

Matter

1. What is Atom?

Ans. An atom is defined as the smallest unit of an element that always takes part in a chemical reaction but may or may not have any independent existence.

2. What is Molecule?

Ans. Two or more atoms of the same or different elements constitute a molecule. Molecules possess the same physical and chemical properties of that matter. The molecules are held to each other by a force of attraction.

3. How Kinetic Energy of any molecule depends on the heat is supplied to the substances?

Ans. When heat is supplied to the substances, its temperature rises and the molecules move more rapidly due to higher kinetic energy. Whether when the substance is cooled and has lower temperature, the molecules have lower kinetic energy and moves slower. The average kinetic energy of the molecules is directly proportional to the temperature of the substances.

4. What is Intermolecular Force?

Ans. the molecules in the matter always exert force of attraction on each other. This force is called Intermolecular Force of attraction.

5. What is Intermolecular Space?

Ans. Molecules when arranged in a substance have space between them. The space between the neighboring molecules in a substance is called Intermolecular Space.

6. What is the relation between Intermolecular Space and Intermolecular Force?

Ans. The Intermolecular Force is inversely proportional to the Intermolecular Space. That means as the space between the molecules decreases, the intermolecular force of attraction increases and vice versa.

7. A matter is become in how many States?

Ans. There are three states of matter:

- a. Solid, (Very little Intermolecular Space)
- b. Liquid, (Intermolecular Space is larger than the solid but less than gas)
- c. Gases. (Intermolecular space is very large)

8. What are the properties of Solid State?

Ans. the properties of Solid state are:

- a. In solid state the particles are closely packed with a strong force of attraction between the particles of solid which holds them together in fixed position. Thus, the positions of particles in a solid are fixed.
- b. The particles of solid only vibrate about their fixed position. They cannot move from one position to another.
- c. The spaces between the particles of solid are very small.
- d. The particles of solid have minimum kinetic energy.

- e. A solid has fixed shape because the particles of solid are closely packed and their positions are fixed due to the strong force of attraction between them.
- f. A solid has a fixed volume because the space between its particles are fixed.
- g. A solid cannot be compressed much because its particles are already very closely packed and there are no spaces between them.
- h. A solid has a high density because its particles are very close together.
- i. A solid does not fill its container completely because its particles are held tightly by strong interparticle force and hence cannot leave their position to fill the whole container.
- j. A solid does not flow because its particles are held very strongly and unable to leave their fixed position.

9. "A solid cannot be compressed much. But we can compress easily sponge." Is the sponge solid or not? Explain.

Ans. We know that solid has a fixed shape and it cannot compress much. But a sponge can be compressed easily but still sponge is solid because its compressibility is due to the presence of minute force in it which are filled with air. When we press the sponge, air is expelled from its holes making it highly compressible. And when pressure is released the sponge comes back to its shape.

10. What are the properties of Liquid?

Ans. The properties of liquid are:

- a. In liquid the particles are close together, but they are not as close as in solids. In fact, the particles are somewhere loosely packed in liquids.
- b. The spaces between the particles of a liquid are slightly more than that in a solid but they are still very small.
- c. There is a quite less strong force of attraction between the particles of a liquid which holds them together but the force is not strong enough to hold the particles in fixed position. So that a liquid does not have a fixed shape.
- d. The particles of a liquid have more kinetic energy than the particles of a solid. Due to this, the liquids have a more disorderly arrangement of particles than solid.
- e. The particles in a liquid are vibrating. If a liquid is heated, then its particles begin to move faster.
- f. A liquid takes the shape of its container because the particles of a liquid can slide over one another easily.
- g. A liquid has fixed volume because, at a given temperature, the spaces between its particles are fixed.
- h. A liquid cannot be compressed much because its particles are still quite close together and have very small spaces between them.
- i. A liquid has comparatively high density because its particles are still quite close together.
- j. A liquid does not fill its container completely because its particles are held fairly strongly by the interparticle force and hence cannot leave the body of liquid to fill the whole container.

11. What are the properties of gases?

Ans. The properties of Gases are-

- a. The spaces between the particles of gases are very large.
- b. The force of attraction between the particles of gases is negligible. So the particles of gases are free to move in any direction.
- c. The positions of particles of gas as well as the spaces between the particles of gases are not fixed.
- d. The particles of gases have the maximum movement. Due to this, the gases have the most disorderly arrangement of particles.
- e. A gas does not have a fixed shape because the position of its particles are not fixed.
- f. A gas does not have fixed volume because the spaces between its particles are not fixed. Since the particles of the gases are free to move anywhere, it takes the shape and the volume of its container.
- g. A gas is compressed easily because its particles are far apart and there are large space between them.
- h. A gas has very low density because its particles are very far apart from one another.
- i. A gas fills its container completely because due to high kinetic energy and negligible force of action, the particles of gas are moving with high speeds in all direction.
- j. A gas flows easily because its particles are completely free to move anywhere.

12. What are the differences between Solid, Liquid, Gas?

Ans.

Solids	Liquids	Gases
Highly Strong intermolecular forces between the molecules, leads to a definite volume in Solids.	The intermolecular forces are stronger than gases but weaker than solids.	The intermolecular forces are practically non-existent. Thus, there is no definite volume.
Solids have a definite shape to them.	Liquids do not have a definite shape.	Gases do not have a definite shape.
The intermolecular space between solids is absent.	The intermolecular space is moderate but present.	The intermolecular space is free-flowing and plenty.
The force of attraction between the molecules is incredibly high.	The force of attraction between molecules is pretty moderate.	There is no intermolecular force of attraction between the molecules.
They are incompressible.	Liquids cannot be compressed.	Gases can be compressed quite easily.

13. What is melting?

Ans. the process in which solid substances changes into liquid on heating is called melting.

14. What is melting point of any substance?

Ans. The temperature at which a solid substance melt and changes into a liquid at atmospheric pressure called melting point of that substance.

Ex: the melting point of Ice is 0°C .

15. How solid changes into liquid on heating?

Ans. when a solid substance is heated the heat energy makes its particles vibrate more vigorously. At the melting point, the particles of solid have sufficient kinetic energy to overcome the stronger force of attraction holding them in fixed positions and break to form small groups of particles. And the solid melts to form a liquid.

16. What is Boiling or Vaporization?

Ans. The process in which liquid substance changes into a gas rapidly on heating, is called boiling.

17. What is Boiling Point of any particle?

Ans. The temperature at which a liquid boils and changes rapidly to form gas at atmospheric pressure is called boiling point of the liquid.

Ex: When water heated to atmospheric pressure 100°C , it boils rapidly to form steam. So, the boiling point of water is 100°C .

18. How liquid changes to gases on heating?

Ans. When a liquid is heated, the heat energy makes its particles move even faster. At the boiling point the particles of a liquid have sufficient kinetic energy to overcome the forces of attraction holding them together and separate into individual practices. And the liquid boils to form gas.

19. What is condensation?

Ans. The process of changing gas to a liquid by cooling, is called Condensation.

20. How condensation process happens?

Ans. the condensation process happen as follows-

When a gas is cooled enough, then its particles lose so much kinetic energy that they slow down, move closer together until they start being attracted to each other, and form liquid.

21. What is freezing?

Ans. Freezing means solidification. It is reversal of melting. The process in which liquid substance changes into solid is called Freezing.

22. How freezing process happens?

Ans. When a liquid is cooled by lowering its temperature, its particle loss energy due t which they move slowly. If the liquid is cooled enough, its each particle stops moving and vibrate about a fixed point. At this stage the liquid freezes and become solid.

23. What is sublimation?

Ans. the process of directly changing from the solid to gaseous state is called Sublimation.

Ex: Naphthalene, Dry ice etc.

24. What is Deposition?

Ans. Deposition is the reverse of process of sublimation. Here a gas solidifies directly without going through the liquid stage when it undergoes a reduction of temperature.

25. Write difference between Sublimation and Deposition.

Sublimation vs Deposition		
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	Sublimation	Deposition
DEFINITION	Sublimation is the change of a solid substance into a gaseous substance without going through a liquid phase	Deposition is the change of a substance from a gas phase to a solid phase without passing the liquid state
PROCESS	Changes the phase of matter from solid to gas phase	Changes the phase of matter from gas to solid phase
HEAT TRANSFER	An endothermic reaction	An exothermic reaction
USES	Used to purify chemical compounds	To form ice or frost
EXAMPLES	Solid carbon dioxide, solid iodine, etc.	Frost formation from water vapor