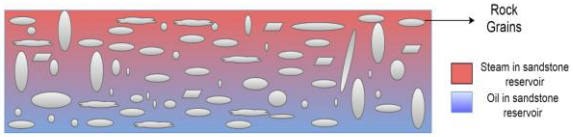


Fig 1. (b): Depicting steam flooding scenario in sandstone reservoir.

III. Reference:

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IV. Biography:

Shantanu is pursuing his MS (by Research) from Indian Institute of Technology, Madras, India. He is currently working on "Understanding the Flow Dynamics in Naturally Fractured Carbonate Reservoir During Steam-Flooding EOR by Numerical Modeling". His area of interest includes Numerical Modeling, Computational Fluid Dynamics, Reservoir Engineering, Drilling Engineering, Petroleum Production Engineering. Previously he has completed his Bachelor of Technology (Honors) from University College of Engineering, Kota, India. He has authored 1 international conference paper.

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