

**DON BOSCO SCHOOL, KOKAR, RANCHI**

**CLASS 9**

**Chemistry**

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**LESSON 1**

**LANGUAGE OF CHEMISTRY**

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**Short answer questions**

**Answer the following in a word or maximum of one sentence.**

1. What does a symbol signify?

Ans: A symbol is an abbreviation for the name of an element.

2 .i. Carbon. a. C

ii. Chlorine. b.Cl

iii. Sulphur. c.S

iv. Strontium d.Sr

v. Tin. e.Sn

vi. Lead. f.Pb

vii. Copper. g.Cu

viii. Boron. h.B

ix. Bromine. i.Br

x. Iron. j.Fe

xi. Iodine. k.I

xii. Phosphorus l.P

xiii. Potassium. m.K

xiv. Sodium. n.Na

xv. Nitrogen. o.N

xvi. Nickel. p.Ni

3. What are the Latin names of iron, tin, lead, sodium, potassium and mercury?

Iron- feruum

Tin-. Stannum

Lead-. Plumbum

Sodium-. Natrium

Potassium-. Kalium

Mercury- hydrargyrum

4. What is atomic mass?

The atomic mass of an element is the number of times an atom of the element is heavier than one-twelfth of an atom of Carbon-12.

5. Give 5 examples of elements forming diatomic molecules.

H<sub>2</sub>, O<sub>2</sub>, N<sub>2</sub>, Cl<sub>2</sub>, Br<sub>2</sub>

6. What is the atomicity of the ozone molecule?

3

7. Name two elements which form monoatomic molecules.

He, Be, Ar, Kr, Xe

8. Write the formulae of the following compounds.

a. Iron (II) sulphate  $\text{FeSO}_4$

b. Iron (III) sulphate.  $\text{Fe}_2(\text{SO}_4)_3$

c. Ammonium hydroxide.  $\text{NH}_4\text{OH}$

d. Tin (II) chloride  $\text{SnCl}_2$

e. Mercury (II) Sulphate  $\text{HgSO}_4$

f. Aluminium phosphate  $\text{AlPO}_4$

g. Potassium sulphate.  $\text{K}_2\text{SO}_4$

h. Calcium hydrogen carbonate.  $\text{Ca}(\text{HCO}_3)_2$

i. Sodium nitrate.  $\text{NaNO}_3$

j. Sodium hydrogen sulphate

$\text{NaHSO}_4$

9. What is the valency of each of the underlined elements in the following oxides. Take the valency of Oxygen to be 2.

a.  $\text{Na}_2\text{O}$ . Val of Na is 1

b.  $\text{MgO}$ . Val of Mg is 2

c.  $\text{Al}_2\text{O}_3$ . Val of Al is 3

d.  $\text{SiO}_2$ . Val of Si is 4

e.  $\text{CO}_2$ . Val of C is 4

f.  $\text{SO}_3$ . Val of S is 6

g.  $\text{N}_2\text{O}_3$ . Val of N is 3

h.  $\text{SnO}_2$ . Val of Sn is 4

10. What is a balanced chemical equation?

Chemical equation in which the numbers of atoms of the different elements on the reaction side are the same as those on the product side is called a balanced equation.

11. Write down balanced chemical equations giving as much information as possible for the following reactions.

a.  $3\text{Mg} + \text{N}_2 \rightarrow \text{Mg}_3\text{N}_2$

b.  $2\text{K} + 2\text{H}_2\text{O} \rightarrow 2\text{KOH} + \text{H}_2$

### Long answer questions

1. What is meant by the term molecular mass and how is it calculated?

Ans.. The molecular mass of an element or a compound is the number of times a molecule of the element or compound is heavier than 1/12th of an atom of carbon - 12.

It is obtained by adding the atomic masses of all the elements present in the molecule accounting for the the individual atoms.

The atomic masses of hydrogen nitrogen Oxygen and chlorine are 1 ,14 ,16 and 35.5 u respectively. As the form diatomic molecules (H<sub>2</sub>,N<sub>2</sub>,O<sub>2</sub> and Cl<sub>2</sub>), their molecular masses will be 2 ,28 ,32, u and 71 u respectively.

Similarly the molecular mass of water (H<sub>2</sub>O) will be 1 x2 +16=18 u.

2. Calculate the molecular formula masses of the following species in u (atomic mass: Na=23,Mg=24,K=39,Zn=65.4 ,Cl=35.5,N=14,O=16)

a.Cl<sub>2</sub>

$$35.5 \times 2 = 71$$

h.HNO<sub>3</sub>

$$1 + 14 + 16 \times 3$$

$$1 + 14 + 48 = 63u$$

3. Calculate the ratios of the masses of the reactants and products in the the following reactions.

Atomic mass: Na=23,Mg=24,Cu=63.5,Cl=35.5

S=32,k=39,

a.Mg +2HCl ---> MgCl<sub>2</sub>+ H<sub>2</sub>

Reactants:

Mg. + 2HCl

$$24 \quad 2(1+35.5)$$

$$24. \quad : \quad 73$$

Products:

MgCl<sub>2</sub>. +. H<sub>2</sub>

$$24+35.5 \times 2. \quad 1 \times 2$$

$$24+71. \quad 2$$

$$95. \quad 2$$

$$95. \quad : \quad 2$$

4. What is the ratio of the volumes of the reactants and the products ( the products are also gaseous) in each of the following reactions?

a.2H<sub>2</sub>+O<sub>2</sub>----->2H<sub>2</sub>O

$$2. \quad 1. \quad 2$$

$$2:1. \quad : \quad 2$$

Or

$$3:2$$

### Objective questions

1. The number of carbon atoms in a carbonate radical is  
a. 1
2. If the formula of sulphuric acid is  $\text{H}_2\text{SO}_4$ , that of iron (III) sulphate will be  
c.  $\text{Fe}_2(\text{SO}_4)_3$
3. If the formula of carbonic acid is  $\text{H}_2\text{CO}_3$ , that of calcium hydrogencarbonate will be  
b.  $\text{Ca}(\text{HCO}_3)_2$
4. If the atomic mass of sulphur be 32, the hydrogen to sulphur mass ratio in hydrogen sulphide is  
b. 1:16
5. What is the volume of HCl formed from 50 ml each of hydrogen and chlorine? assume that the volumes of the gases have been measured at the same temperature and pressure.  
c. 100 ml

### Fill in the blanks

1. a symbol represents one atom of the element.
2. A radical is a group of atoms that behaves like an atom in a chemical reaction.
3. Cation bears a positive charge and an anion bears a negative charge.
4. The ammonium radical is a mono positive radical.
5. Hydroxide and nitrate ions are negative radicals.
6. Sulphide sulphite and sulphate ions are represented as  $\text{S}^{2-}$ ,  $\text{SO}_3^{2-}$ , and  $\text{SO}_4^{2-}$  respectively.

### True or false

1. A molecule of an element is always diatomic.  
False
2. Molecular formula can represent a compound.  
True
3. The molecular formula of a compound should be such that the valencies of the elements are satisfied.  
True
4. The molecular formula of water represents 9 parts by mass of water.  
False
5. Balanced equation obeys the law of conservation of mass and so does an unbalanced equation.  
False
6. A chemical equation does not indicate the ratio of the volumes of the reactants and products if they are gaseous.  
False