EXPERIMENT No - 7

OBJECT: To determine the surface tension of the given sample solution by drop number method.

REQUIREMENT:

APPARATUS: Stalagmometer, beaker, Electronic Weighing Balance, R.D. Bottle.

CHEMICALS: Reference liquid (water), Experimental liquid..

PRINCIPLE: Surface tension is the force in Newton acting at right angles along the surface of a liquid one meter in length. Its unit is N/m in SI System or dynes/cm in CGS System.

The stalagmometer is filled up to mark A with The sample liquid under study. The liquid is allowed to flow until the lower mark B is reached. The numbers of drops are counted carefully. The same procedure is repeated with water sample (reference liquid).

Let n= number of drop of sample liquid between mark A and B.

Then surface tension of liquid drop is given by:

$$\gamma_1 / \gamma_2 = n_2 / n_1 \times d_1 / d_2$$

Where n_1 = Number of drops of sample liquid between mark A & B.

n_2 = Number of drops of water liquid between mark A & B.

d_1 = Density of sample

d_2 = Density of water

γ_1 = Surface tension of sample

γ_2 = Surface tension of water at 25^0 C (72.14 dynes / cm) surface tension of sample liquid can be calculated.

Hence if the surface tension of water sample (reference liquid) is known, that of the sample liquid can be easily calculate.

PROCEDURE:

1. Clean the stalagmometer with distilled water and dry it.
2. Fill it with distilled water by sucking water up to the mark A.
3. Allow the liquid flow slowly.

4. Count the number of drop obtained when a fixed volume of a water flow between the mark A and B.
5. Resuck the water &repeat the counting thrice.
6. Now fill the stalagmometer with sample liquid.
7. Count the numbers of drops fallen for the same volume of sample liquid between mark A & B.
8. Repeat the counting process thrice and record it in the observation table.

OBSERVATION TABLE:

S. no.	Number of drop of water	Concordant reading	Number of drop of given liquid	Concordant reading
1				
2				
3				

Surface Tension of water = 72.14 dynes / cm.

CALCULATION:

Surface tension of sample liquid $= \frac{\textit{No .of drop of water}}{\textit{No.of drop of sample}} \times \frac{\textit{Density of sample liquid}}{\textit{Density of water}} \times 72.14$

dynes/cm

RESULT:

The surface tension of the given sample liquid is found to be .....dynes / cm.

PRECAUTION:

1. Stalagmometer should be clean and clear.
2. No air bubble should be formed while sucking the liquid into the stalagmometer.
3. During the drop counting process, stalagmometer should be held in vertical position.