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VISCOSITY

REDWOOD

VISCOSIMETER

VITSCOMETER

REDWOOD

VITSCOMETER

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Aim:

To study the effect of change of temperature on viscosity of lubricating oil by using a Redwood Viscometer no. 1.

Objectives:

After performing the practical, the learner will be able to:

PRO1: Understand the Redwood Viscometer Apparatus for viscosity.

PRO2: Understand the viscosity of oil.

PRO3: Understand the relation between Temperature & viscosity.

PRO4: Infer the relation between viscosity & temperature by Graphically.

Apparatus:

Red Wood Viscometer no. 1, stop Watch, Thermometer, Beaker, Flask, Castor oil, etc.

PRO 1:

Observations:

- 1] Material used as heating medium in the experiment is: Water
- 2] Material placed in central oil cup for Experimentation: Castor Oil.

PRO 2:

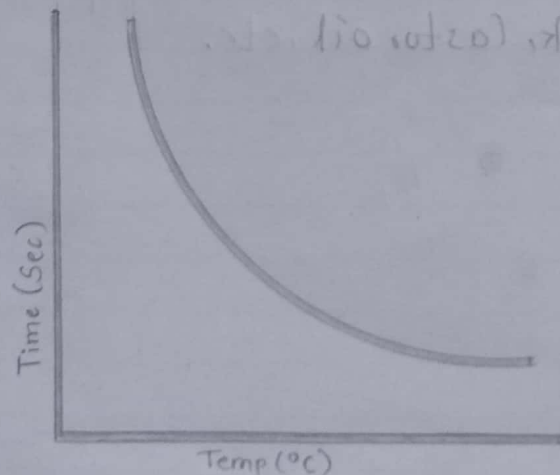
Time in Seconds at Room Temperature: 367 (sec).

PRO 3:

Observation Table:

Obs. No.	Temperature ($^{\circ}\text{C}$)	Time in Seconds (Sec)	Fluctuations
1.	30.5 $^{\circ}\text{C}$ [Room Temperature]	367 sec	-
2.	50 $^{\circ}\text{C}$	99 sec	3 $^{\circ}\text{C}$
3.	60 $^{\circ}\text{C}$	72 sec	1.5 $^{\circ}\text{C}$
4.	70 $^{\circ}\text{C}$	49 sec	0.2 $^{\circ}\text{C}$

PRO 4:



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• Result & Discussion:

PRO1: The instrument allows to store Castor Oil & water in Seperate Containers & is able to conduct a Steady Heatflow which can be tracked using Thermometers.

PRO2: The Oil at room temperature has High Viscosity. It takes enough time to flow down from the container in which Temperature Fluctuations can be Observed.

PRO3: It takes less time for Oil to flow down the container for every Successive Rise in Temperature.

PRO4: Viscosity of oil decreases with Increase in its Temperature.

• Conclusion:

Viscosity is Inversely Proportional to Temperature.

• Quiz:

1] what is viscosity?

⇒ Viscosity is defined as the measure of the Resistance of a fluid to gradual deformation by Shear or Tensile Stress.

2] How will you adjust the Temperature?

⇒ Temperature can be adjusted with a Rheostat. It gives

Result & Discussion:

PR01: The instrument allows to store last 24 hours in separate containers & is able to conduct a 24-hour test which can be tracked using thermometer.

PR02: The Oil of room temperature has High Viscosity. It takes enough time to flow down from the top of the tube which temperature fluctuations can be observed.

PR03: It takes less time for Oil to flow down from the top of the tube for every successive rise in temperature.

PR04: Viscosity of oil decreases with Increase in temperature.

Conclusion:

Viscosity is Inversely proportional to temperature.

Ques:

- 1] What is viscosity?
⇒ Viscosity is defined as the measure of the resistance of a fluid to gradual deformation by shear or tensile stress.
- 2] How will you adjust the temperature?
⇒ Temperature can be adjusted with a heater. It gives

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a Continuous Heat Supply of a Constant Temperature Resulting in Accurate Readings.

3] What is viscosity co-efficient?

⇒ The Coefficient of viscosity is defined as the force of friction that is required to maintain a difference of velocity of 1 cm/sec between parallel figures of fluid. The unit is usually expressed in Poise or CentiPoise.

4] Where we should insert thermometer inside oil bath or water bath?

⇒ The thermometer should be inserted in the Oil bath as we are concerned with Temperature of Oil. The water acts as a Heating body & its Temperature doesn't need to be Tracked.

• Precautions:

While performing the practical the learner must:

1. Ensure that oil should not slide down and fall on the ground.
2. Ensure heater & thermometer is properly arranged.
3. Ensure frequent stirring of oil to get best results.
4. Keep safe distance from the Apparatus.

Objective	PRO 1	PRO 2	PRO 3	PRO 4	Total
Weight Points	20	20	20	20	Score
Score					
Earned points (EP) =	Marks in 100 = EP * 20				
Total Score / 80 =					

a continuous heat supply of a constant temperature resulting in accurate readings.

3) What is viscosity co-efficient?
 ⇒ The coefficient of viscosity is defined as the force of friction that is required to maintain a difference in velocity of 1 cm/sec between parallel layers of 1 cm² area. The unit is usually expressed in Poise or Centipoise.

4) Where we should insert thermometers inside oil bath or water bath?
 ⇒ The thermometer should be inserted in the Oil bath as we are concerned with temperature of Oil. The thermometer acts as a floating body & its temperature doesn't need to be tracked.

Precautions:

1. While performing the practical, the thermometer should not be touched by hand.
2. Ensure that oil should not slide down and fill in the bulb.
3. Ensure proper & thermometer is properly calibrated.
4. Ensure frequent stirring of oil.
5. Do not move the thermometer from the bath.

Objective	1	2	3	4	Total
Weight	20	20	20	20	Score
Points					
Score					
Total score					