Experiment No 8

To determine viscosity of given liquid by Ostwald's Viscometer

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- **AIM:** To determine viscosity of given liquid.
- **APPARATUS:** Ostwald's Viscometer, Stop watch, Air dryer etc
- **REAGENTS:** Given liquid, Distilled water, Acetone etc

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- **THEORY:**
- It is property of liquid or fluid by virtue of which it offers resistance to its own flow.
- The flowing liquid consists of a series of parallel layers moving one over other.
- Any two layers will move with velocity of different magnitudes.
- Top layer moves faster than the next lower layer, due to internal friction called viscous drag.
- The unit of viscosity is poise & is define as, when force of one dyne is required to maintain a relative velocity difference of 1cm/sec between two parallel layers, separated by 1cm
- The coefficient of viscosity of a liquid is 1 poise. A smaller corresponding unit is centipoise.
- **1poise = 100 centipoise.**

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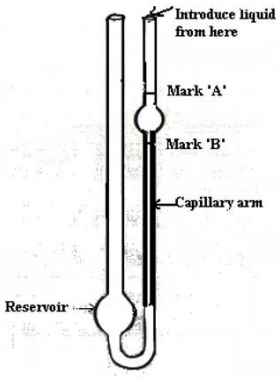

- Simple method for estimate viscosity of any liquid at room temperature is Ostwald's Viscometer.
- In this method fixed volume of liquid & pure water allow to flow through a standard capillary tube in a fixed distance. The time in second taken by liquid & pure water is a comparative parameter to find out viscosity of unknown liquid at room temperature

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OBSERVATION TABLE

Name of Liquid	Sp. Gravity	Time required in sec.	Mean time in sec
Distilled water	0.997	1 21.94 2 21.37 3 21.13	21.48
Liquid Turpentine	0.852	1 26.33 2 25.91 3 25.75	25.99

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CALCULATIONS

$$\text{Viscosity of liquid } \eta = \frac{do * to}{dw * tw} \times \eta w \text{ Centipoise}$$

Where, ηw = Viscosity of Water (0.8937), do = density of Turpentine, dw = density of water, to = time

For Turpentine, tw = time for water.

Viscosity of liquid η = (0.852 X 25.99/0.997X21.48) X 0.8937 = 0.9240 Centipoise

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- **Result:** Viscosity of given liquid = 0.9240 **Centipoises at 25 °C**