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Enhanced oil recovery with polymer flooding. SHIMA PARSA, DAVID WEITZ, Harvard University — Polymer flooding is a method for enhanced oil recovery, however the mechanism responsible for the effectiveness of polymer flooding is not well understood. We use confocal microscopy and bulk transport measurements to probe the effectiveness of different molecular weight and concentrations of Polyacrylamide solution in imbibition of crude oil in 3D micromodel. We show that large molecular weight and moderate to high concentration of polymer is required for enhanced recovery. By directly measuring the pore level velocities in the medium, we show that polymer retention in the medium results in diversion of flow in some pores. The inhomogeneous changes in the flow velocities result in redistribution of viscous forces and enhanced recovery of oil.

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