

Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

Polymer as permeability modifier in porous media for enhanced oil recovery SHIMA PARSA, DAVID WEITZ, SEAS, Harvard University — We use confocal microscopy to directly visualize the changes in morphology and mobilization of trapped oil ganglia within a 3D micromodel of porous media upon polymer flooding. Enhanced oil recovery is achieved in polymer flooding with large molecular weight at concentrations close or higher than a critical concentration of polymer. We also measure the fluctuations of the velocity of the displacing fluid and show that the velocities change upon polymer flooding in the whole medium. The changes in the fluid velocities are heterogeneous and vary in different pores, hence only providing enough pressure gradient across a few of the trapped oil ganglia and mobilize them. Our measurements show that polymer flooding is an effective method for enhancing oil recovery due to retention of polymer on the solid surfaces and changing the resistances of the available paths to water.

Shima Parsa
SEAS, Harvard University

Date submitted: 01 Aug 2017

Electronic form version 1.4