H.W
3.8.21

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EXERCISE - I

(2) Give the symbols of: Carbon, calcium, copper, chlorine, cobalt, argon

Ans- Carbon - C
Calcium - Ca
Copper - Cu
Chlorine - Cl
Cobalt - Co
Argon - Ar

(3) Define a pure substance. How many types of pure substances do you know?

Ans- Pure substances:
A substance of a definite composition which has consistent properties throughout, is called a pure substance.

There are two types of pure substances. Those are -

i) Elements.
ii) Compounds.

(5) Give two examples for each of the following:

a) Metals - Iron, gold
b) Non-Metals - Carbon, Oxygen

c) Metalloids - Antimony, boron.

d) Noble gases - Argon, Neon.

(6) Name the elements which form water. How will you justify that water is a compound?

Ans- The elements which form water are:

i) Hydrogen
ii) Oxygen.

Water has entirely different properties from the elements it's made up of, i.e., Hydrogen (a gas that catches fire) and oxygen (a gas that is supporter of combustion.

Water is a compound (i.e., a pure substance) as it cannot be separated into simpler substances by any simple physical means.

(7) Give three differences between metals and non-metals.

Any 3 difference between metals and non-metals are-

Metals	Non-Metals
→ Metals are ductile (they can be drawn into wires)	→ Non-Metals are non-ductile (they cannot be drawn into wires)
→ Metals are highly malleable (they can be beaten to form sheets)	→ Non-metals are non-malleable (they cannot be beaten to form sheets).
→ Metals are good conductors.	→ Non-metals are poor conductors.

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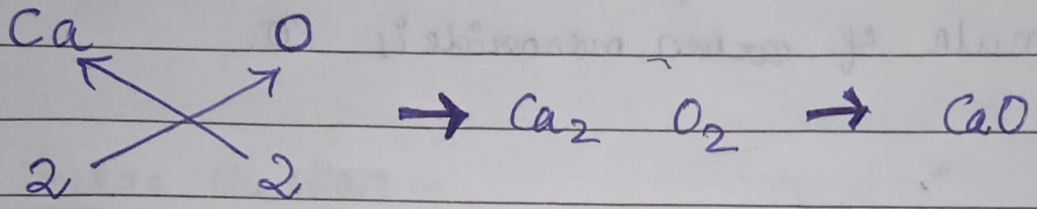
EXERCISE – II

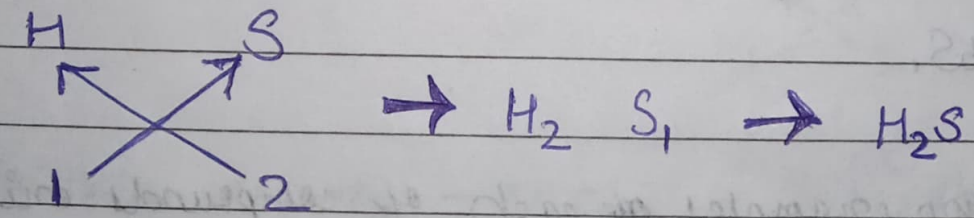
Q.7. write the molecular formulae of compounds calcium oxide, hydrogen sulphide, carbon monoxide and lead sulphide.

Ans – Calcium oxide is formed of elements calcium (Ca) and oxygen (O).



As the subscript no.s are same, the formula of Calcium oxide is CaO not Ca_2O_2.

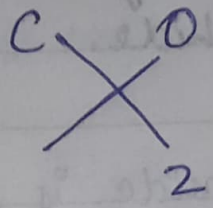
Hydrogen Sulphide is formed of elements hydrogen (H) and sulphur (S).



Formula is H_2S

Carbon Monoxide is formed of elements Carbon (C) and oxygen (O).

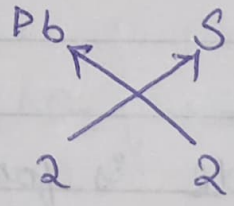
Symbols of combining power ⇒



Formula of carbon monoxide is CO.

Lead Sulphide is formed of elements lead (Pb) and Sulphur (S)

Symbols of combining power →



→ Pb_2S_2 → PbS

As the subscript no.s are the same, the formula is PbS.

Q.8. Give two examples of each of compounds existing in the following states:

a) Solid – • Common Salt ($NaCl$)
• Sand (SiO_2)

b) Liquid – • Water (H_2O)
• Hydrochloric Acid (HCl)

c) Gas – • Carbon Dioxide (CO_2)
• Methane (CH_4)

<u>Extra Question</u> –

Write the formulas of :

i) Iron oxide – FeO / Fe_2O_3

ii) Calcium oxide – CaO Ca 2, O 2 ($Ca_2O_2 \rightarrow CaO$)

iii) Sodium Oxide – Na_2O Na 1, O 2 ($Na_2O_1 \rightarrow Na_2O$)

iv) Zinc chloride – $ZnCl_2$ Zn 2, Cl 1 ($Zn_1Cl_2 \rightarrow ZnCl_2$)

EXERCISE - III

① Name:

a) Three different forms of carbon -
   i) Diamond
   ii) Graphite
   iii) Coal

b) A form of carbon used as a gem - Diamond

c) 2 substances used to make electric wires -
   i) Copper
   ii) Aluminium

Because both of them are good conductor of electricity.

d) 2 substances used to make ~~electri~~ jewellery -
   i) Gold
   ii) Silver

Because these are shining lustrous and ductile.

e) A substance used as an insulator -
Plastic is used as an insulator because it is a bad conductor of electricity.

(2) Give one use of each of the following substances:

a) Iron: To make machines, tools and building material

b) Brass: To make water taps and utensils.

c) Coal: It is used as fuel, also used in thermal power plant to produce electricity.

(3) Give Reasons:

a) a frying pan is made up of steel but its handle is made up of wood.

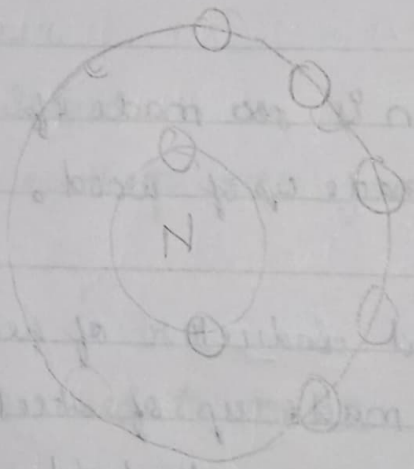
Ans- Steel is a good conductor of heat to cook food, so the pans is made up of steel. Where as wood is an insulator of heat to hold, so the handle is made up of wood.

b) Graphite is used to make lead of the pencils.

Ans- Graphite leaves mark on the paper and makes it black. So, its used to make the lead of the pencils.

c) Argon is filled in electric bulbs

Ans- Argon is an inert gas and protects the element of bulb from oxidation and burning. So, also argon is filled in electric bulbs as it increases the bulb life.



(m) Sand –

→ Compound used to prepare glass.

(n) Argon and Neon –

→ Filled in electric bulbs
→ Does not react with the tungsten filament of the bulb and prevents it from destruction.

EXERCISE – I

(i) Classify the following substances into elements and compounds.

~~Mercury~~ Mercury, sulphur, sugar, water, sand, gold, carbon, ~~oxygen~~, ~~ether~~ alcohol, iron, marble, baking soda, coal.

Ans- Element : Mercury, sulphur, gold, carbon, oxygen, iron, coal.

Compound : sugar, water, sand, alcohol, marble, baking soda.

(4) Define:

a) Element -

An element is defined as a pure substance made up of only one kind of atom that cannot be converted into anything simpler than itself by any physical or chemical process.

b) compound -

Compounds are pure substances composed of two or more elements in definite proportion by mass and has a definite set of properties. Compound is made up of only one kind of molecule.

(8) State four important characteristics of compounds.

Ans - Four important characteristics of compounds are -

→ When compound is formed, energy like heat, light or electricity is either needed or produced.

→ A compound has properties entirely different from the properties of its constituent.

→ Change in weight takes place.
→ It cannot be separated into its constituents by simple physical means.

(9) How is sodium chloride different from its constituent elements, sodium and chlorine?

Ans- Sodium is a metal that is stored in kerosene oil as it reacts very fast with air and water. Chlorine is a reactive greenish yellow gas which is poisonous. When these two elements combine chemically, they form common salt, sodium chloride which is non-poisonous colourless solid substance that we use in our food to add taste and to obtain some nutrition.

(10) Give two examples for each of the following :

a) Non-metals which are solids -
Phosphorus and Sulphur

b) Metals which are soft -
Lead and Sodium

c) Non-metals which are lustrous -
Radium and Graphite.

d) Elements which are liquids -
Mercury, Bromine.

e) Inert gases -
Helium, Neon.

f) Metalloids - (Extra Question)
Antimony, Arsenic

(11) Name the elements present in the following compound -

a) Sugar - Carbon, hydrogen and oxygen.
b) Ammonia - Nitrogen and hydrogen.
c) Marble - Calcium, carbon and oxygen
d) Washing soda - Sodium, carbon and oxygen.

(12) What is the proportion of elements by mass present in the following compounds?

a) H_2O , b) CO_2 , c) CaO , d) NO_2

Compounds	Elements	Proportion of Elements
a) H_2O	H : O	1 : 8
b) CO_2	C : O	3 : 8
c) CaO	Ca : O	5 : 2
d) NO_2	N : O	7 : 16

EXERCISE - II

(1) Define:

a) Atom - An atom is the smallest indivisible unit of an element which exhibits all the properties of that element and may or may not have independent existence.

b) Molecule - A molecule can be defined as the smallest unit of an element or a compound which exhibits all the properties of that element or compound and has independent existence. They are divisible into atoms.

Atomicity - The no. of atoms in a molecule of an element is called its atomicity.

Formulae - Formulae is a short way of representing the molecule of an element or a compound.

(2) Why are symbols and formulae of substances important?

Ans- Symbols and formulae of a substance gives us a lot of information, like:

(i) Types of elements present is the a compound. (e.g. H_2O is made of of two elements, hydrogen and oxygen)

(ii) No. of each kind of atoms in one molecule. (e.g. water has 2 atoms of hydrogen combined with 1 atom of oxygen.)

(iii) Mass of one molecule of the compound [e.g. H_2O has mass $(1 \times 2) + 16 = 18g$]

(3) Mention three gaseous elements and write their molecular formulae.

Ans-

Three Gaseous Elements	Molecular Formula	Atoms in one molecule
→ Hydrogen	H_2	2
→ Oxygen	O_2	2
→ Chlorine	Cl_2	2

(4) State the information obtained from the formula of a compound.

Ans- The formula gives us the following information about a compound:

(i) Types of elements present in the compound.
(ii) No. of each kind of atoms in one molecule of the compound.
(iii) Mass of one molecule of the compound.

Example:
A molecule of carbon dioxide gas is represented by CO_2. It indicates that a carbon dioxide molecule is formed by the combination of two elements, i.e. carbon and oxygen. The no. of carbon atom is one and that of oxygen atom is two. The mass of one molecule of carbon dioxide can be calculated by adding the mass of one atom of carbon and two atoms of oxygen.

(5) State the difference between the following:

a) 2H and H_2 –
2H represents two atoms of hydrogen.
H_2 is one molecule of hydrogen gas.

b) H_2O and $3H_2O$ –
H_2O represents one molecule of water.
$3H_2O$ represents 3 molecules of water.

(6) State the no. of atoms of each element, present in: a) $C_6H_{12}O_6$, b) H_2SO_4,
c) HNO_3, d) $CaCO_3$

Also name these compounds.

Ans- a) $C_6H_{12}O_6$ has atoms of :

Carbon - 6 atoms in number
Hydrogen - 12 atoms in number
Oxygen - 6 atoms in number.

The name of the compound is Glucose.

b) H_2SO_4 has atoms of :

Hydrogen - 2 atoms in no.
Sulphur - 1 atom in no.
Oxygen - 4 atoms in no.

The name of the compound is Sulphuric acid.

c) HNO_3 :

Hydrogen - 1 atom in number
Nitrogen - 1 atom in number
Oxygen - 3 atoms in number

The name of the compound is Nitric acid.

d) $CaCO_3$:

Calcium - 1 atom in no.
Carbon - 1 atom in no.
Oxygen - 3 atoms in no.

The name of the compound is Calcium Carbonate.

EXERCISE - III

(4) Answer the following questions :-

a) Why are copper and aluminium used to make electric wires?

Copper and Aluminium are good conductors of heat and electricity. They can be drawn into wires and be beaten into sheets. Therefore, they are used to make electric wires.

b) What do you understand by the statement: 'metals are ductile and malleable.

Ans- Metals are ductile, i.e., they can be drawn or stretched into thin wires. They are malleable, i.e.,

they can be beaten into thin sheets.

c) Give the advantages of using symbols instead of names of elements or compounds. (Extra Questions)

Ans- → Symbols increase scientific communication across the world.
→ Symbols help to make equations and data shorter and concise.
→ Symbols are helpful for scientists as it would take time and paper to do this job.
→ They had to write out the full name of every element instead of its symbol.

d) When iron is mixed with sulphur at room temperature, it does not form a compound. Why? (Extra Q)

Ans- When iron is mixed with sulphur at room temperature, it does not form a compound because the mixture of iron and sulphur requires heat to form a compound, i.e., iron sulphide.

e) Find the atomicity of the following molecules:

(i) Calcium Chloride –

$CaCl_2$

$= (1 \times 1) + (2 \times 1)$

$= 1 + 2$

$= 3$.

(ii) Ammonium sulphide –

$(NH_4)_2S$

$= (1+4) \times (2 + (1 \times 1))$

$= 2 + 8 + 1$

$= 11$

(iii) Acetic Acid –

CH_3COOH

$= 1 + (1 \times 3) + 1 + 1 + 1 + 1$

$= 1 + 3 + 1 + 1 + 1 + 1$

$= 8$

(iv) Dinitrogen oxide –

N_2O

$= (1 \times 2) + 1$

$= 2 + 1$

$= 3$

v) Carbon Monoxide.

CO

$= (1 \times 1) + (1 \times 1)$

$= 1 + 1$

$= 2$

Objective Type Question

(1) Fill in the blanks :-

a) Atomicity refers to the no. of atoms in the molecule of an element.

b) The most abundant element in the earth's crust is oxygen.

c) A metal which is a liquid at room temperature is mercury.

d) The most abundant element in the atmosphere is nitrogen.

e) A metal which is a poor conductor of electricity is tungsten.

f) A diatomic gaseous element is oxygen.

g) A liquid non-metal is bromine.

(2) Match the columns:-

Column A	Column B
a) Metals	i) Non-reactive (d)
b) Molecules	ii) Brittle (c)
c) Non-Metals	iii) Lustrous. (a)
d) Noble gases	iv) Smallest unit of compound. (b)

(3) Indicate whether the following statements are true or false:-

a) A compound is made up of just one kind of atom. False

b) Metal reflect light and are good conductors of heat electricity. True

c) Metals can be polished. True

d) Elements are made up of compounds. False

e) All elements are artificially prepared. False

g) Molecules combine to form atoms. ~~True~~ False

~~g) Molecules combine to form atom~~

f) ~~g)~~ Molecules can exist independently. ~~Ra~~ True

h) Noble gases are highly reactive. False

i) Ozone is a triatomic molecule. True

Correct statements -

a) A compound is made up of ~~one~~ two or more elements in a fixed proportion by mass.

d) Elements are made up of atoms.

e) All elements are made up of a limited number of basic substances

g) Atoms combine to form molecules.

h) Noble gases are non-reactive.

Multiple Choice Questions –

Tick the correct alternatives :–

① All pure substances have :

Ans- d) a definite set of properties.

② Sugar is a compound which consists of the elements :

Ans- c) carbon, hydrogen and oxygen.

③ Atoms of different kinds combine to form molecules of :

Ans- b) a compound.

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(4) Sulphur and Carbon are :

Ans- b) non-metals

(5) Gold is used to make jewellery because :

Ans- b) lustrous and attractive.

(6) The most abundant elements in the universe are :

Ans- b) hydrogen and helium

(7) The compound used as common salt is :

Ans- a) sodium chloride.

(8) Brass and bronze are :

Ans- b) mixtures

(9) Sand is a compound of :

Ans- b) silicon and oxygen.

(10) From the list given below select the correct substances which is most suitable to the statements given :

[oxygen, diamond, zinc, graphite, gold]

Ans- a) zinc
b) Graphite
c) Diamond
d) gold.
e) oxygen