Date
Page

. Phone and so many other electrical and electronic ~~gadgets~~ gadgets are the most important contributions of physics.

## MATTER Ch-1

(A) 1) a) The molecules of each substance are identical. F

b) The inter-molecular forces are attractive at all distances between the two molecules. F

c) The molecules ~~can move~~ in a substance are in random motion. T

d) In a gas, the molecules can move anywhere in space. T

e) Liquids are less viscous than gases. F

2) a) All the ~~st~~ molecules of a substance are Identical.

b) The inter molecular spacing is least in solids more in liquids and still more in gases.

c) The molecular ~~to~~ motion in liquid and gas is in zig-zag Path.

d) In a solid, the molecules vibration either side but they remain at their fixed positions.

e) The inter-molecular forces are the most in gases.

f) A Solid exert Pressure downwards on its base

g) Gases are least dense.

h) solids are most rigid.

3. (a) The diameter of a molecule is approximately
A → $10^{-10}$ m

(b) The inter-molecular forces are strongest in.
A → solids

(c) The molecules

A) In a liquid, molecules within its boundary

(d) Solids are

A) more dense

(e) The inter-molecular forces on liquids are

A) weaker than in solids.

(4)

| Column A | Column B |
|---|---|
| a) A molecule is composed of | i) does not exist free in nature |
| b) Ice, water and water vapour | ii) can vibrate only up to about 10⁻¹⁰m from their mean positions. |
| c) An atom | iii) atoms |
| d) Gases | iv) are the three states of water. |
| e) The molecules of a solid | v) occupy space |

(B) (1) matter is defined as anything which occupies space and has mass. It can be perceived by our sense of ~~matt~~ smell, touch, sight,

hearing and taste. Matter is composed of tiny particles known as atoms.

(2) The three states of matter are solids, liquids and gases.

Solids :- A solid has a definite shape and definite volume. EX :- wood, stone, iron, ice, definite/etc.

Liquid :- A liquid has a definite volume but no definite shape. EX :- water, juice, milk, oil, etc.

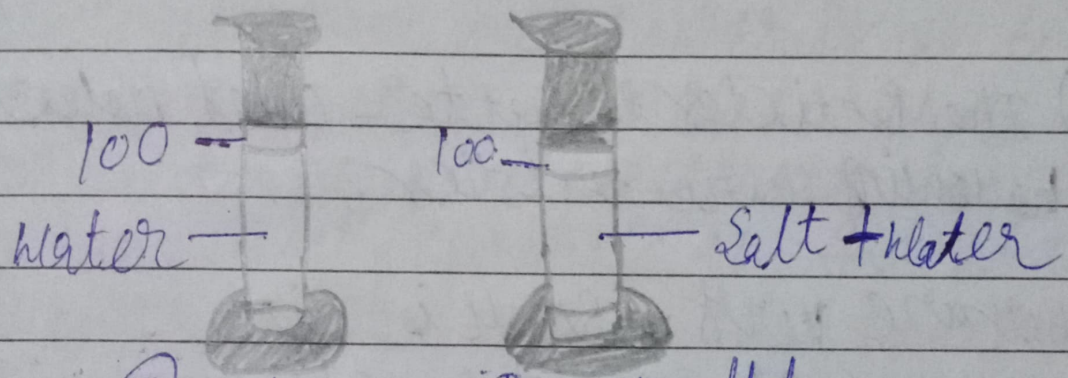
Gases :- A gas neither has definite shape nor a definite volume. EX :- air, hydrogen, oxygen, water vapour etc.

(3) The smallest unit of matter which can exist independently is called molecule. EX :- oxygen molecule ($O_2$) made up of two (O) atoms.

(4) Matter is made up of molecules which are very small in size ~~+10~~ ($\sim 10^{-9}$ m).

(5) Intermolecular space - The space between any two consecutive molecules of a substance is called intermolecular space.

⑥ Take 100 ml of water in a ~~measure cylinder~~ measuring cylinder. Add 20 gram of salt in water gently and stir it well so as to dissolve the salt well in water. It is noticed that the level of water does not change. It shows that the particles of salt occupy spaces between the particles of water.




ⓐ water alone ⓑ Salt added to water

The particles of salt occupy the spaces between the particles of water.

⑦ Intermolecular force of attraction - the force of attraction between the molecules (like molecules or unlike molecules) is called intermolecular force of attraction.

⑧ The force of attraction between the molecules of similar kind is called force of cohesion.

Ex:- The horcess between water molecules. This horce of the cohesion keep the molecules of the substance bind together. The horce of attraction between different types of molecules is called horce of athesion. Ex:- when a glass is fillet with water is emptied some water remain stuck to the glass due to the athesion between water molecules and glass.

(9.) The particles of matter called molecules the following characteristics:

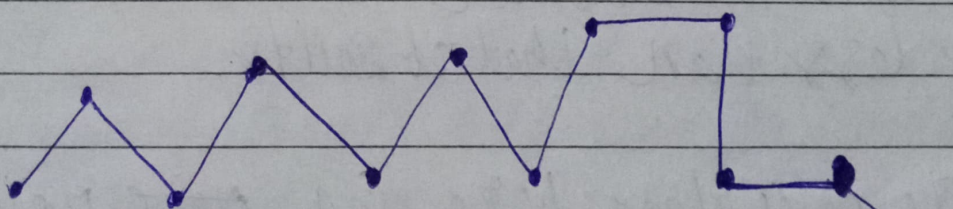
1. They are very small in size.
2. They halle spaces between them.
3. They are in constant random motion.
4. They always attarct each other.

(10.) The spacing between particles of a matter is called inter-molecular space.

| | Solids | Liquids | Gases |
|---|---|---|---|
| Size | They halle definite size | Indefinite | Indefinite |
| Shape | They halle definite shape | Indefinite | Indefinite |
| Density | Highly dense | Less denser than solids | Less denser than liquids and solids |

(11) The particles in a substance are not at rest (in motion), and they move randomly in all possible directions in a zig-zag path.

(12) Take a breaker. Fill it partly with water. Add some Tycopodium powder in the beaker containing ~~not~~ water. Stir the contents of the beaker with a glass rod. Take out. few drops of this suspension on a glass plate. Place it on the ~~the~~ table and illuminate it with a table lamp. Observe the ~~the~~ glass through a microscope. It is found that the fine particles of tycopodium powder move rapidly in a random manner and their zig zag as shown in figure below.



zig zag path of fine particle of Tycopodium powder

(13) Solids :- 1) The molecules here are very

tightly packed having negligible or very less intermolecular space.

2.) They have the strongest intermolecular force of attraction.

3.) The molecules have very small vibration about their mean position i.e. small amplitude

4.) They have a definite shape and volume.

5.) They are generally hard and rigid.

6.) They are good conductors of heat.

Liquid :- 1.) Molecules are less tightly packed

2.) The intermolecular force of attraction is less than that of solids.

3.) The molecules here can ~~more~~ move brom one place to another.

4.) Do not have any particular shape of their own and thus acquire the shape of the

Gases :- 1) The force of attraction between the ~~molecules~~ molecules is the least.

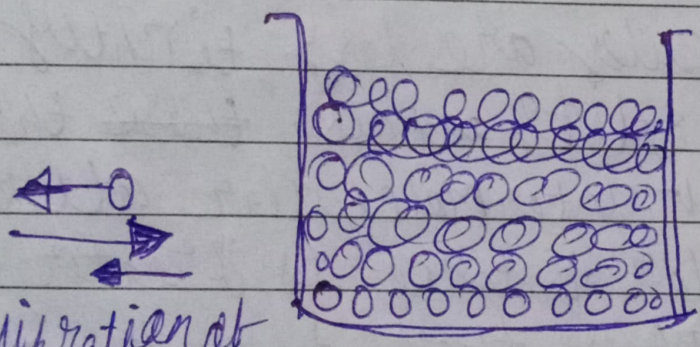
2) The intermolecular space is the largest.

3) Neither have a definite shape nor a definite volume.

4) The molecules ~~move~~ move independently.

5) Worst conductors of heat.

(14)



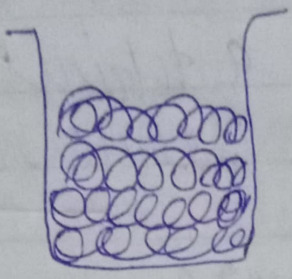
vibration of a molecule about its mean position

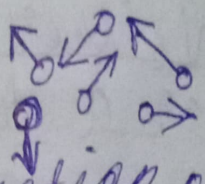
Molecules of a solid are arranged closely and a definite manner, not free to move about.

A) Here the molecules are very tightly packed that there is no or very intermolecular space and there is high intermolecular force

of attraction (force of cohesion). The molecules do not move about their mean position and thus solids have a definite shape and volume at ~~temperature~~.

(15)



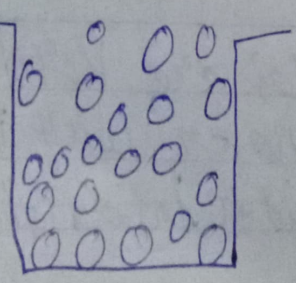


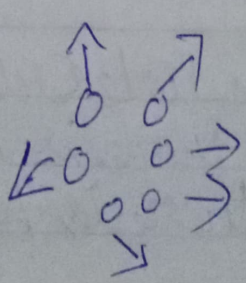
motion of molecules

Molecules of a liquid arranged less closely are free to move about, within liquid.

Here the molecules are less tightly bound as compared to solids and also ~~those~~ there is lesser force of intermolecular attraction. The intermolecular distance is greater than that in solids. Thus they do not have a definite shape but acquire the shape of the vessel in which they are contained. have a definite volume at a given temperature.

Q:-(16)

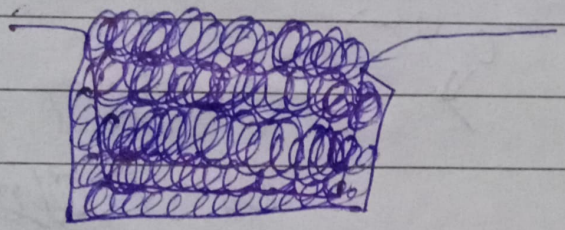




Random motion of molecules

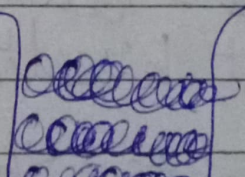
Here the molecules are bar apart from other i.e. have the greatest ~~intermolecular~~ intermolecular distance which result into the weakest intermolecular forces of ~~attra~~ attraction. The molecules as are not bound by any strong force move about freely and thus gases do not have a definite shape and also do not have any definite volume.

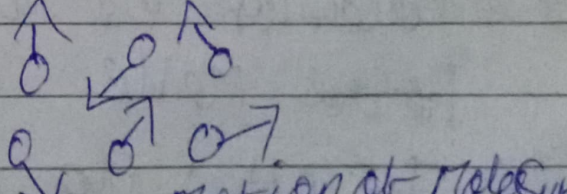
(17) Solids :- ⇐0⇒ vibration of a molecule about its mean position



~~Ho~~ Here the molecules are very tightly ~~packet~~ packed that there is noor very less intermolecular force of attraction (force of cheesion). The molecules do not move about their mean position and thus solids have a definite shape and volume.

Liquids :-

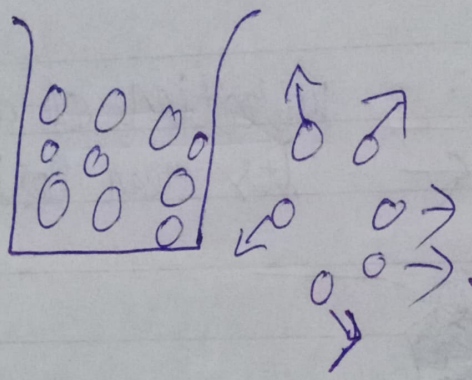




motion of molecules

Here the molecules are less tightly packed compared to solids and also there is lesser force of intermolecular attraction. The intermolecular distance is greater than that in the solids. They do not have a definite shape but assume the shape of the vessel in which they are contained but have a definite volume at a given ~~temperature~~ temperature.

Gases :-



Random motion of molecules

Here the molecules are far apart from each other i.e. have the greatest intermolecular distance which result into the weakest intermolecular forces of attraction. The molecular gas are not bound by any strong forces more about freely and thus gases do not have a definite shape and also definite volume

18.

| | Solids | Liquids | Gases |
|---|---|---|---|
| a) Compressibility | Not Compressible | Negligibly Compressible | Highly Compressible |
| b) Fluidity | Not possible | Can flow | Can flow |
| c) Rigidity | Highly rigid | Less rigid | Not rigid |
| d) Expansion on heating | Low | More than solids | More than liquids |

(19) The change in state of matter of a substance from solid ~~state into its liquid state on absorption of heat at a particular temperature, called the melting point is called Melting or fusion i.e. to liquid to gas is brought~~ Or from liquid to gas is brought by imparting heat energy to it at a constant temperature.

a) The process of change of a substance from solid state into it's liquid state on absorption of heat at a particular temperature, called the melting point, is called melting or fusion i.e.

Solid $\xrightarrow[\text{Heat absorbed}]{\text{melting}}$ ~~Liq~~ Liquid

b) The process of change of substance from a liquid state to its gaseous state at a particular is called boiling or Vaporisation

Liquid $\xrightarrow[\text{Heat absorbed}]{\text{Boiling}}$ Gas

(20.) a) Solid $\xrightarrow{\text{melting}}$ Liquid

b) Liquid $\xrightarrow{\text{Boiling}}$ Gas