# Buoyancy, seals, and the upward migration of petroleum, Part II

Passage of an immiscible fluid through pore throats is limited by the "capillary resistance force" or "capillary pressure" or "displacement pressure" inherent in the interaction of fluid and pore throat:

γ = interfacial tension, a measure of the immiscibilty of two liquids because of the cohesion of like molecules in each. If hydrocarbons were soluble in water, this term would go to zero, and resistance would go to zero. Relative to water, $\gamma_{gas} > \gamma_{light\ oil} > \gamma_{heavy\ oil}$. γ decreases with increasing temperature.

Θ = wettability or wetting angle, a rock-dependent term for the extent to which water (or hydrocarbon in some cases) is the fluid on the rock surface. Θ is commonly so small, and thus $\cos \Theta$ so nearly 1.0, that this term is neglected.
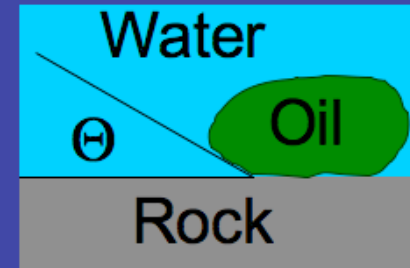
$$\text{Resistance} = \frac{2 \cdot \gamma \cdot \cos \Theta}{r_t}$$
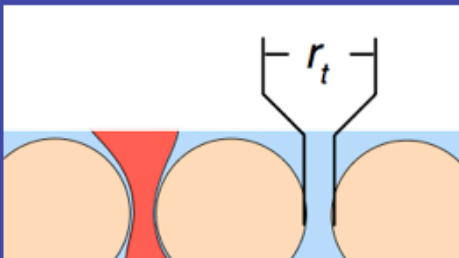
r_t = radius of pore throat
(the smaller the pore throat, the greater the resistance).