

Production Engineering Laboratory

Surface Tension

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Definition

- Contractive tendency of the liquid surface that allows it to resist an external force.
- At liquid-air interface, surface tension results from the greater attraction of water molecules to each other

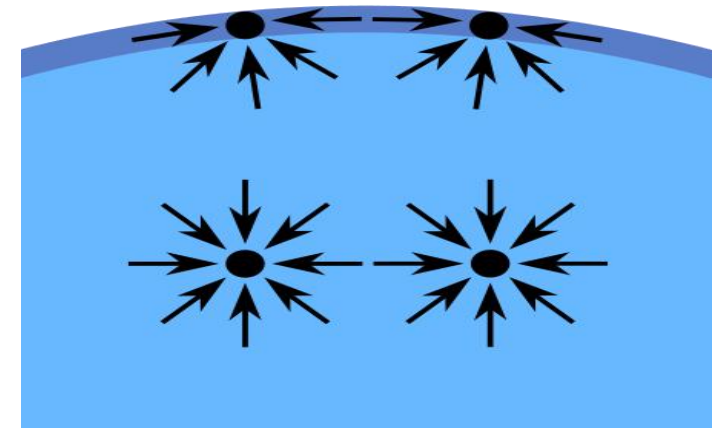
(due to cohesion)

than to air

(due to adhesion)



SURFACE TENSION



Units

- $\gamma = \frac{F}{L}$
 - force/unit length
 - Newton/meter
 - Water (72.8 mN/m @ 20 °C)
 - What does it mean?
 - Mercury (487 mN/m @ 15 °C)
 - dyne/cm



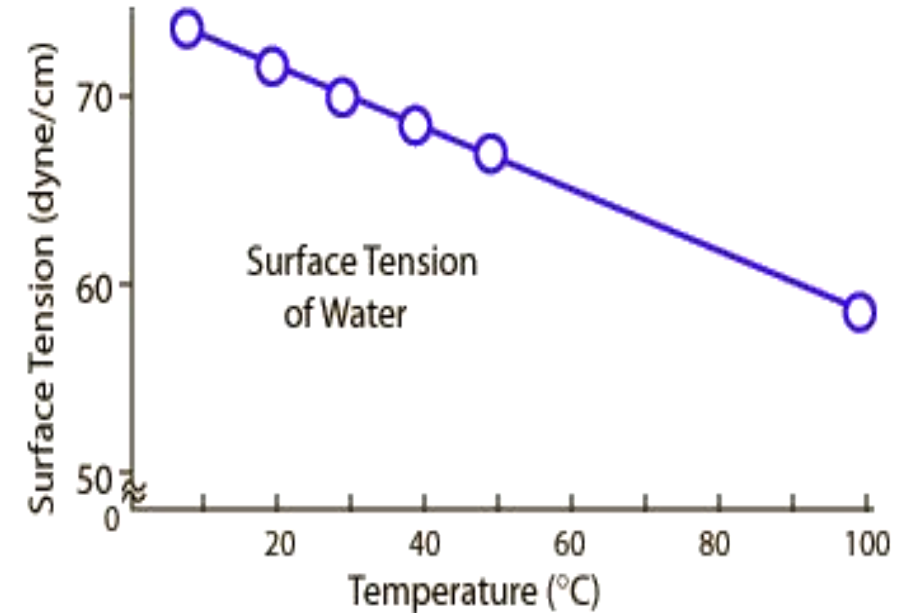
Examples

- Walking on water
- Floating a needle
- Do not touch the tent
- Soap and detergents
- Washing with cold water



Parameters effect

- Temperature effect
 - Example (water)
 - Why hot water is better cleaning agent?
- IFT
 - Difference between ST & IFT
- Importance in oil industry applications
 - Should be discussed in the report



Videos

- <http://www.youtube.com/watch?v=ynk4vJa-VaQ>
- <http://www.youtube.com/watch?v=u5AxlJSiEEs>
- <http://www.youtube.com/watch?v=whukr452ZvY&hd=1>
- <http://www.youtube.com/watch?v=ev9XyuLwjul&hd=1>