MATTER CH-1

Date 12/5/2021 (CW)

Saathi

A. Objective Questions

1. Write true or false for each statements:

a) The molecules of each substances are identical. (False)

b) The inter-molecular force are effective at all distances between the two molecular. (False)

c) The molecules in a substance are in random motion. (True)

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

e) Liquids is less viscous than gases. (False)

2. Fill in the blanks:

a) All the molecules of a substance are indintical.

b. The inter-molecules spacing is least in ~~More, still more~~ solids more in liquids

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and still more in gases.

c) The molecules motion in liquids and gases in zig-zag path.

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

e) The inter-molecules forces are the weakest in gases.

f) A solid exerts pressure downwards on its base.

g) Gases are least dense.

h) Solids are most rigid.

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3. Select the correct alternative

(a) The diameter of a molecule is approximately.

ans-(iii) 10^{-10} cm

(b) The inter-molecular forces are strongest in

ans-(iv) both (i) and (ii)

(c) The molecule

ans-(iii) in a liquid, move within its boundary

(d) Solids are

ans-(i) more dense

(e) The inter-molecular forces in liquids are.

ans-(iii) weaker than in solids

4. Match the following columns:

ans	A	B
(iii)(a)	A molecule is composed of	(i) does not exist free in nature
(iv) b)	Ice, water and water vapour	ii) can vibrate only up to 10^{-10} m from their mean positions

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ans

ii) c) An atom

iii) atoms

v) d) gases

iv) are the three states of water

i) e) the molecules of a solid

v) occupy space

3. Short/long answer questions.

1. Define matter what is its composition?

ans- Matter is defined as anything that occupies space and mass. It can be perceived by our sense of smell, touch, sight, hearing and taste. Matter is composed by tiny pareticles known as atmore.

2. Name the three states of matter?

ans- The three states of matter are solids, liquids and gases.

Solid - A solid has a definite shape and volume. Ex - wood, ston, iron, ice etc.

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Liquids - A liquid has definite volume but not a definite shape. Ex - water, juice, milk, oil etc.

Gases - A gas neither has definite shape nor a definite volume. Ex - air, hydrogen, oxygen, watervapours etc.

3. What is molecule?

ans - The smallest unit of matter which can exist independently is called molecule. Ex - Oxygen molecule (O_2) made up of two (O) atoms

4. Mention one example each of monoatomic and a diatomic molecules?

ans - monoatomic molecule - Neon, Argon
diatomic molecule - Oxygen, Nitrogen

5. What do you mean by inter-molecular spacing?

ans - Intermolecular space - The space between any two consecutive molecules of a substances is called Intermolecular space.

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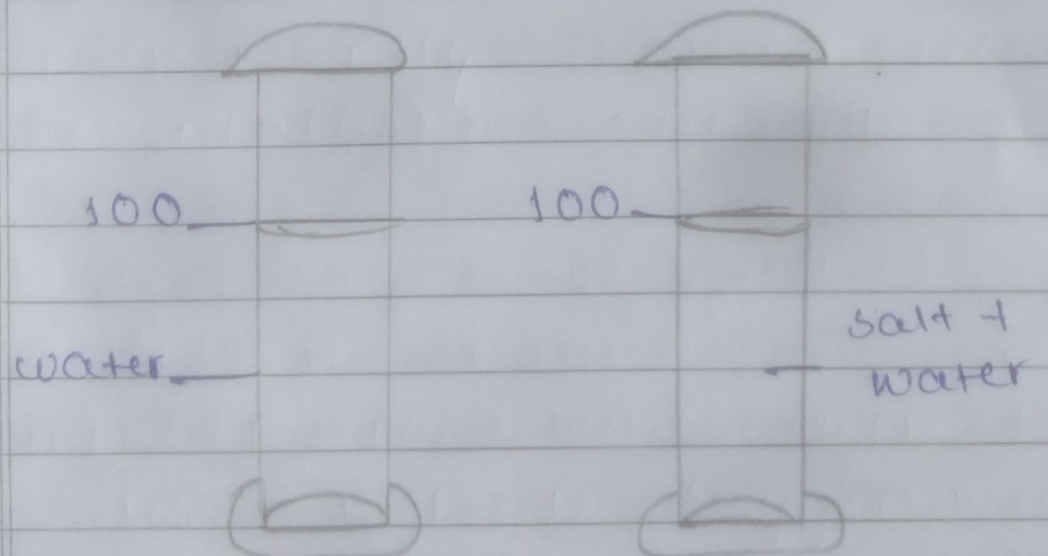
6. Describe a simple experiment to illustrate the existence of inter-molecular space?

ans- Take 100 ml of water in a measureing cylinder. Add 20 gr 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 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.

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7. What do you mean by intermolecular Space?

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

8. What are the forces of cohesion and adhesion?

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

→ Ex - The forces between water molecules
This force of cohesion keep the molecules of the substance bind together.

The force of attraction between two different type of molecules is called force of adhesion

→ 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.

9. State three characteristic of molecules of matter which determine its solid, liquid and gaseous state?

ans- The particles of matter called molecules have

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the following characteristics:

1. They are very small in size.
2. They have space between them.
3. They are in constant random motion.
4. They always attract each other.

10. How do solids, liquids and gases differ in their following properties:-

ans.

	Solid	liquids	Gases
Size	definite	Indefinite	Indefinite
Shape	definite	Indefinite	Indefinite
Density	highly dense	less denser than solid	lesser than liquids & solid

11. The molecules in a substance are in motion. What type of path do they follow?

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

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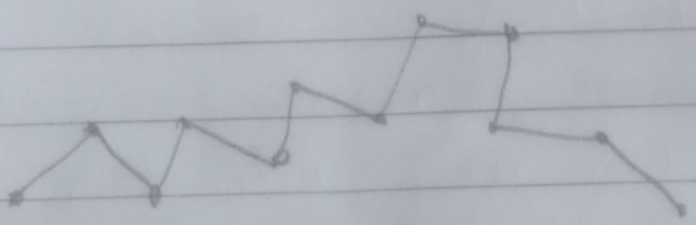
12. Describe a simple experiment to illustrate that molecules are not at rest, but they constantly move.

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



zig zag path of fine particle of lycopodium powder.

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13. Write down five general properties of solids, liquids and gases.

ans: Solids:

1. The molecules here are very tightly packed having negligible or verry 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 definite shape and volumn.

5. They are generally hard and rigid.

6. They are good conductors of heat.

Liquids:

1. Molecules are less tightly packed.

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

3. The molecules here can move from one place to another.

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

5. A particular quantity of a liquid has a definite volumn at a given temperature.

Gases:

1. The force of attraction between the molecules is the least.

2. The intermolecular space is the largest.

3. Neither have a definite shape nor a definite volumn.

4. The molecules move independently.

5. Worst conductor of heat.

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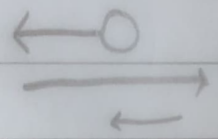
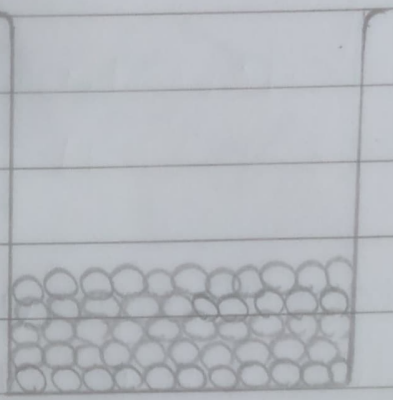
14. Give the molecular model for a solid and use it to explain why a solid has a definite volume and definite shape.

ans





Vibration of a molecule about its means position.

Molecules of a solid arranged closely are in definite manner, not free to move

Here the molecules are very tightly packed that there is no or very less intermolecular space and there is high ~~tempreture~~ intermolecular force attraction (force of cohesion). The molecules don't move about there mean position and thus solid had a definite shape and volume.

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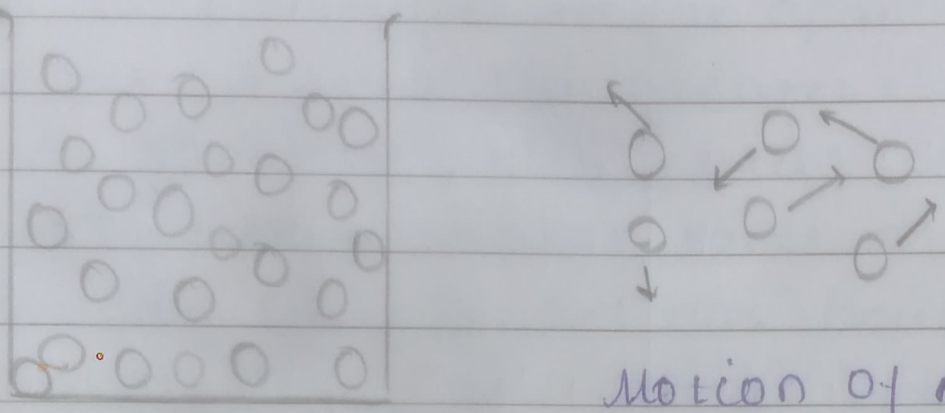
15. Describe the molecular model for a liquid. How does it explain that a liquid has no definit shape, but has definite volume?

ans.



Motion of molecules

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

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

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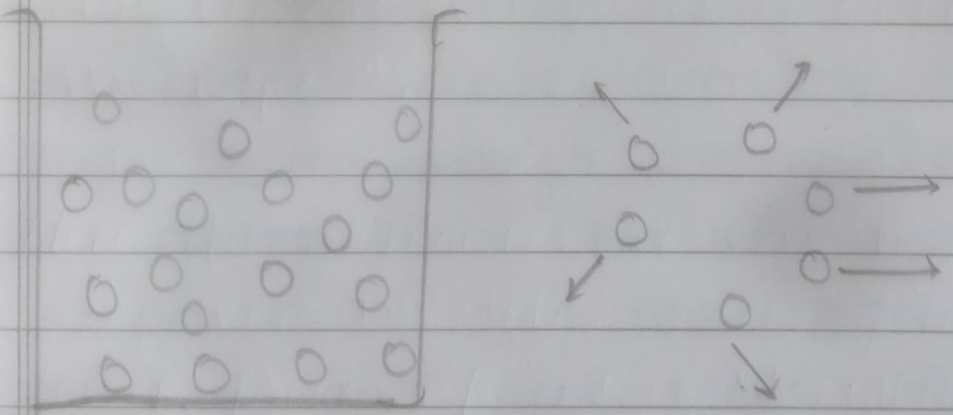
16. A gas has neither definite volume nor a definite shape. Describe the molecular model to explain it.

ans. Here the molecules are far apart from each other i.e have the greatest intermolecular distance which result into the weakest intermolecular force 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 don't have any definite volumn.



Random motion of molecules.

Molecules of a gas are far apart and are free to move about.

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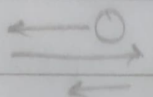
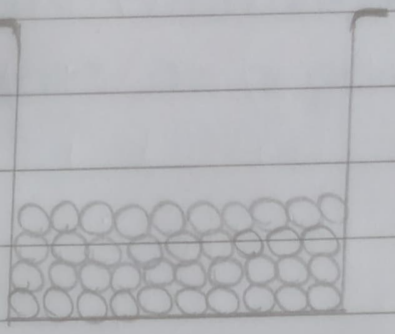
17. Distinguish between the three states of matter — Solid, Liquid and gas on the basis of their molecular models.

ans- Solids

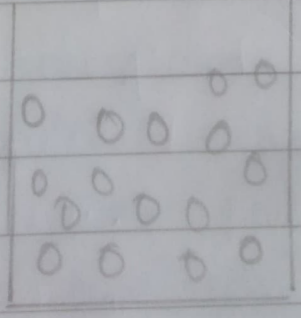


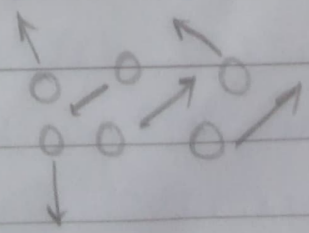
Vibration of a molecule about its mean position.



Here the molecules are very tightly packed that 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.

Liquids:

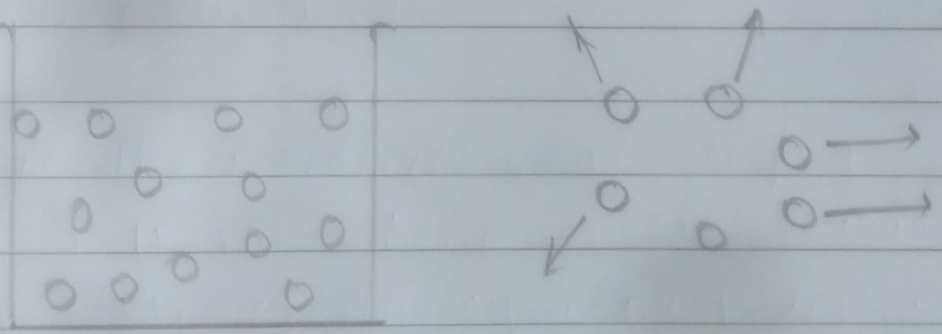




Motion of molecules

Here the molecules are less tightly packed as compared to solids and also there is lesser force of intermolecular attraction. The intermolecular distance is greater than that in the solids. Thus, they don't have a definite shape but acquire the shape of the vessel in which they are contained but have a definite volumn at a given 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 molecules are not bound by any strong force move about freely and thus

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gases do not have a definite shape and also do not have any definite volumn.

18 Distinguish between Solids, liquids and gases on the basis of their following properties.

ans.

	Solid	Liquid	Gas
a) Compressibility	Not compressible	Negligible compressible	Highly compressible
b) Fludity	Not possible	Can flow	Can flow
c) Rigidity	highly rigid	less rigid	Not rigid
d) expansion on heating	Low	More than solid	More than liquid

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19. What do you mean by Change of state of matter? Explain!

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

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

Cons: 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 temprature.

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

$$\text{Solid} \xrightarrow[\text{Heat absorded}]{\text{melting}} \text{Liquid}$$

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

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Liquid boiling, Gas
heat absorbed

20. Complete the following :—

a) Solid heating, liquid

b) Liquid boiling, Gas.

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