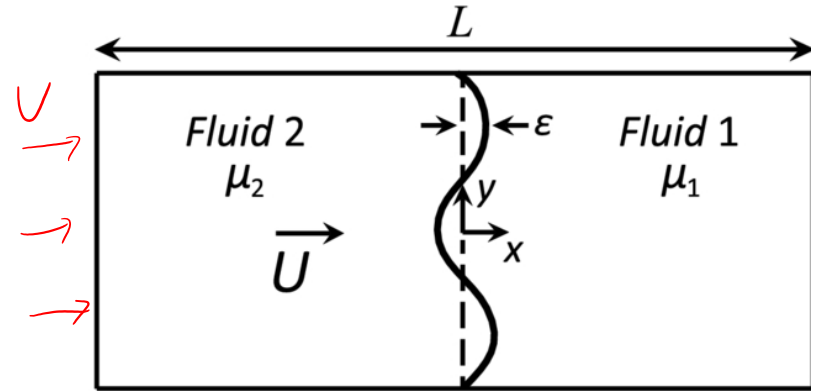
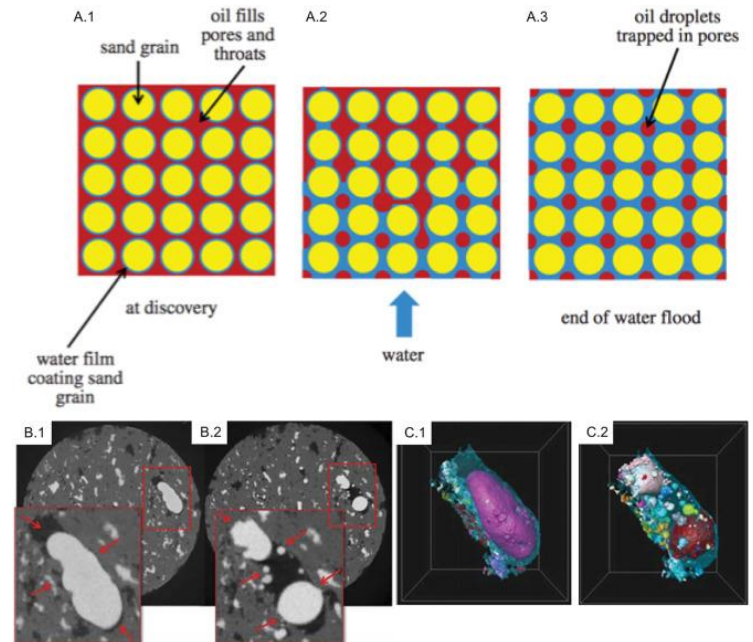
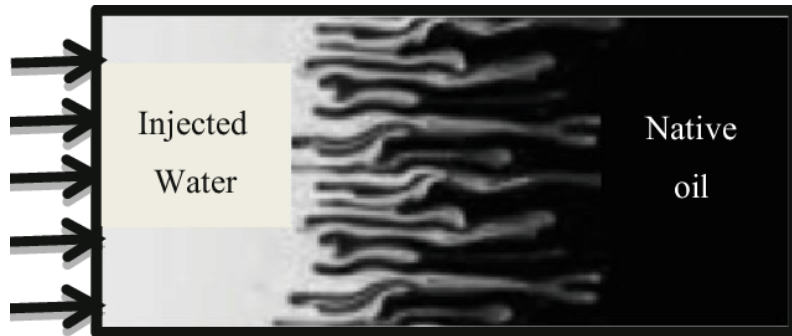
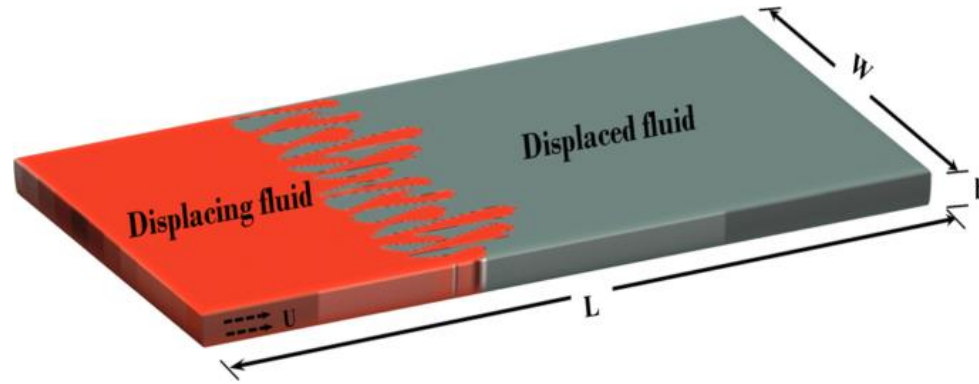


$\mu_2 > \mu_1$



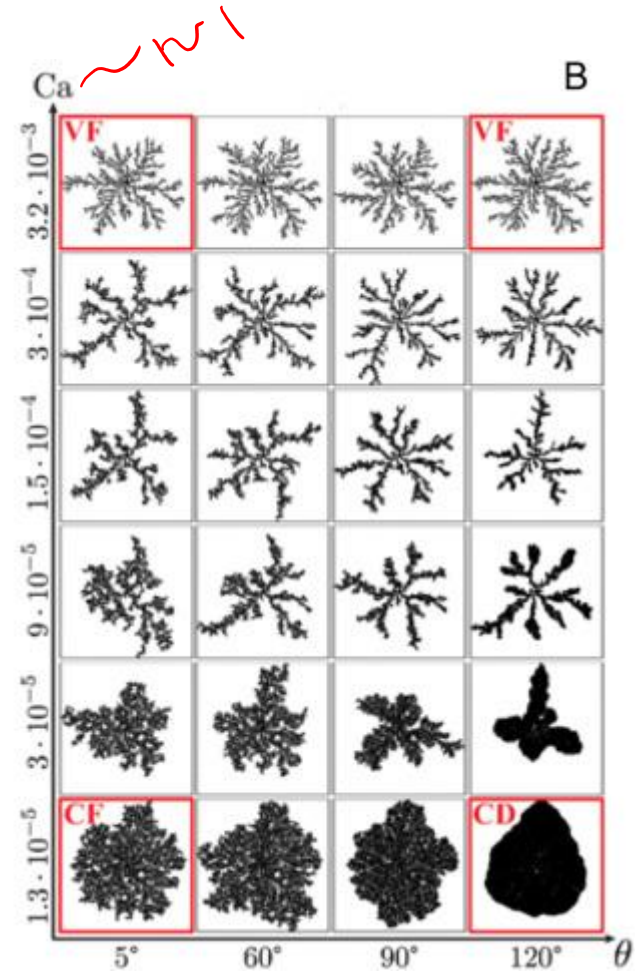
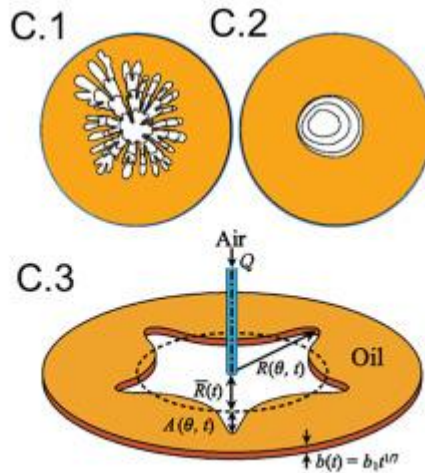
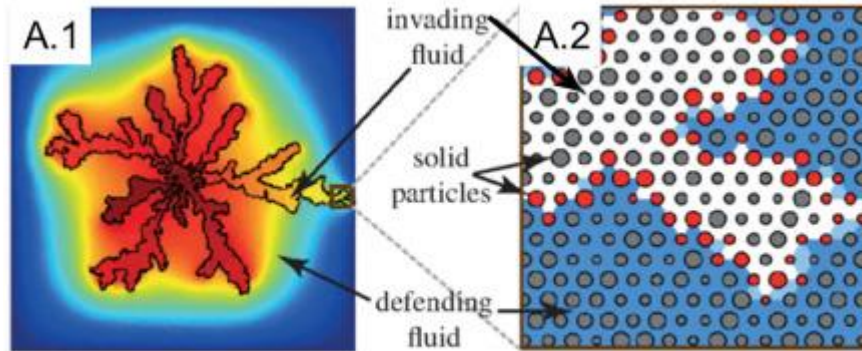
Saffman-Taylor

- Instability that occurs when a more viscous fluid μ_2 , is pushed through a less viscous one μ_1 .



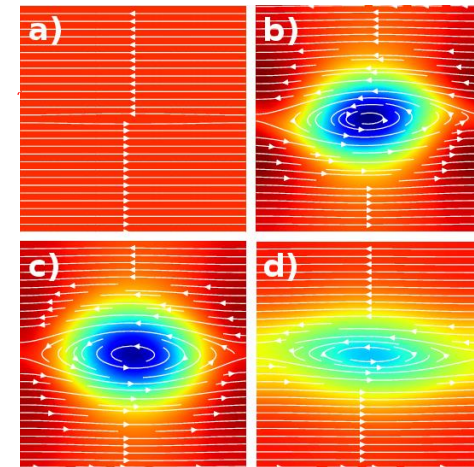
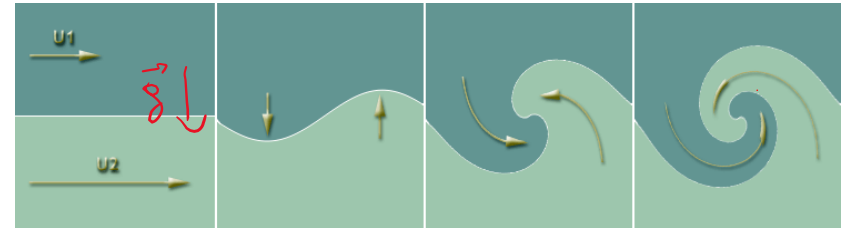
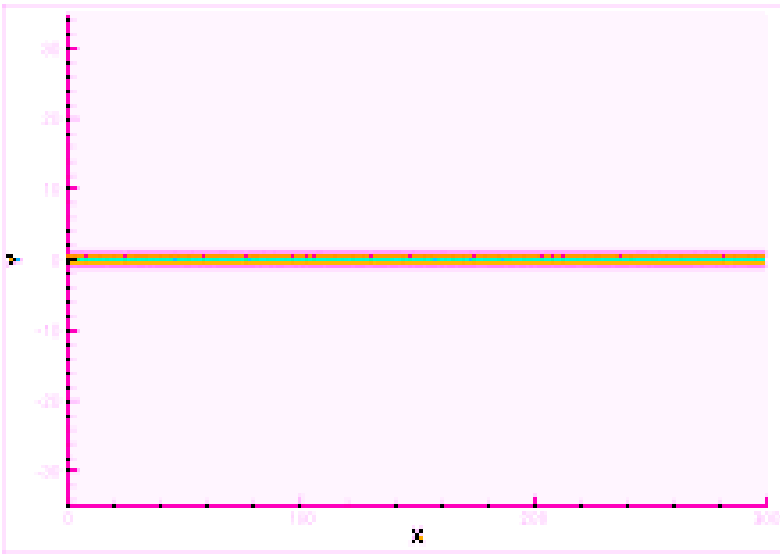
Application: oil extraction

<https://www.sciencedirect.com/science/article/pii/S001868618300174>



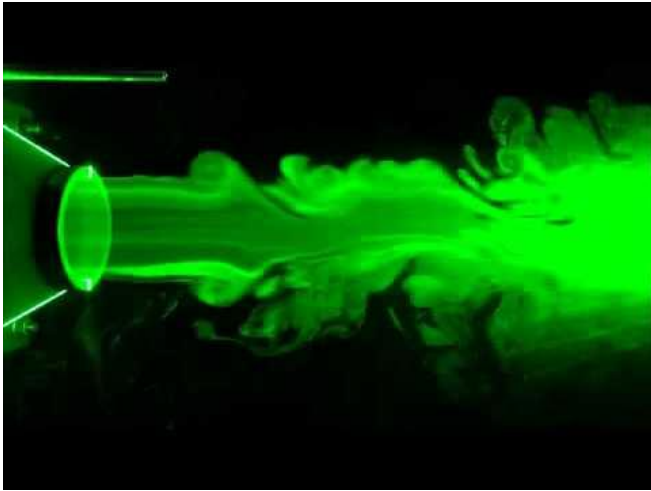
→ <https://www.sciencedirect.com/science/article/pii/S0001868618300174>

$\theta < 90^\circ \Rightarrow$ Hidrofílica
 $\theta > 90^\circ \Rightarrow$ Hidrofóbica



Kelvin-Helmholtz

- Instability that occurs when there is velocity shear in a single continuous fluid, or when there is a velocity difference across the interface between two fluids.

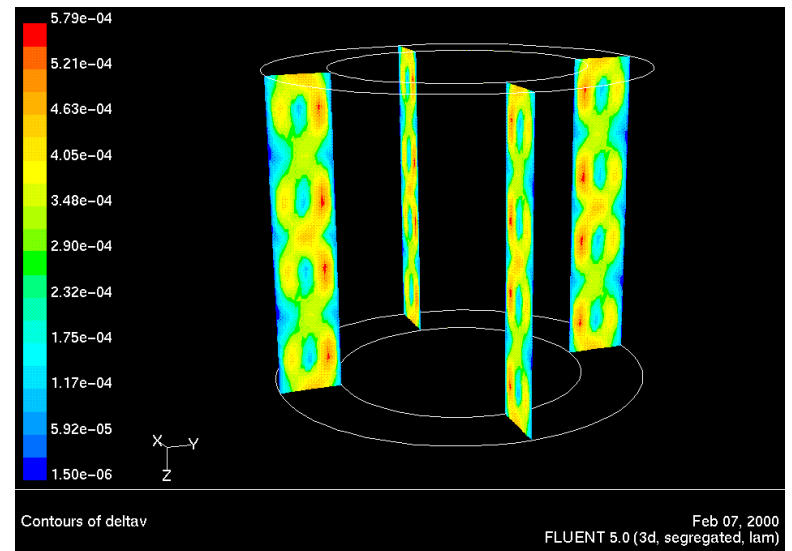
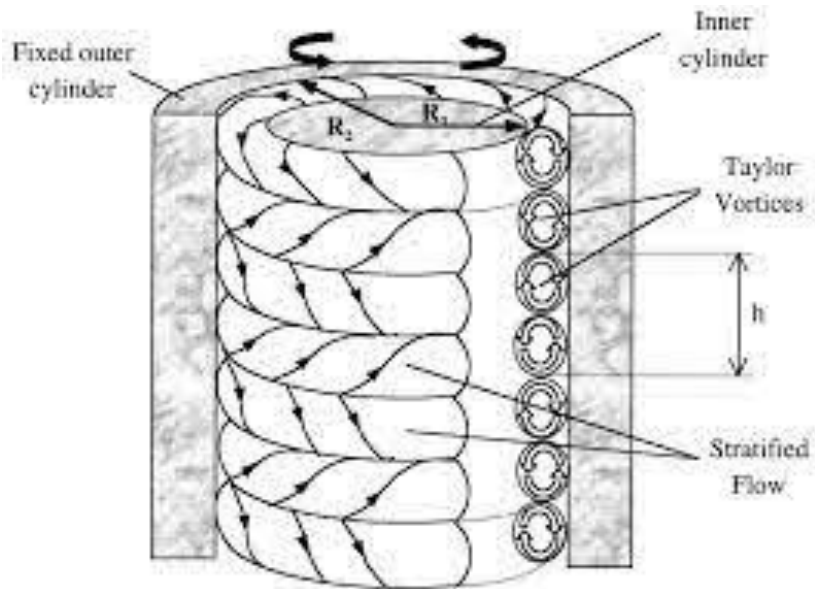


→ <https://www.youtube.com/watch?v=qgamfo86FQo>



Taylor-Couette

Taylor showed that when the angular velocity of the inner cylinder is increased above a certain threshold, Couette flow becomes unstable and a secondary steady state characterized by axisymmetric toroidal vortices, known as **Taylor vortex** flow, emerges. Subsequently, upon increasing the angular speed of the cylinder the system undergoes a progression of instabilities which lead to states with greater spatio-temporal complexity, with the next state being called **wavy vortex flow**. Beyond a certain Reynolds number there is the onset of turbulence.



Marangoni effect

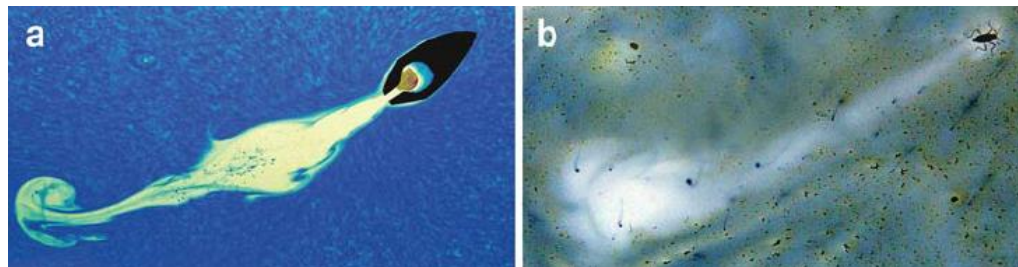
Since a liquid with a high surface tension pulls more strongly on the surrounding liquid than one with a low surface tension, the presence of a gradient in surface tension will cause the liquid to flow away from regions of low surface tension.

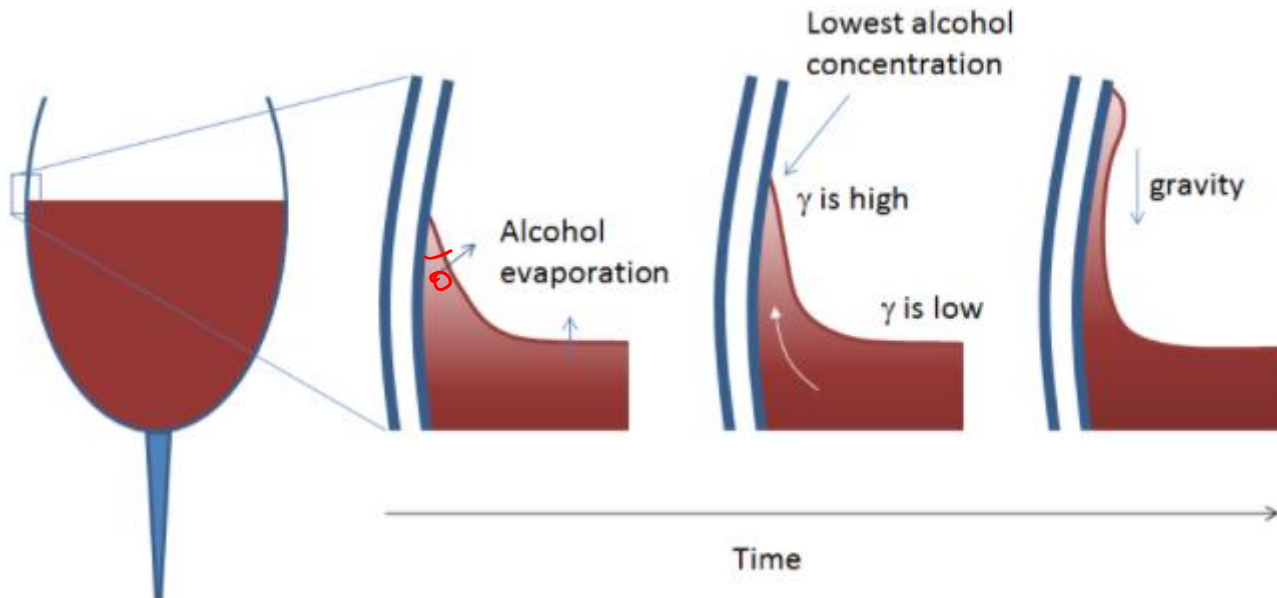
https://en.wikipedia.org/wiki/Marangoni_effect

<https://www.youtube.com/watch?v=rq55eXGVvis>



The Marangoni Effect: How to make a soap propelled boat!





Tears of wine form due to the surface tension (γ) gradient between the meniscus and the flat surface of the wine.



<https://br.comsol.com/blogs/tears-of-wine-and-the-marangoni-effect/>