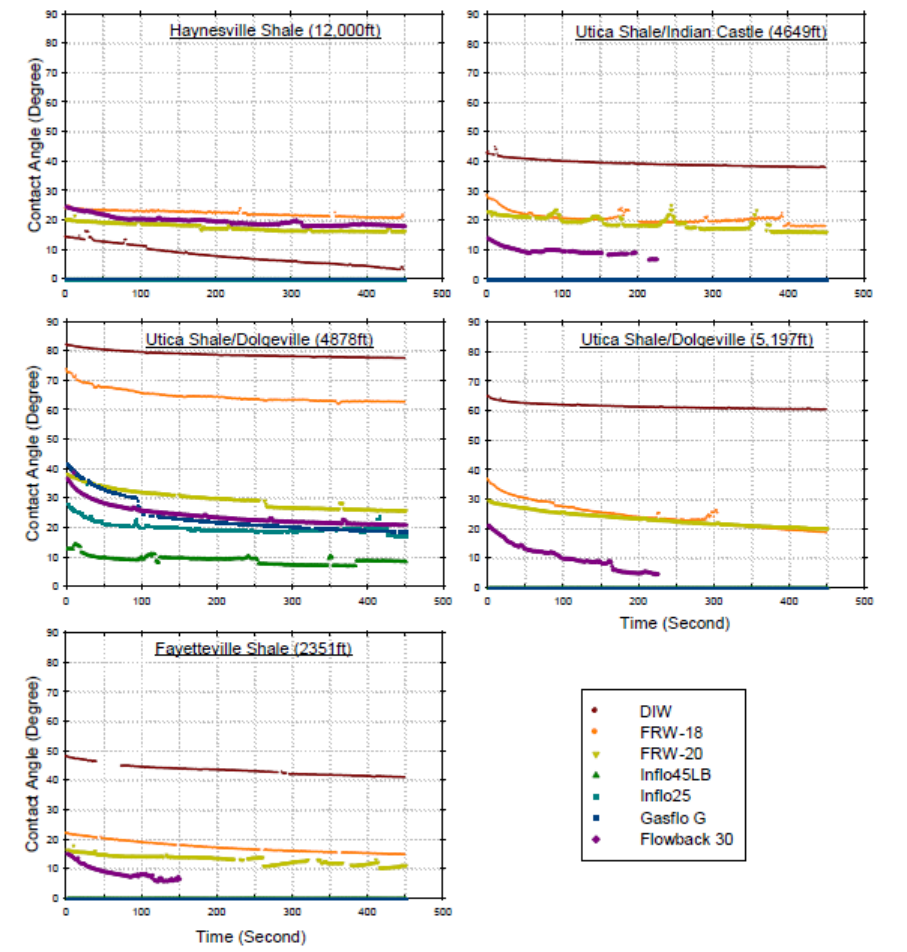
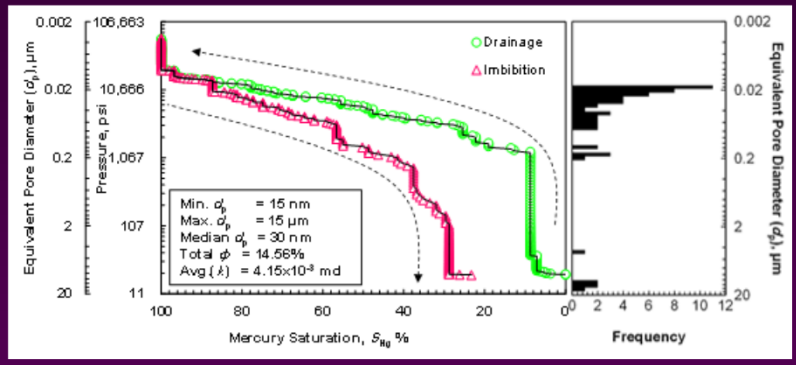
# Effect of Polymer and Polymer Gel on Disproportionate Permeability Reduction to Gas and Water for Tight Gas

Baojun Bai, Petroleum Engineering, Missouri University of Science and Technology, Rolla, MO 65409, baib@mst.edu

## 1. Contact Angle Results of Haynesville, Utica, and Fayetteville Gas Shales Using Various Fluids

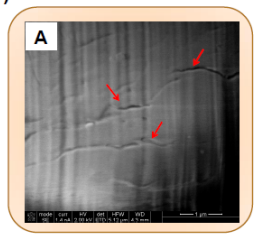



## 2. Mercury Injection Porosimetry Results of Utica Shale

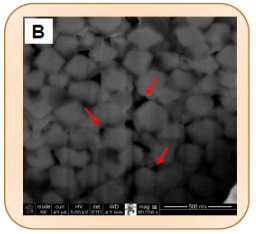



## 3. Various Porosity Types in Shale Gas Rocks

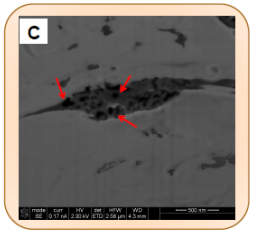
**(A)** Nano fractures of 25−50 nm.




**(B)** Intercrystalline porosity within pyrite framboids with pore sizes between 20 and 100 nm.




**(C)** Abundance of nano-pores with size of 5−100 nm and occupy 40-50% of the organic matter body. It is named "Kerogen porosity".




**(D)** Intraparticular or mineral porosity with opening throat is about 5 nm.