

Surface and interfacial tension is a force that keeps a fluid together at the air/fluid and fluid/oil interface respectively (*Figure 1*). It is the intermolecular force of attraction between adjacent molecules, expressed in force per unit width as dynes centimetre⁻¹ (dynes cm⁻¹) or milliNewtons metre (mN m⁻¹). Water, at ambient temperature, has a high surface tension in the range of 72 dynes cm⁻¹. While alcohols are in a low range of 20 to 22 dynes cm⁻¹. Solvents, typically, are in the 20 to 30 dynes cm⁻¹ range.

THE IMPORTANCE OF SURFACE TENSION

If any formulation changes the molecular level then the surface tension will change. If the formulation changes due to the addition of another chemical, *e.g.* the addition of surfactant, or if anything contaminates the fluid in question, then the surface tension will change. Measuring



Figure 1. Surface tension meter.

surface tension is a direct indicator of the quality of any chemical and any formulation.

Many fluids and formulations contain surfactants, or other impurities that are surface active or time dependent. A surfactant is a chemical having a hydrophobic and a hydrophilic segment. This partial solubility allows this molecule to migrate to and occupy the space at the gas/fluid interface.

FUNCTION OF SURFACTANTS

Surfactants greatly reduce the surface tension of fluids. To reduce the surface tension, however, the surfactant molecules have to migrate to the interface, this takes some finite amount of time. Given enough time, the formulation will eventually reach equilibrium (static) surface tension. This takes several seconds or even several minutes depending on the types of surfactant and the concentration.

Services offered by the physical testing laboratory:

- surface tension; and
- interfacial tension.

Cost: RM 40/sample

Duration: surface tension: one day/sample
interfacial tension: one day/sample

For more information kindly contact:

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