

Test Yourself

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

2. Name the three states of matter.

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

Solid - A solid has a definite ~~volume~~ shape and definite volume. Ex - Wood, Stone, iron, ice etc

Liquid - A liquid has a definite volume but not 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. What is a molecule?

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

Example - Oxygen molecule (O_2) made up two (O) atoms.

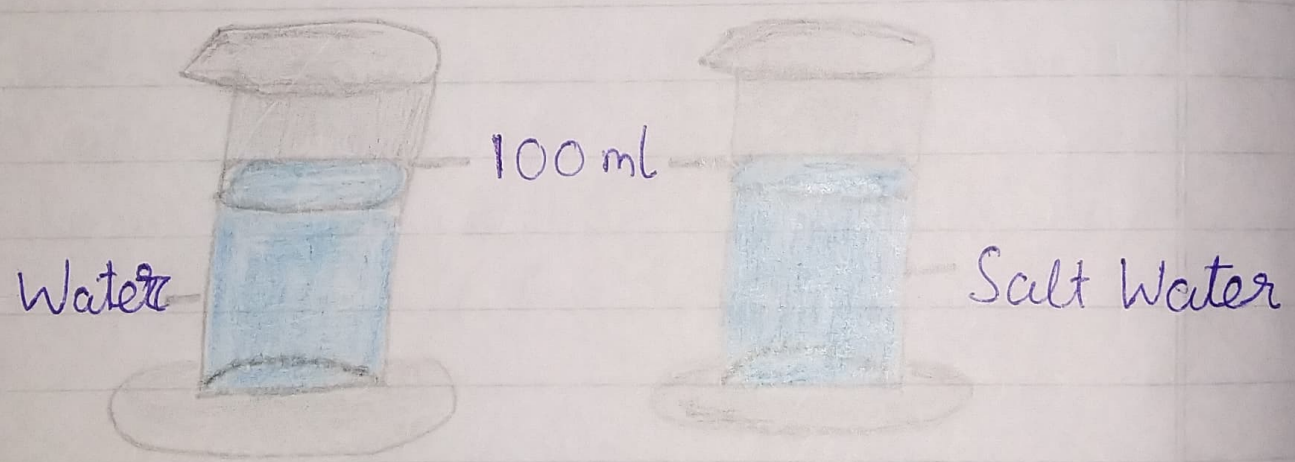
B. Short/Long answer questions.

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

Ans- The spacing between molecules of matter is called inter-molecular spacing.

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

Ans- Take 100 ml of water in 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 ~~space~~ space between the particles of water.



i) Water alone

ii) Salt added to water

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

B. Short / Long answer questions

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

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

For example: neon, argon, etc

Diatomic molecule - A molecule having two atoms is called a diatomic molecule.

For example: hydrogen molecule, oxygen molecule etc.

7. What do you mean by inter-molecular forces?

Ans- 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 substances bind together.

- The force of attraction between different types of molecules is called force of adhesion.

Ex- When ~~to~~ 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 characteristics of molecules of matter which determine its solid, liquid and gaseous state.

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

- i) Inter-molecular space
- ii) Force of attraction between molecules and
- iii) Movement of molecules.

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

- a) Size b) Shape c) Density?

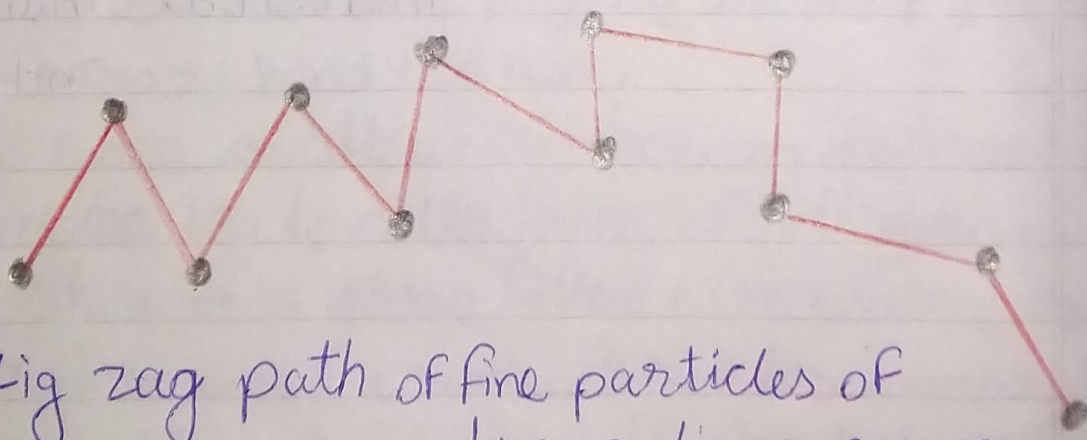
| | Solids | Liquids | Gases |
|------------|--------------------------|-------------------------|-------------------------------------|
| a) Size - | They have definite size. | Indefinite | Indefinite |
| b) Shape | They have definite shape | Indefinite | Indefinite |
| c) Density | Highly dense | Less 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 direction 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 figure below.



Zig zag path of fine particles of Lycopodium powder

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

Ans- The five general properties of -
- Solid

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 ~~vibrations~~ vibration about their mean position i.e. small amplitude.
4. They have definite shape & volume.
5. They are generally hard & 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 move from one place to another.
4. Do not have any particular shape of their own and they acquire the shape of the vessel.

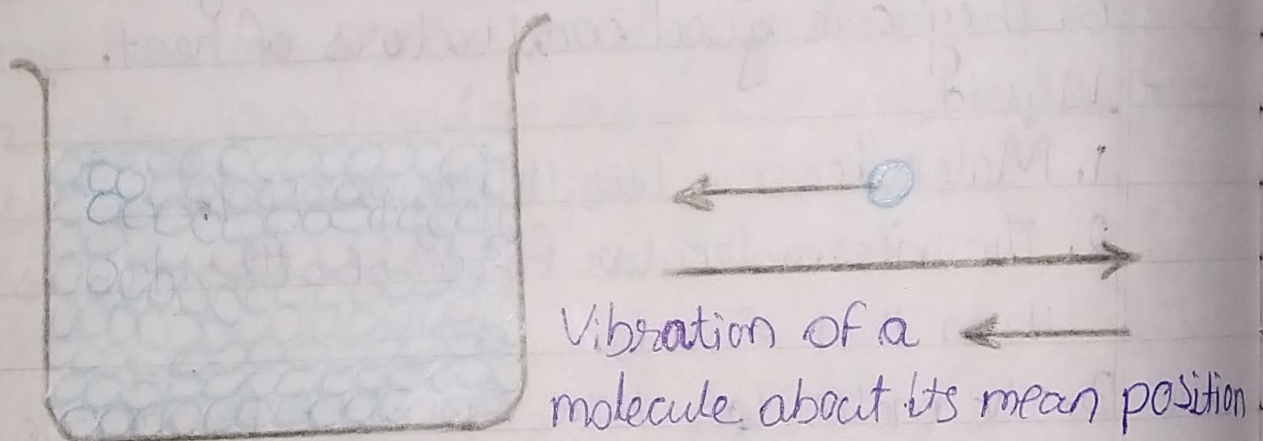
5. A particular quantity of a liquid has a definite volume at a given temperature.

- 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 volume.
4. The molecules move independently.
5. Worst conductors of heat.

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-

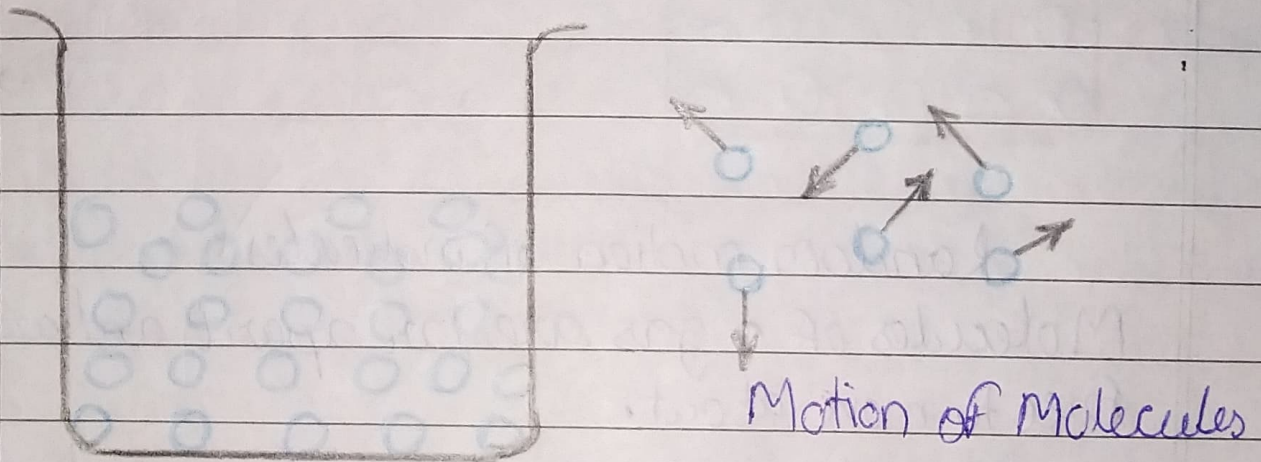


Molecules of a solid arranged closely and in a definite manner, not free to move about.

Here the molecules are very tightly packed that there is no or very less 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.

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

Ans -



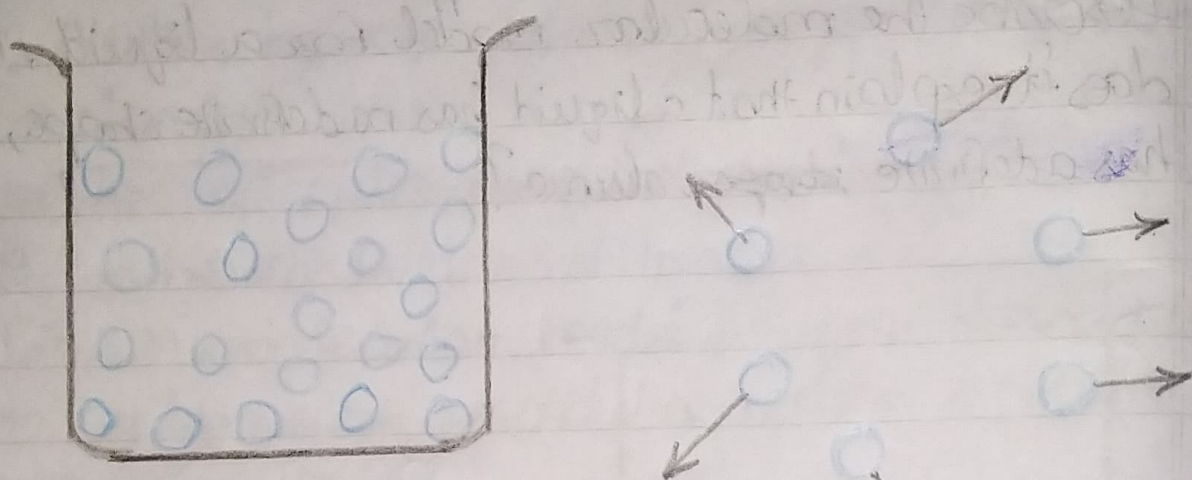
Molecules of a liquid are arranged less closely and are free to move about, within the liquid

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, they 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 temperature.

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

Ans



Random motion of molecules

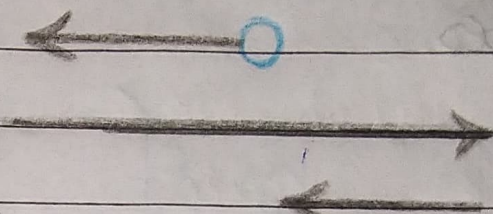
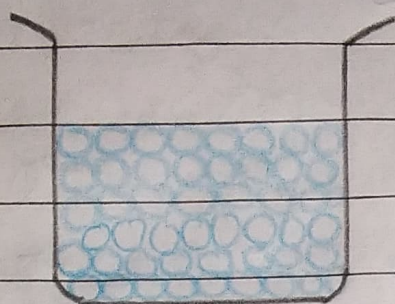
Molecules of a gas are far apart and are free to move about.

Here the molecules are far apart from each other i.e. have the greatest intermolecular distance which result into weakest intermolecular forces of attraction.

The molecules as are not bound by any strong force about freely and thus gases do not have a definite shape and also do not have any definite volume.

17. Distinguish between solids, liquids and gases on the basis of their following models.

Ans- Solids

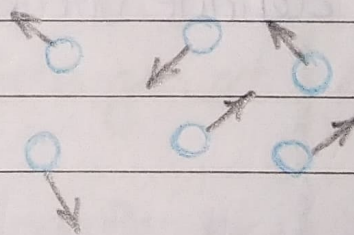
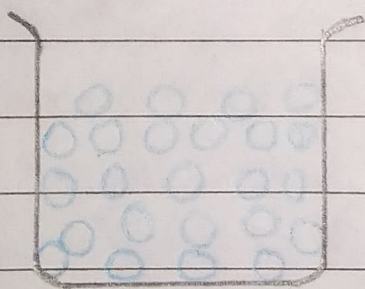


Vibration of a molecule about its mean position.

Here the molecules are very tightly packed that there is no or very less 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.

Liquids

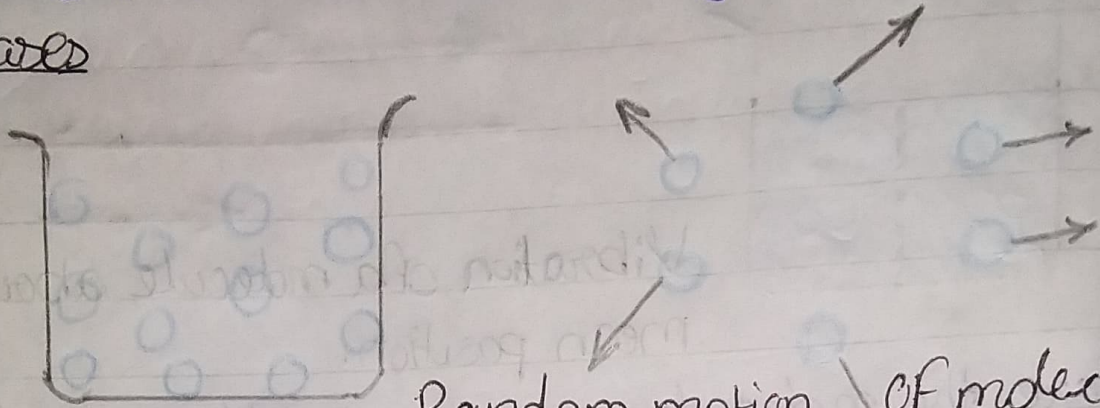


Motion of Molecules

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 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 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 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, liquids and gases on the basis of their following properties.

- a) Compressibility
c) Rigidity

- b) Fluidity
d) Expansion on heating

| | 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 |

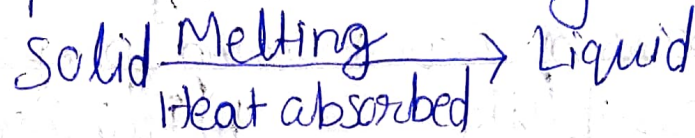
19. What do you mean by change of state of matter? Explain?

- a) the change of a solid into a ~~gas~~ liquid at a constant temperature and
b) the change of a liquid into a gas at a constant temperature

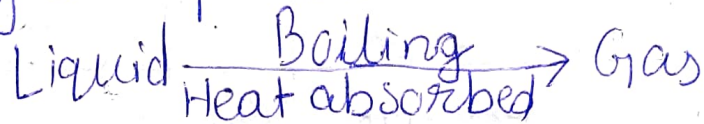
Ans- The change in the state of matter of a substance from solid to liquid or from liquid to gas is brought by importing heat energy to it at a constant temperature.

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 melting or fusion i.e-



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



20. Complete the following

