STRUCTURE OF MATTER

Question bank

Answers for the book back exercises

C. 1. When two elements mix together, they

combine chemically in a fixed ratio to form a

compound.

2. The properties of different compounds are so

different from each other due to following reasons:

(i) Their constituent elements are different.

(ii) Sometimes their constituent elements are

same but ratios are different. Example, H2O

(Water) and H2O2 (Hydrogen peroxide)

3. Many elements have a great tendency to

combine with each other to form compounds.

These elements are, therefore, not found in the

free state in nature.

4. On heating a mixture of iron and sulphur, a

black substance called iron sulphide is formed.

The ratio of iron and sulphur in iron sulphide is

always 7 : 4.

5. A formula represents:

(i) the types of elements present in the

compound.

(ii) the number of atoms of each element

present in the compound.

(iii) the molecule of the compound.

6. The valencies of other elements or groups

is the number of hydrogen atoms which can

combine with or be displaced by one atom of

that element or group.

D. 1. The differences between an element and a

compound are as follows.

Element

(i) A substance that cannot be decomposed

into simpler substances by chemical means

and is made up of only one kind of atoms

is called an element. Examples: hydrogen,

oxygen

(ii) An element cannot be broken further.

(iii) There are 118 elements on the earth.

Compound

(i) A substance formed by the chemical

combination of two or more elements in

fixed proportions is called a compound.

Example: water

(ii) A compound can be broken into its

constituent elements by chemical reaction.

(iii) There are innumerable compounds around us.

2. An atom is the smallest particle of an element

that can take part in a chemical reaction. It may

or may not exist independently.

A molecule is the smallest particle of an

element that can normally exist independently.

Yes, a molecule of an element can be the

same as its atom. That means its atom exists

independently. This element is known as

monoatomic element. Example: He (Helium).

3. a. sodium oxide Na1O2 Na2O

b. magnesium nitrate Mg2(NO3)1 Mg(NO3)2

c. magnesium sulphate Mg2(SO4)2 MgSO4

d. aluminium chloride Al3Cl1 AlCl3

4. A chemical equation shows the result of a

chemical reaction in which the reactants and

the products are represented by symbols or

formulae.

Example: Fe + S FeS

iron sulphur iron sulphide

It is necessary to balance an equation because

the number of each element should be the

same on both sides of the equation.

Example: H2O H2 + O2 [Not balanced]

2H2O 2H2 + O2 [Balanced]

5. a. Mg + H2SO4 MgSO4 + H2

It is a balanced equation.

b. CaCO3 + HCl CaCl2 + H2O + CO2

[Not balanced]

CaCO3 + 2HCl CaCl2 + H2O + CO2

[Balanced]

c. CaO + H2O Ca(OH)2

It is a balanced equation.

d. Ag + HNO3 AgNO3 + H2O + NO2

[Not balanced]

Ag + 2HNO3 AgNO3 + H2O + NO2

[Balanced]

6. The formula of a compound can be written if

the symbols of its elements or radicals and

their valencies are known.

For example, calcium chloride

The elements in calcium chloride are calcium

and chlorine. The valency of calcium is 2 and

the valency of chlorine is 1. So we write them

as Ca2Cl1. There is no common factor in the

valencies 2 and 1. Interchanging the valencies

and writing them as subscripts, we get the

formula of calcium chloride as CaCl2.