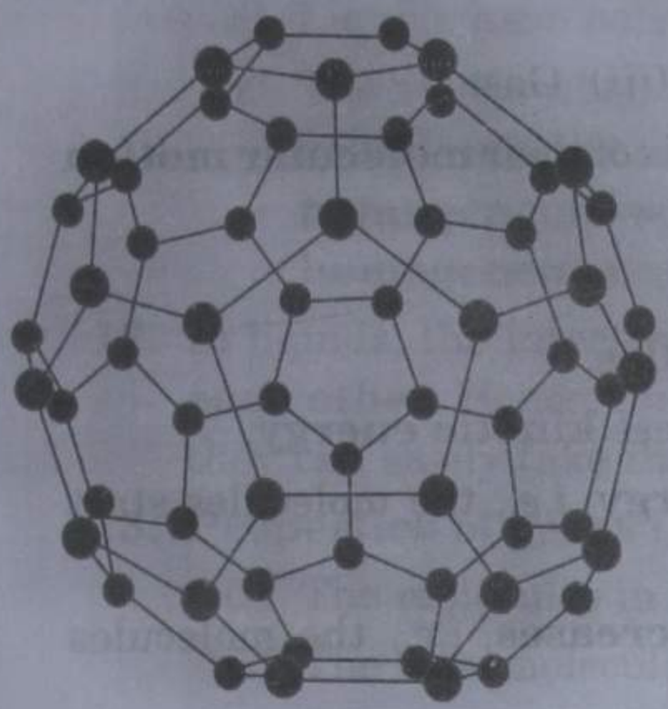


1 MATTER AND ITS COMPOSITION : LAW OF CONSERVATION OF MASS

SCOPE OF SYLLABUS

(*i*) ***Explanation of change of state of matter on the basis of Kinetic Theory of Matter.***

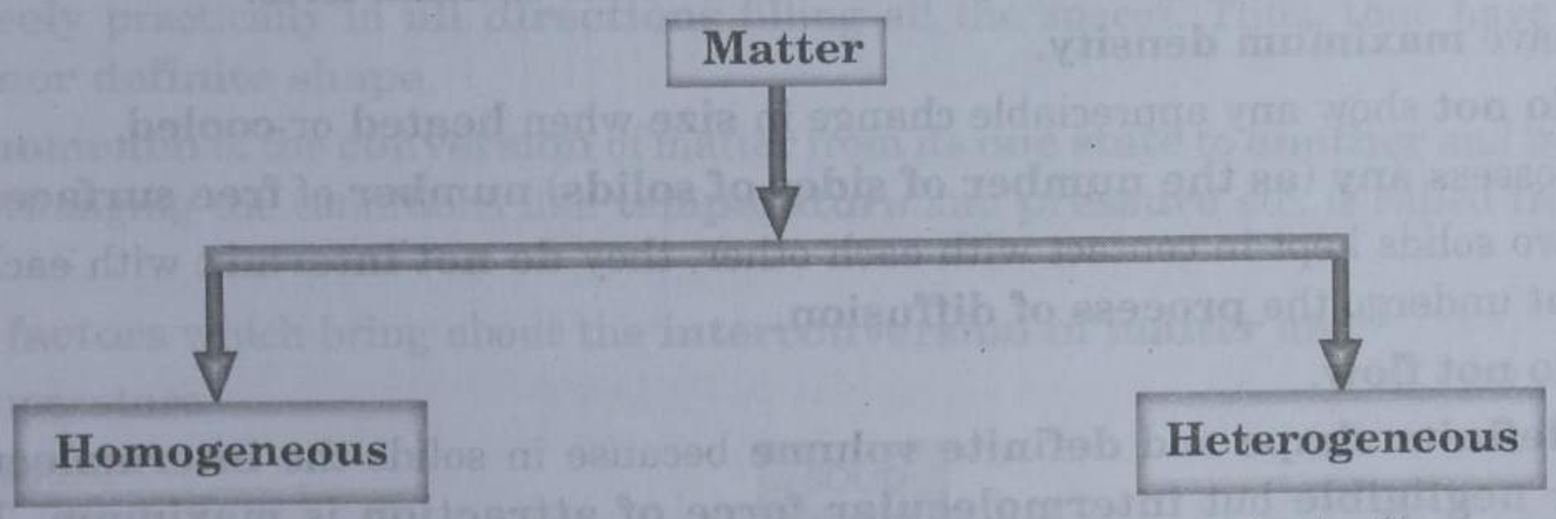
Main postulates of Kinetic Theory of Matter and explanation of change of state on the basis of Inter-particle space and Inter-particle attraction and collision.

(*ii*) ***Law of Conservation of Mass.***

Statement and explanation with examples.

IMPORTANT POINTS TO REMEMBER

1. Anything that **has weight** and **occupies space** is called **matter**.
2. Matter has been classified into **two** types.



3. The matter which has the **same composition** and **same property** in **its every part** is called **homogeneous matter**. Examples—salt solution, sugar solution.
4. The matter which has **different compositions** and **different properties** in **its every part** is called **heterogeneous matter**. Examples—polluted air, soil, etc.
5. The older belief is that **all matter** is **composed** of **four basic elements**, *i.e.*, **air**, **water**, **fire and earth**.
6. **John Dalton** proposed the **atomic theory**.

   The postulates of Dalton's Atomic Theory are given below :

   (*i*) All matter is composed of tiny invisible particles called **atoms**.

   (*ii*) Atoms can **neither be created nor be destroyed**.

   (*iii*) Atoms of same element have **same size**, **shape** and **weight**.

   (*iv*) Atoms of different elements have **different size**, **shape** and **weight**.

   (*v*) Atoms combine in **small whole number ratio** to form **compound atoms**.

   (*vi*) Atom is the **smallest unit** of **matter** which **takes part** in a **chemical reaction**.

7. The **three** different **states of matter** are

(*i*) Solid (*ii*) Liquid (*iii*) Gas.

8. The **difference** between the **three states of matter** was found on the basis of their **molecular motion** which can be explained by **kinetic theory of matter**.

The main postulates of kinetic theory of matter are as follows :

(*i*) All particles are composed of tiny particles called **atoms** or **molecules**.

(*ii*) These molecules are in a state of **unending motion**, *i.e.*, they possess **kinetic energy**.

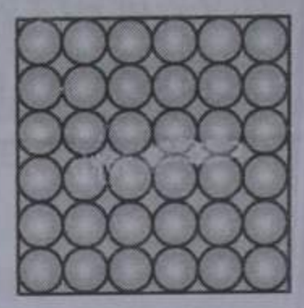
(*iii*) The kinetic energy of molecules **increases** on supplying **heat energy**, *i.e.*, the molecules start moving at a **faster rate**.

(*iv*) If the matter is **cooled**, then the kinetic energy of molecules **decreases**, *i.e.*, the molecules **slow down**.

(*v*) As the **intermolecular space increases**, the **intermolecular force of attraction decreases** and if the **intermolecular space decreases**, the **intermolecular force of attraction increases**.

(*vi*) The force of attraction between the molecules is called as **cohesive force** if the particles are of **same kind**, and **adhesive force** if the particles are of **different kinds**.

9. Properties of solids :



(*i*) In solids, the molecules are **closely** or **tightly packed**.

(*ii*) The intermolecular space is **minimum** or **negligible**.

(*iii*) The intermolecular force of attraction is **maximum**.

(*iv*) They have **definite shape** and **definite volume**.

(*v*) They are **generally rigid** except some like rubber which changes its shape on applying external force but it regains its original shape on removal of the external force.

(*vi*) Solids have **maximum density**.

(*vii*) Solids **do not** show any appreciable change in **size** when **heated** or **cooled**.

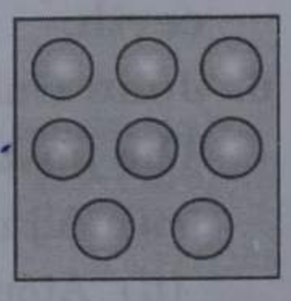
(*viii*) Solids possess **any** (**as the number of sides of solids**) **number** of **free surfaces**.

(*ix*) When two solids kept in contact with each other, they **do not intermix** with each other, *i.e.*, it **does not** undergo the **process of diffusion**.

(*x*) Solids **do not flow**.

10. Solids have **definite shape** and **definite volume** because in solids the **intermolecular space** is **minimum** or **negligible** but **intermolecular force of attraction** is **maximum**. Therefore, the molecules of solid **cannot move**, they can only **vibrate**, *i.e.*, they possess **minimum kinetic energy**. So, they cannot move from one position to other.

11. Properties of liquid :



(*i*) In liquids, the molecules are **loosely packed**.

(*ii*) The intermolecular space in liquids is **more** than solids but **less** than gases.

(*iii*) The intermolecular force of attraction in liquids is **less** than solids but **more** than gases.

(*iv*) They have **definite volume** but **not definite shape**. They only take the shape of the container.

(*v*) Liquids have **less density** as **compared** to **solids**.

(*vi*) Liquids flow from **higher level** to **lower level**.

(*vii*) When **heated** or **cooled**, the volume of **liquid** shows **appreciable change**, which is **not seen** in the case of **solids**.

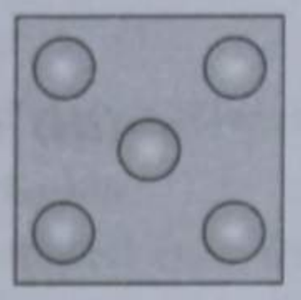
(*viii*) Liquids have only **one free surface**.

(*ix*) The liquids when kept in contact with each other **intermix** with each other to form **homogeneous solution**. Mixture of **miscible liquids** like ethanol and water intermix **thoroughly** to form **homogeneous solution** whereas **immiscible liquids** like oil and water **do not diffuse** to form **homogeneous solution**.

12. In liquids, the intermolecular force of attraction is **enough** to keep the **molecules** in **contact with each other**. Hence, the **molecules** of **liquids** are **free to move** within the body of the liquid. Therefore they can easily take the shape of container.

13. Properties of gases :

(*i*) The molecules in gases are **far apart from** each other.



(*ii*) The intermolecular space is **maximum**.

(*iii*) The intermolecular force of attraction is **minimum** or **negligible**.

(*iv*) The gases have **neither definite shape nor definite volume**.

(*v*) Gases **flow easily** in **all directions**.

(*vi*) Gases have **minimum density**.

(*vii*) Gases have **maximum compressibility**.As the **intermolecular space** is **maximum**. So, **on applying pressure**, the **molecules come closer to each other**.

(*viii*) Gases do not have any **free surface**.

(*ix*) Gases **rapidly** undergo the process of **diffusion**. It is the process of **intermixing of gases** without applying any external agency so as to form **homogeneous mixture**.

(*x*) When **heated** or **cooled** gases show **appreciable expansion** or **contraction**.

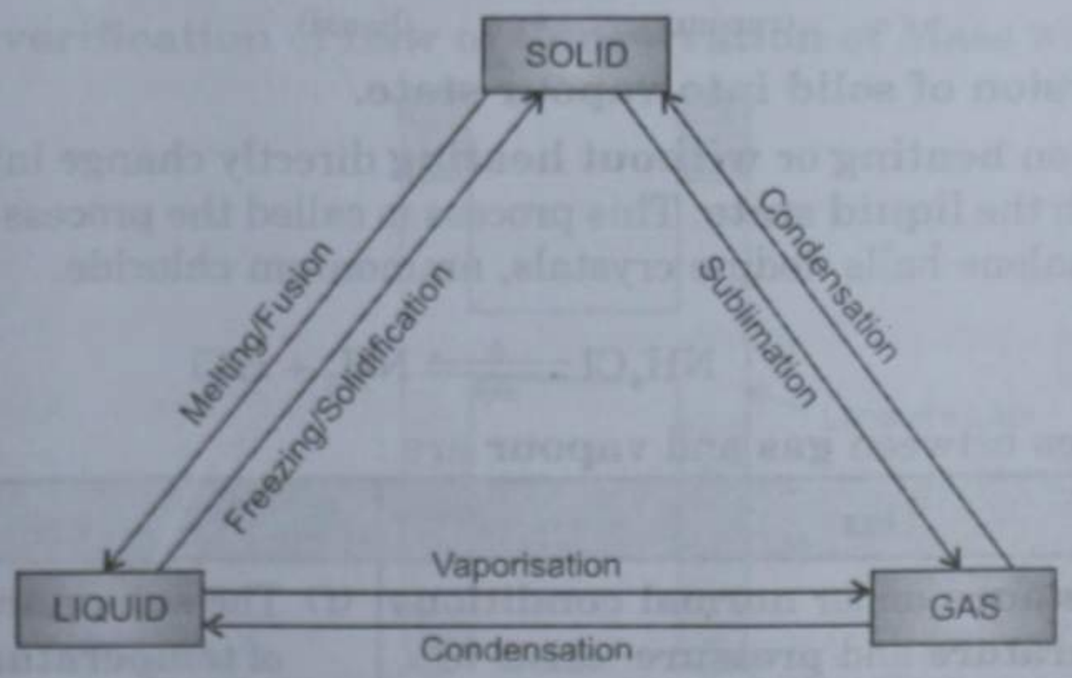
14. The intermolecular space in gases is **maximum**, therefore the molecules do not feel the **appreciable force of attraction**. Moreover, the molecules have **maximum kinetic energy**. So the molecules **move freely** practically in **all directions** filling all the spaces. Thus, they have **neither definite volume nor definite shape**.

15. The **phenomenon** of the **conversion** of matter from its **one state** to **another** and **back** to its **original state** by changing the conditions like **temperature** and **pressure** etc. is called **interconversion of matter**.

16. The **two factors** which bring about the **interconversion of matter** are :

(*i*) Temperature

(*ii*) Pressure



Interconversion of matter

17. Effect of temperature on the different states of matter.

(*i*) Conversion of solid into liquid.

(*a*) The process of conversion of the **solid** into its **liquid** by **absorbing heat** is called as the process of **melting** or **fusion**.

(*b*) The **constant temperature** at which **solid** gets converted into **liquid** is called **melting point**. For example, melting point of ice is 0°C.

$$\underset{\text{(solid)}}{\text{Ice}} \xrightarrow{\Delta} \underset{\text{(liquid)}}{\text{Water}}$$

(*ii*) Conversion of liquid into solid.

(*a*) The process of conversion of **liquid** into **solid** by giving **out heat energy** or by **reducing temperature** or by **cooling** is called **freezing** or **solidification**.

(*b*) The **constant temperature** at which **liquid** changes into **solid** is called freezing point.

(*c*) The **numerical value** of **melting point** and **freezing point** is **same**.

$$\underset{\text{(liquid)}}{\text{Water}} \xrightarrow{\text{cool}} \underset{\text{(solid)}}{\text{Ice}}$$

(*iii*) Conversion of liquid into gaseous state or vapour state.

(*a*) The process of conversion of **liquid** into its **vapour** at a **constant temperature** is called as **boiling** or **vaporisation**.

(*b*) The process of conversion of **liquid** into its **vapour** at **any temperature** is called **evaporation**. The **process of evaporation** takes place much **below boiling point**.

(*c*) The **constant temperature** at which **liquid** gets converted into its **vapour** is called **boiling point**.

$$\underset{\text{(liquid)}}{\text{Water}} \xrightarrow{\Delta} \underset{\text{(vapour)}}{\text{Water vapour}}$$

(*d*) The **differences** between **evaporation** and **boiling** are :

Evaporation	*Boiling*
(*i*) It takes place at **all the temperatures below the boiling point**.	(*i*) It takes place at a **certain fixed temperature** called **boiling point**.
(*ii*) It is a **slow process**.	(*ii*) It is a **rapid process**.
(*iii*) It takes place only **on the surface**.	(*iii*) It takes place **throughout the liquid**.
(*iv*) It is a **cooling process**.	(*iv*) It is a **heating process**.

(*iv*) Conversion of gaseous state or vapours into liquid.

The process by which **gaseous state** or **vapour** changes into **liquid state** on **cooling** is called **condensation**.

$$\underset{\text{(vapour)}}{\text{Water vapour}} \xrightarrow{\text{cool}} \underset{\text{(liquid)}}{\text{Water}}$$

(*v*) Direct conversion of solid into vapour state.

Certain **solids** on **heating** or **without heating** directly change into their **vapour state** without passing through the **liquid state**. This process is called the process of **sublimation**. For example, dry ice, naphthalene balls, iodine crystals, ammonium chloride.

$$NH_4Cl \underset{\text{cool}}{\overset{\Delta}{\rightleftharpoons}} NH_3 + HCl$$

The **differences** between **gas** and **vapour** are :

Gas	*Vapour*
(*i*) The **substance** under **normal conditions** of **temperature** and **pressure** exists in **gaseous state** is called a **gas**. (*ii*) *Example*– Oxygen, Nitrogen, Hydrogen.	(*i*) The **substance** under a **normal conditions** of **temperature** and **pressure** exists as **solid** or liquid but at a **certain set** of **conditions**, it occurs in the **gaseous state** is called as vapour. (*ii*) *Example*– Water vapour, Iodine vapour, Sulphur vapour.

18. Changes in state of matter and their explanation on the basis of kinetic theory.

(*i*) Melting : Conversion of **solid** into **liquid**.

Explanation :

(*a*) The **heat energy** given to the **solid** is **absorbed** by **its particles** and thus, **gaining kinetic energy**.

(*b*) The **kinetic energy gained** by the **particles**, **increase** the **rate** of **vibration** of **particles**.

(*c*) The **kinetic energy** of the **particles overcome** the **force** of **attraction**, and thus, the **particles** from the **surface** of **solid** becomes **free** and hence the **state** changes from **solid** to **liquid**.

(*ii*) Boiling : Conversion of **liquid** into **vapour**.

Explanation :

(*a*) The **heat energy** supplied to the particles **increases** the **kinetic energy** of the **particles**.

(*b*) The **kinetic energy overcomes** the **force** of **attraction** between the **particles**.

(*c*) The **particles** of **liquid**, **leaves** the **surface** of the **liquid** and **get converted** into the **vapour state**.

(*iii*) Condensation : Conversion of **vapour** into **liquid**.

Explanation :

(*a*) On **cooling**, the **particles loose** their **kinetic energy** and the **particles move very slowly**.

(*b*) The **decrease** in **motion** causes **decrease** in the **inter-particle space**.

(*c*) The **particles come closer** to **each other** and **develop** the **force** of **attraction** and thus, **get converted** to the **liquid state**.

19. Pressure helps in altering the **state of matter**. When the pressure is **lowered**, the **boiling point** of the liquid is also **lowered**. Therefore, it becomes **difficult** to cook food on **high altitudes**.

The **increase** in **pressure lowers** the **melting point** of **solid** and changes it into **liquid**.

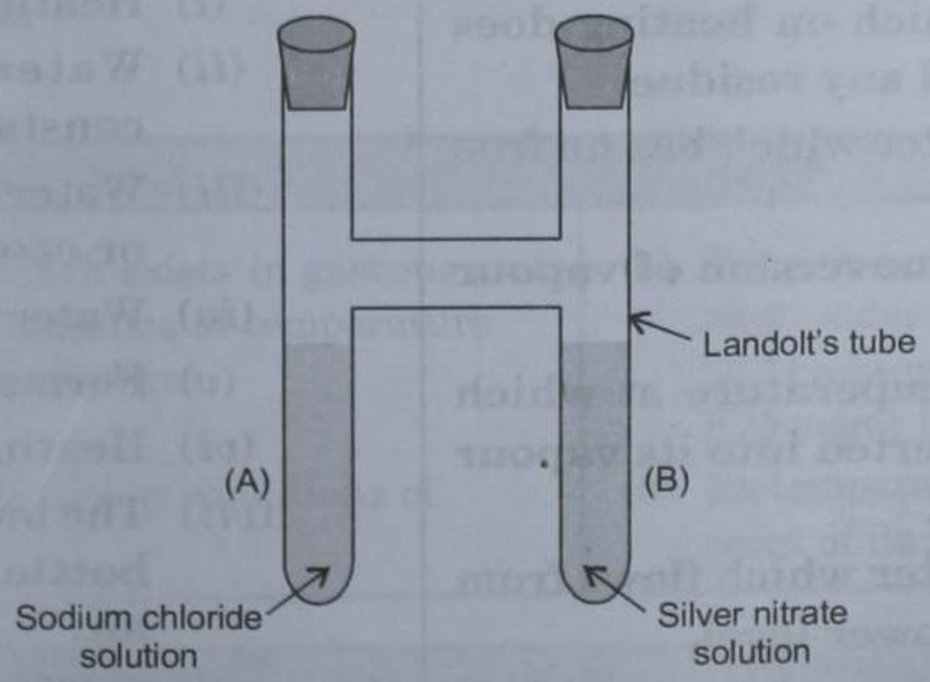
20. On adding an **impurity**

(*i*) boiling point **increases** (*ii*) melting point **decreases**.

21. Law of Conservation of Mass: This law **was given** by **Antoine Lavoisier** in **1789**.

22. Law states that **mass** can **neither be created nor be destroyed** in a **chemical reaction**. However, it can be **converted** from **one form** to **another**.

23. The **experimental verification** of **Law of Conservation of Mass** was done by **Landolt's tube**.



Experimental verification by Landolt's tube

It is a **'H'-shaped** glass tube.

Limb – A contains **sodium chloride** solution.

Limb – B contains **silver nitrate** solution.

Both the **limbs** are **sealed** and the **tube** is **weighed**. And the **tube** is **inverted** so that the **reaction** between **two solutions** can take place **completely**. As a result of reaction **white precipitate** is formed.

$$NaCl + AgNO_3 \longrightarrow \underset{\text{white ppt.}}{AgCl\downarrow} + NaNO_3$$

The **tube** is **weighed again**. It is found that the **mass** of the **tube before** and **after** the reaction **remains the same**.

$$\underbrace{NaCl}_{58.5\text{ g}} + \underbrace{AgNO_3}_{170\text{ g}} \longrightarrow \underbrace{AgCl}_{143.5\text{ g}} + \underbrace{NaNO_3}_{85\text{ g}}$$

$$\downarrow \qquad\qquad\qquad\qquad \downarrow$$

$$228.5\text{ g} \qquad = \qquad 228.5\text{ g}$$

This **experiment** clearly **demonstrates** the **Law of Conservation of Mass.**

IMPORTANT QUESTIONS

Q1. Name the following :

(*i*) Anything that has weight and occupies space.

(*ii*) The state of matter having maximum compressibility.

(*iii*) The state which has maximum intermolecular space.

(*iv*) The process of conversion of solids on heating or without heating directly into their vapour state.

(*v*) The state of matter which has maximum number of free surfaces.

(*vi*) The state of matter having definite shape and definite volume.

(*vii*) The process of conversion of liquid into its vapour at any temperature.

(*viii*) The process of conversion of liquid into its vapour at constant temperature.

(*ix*) A compound which on heating does not leave behind any residue.

(*x*) The state of matter which has no free surface.

(*xi*) The process of conversion of vapour into liquid.

(*xii*) The constant temperature at which liquid gets converted into its vapour state.

(*xiii*) The state of matter which flows from higher level to lower level.

(*xiv*) The state of matter which does not have definite shape but have definite volume.

(*xv*) The process of formation of clouds.

Ans. (*i*) Matter
(*ii*) Gas
(*iii*) Gas
(*iv*) Sublimation
(*v*) Solid
(*vi*) Solid
(*vii*) Evaporation
(*viii*) Boiling
(*ix*) Ammonium chloride
(*x*) Gas
(*xi*) Condensation
(*xii*) Boiling point
(*xiii*) Liquid
(*xiv*) Liquid
(*xv*) Condensation.

Q2. Name the process when the following changes take place.

(*i*) Heating of camphor.

(*ii*) Water into steam by heating t constant temperature.

(*iii*) Water to ice by reducing temperatur or cooling.

(*iv*) Water vapour to water by cooling.

(*v*) Formation of distilled water.

(*vi*) Heating iodine crystals.

(*vii*) The level of nail polish remover in th bottle decreases when exposed t air.

Ans. (*i*) Sublimation (*ii*) Boiling
(*iii*) Freezing (*iv*) Condensation
(*v*) Distillation (*vi*) Sublimation
(*vii*) Evaporation.

Q3. Give reasons for the following :

(*i*) Gases are fluids.

(*ii*) During boiling the temperature remains constant.

(*iii*) Liquids flow from higher level to lower level.

(*iv*) Gases flow in all directions.

(*v*) Gases have maximum compressibility.

(*vi*) Solids have definite shape.

(*vii*) Gases diffuse rapidly.

(*viii*) It is difficult to cook food on hills.

Ans. (*i*) Gases are fluids as they can easily flow in all directions.

(*ii*) During the process of boiling the temperature remains constant because the heat energy is utilised in converting the state, *i.e.*, from liquid to vapour.

(*iii*) The force of attraction between the molecules in liquids is enough to keep the molecules in contact with each other, therefore liquid flows from higher level to lower level.

(*iv*) In case of gases, the molecules are far apart from each other, therefore the molecules do not feel appreciable force of attraction and hence the molecules of gases freely move in all the directions.

(*v*) In case of gases, the molecules are far apart from each other having maximum intermolecular space. Hence on applying pressure, the molecules come closer to each other occupying the vacant intermolecular spaces.

(*vi*) In solids, the molecules are tightly bound having minimum intermolecular space and maximum intermolecular force of attraction and hence they have definite shape.

(*vii*) Gases have maximum intermolecular spaces. Therefore when two gases are brought in contact, they readily fill the intermolecular spaces and form a homogeneous mixture.

(*viii*) It is difficult to cook food on hills as the atmospheric pressure decreases with the increase in altitude. As the pressure decreases the boiling point of water also decreases and water boils at the temperature much below 100°C and therefore food takes more time for cooking.

Q4. Differentiate between :

(*i*) Gas and Vapour.

(*ii*) Homogeneous and Heterogeneous matter.

(*iii*) Boiling and Evaporation.

(*iv*) Solids and Gases

(*v*) Liquids and Gases.

Ans. Differences between :

(*i*)

Gas	*Vapour*
(*a*) The substance which exists in gaseous state under normal conditions of temperature and pressure is called gas. (*b*) It is present at ordinary conditions of temperature.	(*a*) The substance which exists in solid or liquid state under normal conditions of temperature and pressure but at certain specific condition it changes into gas is called vapour. (*b*) Its temperature is lower than the boiling point of its liquid state.

(*ii*)

Homogeneous matter	*Heterogeneous matter*
Homogeneous matter has the same composition and same property in its every part.	Heterogeneous matter has the different compositions and different properties in its every part.

(*iii*)

Boiling	*Evaporation*
(*a*) It is the conversion of liquid into vapour at constant temperature. (*b*) It does not cause cooling. (*c*) It is a rapid process. (*d*) It is a noisy process.	(*a*) It is the conversion of liquid into vapour at any temperature. (*b*) It causes cooling. (*c*) It is a slow process. (*d*) It is a silent process.

(*iv*)

Solids	*Gases*
(*a*) The molecules are closely packed. (*b*) The intermolecular space is minimum. (*c*) The intermolecular force of attraction is maximum. (*d*) They have maximum density. (*e*) They have minimum compressibility. (*f*) They can have any number of free surfaces. (*g*) They cannot move. (*h*) Solids have definite shape and definite volume.	(*a*) The molecules are far apart from each other. (*b*) The intermolecular space is maximum. (*c*) The intermolecular force of attraction is minimum or negligible. (*d*) They have minimum density. (*e*) They have maximum compressibility. (*f*) They have no free surfaces. (*g*) They can easily flow in all the directions. (*h*) Gases have neither definite shape nor definite volume.

(*v*)

Liquids	*Gases*
(*a*) The molecules in liquids are loosely packed. (*b*) The intermolecular space is more than solids but less than gases. (*c*) The intermolecular force of attraction is less than solids but more than gases. (*d*) Liquids have definite volume but no definite shape. They have to take the shape of the container. (*e*) Liquids flow from higher level to lower level. (*f*) Liquids have only one free surface.	(*a*) The molecules in gases are far apart from each other. (*b*) The intermolecular space is maximum. (*c*) The intermolecular force of attraction is minimum or negligible. (*d*) Gases have neither definite volume nor definite shape. (*e*) Gases flow in all directions. (*f*) Gases have no free surface.

Q5. What do you observe when

(*i*) Ammonium chloride is heated ?

(*ii*) Iodine crystals are heated ?

(*iii*) Naphthalene balls are exposed to air at room temperature ?

Ans. (*i*) Ammonium chloride on heating directly gets converted into its vapour state and these vapours condense or recombines on the upper cooler portions of the test-tube to form solid ammonium chloride.

$$NH_4Cl \underset{cool}{\overset{\Delta}{\rightleftharpoons}} NH_3 + HCl$$

(*ii*) Grey coloured crystals on heating give violet coloured vapour which condenses on the upper cooler portions of the test-tube to give shining globules of iodine.

(*iii*) When naphthalene balls are exposed to air at room temperature their size get reduced.

Q6. Arrange solid, liquid and gas in the increasing order of

(*i*) Intermolecular force of attraction

(*ii*) Intermolecular space.

Ans. (*i*) Gas, Liquid, Solid

(*ii*) Solid, Liquid, Gas.

Q7. Correct the following statements :

(*i*) On addition of impurity the boiling point of the liquid decreases.

(*ii*) Pure water boils at 99°C under 4 atmospheric pressure.

(*iii*) Solids have definite volume but do not have definite shape.

(*iv*) On heating, the particles looses kinetic energy.

(*v*) The gaseous form of water is called as water gas.

Ans. (*i*) On addition of impurity the boiling point of the liquid increases.

(*ii*) Pure water boils at 100°C under 1 atmospheric pressure.

(*iii*) Liquids have definite volume but do not have definite shape.

(*iv*) On heating, the particles gain kinetic energy.

(*v*) The gaseous form of water is called as water vapour.

Q8. In an experiment 10 g of $CaCO_3$ on heating gave 5.6 g of CaO and 4.4 g of CO_2. Show that these results are in accordance with the law of conservation of mass.

Ans. $\underset{10\,g}{CaCO_3} \xrightarrow{\Delta} \underset{5.6\,g}{CaO} + \underset{4.4\,g}{CO_2}$

Total mass of $CaCO_3$ = 10 g

Total mass of products ($CaO + CO_2$) = 5.6 + 4.4

= 10 g

Since the total mass of the products obtained in the reaction is the same as that of the reactant taken, the results are in accordance with the law of conservation of mass.

Q9. When 8.4 g of Potassium bicarbonate is added to a dilute solution of hydrochloric acid weighed as 20 g, it is observed that 4.4 g of CO_2 is released into the atmosphere. The residue left behind is found to be 24 g. Show that these observations are in accordance with law of conservation of mass.

Ans. $\underset{8.4\,g}{KHCO_3} + \underset{20\,g}{HCl} \longrightarrow \underbrace{KCl + H_2O}_{\underset{Residue}{24\,g}} + \underbrace{CO_2}_{4.4\,g}$

Total mass of reactants ($KHCO_3 + HCl$)

= 8.4 + 20 = 28.4 g

Total mass of the products ($KCl + H_2O + CO_2$)

= 24 + 4.4 = 28.4 g

Since, the total mass of the products is the same as that of the reactants, the observations are in accordance with the law of conservation of mass.

LET'S RECALL

Fill Your Answer in the Space Given for Each Question.

Q1. Match the following :

Column I	Column II
(*i*) Solid	(*a*) Gases
(*ii*) Liquid	(*b*) Sublimation
(*iii*) Gas	(*c*) No definite shape but definite volume
(*iv*) Iodine	(*d*) No definite shape and no definite volume
(*v*) Diffusion	(*e*) Definite shape and definite volume

Ans. (*i*) ☐ (*ii*) ☐ (*iii*) ☐ (*iv*) ☐ (*v*) ☐

Q2. Fill in the blanks.

(*i*) Gases flow in _____ directions.

(*ii*) Liquids flow from _____ to _____ level.

(*iii*) Solids have _____ density.

(*iv*) _____ sublimes on heating and leaves behind no residue.

(*v*) Molecules of gas are _____ from each other.

Q3. State whether the following statements are True or False.

(*i*) Solids move from higher level to lower level. ☐

(*ii*) Gases diffuse rapidly. ☐

(*iii*) Dry ice does not sublime. ☐

(*iv*) Liquids have definite shape and definite volume. ☐

(*v*) Gases show maximum compressibility. ☐

Q4. Each question has four options, out of which only one option is correct. Dark the bubble for correct answer.

(*i*) The force of attraction between same molecules is called as

(*a*) cohesive force (*b*) adhesive force

(*c*) electrostatic force (*d*) None of these

Ans. (a) (b) (c) (d)

(*ii*) The force of attraction between different molecules is called as

(*a*) cohesive force (*b*) adhesive force

(*c*) electrostatic force (*d*) None of these

Ans. (a) (b) (c) (d)

(*iii*) When heat energy is supplied, the kinetic energy of the molecules

(*a*) decreases (*b*) increases

(*c*) remains same (*d*) first increases and then decreases.

Ans. (a) (b) (c) (d)

(*iv*) When the matter is cooled, then the kinetic energy of the molecules

(*a*) increases (*b*) decreases

(*c*) remains same (*d*) first increases and then decreases.

Ans. (a) (b) (c) (d)

(*v*) Soil is an example of

(*a*) homogeneous matter (*b*) heterogeneous matter

(*c*) Both of these (*d*) None of these

Ans. (a) (b) (c) (d)

(*vi*) Salt solution is an example of

(*a*) homogeneous matter (*b*) heterogeneous matter

(*c*) Both of these (*d*) None of these

Ans. (a) (b) (c) (d)

(*vii*) The number of free surface in liquid are

(*a*) one (*b*) many

(*c*) two (*d*) three

Ans. (a) (b) (c) (d)

(*viii*) The process of conversion of solid to liquid is

(*a*) melting (*b*) freezing

(*c*) sublimation (*d*) None of these

Ans. (a) (b) (c) (d)

(*ix*) The process of conversion of liquid to solid is

(*a*) melting (*b*) freezing

(*c*) sublimation (*d*) None of these

Ans. (a) (b) (c) (d)

(*x*) When the pressure decreases, the boiling point

(*a*) decreases (*b*) remains same

(*c*) increases (*d*) first increases and then decreases.

Ans. (a) (b) (c) (d)

Answers

1. (*i*) *e*	(*ii*) *c*	(*iii*) *d*	(*iv*) *b*	(*v*) *a*
2. (*i*) all	(*ii*) higher, lower			
(*iii*) maximum				
(*iv*) Ammonium chloride				
(*v*) far apart				
3. (*i*) False	(*ii*) True	(*iii*) False	(*iv*) False	(*v*) True
4. (*i*) *a*	(*ii*) *b*	(*iii*) *b*	(*iv*) *b*	(*v*) *b*
(*vi*) *a*	(*vii*) *a*	(*viii*) *a*	(*ix*) *b*	(*x*) *a*

SELF EVALUATION TEST

Time : *30 minutes* ***Marks :*** *30*

Q1. What happens to the boiling point of the liquid on the addition of impurities ? **1**

Q2. How is the freezing point of water affected on adding salt to it ? **1**

Q3. Why it is difficult to cook food on hills ? **1**

Q4. Mention the postulate of Dalton's atomic theory which is not contradicted. **1**

Q5. State two factors which bring about interconversion of matter. **2**

Q6. Define sublimation. Name four substances that sublime. **3**

Q7. Define **3**

(*i*) boiling point
(*ii*) freezing point
(*iii*) condensation

Q8. Differentiate between evaporation and boiling. **3**

Q9. Differentiate between solid, liquid and gas on the basis of **5**

(*i*) intermolecular space
(*ii*) intermolecular force of attraction
(*iii*) density
(*iv*) diffusion
(*v*) shape and volume

Q10. State the process involved in **5**

(*i*) formation of clouds.
(*ii*) formation of dew.
(*iii*) decrease in level of ether
(*iv*) heating of camphor.
(*v*) formation of steam.

Q11. Give the main postulates of kinetic theory of matter. **5**