Chapter 6 Composition of Matter

1. Choose the appropriate option and rewrite the following statements.

A. The intermolecular force is maximum in the paricles of solid.

B. Solids retain their voume even when external pressure is applied. This property is called incompressibility.

C. Matter is classified into the types mixture, compound and element by applying the criterion states of matter.

D. Matter that contain two or more constituent substances is called compound.

E. Milk is an example of type of matter called homogeneous mixture.

F. Water, mercury and bromine are similar to each other, because three are liquids.

G. valency of carbon is 4 and that of oxygen is 2. From this, we understand that there are 2 chemical bond/bonds between the carbon atom and one oxygen atom in the compound carbon dioxide.

2. Identify the odd term out and explain.

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a.Brass is odd one out because it is an alloy and gold, silver, copper are element.
b.Hydrogen is odd one out because it is an element and others are compound.
c.Carbon is odd one out because it is an element and others are mixture of various elements.
d.Water is odd one out because it is universal solvent and rest are not universal solvent.
e.Baking soda is odd one out because it is a mixture of various elements and others are compound.
f.Carbon is odd one out because it has 4 valence electrons and others have 1 valence electron.

3. Answer the following question.

Question a.Plants synthesize glucose in sunlight with the help of chlorophyll from carbon dioxide and water and give away oxygen. Identify the four compounds in this process and name their types.

Photosynthesis:
Carbon dioxide, water, glucose, and Chlorophyll are compounds.
Types: Organic compounds: Glucose
Inorganic compounds: Carbon dioxide and water
Complex compounds: Chlorophyll.

Question b.In one sample of brass, the following ingredients were found: copper (70%) and zinc (30%). Identify the solvent, solute and solution from these.

Brass is an alloy, it contains 70% copper and 30% zinc. The largest proportion is solvent, i.e. copper. The smaller proportion is solute, i.e. zinc. The solution is Brass.

Question c.Seawater tastes salty due to the dissolved salt. The salinity (the proportion of salts in water) of some water bodies Lonar lake – 7.9%, Pacific Ocean 3.5%, Mediterranean sea – 3.8%, 5 Dead sea – 33.7%. Explain two characteristics of mixtures from the above information.

The constituents of a mixture (the proportion of salts in water) do not combine chemically.
The constituent of a mixture can be separated by a physical process.

Question 4: Give two examples each

a.Liquid element = mercury, bromine
b.Gaseous element = oxygen, nitrogen, hydrogen
c.Solid element = sodium, carbon, aluminium
d.Homogeneous mixture = sugar in water, corn oil, blood plasma
e.Colloid = mayonnaise, milk, butter, gelatin, jelly, muddy water
f.Organic compound = proteins, glucose, urea, carbohydrates
g.Complex compound = chlorophyll, hemoglobin, cyanocobalamine
h.Inorganic compound = limestone, rust, common salt
i.Metalloid = silicon, germanium
j.Element with valency 1 = sodium, potassium, chlorine
k.Element with valency 2 = magnesium, calcium

Question 5: Write the names and symbols of the constituent eleements and identify their valencies from the molecular formulae given below.
KCl, HBr, $MgBr_2$, K_2O, NaH, $CaCl_2$, CCl_4, HI, H_2S, Na_2S, FeS, $BaCl_2$

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Compounds	Name of compounds	Symbol of constituent elements	Valency of constituent elements
KCl	Potassium chloride	K, Cl	K = 1, Cl = 1
HBr	Hydrogen bromide	K, Br	K = 1, Br = 1
$MgBr_2$	Magnesium bromide	Mg, Br	Mg = 2, Br = 1
K_2O	Potassium oxide	K, O	K = 1, O = 2
NaH	Sodium hydride	Na, H	Na = 1, H = 1
$CaCl_2$	Calcium chloride	Ca, Cl	Ca = 2, Cl = 1
CCl_4	Carbon tetrachloride	C, Cl	C = 4, Cl = 1
HI	Hydrogen iodide	H, I	H = 1, I = 1
H_2S	Hydrogen sulphide	H, S	H = 1, S = 2
Na_2S	Sodium sulphide	Na, S	Na = 1, S = 2
FeS	Iron (II) Sulfide	Fe, S	F = 2, S = 2
$BaCl_2$	Barium chloride	Ba, Cl	B = 2, Cl = 1

6.Chemical composition of some matter is given in the following table. Identify the main type of matter from their.
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7. Write scientific reason.

A.Hydrogen is combustible, oxygen helps combustion, but water helps to extinguish fire.
Water is a compound of hydrogen and oxygen.
In a compound, the constituents do not retain their individual properties. Hence, hydrogen is combustible and oxygen helps combustion, but water is neither combustible nor supports combustion, it helps to extinguish fire.

b.The constituent substances of a colloid cannot be separated by oridinary filtration.
A colloidal solution is heterogeneous.The particles of a colloid can easily pass through a filter paper as the pore size of a filter paper is big. Hence, the constituents of a colloidal cannot be separated by filtration.

c.Lemon sherbet has sweet, sour and salty taste and it can be poured in a glass.
Lemon sherbet is a mixture. It is made up of lemon juice, sugar, salt and water.
Formation of lemon sherbet does not involve any chemical reaction.
Hence, lemon sherbet is sweet, sour and salty to taste and it can be poured in a glass.

d.A solid matter has the properties of definite shape and volume.
The forces among the constituent particles (atom/molecules) are called intermolecular forces.In solids these forces are strong enough to keep the particles together in fixed positions, as a result solids have a definite shape and volume.

8. Deduce the molecular formulae of the compound obtained from the following pairs of elements by the cross multiplication method. DONE IN CLASS

Question a. C (Valency 4) & Cl (Valency 1)

Step 1: Write the symbols of the constituent elements.

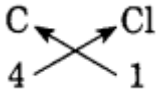
C Cl

Step 2: Write the valency below the respective elements.

C Cl

4 1

Step 3: Cross multiply the valencies.



The molecular formula: CCl_4

Question b. N (Valency 3) & H (Valency 1)
Answer:
Step 1: Write the symbols of the constituent elements.

N H

Step 2: Write the valency below the respective elements.

N H

3 1

Step 3: Cross multiply the valencies.

The molecular formula: NH_3

Question c. C (Valency 4) & O (Valency 2)
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Step 1: Write the symbols of the constituent elements.

C O

Step 2: Write the valency below the respective elements.

C O

4 2

Step 3: Cross multiply the valencies.

The formula: C_2O_4

Final molecular formula obtained by dividing by '2'.
Molecular formula: CO_2

Question d. Ca (Valency 2) & O (Valency 2)

Answer:

Step 1: Write the symbols of the constituent elements.

Ca O

Step 2: Write the valency below the respective elements.

Ca O

2 2

Step 3: Cross multiply the valencies.

The formula: Ca_2O_2

Divide the formula by suitable number '2'.

The molecular formula: CaO.

Chapter 7 Metals and Non- Metals

1. Complete the table:

Property of metal	Use in everyday life
i. Ductility	i. Gold, silver ornaments
ii. Malleability	ii. Aluminium sheets, galvanised sheets
iii. Conduction of heat	iii. Stainless steel vessels, copper vessels, boilers
iv. Conduction of electricity	iv. Copper wires
v. Sonority	v. Brass articles

2. Identify the odd term.

Question a.Gold, Silver, Iron, Diamond.
Answer:Diamond. (Others are metals.)

Question b.Ductility, Brittleness, Sonority, Malleability.
Answer : Brittleness. (Other properties are metallic properties.)

Question c.Carbon, Bromine, Sulphur, Phosphorus.
Answer:Bromine. (Others are solids.)

Question d.Brass, Bronze, Iron, Steel.
Answer:Iron. (Others are alloys.)

3. Give scientific reasons:

a.The stainless steel vessels in kitchen have copper coating on the bottom.

Ans. Stainless steel is an alloy of iron ; with carbon, chromium and nickel.Copper heats faster. The time for cooking is reduced, as a result it saves fuel. Hence, the stainless steel vessels in kitchen have copper coating on the bottom.

b. Copper and brass vessels are cleaned with lemon.

Copper undergoes oxidation in air to form black copper oxide and gains a green coat. This green substance is copper carbonate.Lemon contains acid that dissolves the green coating of copper and brass vessels and makes them shiny again.

c.Sodium metal is kept in kerosene.

Sodium reacts with atmospheric oxygen and water and catches fire if kept in the open. It does not react with kerosene and sinks in it. Hence, to protect sodium and to prevent accidental fires it is always kept in kerosene.

4. Answer the following:

a.What is done to prevent corrosion of metals?

Corrosion of metals is prevented by applying a layer of paint, oil, grease or varnish on the surface of a metal. Also plating with non-corroding metal is done. Iron is coated with thin layer of zinc

b. What are the metals that make the alloys brass and bronze?

The alloy brass is formed from copper and zinc and the alloy bronze is formed from copper and tin.

c.What are the adverse effects of i corrosion?

A reddish coloured deposit (rust) is formed on iron by reaction with oxygen gas.
A greenish coloured deposit (copper carbonate) is formed on copper by reaction with carbon dioxide.
A blackish coloured deposit is formed (silver sulphide) on silver.
Corrosion causes damages to car bodies, bridges, iron railings, ships specially those of iron, silver articles and copper vessels.

d.What are the uses of noble metals?

Uses of Noble Metals:

Gold, silver and platinum are used to prepare ornaments.
Silver is used in medicines. (It has antibacterial property).
Gold and silver are also used to make metals and few electronic devices.
Platinum, palladium metals are used as catalyst.

5. Three experiments to study the process of rusting are given below. Observe the three test tubes and answer the following questions.

a.Why the nail in the test tube 2 is not rusted?
In the test tube 2, oil cuts the supply of air to nail due to which oxidation of nail is prevented and boiled water is free from gases. Hence, the nail in the test tube 2 is not rusted.

b.Why is the nail in the test tube 1 is rusted highly?
The nail in the test tube 1 is highly rusted because nail is in contact with water and air. The oxidation process is fast.

C.Would the nail in the test tube 3 get rusted?
No change is observed in the test tube 3. Nail remains as it is because the calcium chloride absorbs moisture, making the air dry, thus preventing rusting of the nail.