

Class 9 - subject -science

Chapter 1

Latent heat

The hidden heat which breaks the force of attraction between the molecules is known as the latent heat. Since, the heat energy is hidden in the bulk of the matter, it is called latent heat.

- Latent heat of fusion

→ The heat energy required to convert 1 kilogram of a solid into liquid at atmospheric pressure at its melting point, is known as the latent heat of fusion.

→ The temperature at which a liquid starts boiling, at atmospheric pressure, is called its boiling point.

→ Boiling is a bulk phenomenon. Particles from the bulk of the liquid gain energy to change into gaseous state. For example, boiling point of water is  $100^{\circ}\text{C}$ . (or  $100^{\circ}\text{C} = 273 + 100 = 373\text{ K}$ )

- Latent heat of vaporisation

→ The heat energy required to convert 1 kilogram of liquid into gas, at atmospheric pressure, at its boiling point, is known as the latent heat of vaporisation

→ The process, in which a gas, on cooling, turns into a liquid at a specific temperature is called condensation or liquefaction.

Formation of clouds is due to the condensation of water vapour from the Earth's surface.

→ The change of state of a substance directly from a solid to gas, without changing into the liquid state (or vice versa) is called sublimation.

→ When a solid melts, its temperature remains the same because heat gets used up in changing the

state by overcoming the forces of attraction between the particles. It is considered that it gets hidden into the contents of the beaker and is known as the latent heat.

→ Water vapour at 373 K has more energy than water at the same temperature because particles in steam have absorbed extra energy in the form of latent heat of vaporisation.

### Effect of change of pressure

→ Gases can be liquefied by applying pressure and reducing the temperature. When a high pressure is applied to a gas, it gets compressed and if the temperature is lowered, the gas is liquefied.

→ Solid CO<sub>2</sub> gets converted directly to gaseous state on decrease of pressure to 1 atmosphere without coming into liquid state. This is the reason that solid carbon dioxide is also known as dry ice.

### Evaporation

→ The process of conversion of a substance from the liquid state to the gaseous state at any temperature below its boiling point is called evaporation or vaporisation.

→ Evaporation is a surface phenomenon.

- Factors affecting the rate of evaporation

→ The rate of evaporation increases on increasing the surface area of the liquid.

- The rate of evaporation increases with an increase in temperature.
- Decrease in the humidity increases the rate of evaporation.
- An increase in the wind speed increases the rate of evaporation.

- Evaporation causes cooling

→ The particles of liquid absorb energy from the surrounding to regain the energy lost during evaporation. This absorption of energy from the surroundings make the surroundings cold.

Ques 1 Define evaporation.

Ques 2 Define latent heat.