

CLASS-8

PHYSICS

CHAPTER-1

MATTER

NOTES-

MATTER:

Matter is a substance that has inertia and occupies physical space.

There are four natural states of matter-

Solids, liquids, gases and plasma.

Matter:

Every substance living and non-living that we see is made up of matter and MATTER "is something which has mass, occupies space and can be perceived by our senses." e.g. Hydrogen, milk, oxygen, pen, table, water, iron, air, oil, sugar etc.

Matter is composed of tiny particles called molecules, which are in constant motion, have spaces between them and have inter-molecular attraction.

Every molecule can exist freely in nature and has all the properties of matter.

A molecule is composed of ATOMS, but atom cannot exist free in nature.

INTER-MOLECULAR FORCE:

The molecules of a matter exert a force of attraction on each other – The force of attraction is called INTERMOLECULAR FORCE. This force in solid is very strong and we cannot break a solid easily. In liquids this force is less strong and in molecules of gas it is very less.

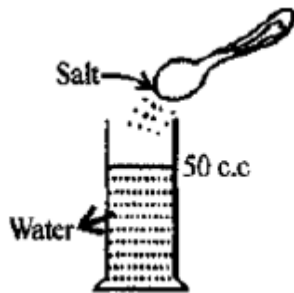
FORCE OF COHESION:

The inter-molecular force of attraction between the molecules of same substance is called FORCE OF COHESION. i.e. between water and water.

FORCE OF ADHESION:

The force of attraction between the molecules of two different substances is called FORCE OF ADHESION i.e. between glue and paper.

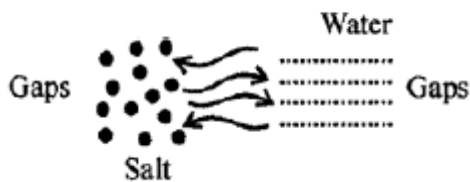
Matter is composed of tiny particles and molecules of matter have spaces between them can be proved by an experiment.



it.

Take 50 c. c of water in a measuring cylinder. Add a small quantity of salt in it. Salt gets dissolved in water and still level remains at 50c.c. Where has salt gone?

The salt molecules enter into spaces of water and water molecules into spaces of salt molecules. This experiment show that particles of matter are very minute and cannot be seen by naked eye and there are spaces between molecules.



The molecules of matter are in constant motion can be seen by opening a bottle of perfume in a corner of room, it reaches the other parts of the room.

SUBLIMATION:

Change of solid directly into vapours on absorbing heat.

DEPOSITION:

The change of vapours directly into solid on cooling.

MELTING:

Change of solid in liquid at fixed temperature on heating.

FUSION or FREEZING:

Change of liquid to solid state on cooling at a fixed temperature.

FUSION or MELTING:

Change of a solid to liquid state at a fixed temperature on absorbing heat.

EVAPORATION:

Surface phenomenon i.e. only takes place at surface "Is change of liquid to vapours. Evaporation has cooling effect. Takes place at all temperatures.

VAPORIZATION:

Change of liquid to vapour state on heating at constant temperature. It is fast process and produces hotness.

A. Objective Questions

1. Write true or false for each statement

(a) The temperature of a substance remains unaffected during its change of state.

Answer: True.

(b) Ice melts at 100°C.

Answer: False. The ice melts at 0° by absorption of heat.

(c) Water at 100°C has more heat than the steam at 100°C.

Answer: False.

(d) Evaporation of a liquid causes cooling.

Answer: True.

(e) Water evaporates only at 100°C.

Answer: False.

(f) Boiling takes place at all temperatures.

Answer: False.

(g) Evaporation takes place over the entire mass of the liquid.

Answer: False.

(h) The process of a gas converting directly into solid is called vaporization.

Answer: False.

The process of a liquid converting directly into gas is called vaporization.

(i) At high altitudes water boils above 100° C.

Answer: False.

(j) The melting point of ice is 0°C.

Answer: True.

2. Fill in the blanks

(a) Evaporation takes place at all temperature.

(b) Freezing process is just reverse of melting.

(c) Sublimation is a process that involves direct conversion of a solid into its vapour on heating.

(d) The temperature at which a solid converts into a liquid is called its melting point.

(e) The smallest unit of matter that exists freely in nature is called molecule.

(f) Molecules of a substance are always in a state of motion and so they possess kinetic energy.

(g) Intermolecular space is maximum in gases less in liquids and the least in solids.

(h) Intermolecular force of attraction is maximum in solids, less in liquids and the least in gases.

3. Match the following

Column A	Column B
(a) Molecules	(i) water boils
(b) 100°C	(ii) evaporation
(c) 0°C	(iii) changes from solid to gas
(d) At all temperatures	(iv) matter
(e) Camphor	(v) water freezes

Ans.

Column A	Column B
(a) Molecules	(iv) matter
(b) 100°C	(i) water boils
(c) 0°C	(v) water freezes
(d) At all temperatures	(ii) evaporation
(e) Camphor	(iii) changes from solid to gas

4. Select the correct alternative

(a) The inter-molecular force is maximum in

1. Solids
2. Gases
3. Liquids
4. None of the above

(b) The inter-molecular space is maximum in

1. Liquids
2. Solids
3. Gases
4. None of the above

(c) The molecules can move freely anywhere in

1. Gases
2. Liquids
3. Solids
4. None of the above

(d) The molecules move only within the boundary of

1. Liquids
2. Gases
3. Solids
4. None of the above

(e) The temperature at which a liquid gets converted into its vapour state is called its

1. Melting point
2. Boiling point
3. Dew point
4. Freezing point.

(f) Rapid conversion of water into steam is an example of

1. Evaporation
2. Freezing
3. Melting
4. Vapourization.

(g) Evaporation takes place from the

1. Surface of liquid
2. Throughout the liquid
3. Mid-portion of the liquid
4. Bottom of liquid.

(h) Boiling takes place from the

1. the surface of the liquid
2. throughout the liquid
3. mid-portion of liquid
4. none of the above.

Short/Long Answer Questions

Question 1.

Define the term matter. What is it composed of ?

Answer:

Anything which occupies space and has mass is called matter. Matter is composed of tiny particles called MOLECULES.

Question 2.

State three properties of molecules of a matter.

Answer:

1. They are very small in size.
2. They have spaces between them.
3. They are in constant motion and they possess kinetic energy.

Question 3.

What do you mean by the inter-molecular spaces? How do they vary in different states of matter?

Answer:

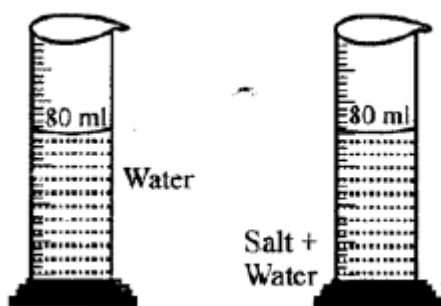
INTER-MOLECULAR SPACES "The spacing between the molecules of matter is called Inter-molecular spaces."

The inter-molecular spaces is less in solids more in liquids and still more in gases.

Explanation of inter-molecular space : Take water in a measuring cylinder say upto 80 ml. mark. Add 10 gm of salt to it.

The volume in cylinder should increase. On dissolving salt we find volume remains same i.e. upto 80 ml mark. This is

because there are spaces in water molecules and salt molecules occupy these spaces and volume remains the same.



Question 4.

What is meant by the inter-molecular forces of attraction ?

Answer:

How do they vary in solids, liquids and gases ?

INTER-MOLECULAR FORCES OF ATTRACTION : “The forces of attraction between the molecules of matter is called the inter-molecular force of attraction.”

This inter molecular force is maximum in solids, less in liquids and least in gases.

Question 5.

Which of the following are correct ?

Answer:

(a) Solids have definite shape and definite volume.

True.

Reason As the molecules here have negligible intermolecular distance between them and have maximum intermolecular

force of attraction.

(b) Liquids have definite volume but do not have definite shape.

True.

(c) Gases have definite volume but no definite shape.

False.

Correct Gases have neither definite volume nor a definite shape.

(d) Liquids have definite shape and definite volume.

False.

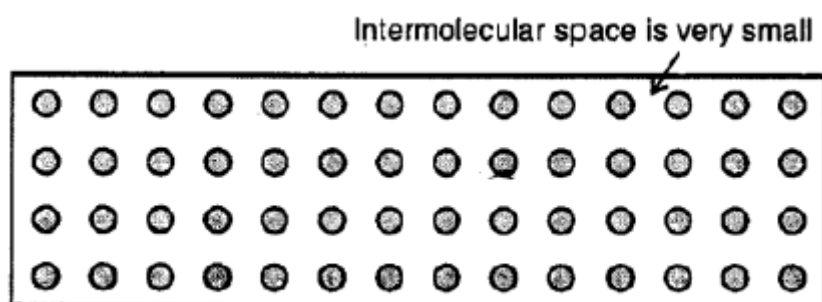
Correct Liquids have a definite volume but not definite shape.

Question 6.

Discuss the three states of matter solid, liquids and gas on the basis of molecular model.

Answer:

Solids

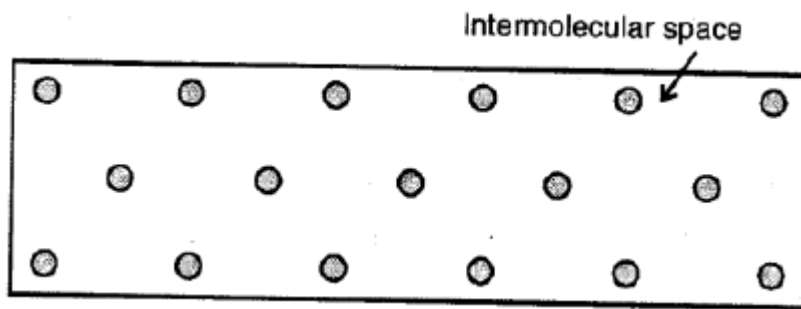


Here the molecules are very tightly packed that there is no or very less intermolecular space and there is high

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 :

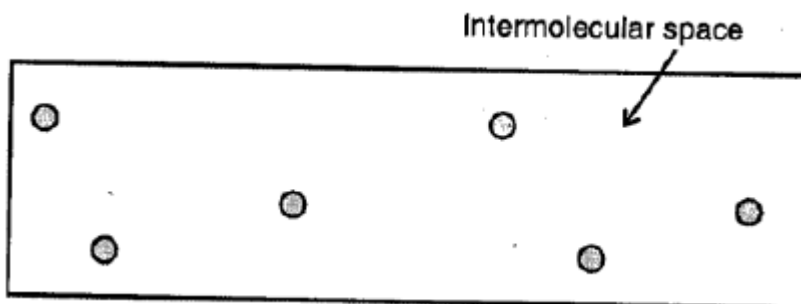


Here the molecules are less tightly packed as compared to solids and also there is lesser force of intermolecular

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 :



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.

Question 7.

What do you mean by the change of state ? Write the flow chart showing the complete cycle of change of state.

Answer:

CHANGE OF STATE: "The process of change from one state(form) to another state (form) either by absorption or

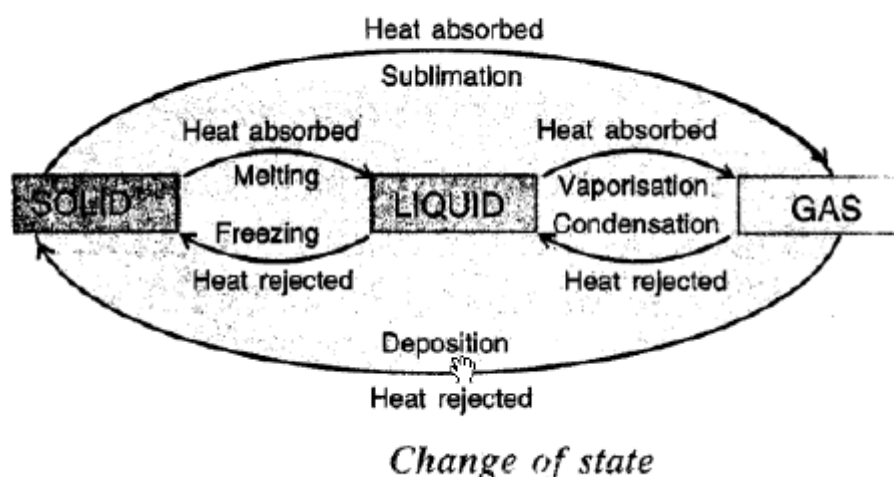
rejection of heat at a constant temperature is called the CHANGE OF STATE."

COMPLETE CYCLE OF CHANGE OF STATE : On heating a solid changes to liquid and liquid on heating changes to

vapours. On cooling vapours condense to LIQUID, LIQUIDS on cooling freeze to SOLIDS. Some SOLIDS on heating

change to vapours. On rejection of heat vapours solidify.

This cycle can be shown by diagram



Question 8.

Differentiate between melting point and boiling point, giving atleast one example of each.

Answer:

MELTING POINT:

The temperature at which a solid starts changing into LIQUID without further increase in temperature is called MELTING

POINT." Or The constant temperature at which a solid changes into liquid."

Example : Ice (solid) melts at 0°C into water (liquid) when heated.

BOILING POINT : "The temperature at which a LIQUID start changing in vapour without further rise in temperature.

Or

'The constant temperature at which a LIQUID starts changing into GAS (vapours)

Example : Boiling point of water (liquid) is 100°C .

Question 9.

Describe the process of condensation and sublimation with examples.

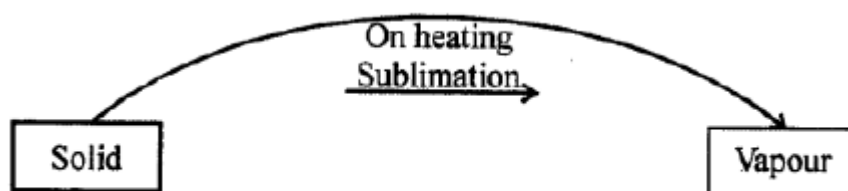
Answer:

CONDENSATION :

"The change of vapours on cooling at fixed temperature to liquid is called condensation."

Example: When water vapours at 100°C are cooled they change into water (liquid).

SUBLIMATION :- The process of change of solid directly into vapours on heating is called sublimation.



Question 10.

Explain the term melting and melting point.

Answer:

Melting — The change from the solid state to the liquid state on heating at a fixed temperature is called melting.

Melting Point — It can be defined as the fixed temperature at which a solid starts changing to its liquid state.

Question 11.

Explain the terms vaporization and boiling point.

Answer:

VAPORIZATION: "Change of liquid to vapours (gas) on heating at constant temperature is called VAPORIZATION."

When we heat a liquid temperature starts rising till it starts changing into vapours and then temperature remains

constant for sometime, through we are supplying heat. This heat supplied is being used to change every molecule of

liquid into vapours and temperature does not rise till the whole of liquid is changed into vapours.

BOILING POINT : "The temperature at which a liquid starts changing into vapours or gas at constant temperature is

called its BOILING POINT."

Question 12.

A liquid can change into vapour state

(a) at a fixed temperature, and

(b) at all temperatures

Name the processes involved in two cases.

Answer:

(a) is Boiling point

(b) is Evaporation.

The process involved in two cases is vaporization or boiling.

Question 13.

State (a) the melting point of ice, and (b) the boiling point of water.

Answer:

(a) MELTING POINT OF ICE: "Is the constant temperature at which it starts (melting) changing from ice to water."

It is 0°C for ice.

(b) BOILING POINT OF WATER : "Is that constant temperature at which water starts (BOILING) changing from water to steam (vapours)".

It is 100°C for water.

Question 14.

What is evaporation ?

Answer: EVAPORATION : The change of state of a liquid to vapour at all temperatures from the surface of liquid is called evaporation.

Question 15.

State three factors which affect the rate of evaporation of a liquid.

Answer:

Three factors on which affect the rate of evaporation of a liquid:

(i) AREA OF EXPOSED SURFACE.

(ii) TEMPERATURE OF LIQUID.

(iii) NATURE OF THE LIQUID.

(iv) PRESENCE OF HUMIDITY.

Question 16.

Wet clothes dry more quickly on a warm dry day than on a cold humid day. Explain.

Answer:

Rate of evaporation is directly proportional to temperature. Thus, rate of evaporation is higher on warm day i.e. hot day than cold day having low temperature and clothes dry soon on warm day.

Question 17.

Water in a dish evaporates faster than in a bottle. Give reason.

Answer:

Rate of evaporation is more when the area of exposed surface is more. As area exposed in a dish is more, evaporation is also more.