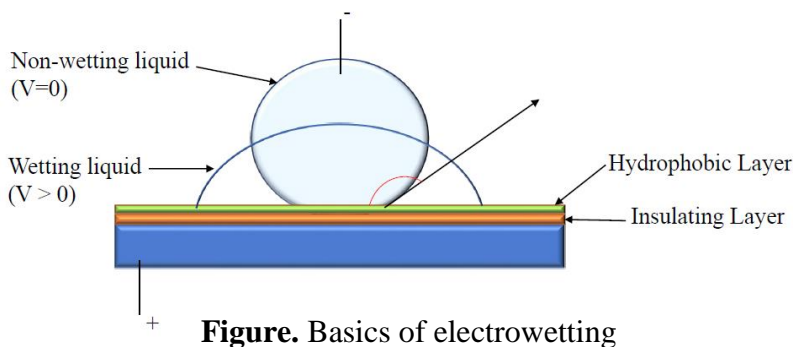


Electrowetting Application in Coalescence

Electrowetting is one of the most extensively used phenomena for manipulating liquids on the hydrophobic surfaces. Due to the low power consumption, electrowetting is considered as an economical, effective, reversible and accurate method for manipulating the wetting properties of small liquid drops without using any mechanical components. Electrowetting is widely used in electronic displays, lab-on-chips, focal lenses etc. But, recently, people are considering how to use it in filtration and separations. Electrowetting helps to control the drop movement on the surfaces and thus can be used in coalescence.

Electrowetting is a phenomenon of manipulating the contact angle between conducting liquid and solid by application of the electric potential. The solid surface is dual coated with dielectric and hydrophobic polymer layers. Due to the electric potential, the ions present in the liquid droplet tend to migrate toward the oppositely charged electrode. This causes the formation of an electric double layer at the interface of liquid and solid which results in contact angle modulation. Electric forces increase the attractive forces between the water droplets. The droplets stay in contact with each other for a longer time. Due to this, the thin film of inorganic liquid/air between two water droplets ruptures and the droplets coalesce. This phenomenon may be useful in the coalescence of small dispersed droplets and will ease the filtration in liquid-liquid separations.



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