

EXERCISE - I

- Classify the following substances into elements and compounds.
Mercury, sulphur, sugar, water, sand, gold, carbon, oxygen, alcohol, iron, marble, baking soda.
- Give the symbols of : carbon, calcium, copper, chlorine, cobalt, argon.
- Define a pure substance. Name the types of pure substances you know.
- Define :
(a) Elements (b) Compounds.
- Give two examples for each of the following :
(a) Metals (b) Non-metals
(c) Metalloids (d) Noble gases
- Name the elements which form water. State three characteristics of water to justify that it is a compound.
- Give three differences between metals and non-metals.
- State four important characteristics of compounds.
- How is sodium chloride different from its constituent elements, sodium and chlorine in its properties ? Justify.
- Give two examples for each of the following :
(a) Non-metals which are solids
(b) Metals which are soft
(c) Non-metals which are lustrous
(d) Elements which are liquids
(e) Inert gases
- Name the elements present in the following compounds.
(a) Sugar (b) Ammonia
(c) Marble (d) Washing soda
- What is the proportion of elements present in the following compounds ?
(a) H_2O (b) CO_2
(c) CaO (d) NO_2

ATOMS AND MOLECULES

You have studied in the previous chapter that matter is made up of particles called molecules which have independent existence. These molecules are made up of even smaller particles called **atoms** which may or may not have independent existence. Hence,

“An atom can be defined as the smallest indivisible unit of an element which exhibits all the properties of that element and may or may not have independent existence”.

However, these atoms can take part in chemical reactions.

Atoms were discovered by the famous scientist John Dalton.

“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”.

Molecules do take part in chemical reactions.

Molecules of elements are of following types :

1. A molecule is **monoatomic** when it contains only one atom.

Examples : Helium (He), Potassium (K), Sodium (Na), Calcium (Ca).

2. A molecule is **diatomic** when it contains two atoms.

Examples : Elementary gases (gases made up of only one element)

Hydrogen H_2 , Oxygen O_2 , Nitrogen N_2 , Chlorine Cl_2 .

3. A molecule is **triatomic** when it contains three atoms. *Example* : Ozone O_3 .

4. A molecule is **polyatomic** when it contains more than three atoms.

Example : • Phosphorus [P_4] which contains four atoms in its molecule.

• Sulphur [S_8] which contains eight atoms in its molecule.

Molecules of compounds : When atoms of two or more elements combine, they form a molecule of a compound.









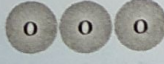

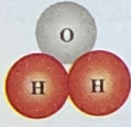


Examples :

(i) A water molecule is formed by two atoms of hydrogen and one atom of oxygen.

(ii) A molecule of carbon-dioxide is formed by one atom of carbon and two atoms of oxygen.

The combination of atoms to form molecules of different elements and compounds can be represented diagrammatically. (Table 4.5).

Table 4.5 : Diagrammatic representation of molecules

<i>Molecules of Elements</i>	<i>Molecules of Compounds</i>
 (ZINC)	 HYDROGEN MOLECULE
 (GOLD)	 CHLORINE MOLECULE
 COPPER	 NITROGEN MOLECULE
 HELIUM	 OXYGEN MOLECULE
	 OZONE MOLECULE
	 HYDROGEN CHLORIDE MOLECULE
	 WATER MOLECULE
	 ZINC OXIDE MOLECULE
	 CARBON DIOXIDE MOLECULE
[Atoms of zinc, gold, copper and helium also represent their molecules]	

FORMULA

The molecule of an element or a compound can be represented by a formula which is accepted universally all over the world.

A formula (plural : formulae) is a short way of representing the molecule of an element or a compound.

It is meant to save time, space and energy.

Formulae of elements : In case of an element, each molecule is made up of a definite number of atoms. The number of atoms in a molecule of an element is called its **atomicity**. While writing the formulae, atomicity is mentioned as sub-script along with the short form of the element. Normally subscript 1 (one) is not written. *Examples* :

1. We write the formulae of monoatomic element by simply writing their symbols.

e.g. Helium (He), Potassium (K), Sodium (Na), Calcium (Ca), etc.

2. If an element is diatomic, we write the subscript 2 along with the symbols.

e.g. Hydrogen (H_2), Oxygen (O_2), Nitrogen (N_2), Chlorine (Cl_2), etc.

3. We follow the above method in writing the formulae of triatomic and poly atomic elements.

e.g. Ozone is written as O_3 , Phosphorus is written as P_4 and Sulphur is written as S_8 .

Formulae of compounds : Compounds are formed by the combination of the atoms of more than one element. Atoms combine with each other in whole numbers, which can be 1, 2, 3 or more. This whole number is the combining capacity of the elements.

For example, water is a compound of hydrogen and oxygen. Two atoms of hydrogen combine with an atom of oxygen to form a molecule of water. This is represented by the formula, H_2O . Therefore, the whole number ratio in which hydrogen and oxygen

10	October 2020						
Wk	M	T	W	T	F	S	S
40				1	2	3	4
41	5	6	7	8	9	10	11
42	12	13	14	15	16	17	18
43	19	20	21	22	23	24	25
44	26	27	28	29	30	31	

SEPTEMBER 2020

DAY 260-106 WEEK 38

WEDNESDAY

16

APPOINTMENT / MEETING

Class VI
Chapter - 4 Elements, Compounds & Symbols
and formula Part-4

Subject - Chemistry Date - 23.6.20

① What is atom?

② What is molecule?

③ Give definition and eg. for the following
monoatomic, diatomic, triatomic,
Polyatomic.

④ What do you understand by molecules of compound? Give eg.

⑤ Give the diagrammatic representation for the following
Zinc, Hydrogen molecule, Hydrogen chloride molecule, Chlorine molecule, Water molecule, Copper, Nitrogen molecule, Helium, Oxygen molecule, Zinc Oxide molecule, Ozone molecule, Carbon di oxide molecule.

NOTES

P. S. L
23.6.20