HW
7/5/21

Date
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TEST YOURSELF

B. Short / Long answer questions:-

① Define matter. What is its composition?

Ans- Matter is defined as anything which occupies space and has mass, It can be perceived by our sense of smell, touch, sight, hearing ~~and~~ and taste. Matter is composed of tiny particles known as atoms.

② Name the three states of matter.

Ans - The three states of matter are

→ Solid -

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

→ Liquid -

A liquid has a definite volume, but not definite shape.

Example: water, juice, milk, oil, etc.

→ ~~Gas~~ Gas -

A gas ~~neither~~ neither has definite shape nor a definite volume.

Example: air, hydrogen, oxygen, water vapour, etc.

(3) What is a molecule?

Ans- The smallest unit of matter which can exist independently is called molecule.

Ex- oxygen molecule (O_2), is made up of two oxygen (O) atoms.

(4) Mention one example each of a monoatomic and a diatomic molecule.

Ans- Monoatomic - A molecule consisting of one atom is called a monoatomic molecule.

Ex: Neon, Argon, etc.

Diatomic - A molecule consisting of two atoms is called a ~~at~~ diatomic molecule.

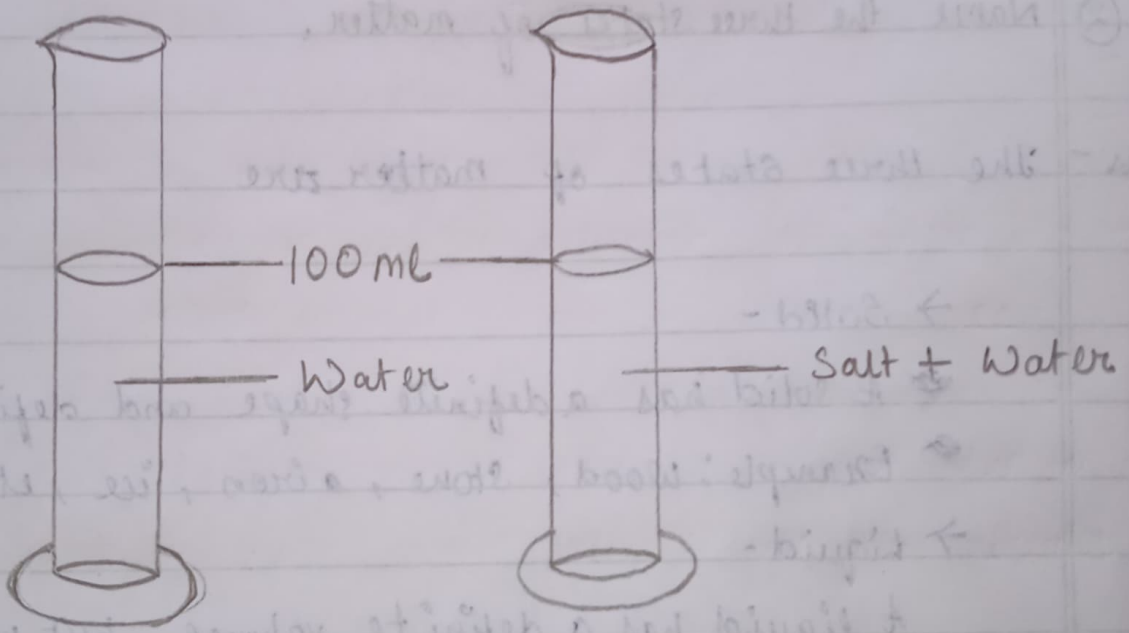
Ex: Hydrogen molecule, Oxygen molecule, etc.

(5) What do you mean by intermolecular spacing?

Ans- The spacing between any two consecutive molecules of a substance is called intermolecular space.

(6) Describe a simple experiment to illustrate the existence of inter-molecular spacing.

Ans - Take 100 mL of water in a measuring cylinder. Add 20 gram of salt in water 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.



(a) Water alone (b) Salt added to Water.

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

(7) ~~Why~~ What do you mean by inter-molecular forces?

Ans- The force of attraction between the molecules (like molecules or unlike molecules) is called inter-molecular force of attraction.

(8) What are the forces of cohesion and adhesion?

Ans- Cohesion - The force of attraction between the molecules of similar kind is called force of cohesion or cohesive force. This force keep the molecules of the substance bind together.

Ex: The forces between water-molecules.

Adhesion- The force of attraction between different molecules of two different substances is called force of adhesion or adhesive force.

Ex; When a glass filled with water is emptied, some water particles remain stuck to the glass, due to the adhesion between water molecules and glass molecules.

(9) State three characteristics of molecules of matter which ~~demonstrate~~ determine its solid, liquid and gaseous state.

Ans- The three characteristics of molecules of matter which determine its solid, liquid and gaseous state are -

→ Inter-molecular spacing
→ Inter-molecular force of attraction.
→ Movement of molecules.

(10) How do solid, liquid and gas differ in their following properties :

a) Size b) Shape c) Density ?

Ans -

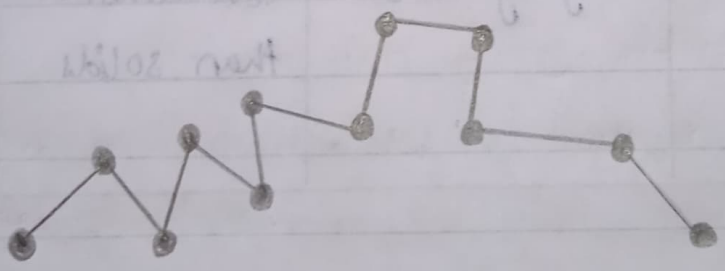
Properties	Solids	Liquids	Gases
a) Size	They have definite size.	Indefinite	Indefinite
b) Shape	They have definite shape	Indefinite	Indefinite
c) Density	Highly dense	Less denser than solids	Less denser than liquids and solids

(11) The molecules in a substance are in motion, what type of path do they follow?

Ans- 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) Describe a simple experiment to illustrate that molecules are not at rest, but they constantly move.

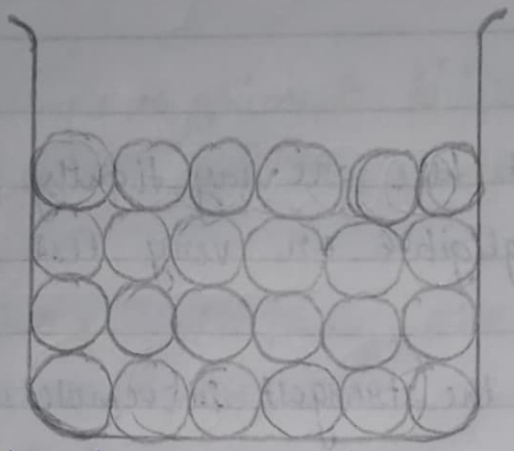
Ans- Take a beaker. Fill it partly with water. Add some lycopodium powder in the beaker containing water. Stir the contents of the beaker with a glass rod. Take out few drops of this suspension on a glass plate. Place it on the table and illuminate it with a table lamp. Observe the glass plate through a microscope. It is found that the fine particles of lycopodium powder move rapidly in a random manner and their path is zig-zag, as shown in the figure below.



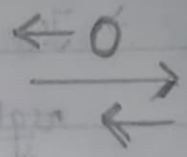
zig-zag path of fine particle of lycopodium powder.

(14) Give the molecular model for a solid and use it to explain why a solid has a definite volume and a definite shape.

Ans



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



Vibration of a molecule on either side of its mean position.

Here, the molecules are tightly packed, that there is no or very less inter-molecular space and there is high inter-molecular force of attraction (force of cohesion). The molecules do not move about their mean position and thus, solids have a definite shape and ~~volume~~ volume.

(13) Write down five general properties of solids, liquides and gases.

Ans- Solids:

→ The molecules here are very tightly packed having negligible or very less intermolecular space.
→ They have the strongest intermolecular force of attraction.
→ The molecules have very small vibration about their mean position, i.e. small amplitude.
→ They have a definite shape and volume.
→ They are generally hard and rigid.
→ They are good conductors of heat.

Liquids:

→ Molecules are less tightly packed.
→ The intermolecular force of attraction is less than that of solids.
→ The molecules here can move from one place to another
→ Do not have any particular shape of their own and thus acquire the shape of the vessel.

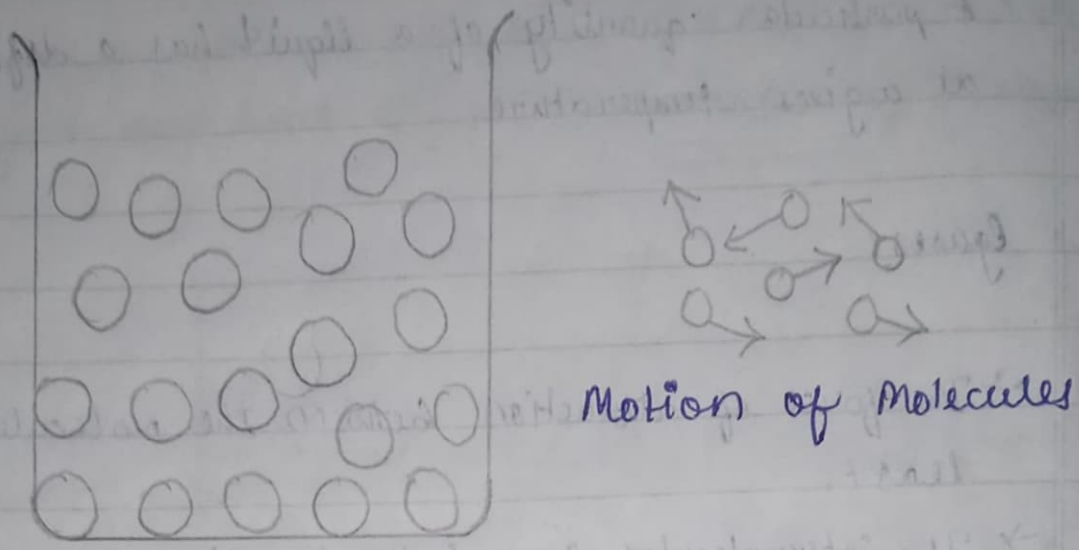
→ A particular quantity of a liquid has a definite volum at a given temperature.

Gases:

→ The force of attraction between the molecules is the least.
→ The intermolecular space is the largest.
→ Neither have a definite shape ~~nor~~ nor a definite volume.
→ The molecules move independently.
→ Worst conductors of heat.

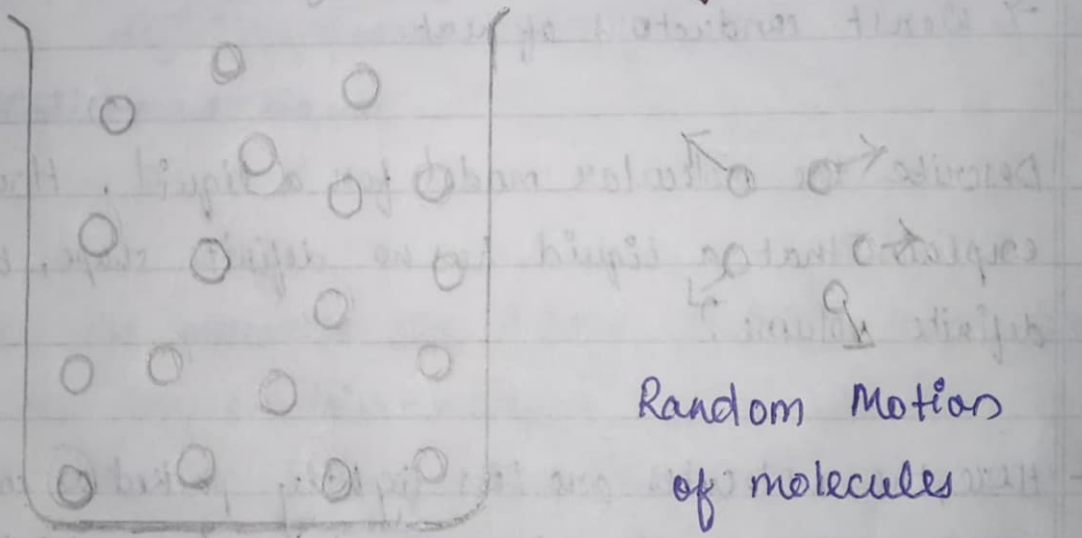
(15) Describe the molecular model for a liquid. How does it explain that a liquid has no definite shape, but has a definite volume?

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



(16) A gas has neither a definite volume nor a definite shape. Describe the molecular model to ~~exp~~ explain it.

Ans -



Here the molecules are far apart from each other, i.e, ~~that~~ they have the greatest molecular distance which result into the weekest intermolecular forces of 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.

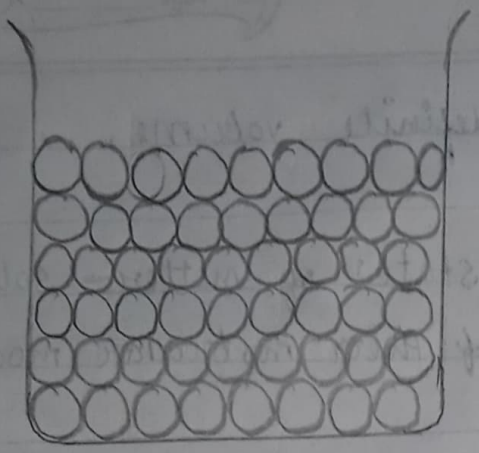
(17) Distinguish between the three states of matter - solid, liquid and gas on the basis of their molecular models.

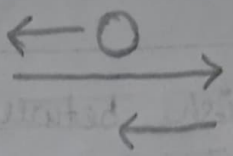
Ans- Solid:
Here the molecules are tightly packed, that there is no or very less inter-molecular space and there is high inter-molecular force of attraction (force of cohesion). The molecules do not move about their mean position and thus, solids have a definite shape and volume.

Liquid:
Here the molecules are less tightly packed as compared to solid and also there is lesser force of inter-molecular force of attraction. The inter-molecular distance is greater than that in the solids. Thus, they do not have definite shape but acquire the shape of the vessel in which they are contained but have a definite volume at a given temperature.

Gas:
Here the molecules are far apart from ~~the~~ each other, i.e., they have the greatest molecular distance which result into the weakest intermolecular forces of ~~attraction~~

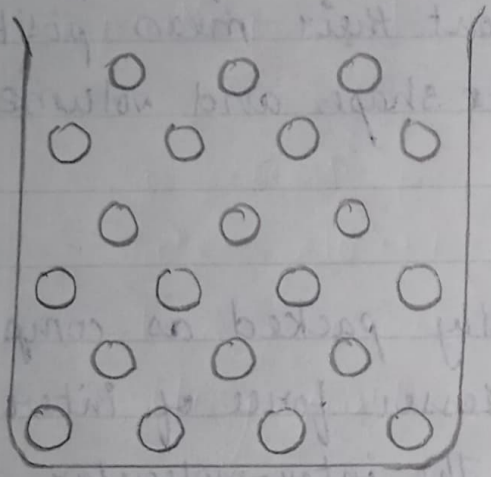
Solid -

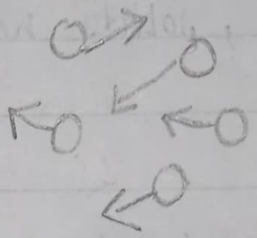




Vibration of molecule on the either side of its mean position.

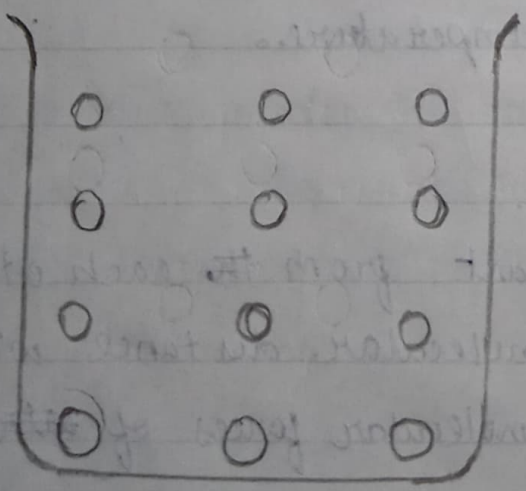
Liquid -

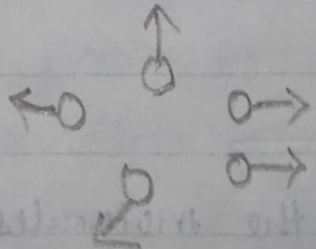




Motion of molecules

Gas -





Random Motion of molecules.

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.

(18) Distinguish between solids, ~~tig~~ liquids and gases on the basis of their following properties:

a) compressibility
b) fluidity
c) Rigidity
d) expansion on heating

Ans-

Properties	Solid	Liquid	Gas.
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) What do you mean by change of states of matter? Explain

a) the change of a solid into a liquid at a constant temperature, and

b) the change of a liquid into a gas at a ~~constant~~ constant temperature.

Ans- The change in state of matter of a substance from solid to liquid 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 a solid state into its liquid state on absorption of heat at a particular temperature, called the ~~melting~~ melting point, is called melting or fusion, i.e.

$$\text{Solid} \xrightarrow[\text{Heat Absorbed.}]{\text{Melting}} \text{Liquid}$$

b) The process of change of a substance from a liquid state to its gaseous state at a particular ~~temperature~~ temperature, called the boiling point, is called ~~boi~~ boiling or vaporisation, i.e.

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

(20) Complete the following :

a) Solid $\xrightarrow{\text{Melting}}$ Liquid

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