Aim :-

To study safety rule of pharmaceutical chemistry lab.

(i) Conduct yourself in a responsible manner.
(ii) Follow all detail and further instruction.
(iii) Ask your teacher before proceeding with the activity.
(iv) Never work alone in the laboratory.
(v) Do not touch any experiment equipment, chemicals or other material in the laboratory
(vi) Unauthorised experiment are not followed.
(vii) Do not eat food, drink or chewing gum in the laboratory.
(viii) Read all procedure thoroughly before entering the laboratory.
(ix) Work area should be kept clean.
(x) Be alert and proceed with caution at all times in the laboratory.
(xi) Inform the teacher immediately of any mishappening condition in the lab.
(xii) Dispose of all chemical, waste material in dustbin and never mix chemical in the sink.
(xiii) Labels and equipment instruction must be read carefully before use.
(xiv) keep hand away from face, eye, mouth and body while using chemicals
(xv) All students should wear lab coat before entering the laboratory.

Teacher's Signature _____

Aim :

Determination of viscosity of liquid using ostwald viscometer.

Reference :

Requirements :-

ⓐ Apparatus :- Ostwald viscometer, Measuring cylinder Pippette, beaker, burette stand.

ⓑ Glassware :- Ost
 Chemicals :- Benzene, toluene, distilled water.

Theory :-

Viscosity is the measure of resistance to flow. Resistance is the internal friction of moving liquid layers fluid with large viscosity has more internal friction. Fluids with less viscosity have low internal friction. SI unit of viscosity is Pascal Second. Common unit of viscosity is paise (p).

$$1\ Pa\ s = 1\ ap.$$

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Procedure :

(i) Wash and dry each glassware.

(ii) Take 50% v/v of benzene and toulene in a beaker.

(iii) Mix it well and put it in ostwald viscometer and fill it at the marking level by closing one end of viscometer.

(iv) Release the closed end of viscometer and measure the time

(v) Take the reading atleast three time and calculate average viscosity.

Result :

Determination of viscosity of given liquid has been successfully determined in the laboratory.

Aim :

Determination of viscosity of liquid using ostwald viscometer.

Reference :

Requirement :

(a) Chemicals :→ Glycerine, distilled water.

(b) Glassware :→ Ostwald viscometer, Measuring cylinder, Pippette, beaker, burette stand.

Theory :-

A fluid with large viscosity resists motion because its strong intermolecular forces give it a lot of internal friction, resisting the movement of layers past one another.

Viscosity is a measure of a fluid's resistance to flow. The SI unit of viscosity is poiseille (PI) It's other units are newton-second per square meter $(N\,s\,m^{-2})$ or pascal-second $(Pa\,s)$.

Observation :

S. No	Initial time	final time
1.	0	3:10 min
2.	0	2:99 min
3	0	2:59 min

$$\text{Average time} = \frac{3:10 + 2:99 + 2:59}{3} \Rightarrow \frac{8:58 \text{ min}}{3}$$

$$\Rightarrow 2:59 \text{ min}.$$

Procedure :

(i) Wash and dry each glassware.

(ii) Take 50% $^V/_V$ of glycerine and water in a beaker

(iii) Mix it well and put it in ostwald viscometer and fill it at the marking level by closing one end of viscometer.

(iv) Release the closed end of viscometer and measure the time.

(v) Take the reading atleast three time and calculate average viscosity.

Result :

Determination of viscosity of given liquid has been successfully determined in the laboratory.

Date _____

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Aim :-

To determine surface tension of given liquids by drop count method.

Reference :

Requirement :→

(a) **Apparatus** :- Pycnometer, Stalagmometer, Pipette, Thermometer, Analytical balance, Weight box, beaker, etc.

(b) **Chemicals** :→ Distilled water.

Theory :

Surface tension : This property of liquids arises from the intermolecular forces of attraction. A molecule in the interior of a liquid is attracted equally in all directions by the molecules around it.

Its SI unit is newton per metre (Nm^{-1}).

Surface Tension Determination methods :

The methods commonly employed for the determination of surface tension are :-

1. Capillary-rise method
   ⓐ Single capillary-rise method
   ⓑ Double capillary-rise method

2. Drop formation method
   ⓐ Drop number method
   ⓑ Drop weight method

3. Ring-detachment method

4. Maximum bubble pressure method

5. Wilhelmy plate method.

6. Pendant drop method.

Procedure:

1. Thoroughly clean pycnometer and stalagmometer with chromic acid and wash two times with fresh distilled water.

2. Stalagmometer must be fixed in a vertical position using stand.

Observations :

1. Room temperature = ...°C

2. Weight of Empty pycnometer = W_1.

3. Weight of Pycnometer + Distilled water = W_2

4. Weight of Pycnometer + Liquid = W_3.

Liquids	Number of drops				Specific gravity	Surface tension.
	I	II	III	Mean		

Calculations :

1. Weight of liquid = $W_3 - W_1$.

2. Weight of distilled water = $W_2 - W_1$

3. Specific gravity of liquid = $\dfrac{(W_3 \cdot W_1)}{(W_2 - W_1)}$

$$Y_2 = \frac{P_2 \, n_1}{P_1 \, n_2}$$

Calculate surface tension of other liquids by substituting data in place of distilled water using same equation.

3. Fill water in stalagmometer up to mark A and count total number of drops formed from mark A to B.

4. Repeat step 3 at least 3 times for accuracy.

5. Wash stalagmometer using same liquid of which surface tension is to be determined.

6. Repeat step 3, 4, 5 for other chemicals.

7. Determine density of liquids by using pycometer.

Result:

Surface tension of the given liquid has been determined in the laboratory successfully.