

HW
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Q) Give an example to show that matter offers resistance.

ans) Matter offers resistance. For ex:- If we try to swim in fast flowing water or we try to walk during an air storm, we will experience resistance.

Q) What do you mean by intermolecular force of attraction?

ans) Particles of matter are held together by a force of attraction that exists between them. This force is known as 'Intermolecular force of attraction'.

Ex-1

1) Define matter.

ans) Anything that has mass and occupies space is called matter.

2) What are the two main types of matter?
Give two examples for each type.

ans) The two main types of matter are :- Living matter and Non-living matter.

- i) Living matter :- Plants and Animals
 ii) Non-Living matter :- Chair, Desk, shoes, etc.

3) Differentiate between living and non-living matter.

ans) Living	Non-Living
• Can grow	• Cannot grow
• Can move	• Cannot move
• Can reproduce on their own.	• Cannot reproduce on their own.
• Responds to the environmental change.	• Does not respond to environmental change.
• Needs Air, water and food.	• Does not need air, water and food.

4) Select natural and man-made matter from the following list:

Wood, plastic, silk, medicines, detergents, coal, water, ceramic, cotton, glass, nylon, fruits.

ans) Natural	Man-made
Wood	Plastic
Silk	Medicines
Coal	Detergents
Water	Ceramic
Cotton	Glass
Fruits	Nylon

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Exercise-2

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1) Name the smallest particle from which matter is made up of.

ans) The smallest particle from which matter is made up is an atom.

2) Give reasons

a) Liquids and gases flow but solids do not.

ans) Liquids and gases have more intermolecular spaces between the molecules while solids have ~~not~~ negligible or almost no intermolecular spaces. So, liquids and gases flow while solids do not.

b) A gas fills up the space available to it.

ans) The molecules of gas are wide apart from each other. There are very large intermolecular spaces between their molecules. Hence, gases can fill up the space available to them.

c) The odour of scents spreads in a room.

ans) Scent fumes being gases fill the spaces between air molecules and the molecules due to diffusion. Fumes spread into a room.

d) We can walk through air.
ans) The molecules of air are far apart i.e. large gaps and we can walk through air easily.

e) Liquids have a definite volume but no definite shape.
ans) The molecules of liquid are loosely packed and intermolecular force of attraction is small but no. of molecules in it remain the same. Hence liquids have definite volume but no definite shape.

f) When a teaspoon of sugar is added to half a glass of water and stirred, the water level in the glass remains unchanged.

ans) When a teaspoon of sugar is added to half a glass of water and stirred, the water level in the glass remains unchanged because there are more intermolecular spaces in liquids and when the sugar molecules fill up these spaces.

g) When an empty gas jar is inverted over a gas jar containing a coloured gas, the gas also spreads into the empty jar.

ans) This is because gases can diffuse or flow in all directions.

h) A red ink drop added to a small amount of water in glass turns the water red in some time.

ans) When we put a drop of red ink in a glass of water, its particles diffuse with particles of water slowly but continuously and the water turns red.

g) Define: _____ between
a) Cohesive force: The force of attraction between particles of the same kind is called cohesive force.

b) Diffusion: The phenomenon of its intermixing of particles of one kind with another kind is called diffusion.

c) Brownian movement: The zig-zag motion of particles suspended in a medium is called Brownian movement.

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Exercise - II

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ans) 2) Molecules are the smallest unit of matter. They exhibit all the properties of that kind of matter and is capable of independent existence.

3) ans) Atoms may or may not have independent existence. While molecules have independent existence.

4) ans) a) The molecules of matter are always in motion and attract each other with a force, and this force is called intermolecular force of attraction due to which they are held together.

b) The molecules can move only when there are gaps or space between them, this space is called intermolecular space.

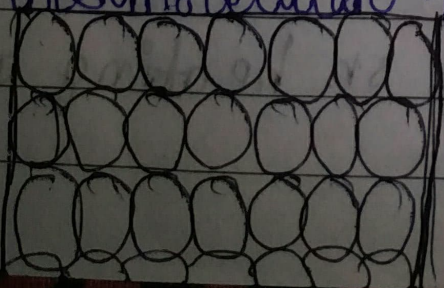
5) ans) The three states of matter are:

1) Solids state

2) Liquids

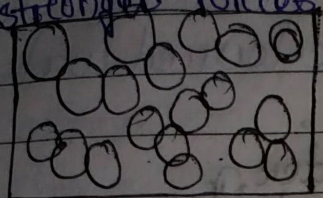
3) Gases

Solid State: The molecules are very close to each other hence intermolecular spaces are small and intermolecular force is strong.



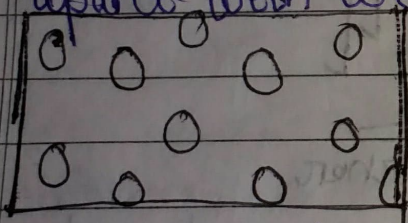
Hence solids have definite volume, rigid, retain definite shape and are incompressible.

Liquids: The molecules are less closely packed have more intermolecular spaces than solid, less stronger forces than solids.



Hence liquids have definite volume but no definite shape. They take the shape of container in which they are put.

Gases: The molecules in the gases are far apart, with weakest force of attraction.



Hence gases have neither definite volume nor definite shape but easily compressible.

6) ans) Substances that can flow are called fluids.

Both gases and liquids are fluids, e.g. gases (carbon dioxide, hydrogen), liquids (water, petrol and sulphuric acid).

7) ans)	<u>Solids</u>	<u>Liquids</u>	<u>Gases</u>
	Common salt	Milk	Oxygen
	Wax	Mercury	L.P.G.
	Stone	Blood	Carbon dioxide
	Sugar	Coconut oil	
	Coal	Kerosene	
	Butter		
	Copper		

10) ans) When we invert the bottle and blow air into the bottle through the side opening, it creates high pressure inside the bottles and the egg is kicked out of the bottle.

Exercise - III

1) ans) When a substance is heated, it can cause.

- 1) Interconversion of states of matter.
- 2) Thermal expansion of the substance.
- 3) Chemical change.

2) ans) a) The process by which matter changes from one state to another and back to original state, without any change in its chemical composition.

b) Two conditions are:

- 1) Change in temperature.
- 2) By applying pressure.

a) Fusion: The heating process by which a solid changes into the liquid state is called fusion.

b) Vapourisation: The heating process by which a liquid changes into its vapour state is called vapourisation.

c) Condensation: The process by which a substance in gaseous state changes into its liquid state is called Condensation.

d) Sublimation: The change of solid on heating to vapours directly and vice-versa without passing through the liquid state is called sublimation.

Solid $\xrightarrow{\text{heating}}$ Vapour
 $\xleftarrow{\text{cooling}}$

e) Diffusion: The phenomenon of intermixing or spreading of gaseous molecules is called diffusion.

f) Melting point: The fixed temperature at which a solid changes into a liquid at a given pressure is called its melting point. The temperature remains constant as long as the conversion is going on.

g) Boiling point: The fixed temperature at which a liquid starts changing into gaseous state is called its boiling point. The temperature remains constant till the whole of the liquid changes into gaseous state.

h) Liquefaction: Change of vapours on cooling to liquid is called liquefaction.

4) a) Solidification: The process of changing liquid into a solid state by cooling is known as solidification.

Ex: water \rightarrow ice

Condensation: The process of changing a gas or vapour state to a liquid state by cooling is known as condensation.

Ex: steam \rightarrow water

b) Melting: The fixed temperature at which a solid changes into a liquid at a given pressure is called its melting point. Ex: - ice \rightarrow water

Boiling: The fixed temperature at which a liquid starts changing into gaseous state is called its boiling point. Ex: - water \rightarrow steam

c) Vapourisation: The process by which a substance changes from a liquid state to vapour state is called vapourisation or evaporation. Ex: - Water changes into gaseous state on heating.

Gas: The substance which remain in the gaseous state under normal conditions of temperature and pressure are called gases. Ex: - Oxygen, hydrogen, nitrogen.

d) Miscible: Liquids which mix with each other are called miscible liquids. Ex: Water and alcohol.

Immiscible liquids: Liquids which do not mix with each other are called immiscible liquids. Ex: Water and Oil.

5) a) During interconversion of state of matter composition of substance remains the same. Matter changes from one state to another and back to the original state, while chemical reaction involves

re-arrangement of the molecular structure and composition changes.

b) In solids there is a strong force of attraction between the molecules and the space between them is very negligible. The molecules are therefore, not free to move. They merely vibrate about their mean positions. But in the case of liquids, the molecules are not very closely packed. They do not attract each other as strongly as the molecules of solid. Thus, the intermolecular spaces are larger and the molecules are able to move about more freely. This makes a liquid flow.

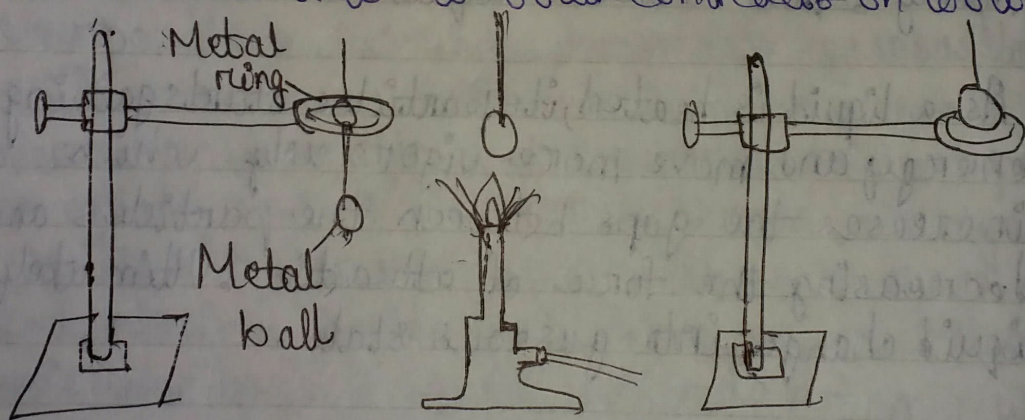
6) ans) As a liquid is heated, its particles start gaining energy and move more vigorously which increases the gaps between the particles and decreasing the force of attraction. Ultimately a liquid changes into gaseous state.

7) ans) Water from oceans, rivers, lakes from leaves of trees (transpiration) changes into vapours when temperature increases and evaporates and enters the atmosphere as clouds. When temperature falls the vapours change into water and some of it in the form of snow.

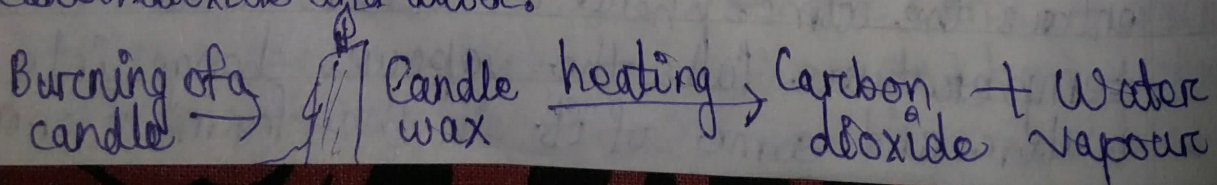
fall on mountains and earth in the form of water and hales and his continues. This water cycle is example of inter-conversion of states of water.

8) ans) When metal ball is heated, it expands. This can be proved by following experiment
Take a metallic ring and ball. Try to pass the metal ball through the ring. The ball is able to pass through the ring. Now heat the metal ball for 5-6 minutes. The hot ball is not be able to pass through the ring.

This shows that a solid expands on heating. Now cool the ball, it again passes through the ring. This shows that a solid contracts on cooling.



9) ans) On heating, candle wax melts, then turns into vapour which reacts with air to produce two new substances, carbon dioxide and water.



Objective type Questions

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1) a) Water is a matter, because it has mass and occupies space.

b) Any matter which has a definite volume but no definite shape is called a liquid.

c) Liquids and Gases can flow.

d) The molecules ~~are~~ are at a greater distance in gases compared to liquids.

e) Water boils at 100°C .

f) The physical state of a substance, which has neither fixed volume nor fixed shape is a gas.

2) a) Only water can exist in three different states.
True

b) If the container in which a gas is collected has an opening, the gas will flow out and spread itself indefinitely. True

c) Solids have the largest inter-molecular space.
False

Solids have the very small (negligible) inter-molecular space.

d) There is no difference between evaporation and boiling. False
There is a difference between evaporation and boiling.

e) All solids, on heating, first change to the liquid and then to the gaseous state always. False
Few solids, on heating, first change to the liquid & then to the gaseous state.

f) The intermolecular force of attraction is the weakest in gases. True

g) A gas has no free surface. True

3) a) Particles move about very quickly but do not leave the surface: Liquid

b) Particles are quite close together: Solid

c) Particles are far apart and move in all directions: Gas

4) Column A

a) Solids

b) Sublimation

c) Boiling point

d) Gases

Column B

ii) Can have any number of free surfaces.

v) Change of state from solid to gas.

ii) The temperature at which liquid changes into its gaseous state.

Can flow in all directions.

e) Intermolecular space (iv) Gaps between particles

5) a) Formation of water vapour from water is vaporisation

b) Disappearance of camphor when exposed to air, sublimation

c) Conversion of ice into water, melting

d) Conversion of water into steam, boiling

6) a) Substances which sublime.

ans) Naphthalene, camphor, dry ice.

b) Substances which do not change their states.

ans) Oxygen, hydrogen, nitrogen.

c) Substance which are rigid and not compressible.

d) Glass, stone, pen.

7) MCQ

1) Which one is a kind of matter?

ans) b) Petroleum

2) The state of matter which has no definite shape or volume is called
ans) c) gas

3) There are large intermolecular gaps in
ans) d) air

4) All kind of matter
ans) a) occupy space and have a definite mass

5) A kind of matter which can sublime is
ans) d) iodine

6) A substance which can change its state.
ans) b) oxygen

7) The process by which a solid changes into a liquid is called.

ans) b) melting

AV 2
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2) a) List the characteristics of pure substances.

ans) Characteristics of pure substances:

- They have a perfectly homogeneous nature.
- They are made up of only one type of atoms (elements) or molecules (compounds).
- They have a fixed composition.
- They have a fixed density, melting point, boiling point physical and chemical properties.

b) Differentiate between:-

- i) Elements and Compounds
- ii) Homogeneous and Heterogeneous mixtures.

ans) i) Elements	Compounds
• They are made up of only one kind of atom.	• They are made up of only one kind of molecules.
• Ex:- Iron, gold, silver, carbon, etc.	• Ex:- Ammonia, Methane, Water, etc.

i) Homogeneous

- Particles are distributed uniformly.
- We can't judge it by just seeing it.

• Uniform composition.

• Ex: - Rainwater, vinegar, juice, tea, etc.

Heterogeneous

- Particles are distributed non-uniformly.
- We can judge this mixture by just seeing it.

• Non-uniform composition.

• Ex: - Seawater, soil, ice in water, oil in water, etc.