Chapter 1

{Matter in our Surroundings}

Delta

- **Matter** → Anything that occupies space and has mass and offers resistance to any applied force.

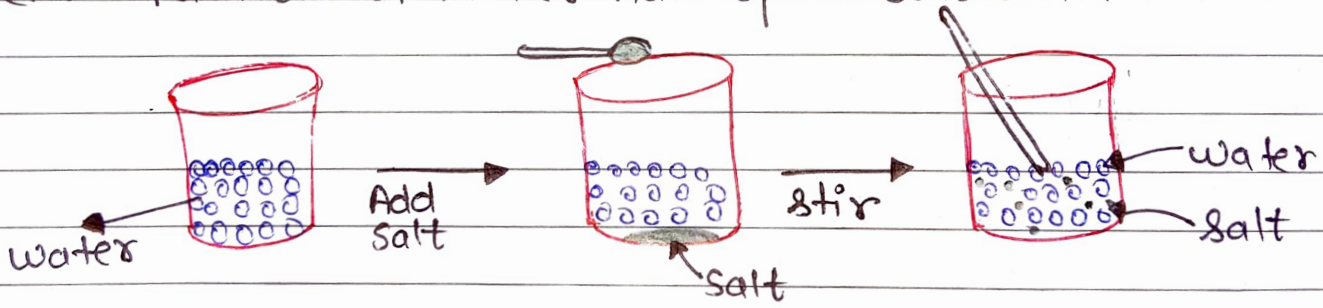
Matter is made up of Particles (very small)

- **Characteristic of Particles :**

(i) Particles of matter are continuosly moving

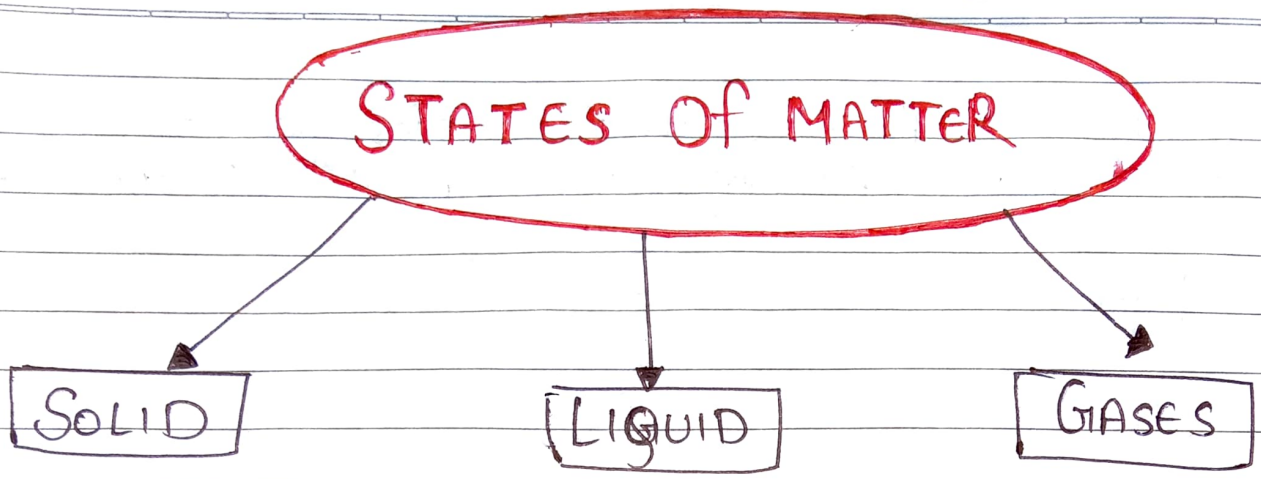
उनके अंदर Kinetic energy होती है, As the temperature rise, Particle moves faster because Kinetic energy of Particle increases.

(ii) Particle of matter have space between them



(iii) Particles of matter attract each other

- SPace between Particles → Gases > Liquid > Solids
- Force of Attraction → Solids > Liquids > Gases
- Movement of Particles → Gases > liquids > Solids



(i) Solid state :

(a) Have definite shape
(b) Have distinct boundaries
(c) Have rigidity and incompressibility
(d) Have definite Volume

(ii) Liquid state :

(a) Have fluidity (not rigid)
(b) Low compressibility
(c) No definite shape and boundaries.
(d) Have definite Volume.

(iii) Gaseous state :

(a) Have fluidity
(b) Have high Compressibility
(c) Have no definite boundaries.
(d) Have no definite shape
(e) Have no definite Volume

Change in Physical state of Matter Can be done in two ways :

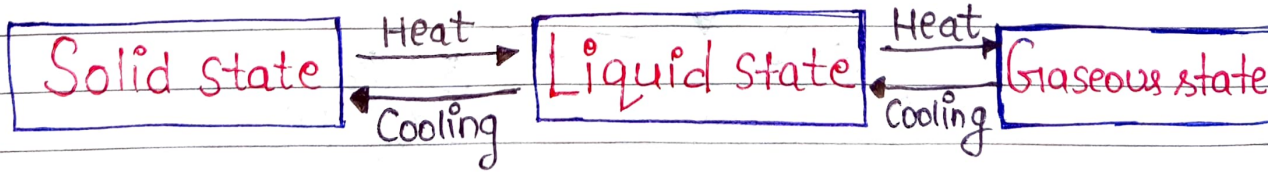
(A) By changing the temperature :

(i) Melting Point : The temperature at which a solid melts to form Liquid at atmospheric pressure is Called Melting point.

- Latent heat of fusion : The amount of heat required to change 1 Kg solid to its Liquid state at atmospheric Pressure.

(ii) Boiling Point : The temperature at which a Liquid boils to form vapours at atmospheric Pressure is Called boiling Point. Boiling point of water is 373 K or 100°C

- Latent heat of Vapourisation : The amount of heat required to change 1kg Liquid to its gaseous state at atmospheric Pressure.



At 25°C → Water is Liquid
At 0°C → Water is solid (ice)
At 100°C → Water is gaseous (steam)

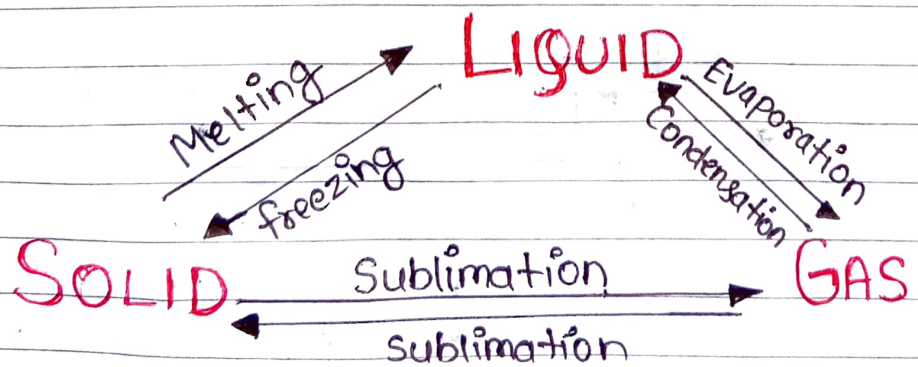
(iii) Sublimation : Change of solid directly into vapour on heating and vapours into solid on cooling without passing through liquid state is called Sublimation.

सीधा Solid से Gaseous और Gaseous से Solid में change होना → sublimation

Example : Camphor (कपूर) (solid state) $\underset{\text{Cooling}}{\overset{\text{heat}}{\rightleftharpoons}}$ Vapour (gaseous state)

(B) By changing the Pressure :

- By applying high Pressure, the particles of a gas can be brought close together.
- Solid Carbon dioxide (dry ice) is changed into Carbon dioxide gas directly without changing into liquid.



- **Evaporation :** A surface phenomenon in which liquid changes into vapours at any temperature below its boiling point is called evaporation.

- **Factors affecting evaporation :**

(a) Exposed surface area : Surface area ↑ = evaporation ↑

(b) Increase in temperature : temperature ↑ = evaporation ↑

(c) Humidity : Humidity ↑ = evaporation ↓

(d) Wind : Speed of wind ↑ = evaporation ↑

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QUESTIONS

VERY SHORT QUESTIONS

1. Write different states of matter.
2. Which has more density – liquid or solid ?
3. What is the melting point of ice ?
4. Boiling point of alcohol is 78°C. Change it into Kelvin scale ?
5. Why do gas exert pressure ?
6. How do we liquefy the gases ?
7. What happens to particles when salt dissolves in water ?
8. What is the physical state of water :
   (a) at 0° C (b) 25°C
9. What is the chemical name of dry ice ?
10. Why is heat energy needed to melt a solid ?

SHORT QUESTIONS

1. Classify the matter on the basis of physical characteristics ?
2. Why solid carbon dioxide is called 'dry ice' ?
3. Why do we keep ether and acetone at cool places ?
4. Write two factors which will increase rate of evaporation ?
5. Which gas is supplied in the liquefied form at home and in hospitals ?
6. Compare the force of attraction between iron, rubber band and chalk ?
7. Arrange sugar, water and oxygen in the increasing order of force of attraction between their particles ?
8. Define boiling point, melting point and evaporation ?
9. What is sublimation? Name two substances which undergo sublimation.
10. Why does steam causes more severe burns than boiling water?
11. Change the temperature in celsius scale temperature :
    (a) 293 K (b) 470 K.

LONG QUESTIONS

1. Describe the factors affecting evaporation ?
2. (a) Why do we wear cotton clothes in summers ?
   (b) Why do we feel cold, when we keep acetone and ether on our palm ?
3. Write three characteristics of particles of matter. Give one example of each ?
4. Write the characteristic responsible for :
   (a) Smell of perfume spreads in the room.
   (b) Water takes the shape of the container in which it is kept.
5. Name three states of matter. Give one example of each and state three characteristic properties of each.
6. Compare the properties of solids, liquids and gases in tubular form.
7. (a) Write full forms of (i) LPG (ii) CNG
   (b) Draw the 'states of matter triangle' to show the interconversion of states of matter.
8. (a) Why does a desert cooler cool better on a hot, dry day?
   (b) What is evaporation? How can the evaporation of a liquid be made faster?

OBJECTIVE TYPE QUESTION:

1. A few substances are arranged in the increasing order of 'forces of attraction' between their particles. Which one of the following represents a correct arrangement ?

   (a) Water, air, wind
   (b) Air, sugar, oil
   (c) Oxygen, water, sugar
   (d) Salt, juice, air

2. Which one of the following sets of phenomena would increase on raising the temperature ?

   (a) Diffusion, evaporation, compression of gases.
   (b) Evaporation, compression of gases, solubility
   (c) Evaporation, diffusion, expansion of gases.
   (d) Evaporation, solubility, diffusion, compression of gases.

3. The property to flow is unique to fluids. Which one of the following statements is correct?

(a) Only gases behave like fluids

(b) Gases and solids behave like fluids

(c) Gases and liquids behave like fluids

(d) Only liquids are fluids

4. Choose the correct statement of the following:

(a) conversion of solid into vapours without passing through the liquid state is called sublimation.

(b) conversion of bapours into solid wihtou passing through liquid state is called vaporisation.

(c) conversion of vapours into solid without passing through the liquid state is called freezing.

(d) conversion of solid into liquid is called sublimation.

5. During summer, water kept in an earthen pot becomes cool because of the phenomenon of

(a) diffusion. (b) transpiration

(c) osmosis. (d) evaporation

6. On converting 25°C, 38°C and 66°C to kelvin scale, the correct sequence of temperature will be

(a) 298K 311K and 339K

(b) 298K, 300K and 338K

(c) 273K, 278K and 543K

(d) 298K, 310K, and 338K

[K=273+t°C]

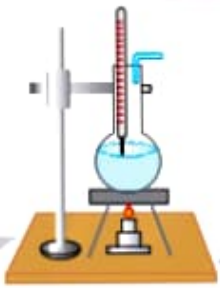
7. Fill in the blanks:

(a) The boiling points of, acetone is 329 K, its temperature in Celsius will be ..... °C.

(b) The arrangement of particles is ordered in the ..... state. However there is no order in the ..... state.

(c) Evaporation of a liquid at room temperature leads to a ..... effect.

(d) Osmosis in a special kind of .....



Chapter - 1

Matter In Our Surrounding

CONCEPT MAPPING

Matter

States of Matter

Solids

1. Definite shape.
2. Definite volume
3. Do not flow
4. Particles are closely packed.
5. Incompressible.

Ex.: Table, Chair.

Liquids

1. No definite shape
2. Fixed volume
3. Can flow
4. Particles are loosely packed
5. Little compressible

Ex.: Water, Milk

Gases

1. No definite shape
2. No Fixed volume
3. Can flow
4. Particles are too loosely packed
5. Highly compressible

Ex.: Air, Oxygen

Matter is made up of Particles

Physical Nature of Particles

1. Particles of matter are continuously moving.
2. Particles of matter have space between them.
3. Particles of matter attract each other.

Change of State of Matter

Effect of change in Temperature

Increase in Temperature

Fusion or Melting

Solids melt to form liquid

Melting Point

The temperature at which solid melts to form liquid

Evaporation

Liquids changes into vapours

Boiling Point

The temperature at which a liquid boils to form vapours

Sublimation

The change of solid directly into gas or vapours

Decrease in Temperature

Freezing

Liquid changes into solid

Condensation

Vapours changes into liquid

Effect of change of Pressure

Sublimation

The change of vapours into solid (directly)

Factors affecting Evaporation

1. Exposed surface Area
2. Increase in temperature
3. Humidity
4. Wind velocity

atch the physical quantities given in column A to their S. I. units given in co

Column A	Column B
Temperature	Pascal
Density	Cubic Metre
Volume	Kelvin
Pressure	Kilogram per cublic meter

hoose the correct option given in breacket.

he amount of heat required to change 1 kg solid to its liquid state at atr
essure is known as its .....

atent heat of fusion / Latent heat of vaporisatoin)