Assignment:-1 Subject: - Chemistry Class:-IX Teacher:- Mrs. Mriga Chhibber

Name:-_____ Class & Sec.:-_____ Roll No.:-___ Date:-28/04/2020

TOPIC: MATTER IN OUR SURROUNDINGS

KEY CONCEPTS:

PLASMA

A fourth state called plasma refers to the super heated gaseous state. This state is a mixture of electrons and positively charged ions with unusual properties. It is found at extremely high temperatures such as interiors of the sun or stars. Astronomers reveal that 99% of all matter in the universe is present in the plasma state.

https://www.youtube.com/watch?v=cCliAR1Wm5E

BOSE-EINSTEIN CONDENSATE.

A fifth state has recently been revealed that refers to the super cooled In the super cooled state atoms lose their separate identity and get condensed. They behave like a single 'super atom'. The existence of this state was first envisaged in 1925 by Albert Einstein, who based the idea on the work by Satyendra Nath Bose, the Indian physicist, who had predicted a class of fundamental particles called 'BOSONS' that were named after him.

A 'Super atom' was actually created on the 5^{th} of June 1995 by the scientists Wieman and Cornell. They chilled atoms of a gas, to the lowest temperature ever achieved, and created a new state of matter called Bose-Einstein Condensate.Using lasers and an exotic evaporation method, they plunged the temperature of Rubidium gas almost to 'absolute zero' or -273^{o}C. All atomic motions come to a standstill at this temperature.
https://www.youtube.com/watch?v=3mfr5FO6Oko

INTER-CONVERSION OF THE STATES OF MATTER

Depending on the conditions of temperature and pressure, matter can exist in any of the three main states i.e., solid, liquid or gas. Matter can be inter-converted from one state to the other by the addition or removal of heat energy. When a chemical compound is heated, it may undergo a chemical change called decomposition and as a result, an entirely new compound is formed. For example, when calcium carbonate is heated, it decomposes into calcium oxide and carbon dioxide.
https://www.youtube.com/watch?v=MrTxRn9MNWM

LATENT HEAT OF FUSION

When we heat a solid, we add energy to the system increasing the vibration of the particles. Eventually these particles break free from their binding forces and fuse. Fusion is the change of state from solid to liquid. This is generally referred to as melting. Melting, also known as fusion is the change of solid state to liquid state. During melting, the temperature of a substance remains constant till the entire substance is converted into liquid due to the latent heat of fusion. The extra heat is used up in changing the state by overcoming the forces of attraction

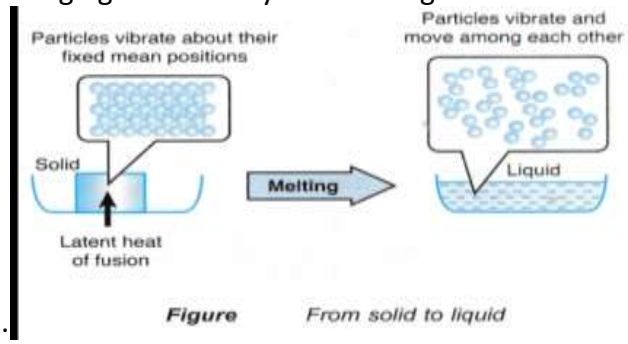


Figure *From solid to liquid*

SUBLIMATION

Some solid substances when heated get converted directly to the gaseous or vapour state without first passing through the liquid state is called as sublimation. When a sublimable solid substance is heated, it is said to 'sublime' into a gaseous state; and when sublimable substances are cooled from their vapour state, the solid obtained is called

the 'sublimate'. Some sublimable substances are: iodine, camphor, naphthalene, dry ice carbon dioxide) etc.

Dry Ice

VAPORIZATION AND EVAPORATION

When molecules of a liquid escape from its surface and go into vapour (gaseous) phase, it is called evaporation or vaporization. Evaporation is a slow change of a liquid into a gas on its surface. It is process of escaping of molecules spontaneously from the surface of the liquid to vapour state. The greater the surface area of the liquid exposed to atmosphere, greater will be the evaporation. So, higher the temperature, higher is the rate of evaporation. Low humidity in the atmosphere also raises the rate of evaporation.

Boiling of a liquid occurs at a point, when it is freely converted into vapour. At this point, called the boiling point, the vapour pressure within the liquid is equal to the external pressure or the atmospheric pressure on the liquid. Thus, molecules escape easily in a gaseous state. At the boiling point, the temperature remains constant till the entire mass of the liquid is converted into gas due to the latent heat of vaporization.

LATENT HEAT OF VAPORIZATION.

The amount of heat required by one kilogram of liquid into gas at atmospheric pressure at its boiling point is known as latent heat of vaporization.

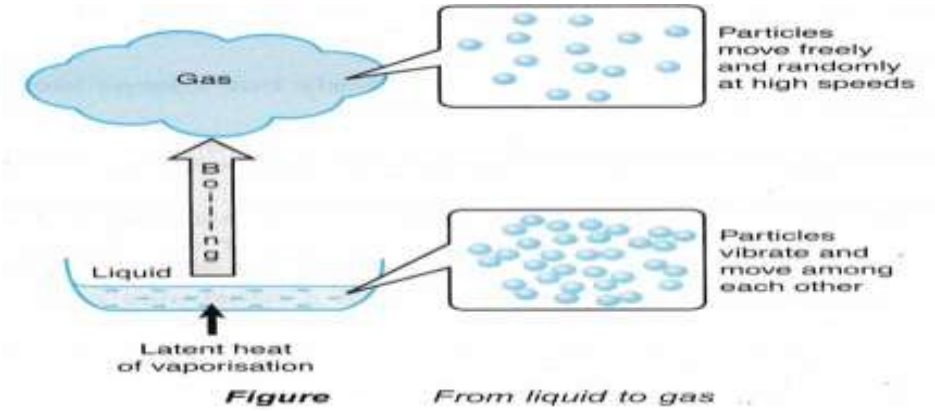
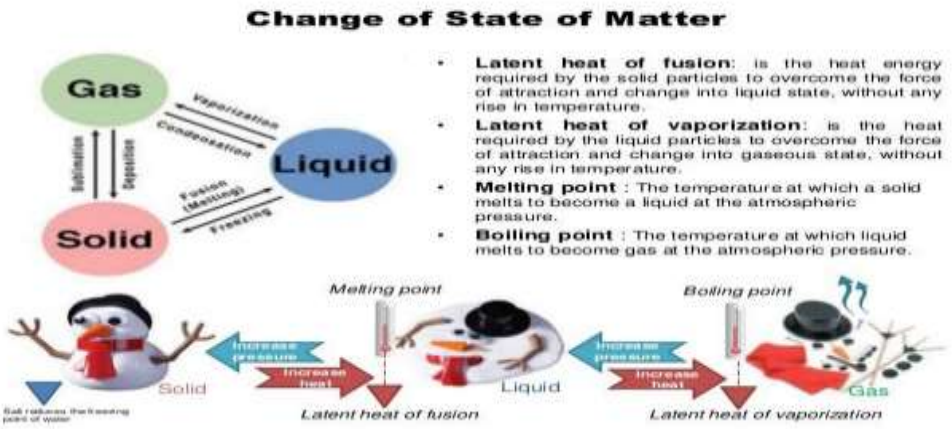


Figure *From liquid to gas*

Solidification or Freezing

When the liquid produced by melting a crystal is cooled, it eventually solidifies or freezes. The temperature at which the liquid freezes under one atmospheric pressure is the normal freezing point. The change from liquid state to solid state is called solidification or freezing. Water freezes at $0^{o}C$.



SOLVED QUESTIONS

1. Give the term used for heat absorbed when solid liquefies.
   Ans. Latent heat of fusion (heat is absorbed here).
2. Why naphthalene balls stored in air tight packing?

   Ans. Naphthalene is a sublime which can diffuse into the air by the process of sublimation. So, to protect from sublimation, it should be packed in air tight container packs.
3. a) Is it necessary to heat the ice to determine the melting point as melting of ice? b) Why melting of ice causes cooling?

   Ans. a) It is not necessary to heat the ice in order to determine the melting point as melting of ice can take place at room temperature. But it would take more time.

   b) During melting ice absorbs heat from the surroundings and causes cooling. Melting is an endothermic process.

QUESTION BANK

Answer the following questions briefly (one mark):

Q1.Why does gas exerts pressure on the walls of a container?

Q2. If a solid melts at 20°C then calculate the temperature on Kelvin scale.

Q3. Differentiate between sublime and sublimate

Answer the following questions (two mark):

Q4.Is there any difference between dry ice and ordinary ice? Explain.

Q5.Why does water becomes cold if we add some ice cubes to it?

Q6. Convert 300K and 756K into ^{0}C.

Answer the following questions (three mark):

Q7.Why does the temperature of a substance remain constant during the change of its state?

Q8. Name the temperature at which

a) A solid changes into liquid

b) A liquid changes into gas at maximum rate

c) A liquid changes into solid

Answer the following question:- (five mark):

Q9. a) Differentiate between evaporation and boiling. (4 points)

b) How perspiration helps in maintaining body temperature constant?

c) Explain why evaporation is considered as a surface phenomenon.