



Baojun Bai

Professor, Lester Birbeck Endowed Chair, Petroleum Engineering
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About Dr. Bai

[\(Profile Link\)](#)



Dr. Baojun Bai is a Professor and the holder of the Lester R. Birbeck Endowed Chair in Petroleum Engineering Program at Missouri University of Science and Technology (S&T). He holds PhD degrees in Petroleum Engineering from New Mexico Tech and in Petroleum Geology from China University of Geoscience-Beijing. He has seven years of industry experience as a reservoir engineer and the head of conformance-control Team of PetroChina. Dr. Bai was a post-Doctoral scholar at the California Institute of Technology before he joined Missouri S&T as a faculty member in 2006. His research areas include EOR, conformance control, CO₂ sequestration and characterizations of fluid flow in unconventional reservoirs. He has more than 20 years of experience in the area of EOR, especially in conformance control. Dr. Bai has published more than 170 papers in peer-reviewed journals and SPE conferences. He served as the *JPT* Editorial Committee and was responsible for “EOR Performance and Modeling” feature from 2007 to 2013. He is a technical committee member of SPE ACTE 2016-2018 and SPE Asia Pacific Oil&Gas Conference and Exhibition (APOGCE) 2015-2018.

Conformance Control for Highly Heterogeneous Reservoirs Using mm-sized Preformed Particle Gels

Presentation Abstract

Excess water production is a major issue that leads to early well abandonment and unrecoverable hydrocarbon for mature reservoirs. Millimeter-sized (10 μm - a few millimeters) preformed particle gels (PPGs) have been applied successfully for more than 10,000 wells as conformance control agents to control water production through high-permeability streaks, fractures or conduits (large pore openings) that naturally exist or are aggravated by mineral solutions, sand production or high injection pressure during water flooding process. This success has been mainly attributed to that the particles can properly propagate through the high permeable features to form efficient plugging while minimizing penetration into unswept zones/areas, from which reservoir conformance can be optimized. In this presentation, I will first present the experimental results about the factors that impact PPG transport and plugging efficiency in conduits which were simulated using 5-ft slim tubes, from which we can identify how PPGs can be effectively placed in target zones. Then I will discuss the methods to control the damage of PPGs on unswept oil-rich zones based on coreflooding test results. Finally, I will summarize where the mm-size particle gels can be best used based on our experimental results and the data analysis of field application projects.

Thursday, September 28th, 2017

2 Eaton Hall (Spahr Auditorium) | 11:00 – 11:50AM