

Chapter 1

Matter In Our Surroundings

Q.1 What is Matter?

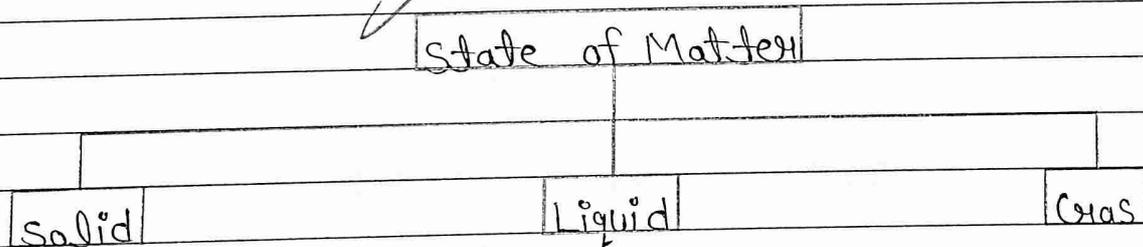
Ans Anything which has mass and volume (occupies space) is called Matter.

Q.2 What is not a Matter?

Ans Now the things like friendship, love attraction, good manners, thought, ideas, taste and smell etc. Do not occupy space and do not have a mass, this are not considered matter, so is this is not a matter.

Matter is made up of tiny pieces of particles -

The Particles which make up matter are so small that we can not see them even with a high power microscope.



The matter around us exists in three states - solid, liquid and gas.

The states of matter are inter-convertible. The state of matter can be changed by changing temperature or pressure.

States of Matter	Solid	Liquid	Gas
Shape	Fixed	Not Fixed	Not Fixed
Volume	Fixed	Fixed	Not Fixed
Density	Maximum	Moderate	Minimum
Type	Rigid	Fluid	Fluid
Compressibility	Negligible	Negligible	Highly
Force of attraction	Maximum	Moderate	Minimum
Speed	minimum	moderate	maximum

The SI unit of temperature -

SI unit = Kelvin (K)

$$\text{Temperature in Kelvin} = \text{Temperature in } ^\circ\text{C} + 273$$

Relation between Celsius and Kelvin.

Note - Relation between Celsius, Fahrenheit and Kelvin.

$$\frac{^\circ\text{C}}{5} = \frac{\text{F} - 32}{9} = \frac{\text{K} - 273}{5}$$

convert Kelvin to Celsius $\Rightarrow (\text{Temp. in K}) - 273$

convert Celsius to Kelvin $\Rightarrow (\text{Temp. in } ^\circ\text{C}) + 273$

$$(K) > ^\circ\text{C}$$

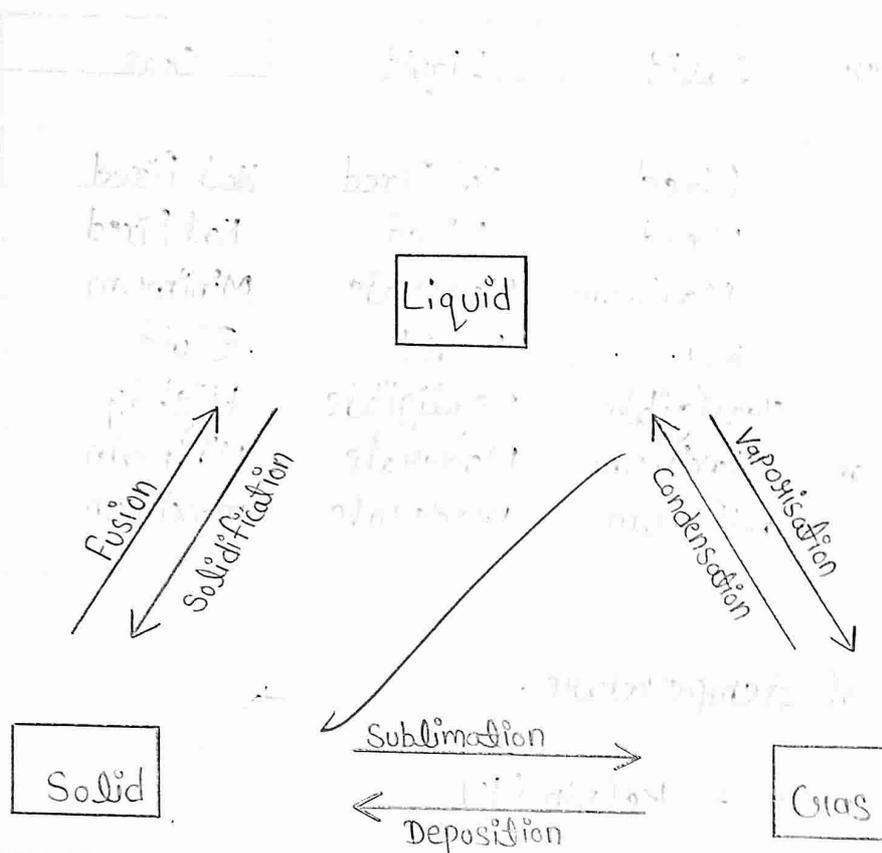


Fig. 1.9: Interconversion of the three state of matter

Effect of change of Pressure :-

$$\text{Kinetic energy} = \frac{1}{2} mv^2$$

x Factors affecting evaporation -
change in state of Matter -

We can change the state of matter in two ways -

- (i) By changing the temperature.
- (ii) By changing the pressure.

Melting Point -

The temperature at which a solid melts and change into liquid at atmospheric pressure is called melting point.

Ice melting point is 0°C .

Boiling Point :-

The temperature at which a liquid change into gas at atmospheric pressure is called boiling point.

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Water boiling point is 100°C .

Latent Heat :-

The amount of heat required by 1 kg of solid to get converted to liquid at atmospheric pressure and at melting point is called Latent heat of fusion.

Evaporation :-

The process in which a liquid gets converted to gaseous state at any temperature below its boiling point is called Evaporation.

Factor affecting evaporation -

- An increase surface area.
- An increase of temperature.
- A decrease in humidity.
- An increase in wind speed.

Q.3 What is Panch Tatva?

Ans Panch Tatva is Earth, air, water, sky and Fire.

Q.4 What is physical state of matter?

Ans Solids, Liquids, gases, plasma, Bose-Einstein condensate.

1. Convert the following temperature to the Celsius scale.

(a) 293 K

(b) 470 K

Solve $^{\circ}\text{C} = \text{K} - 273$

$$^{\circ}\text{C} = 293 - 273$$

$$^{\circ}\text{C} = 20$$

$$= 20^{\circ}\text{C}$$

Solve $^{\circ}\text{C} = \text{K} - 273$

$$^{\circ}\text{C} = 470 - 273$$

$$^{\circ}\text{C} = 197$$

$$= 197^{\circ}\text{C}$$

2. Convert the following temperature to the Kelvin scale.

(a) 25 $^{\circ}\text{C}$

(b) 373 $^{\circ}\text{C}$

Solve $\text{K} = ^{\circ}\text{C} + 273$

$$\text{K} = 25 + 273$$

$$\text{K} = 298$$

$$= 298 \text{ K}$$

Solve $\text{K} = ^{\circ}\text{C} + 273$

$$\text{K} = 373 + 273$$

$$\text{K} = 646$$

$$= 646 \text{ K}$$

3. Give reason for the following observations.

(a) Naphthalene balls disappear with time without leaving any solid.

Ans Naphthalene is a sublimable substance which convert into gaseous state without leaving any solids or liquids due to phenomenon of sublimation and disappear.

(b) We can get the smell of perfume sitting several metres away.

Ans Perfumes vaporize very fast and its vapours diffuse into air easily. That is why we can smell perfume sitting several metres away.

4. Arrange the following substances in increasing order of forces of attraction between the particles - water, sugar, oxygen.

Ans Oxygen < Water < sugar.

5. What is the physical state of water at -

(a) 25°C (b) 0°C (c) 100°C ?

Ans (a) $25^{\circ} = \text{Liquid}$

(b) $0^{\circ}\text{C} = \text{Solid as well as Liquid state}$

(c) $100^{\circ}\text{C} = \text{Liquid as well as gaseous state.}$

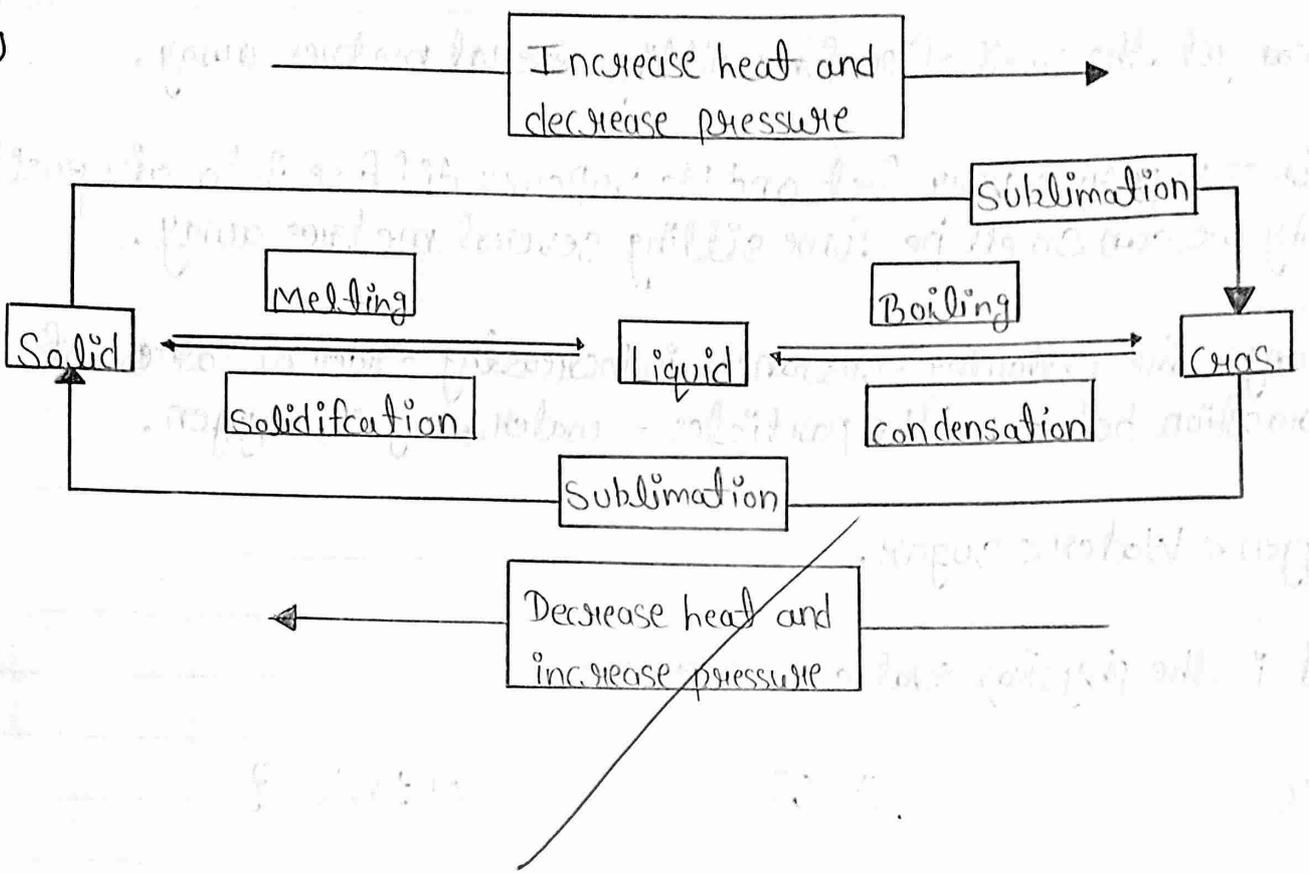
6. Give two reasons to justify -

(a) water at room temperature is a liquid.

Ans Water at room temperature is a liquid because it has fluidity and has definite volume but no definite shape.

(b) an iron almirah is a solid at room temperature.

Ans(9)



Ans An iron almirah is a solid at room temperature because it is rigid and has a definite shape.

7. Why is ice at 273 K more effective in cooling than water at the same temperature?

Ans Ice at 273 K is less energetic than water. It is because of the difference in the latent heat of fusion which is present in water at the same temperature in the form of extra energy.

8. What produces more severe burns, boiling water or steam?

Ans Steam produces more severe burns than boiling water.

9. Name A, B, C, D, E and F in the following diagram showing change in its state

just

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