

Class - IX

Sub - Science

Topic - Matter in our Surrounding

• Melting Point: — The temperature at which a solid melts to form liquid at atmospheric pressure is called its melting point. Melting point of ice is  $273.16^{\circ}\text{K}$  ( $0^{\circ}\text{C}$ ). During melting of ice, the temperature does not rise even though heat is being supplied continuously due to latent heat of fusion. This latent heat of fusion is used to overcome the forces of attraction between ice particles. At  $0^{\circ}\text{C}$  energy of water particles is much more than the energy of particles of ice at  $0^{\circ}\text{C}$ .

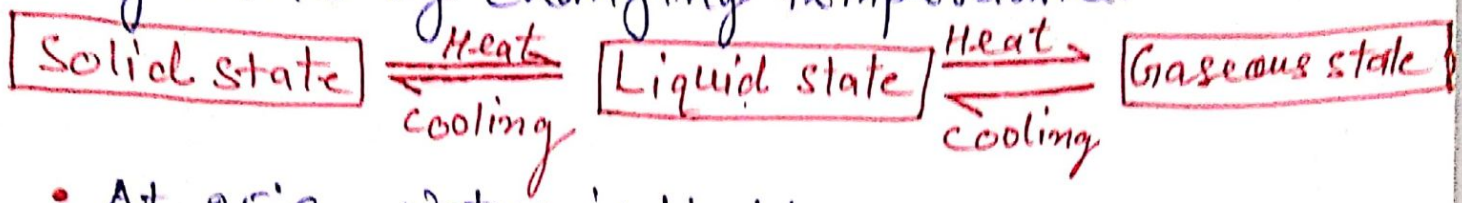
• Latent Heat of fusion: — The amount of heat required to change 1kg solid to its liquid state at atmospheric pressure.

• Boiling Point: — The temperature at which a liquid boils to form vapours at atmospheric pressure, is called its boiling point. Boiling point of water is  $373^{\circ}\text{K}$  ( $100^{\circ}\text{C}$ ).

• Latent Heat of Vaporization: — The amount of heat required to change 1kg liquid to its gaseous state at atmospheric pressure. During boiling the temperature of water does not rise even though heat is being supplied continuously. As this heat of vaporisation is used up to overcome

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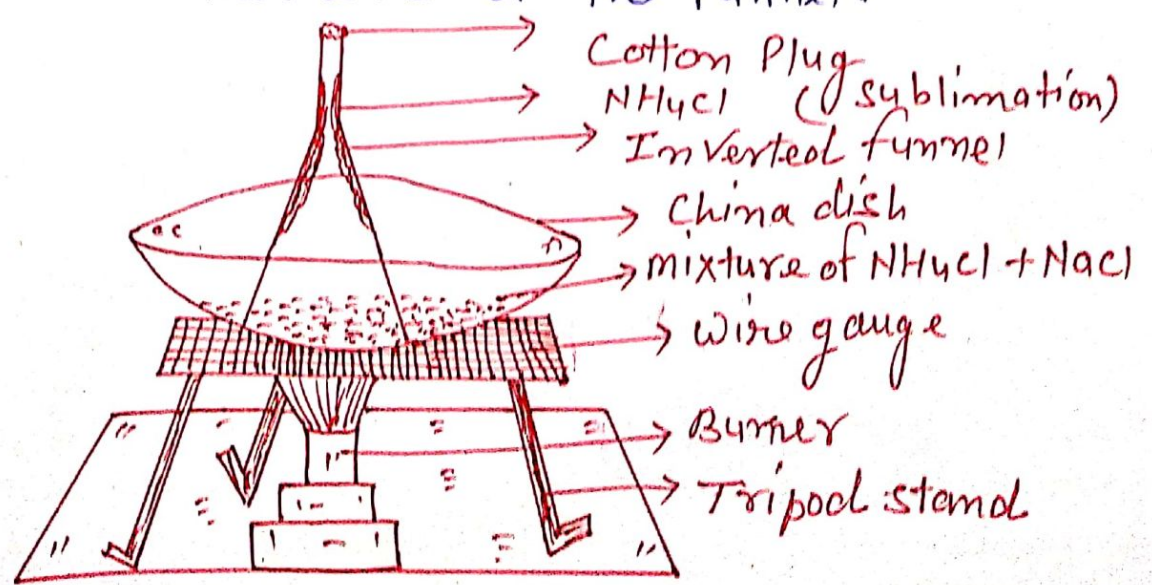
The forces of attraction between water particles. At 100°C energy of water is much more than the energy of water at 0°C. So we can change one state of matter to another state by changing state by changing temperature.



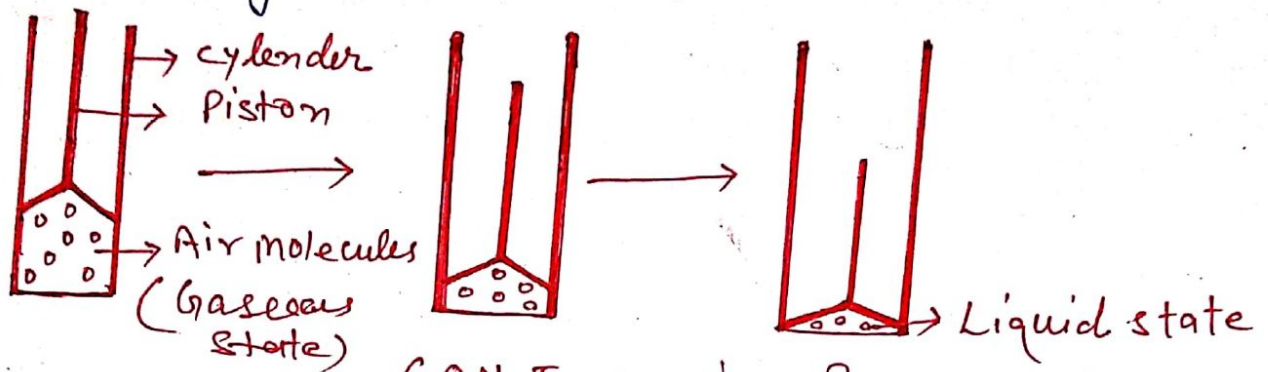
- At 25°C, water is liquid
- At 0°C, water is solid (Ice)
- At 100°C, water is gaseous state (steam)

Sublimation:— The change of solid directly into vapours on heating and of vapours into solid on cooling, without passing through the intervening liquid state is called sublimation.

Example:— When Camphor or Ammonium chloride is heated in a china dish covered by an inverted funnel (with cotton plug in its upper open end) the vapours of ammonium chloride are converted into solid ammonium chloride on coming in contact with the cold inner walls of the funnel.

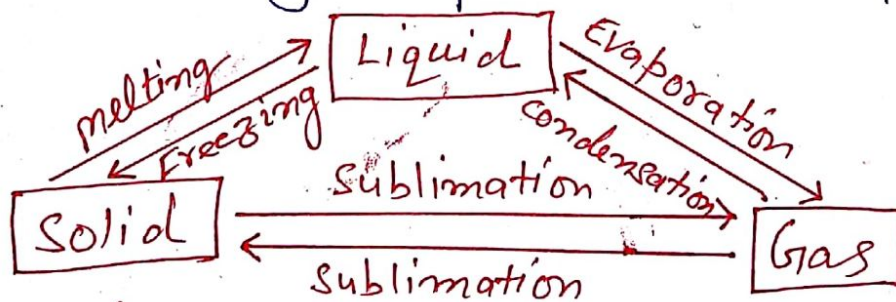


- Effect of change of Pressure: <sup>IX</sup> — if we compress gas in a cylinder, the distance between the particles of gas is reduced and finally gas is liquefied on lowering temperature. (3)



{ ON Increasing Pressure and lowering temperature }

- By applying high pressure, the particles of gas can be brought close together.
- Solid carbon dioxide (Dry Ice) is changed into Carbon dioxide gas directly without changing into liquid when pressure is reduced to one atmospheric pressure.
- Thus states of matter (Solid, liquid, gas) are determined by temperature and pressure.



- Evaporation: — A surface phenomenon in which liquid changes into vapours at any temperature below its boiling point is called evaporation. Particles on the surface of a liquid have higher kinetic energy than others, so they break the forces of

attraction between the particles and escape from the surface of liquid in the form of vapours.

Factors affecting evaporation: — Rate of evaporation depends on:

(a) Exposed surface Area: — on increasing surface area of liquid, rate of

evaporation increases.

(b) Increase in Temperature: — Increases kinetic energy of particles

hence rate of evaporation increases.

(c) Humidity: — when the humidity of air is low, evaporation rate is increased.  
"more Humidity, less evaporation".

(d) Wind: — when wind speed increases, rate of evaporation also increases.

Evaporation always causes cooling: — The cooling caused by evaporation is based on fact that when a liquid evaporates, it takes latent heat of vaporization from surroundings which on losing heat get cooled.

Examples: —

(i) when we put acetone on our hand, it gets vapourised by taking heat from our hand and our hand feels cool.

(ii) we should wear cotton clothes in summer to keep cool and comfortable as cotton is good absorber of water, so it absorbs the sweat.

from our body and exposes it to air for evaporation of sweat thus cools our body.

(iii) often people sprinkle water on ground during summer. This water takes heat from ground and surrounding air to evaporate, thus making the place cool.

**Assignment to do**

- Q No 1: - what is the melting point of Ice?
- Q No 2: - How do we liquefy the gases?
- Q No 3: - what is the chemical name of dry Ice?
- Q No 4: - what is physical state of water at 25°C and 0°C?
- Q No 5: - write two factors which increase rate of evaporation.
- Q No 6: - what is sublimation? Name two substances which undergo sublimation.
- Q No 7: - change the temperature in °C scale temperature.
  - (a) 293°K      (b) 470°K
- Q No 8: - which process/phenomenon is responsible to keep water cool in an earthen pot in summer.
- Q No 9: - why do we put on cotton clothes in summer?
- Q No 10: - The amount of heat required to change 1 kg solid to its liquid state at atmospheric pressure is known as its -----
- Q No 11: - match the column A to column B
 

A	B
1. Temperature	1. Pascal
2. Density	2. cubic metre
3. Volume	3. Kelvin
4. Pressure	4. kg/m <sup>3</sup>
- Q No 12: - which gas is supplied in liquefied form at home and in hospital?