

MODULE-6

CHAPTER-1

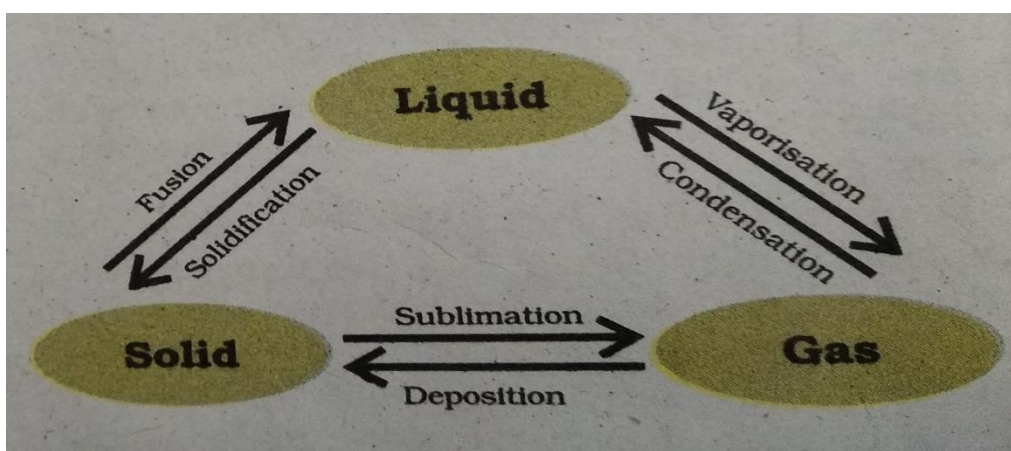
MATTER IN OUR SURROUNDINGS

Topics to be discussed:

- (i) 'States of matter' triangle.
- (ii) Evaporation.
- (iii) Factors affecting rate of evaporation.

'STATES OF MATTER' TRIANGLE

With the help of this triangle we can show the inter conversion between the three states of matter: solid, liquid, and gas.



EVAPORATION

When a liquid is exposed to air, its volume decreases gradually. This is due to evaporation. In this process some liquid at the surface turns in to vapor and mixes with the gases in the air. Thus, when a liquid turns in to vapor, it is said to evaporate.

(i) **The process of a liquid changing into vapor even below its boiling point is called evaporation.** All liquids can evaporate at room temperatures but evaporation will be faster at higher temperatures.

(ii) Evaporation is a surface phenomenon as particles present at surface of the liquid possessing high kinetic energy changes to vapor. But boiling is a bulk phenomenon.

EXAMPLES OF EVAPORATION

(a) The wet clothes dry due to evaporation of water present in them.

(b) Rain water puddles dry up because of evaporation.

(c) Common salt is obtained from sea water by the process of evaporation of sea water.

(ii) Whatever be the temperature at which evaporation takes place the latent heat of vaporization must be supplied to the liquid.

HOW DOES EVAPORATION OCCUR?

Some particles in a liquid always have more kinetic energy than the others and these particles have enough energy to break the forces of attraction between the particles and escape from the surface of the liquid in the form of vapour. Thus, the fast moving particles of a liquid are constantly escaping from the liquid to form vapour. This causes evaporation.

FACTORS AFFECTING EVAPORATION

(i) Temperature- The rate of evaporation increases on increasing the temperature of the liquid. When the temperature of a liquid is increased then; more particles of liquid get enough kinetic energy to go in to the vapor state. So, rate of evaporation increases.

(ii) Surface area- The rate of evaporation increases on increasing the surface area because on increasing surface area no. of molecules exposed to surface for evaporation will increase and more particles will have chance of escaping in to vapor state.

E.g. - (a) washed wet clothes are spread while drying to increase their surface area which leads to quicker drying of wet clothes due to faster evaporation.

(b) Hot tea can be sipped easily from a saucer rather than a cup because saucer has large surface area which leads to faster evaporation. And tea becomes cool faster.

(iii) Humidity of air- The amount of water vapor present in air is called humidity. When the humidity of air is low, then the rate of evaporation is high and water evaporates more readily. When the humidity of air is high then the rate of evaporation is low and water evaporates very slowly.

E.g. - 1. In the later part of summer the humidity of air increases. People sweat a lot in such weather. But the sweat from our bodies does not evaporate readily due to high humidity of air and as a result we feel uncomfortable.

2. The wet clothes take long time to dry when the humidity of air is high because due to high humidity rate of evaporation decreases.

(iv) wind speed- The rate of evaporation of a liquid increases with increasing wind speed. When the speed of wind increases the particles of water vapor move away with the wind, decreasing the amount of water vapor in the surroundings. That's why wet clothes dry faster on a windy day.
