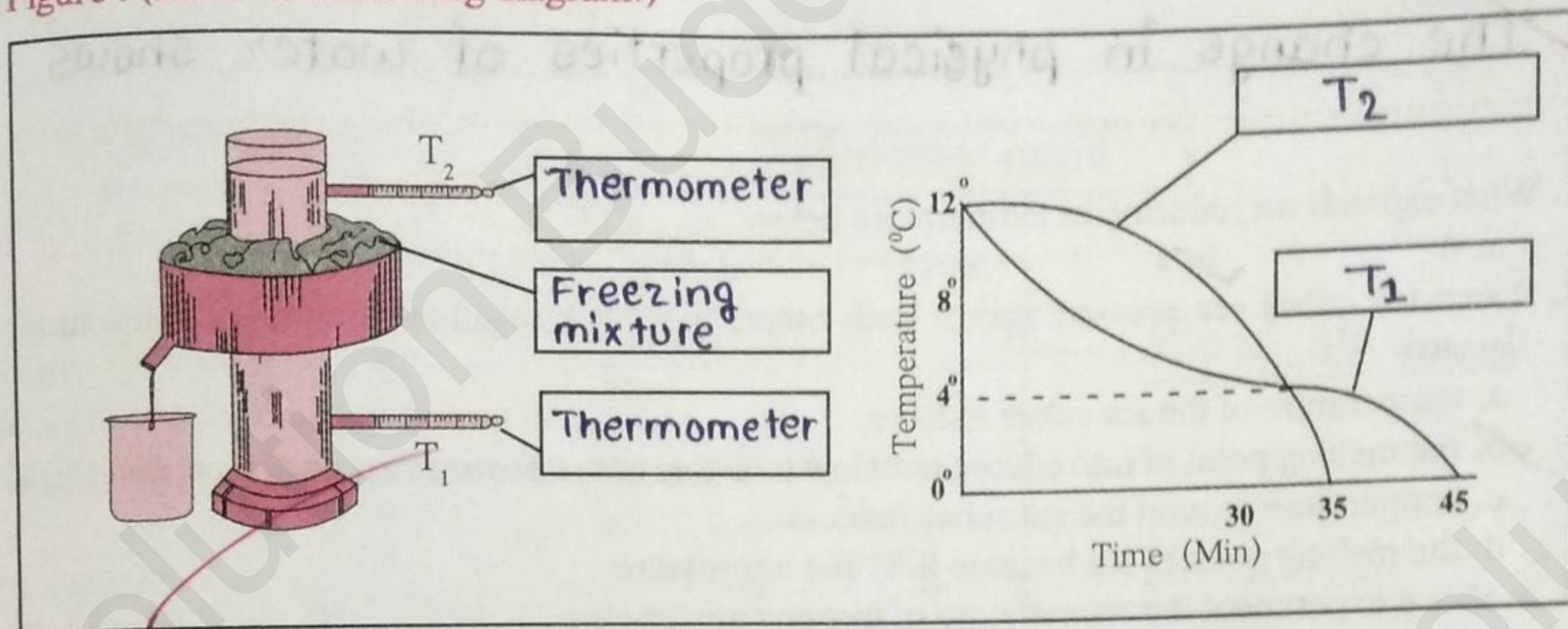


Practical No. 7

Aim : To study anomalous behaviour of water using Hope's apparatus.

Apparatus : Hope's apparatus, ice, common salt, water, thermometer, beaker, etc.

Figure : (Label the following diagram.)



Procedure :

1. Take cold water ($10-12^{\circ}\text{C}$ temp) in the inner cylinder of the Hope's apparatus.
2. In outer wider container, fill in the freezing mixture of ice and salt.
3. Fix the two thermometers T_1 (lower) and T_2 (upper), as shown in the figure.
4. Observe the two temperatures at every minute and make an entry in the observation table below.
5. Study the given graphs and indicate the curves corresponding to T_1 or T_2 .

Observation Table :

No	Time (Minutes)	Temperature (T_1 $^{\circ}\text{C}$)	Temperature (T_2 $^{\circ}\text{C}$)
1	0	10	10
2	1	9	9
3	2	9	8
4	3	8	7
5	4	7	5
6	5	6	4
7	6	5	2
8	7	5	1
9	8	4	0
10	9	4	0
..	..		

Inference / Conclusion :

1. The water expands as the temperature in inner cylinder contracts due to freezing mixture and density of water increases. Therefore the temperature readings in both the thermometers are not change.

2. If temperature decreases below 4 $^{\circ}\text{C}$ water starts expanding and water becomes lighter due to decrease in density. It moves upward in the cylinder and the temperature of upper part of water column decreases to 0°C .
3. The behaviour of water between the temperature 0°C to 4°C is known as Anomalous behaviour of water.
4. What conclusion could you draw from the graph? How is anomalous behaviour of water proved?

The change in physical properties of water shows

Multiple Choice Questions

1. What expands on reducing its temperature below $^{\circ}\text{C}$
 a. 0 ☒ b. 4 c. 12 d. 5
2. If two ice cubes are pressed against each other, they stick together firmly after some time because
 a. temperature of the ice cubes reduces.
☒ b. the melting point of ice reduces to below 0°C due to the pressure applied.
 c. temperature around the ice cubes reduces.
 d. the melting point of ice because 0°C due to pressure.
3. In above experiment the temperature of freezing mixture is $^{\circ}\text{C}$.
 a. 0 to 4 b. 0 to -4 c. -10 to -20 d. -4 to 4
4. In cold countries in winter, water carrying pipes sometimes break, because
 a. volume of water reduces if the temperature is reduced below 0°C .
 b. air pressure increases.
 c. the steel pipes become brittle due to reduced temperature below 0°C .
☒ d. volume of water increases if the temperature is reduced below 0°C .
5. Street ice cream vendors remove the water in their freezing mixture intermittently, as a result of which
 a. the temperature of the freezing mixture increases.
 b. the temperature of the freezing mixture remains constant.
 c. the temperature of the freezing mixture reduces further.
 d. the weight of the freezing mixture reduces.

: Exercise :

1. How to study the anomalous behaviour of water by using Hope's Apparatus?
by the use of two thermometer, Freezing mixture, beaker and stand, we can study the anomalous behaviour of water using Hope's apparatus.
2. Explain anomalous behaviour of water with the help of graph given on page 19.
Many object expands at the stage of 0°C but water can't show that property. they expands from 4°C , this behaviour of water is called 'Anomalous Behaviour of water'
3. What is the importance anomalous behaviour of water by using Hope's Apparatus?
Because of Anomalous behaviour of water by using Hope's apparatus we can judged the properties of water very deeply and also its different behaviour.

Remark and Signature

