

Niscort Fr. Agnel School
Self-Learning Worksheet
Subject- Science Class-9th
Chapter- 3 (Atoms and Molecules)

VERY SHORT ANSWER QUESTIONS

1. The formula of a compound is $\text{Ca}_3(\text{PO}_4)_2$. What is the valency of Ca and the valency of PO_4 in it?
2. Which one of the following is tetra atomic molecule?
 CH_2OH , CH_4 , H_2O_2 , PCl_5
3. Valency of an element X is 3. Write the chemical formula of its oxide.

SHORT ANSWER QUESTIONS

4. Define the following laws –
 - (i) Law of conservation of mass
 - (ii) Law of definite / constant proportion
5. If X and Y are two kinds of atoms, state whether X and Y are metals or non metals in the following representative compounds:
 - a. X_4
 - b. Y_2
 - c. XY_4
 - d. $\text{X}^{+2}(\text{Y}^{-1})_2$
 - e. X_2Y_2
 - f. X^+Y^-
6. In a chemical reaction 100 g of limestone on heating decomposes to give 56 g of quick lime and 44 g of carbon dioxide. Show that these observations are in agreement with the Law of conservation of mass.
7. Magnesium and oxygen combine in the ratio of 3:2 by mass to form magnesium oxide. What mass of oxygen gas would be required to react completely with 24 g of magnesium?
8. H_2 , Cl_2 , CO_2 , NO_2 , H_2SO_4 , H_2O , O_3
Differentiate the above as molecules of Elements and molecules of compounds.

9 . Differentiate between

- a) Na^+ ion and Na atom.
- b) 2N and 2N_2 .

10. Write down the formulae of the following :-

- (i) Calcium Sulphate
- (ii) Ammonium hydroxide
- (iii) Sodium bicarbonate
- (iv) Aluminium nitride
- (v) Ferric sulphide
- (vi) Mercuric chloride

11. Write down the names of compounds represented by the following formulae :-

- (i) KNO_2
- (ii) Na_2S
- (iii) $\text{Al}_2(\text{SO}_4)_3$
- (iv) $\text{Ca}_3(\text{PO}_4)_2$
- (v) HgNO_3
- (vi) $\text{Ca}(\text{HCO}_3)_2$

12. Give symbols of the following ions :-

- (i) Phosphate
- (ii) Ammonium
- (iii) Sulphite
- (iv) Bromide
- (v) Fluoride
- (vi) Aluminium
- (vii) Copper (II)
- (viii) Borate
- (ix) Iron (III)
- (x) Chlorate
- (xi) Hydride
- (xii) Sulphite

13. Calculate the molecular mass of the following compounds in a.m.u.

- (i) Ferric nitrate
- (ii) Ammonium hydroxide
- (iii) Calcium phosphate
- (iv) CH_3OH

(at. Mass Fe = 56, N = 14, O = 16, P = 31, C = 12, H = 1, Ca = 40)

14. An element A has valency +2, while another element B has valency -3. Give the formula of the compound formed when A reacts with B.

15. Find the ratio by mass of the combining elements in the following compounds:



16. An element M forms the oxide MO . What will be the formula of its sulphate and nitrate?

17. An element forms an oxide Y_2O_5

- a. What is the valency of element Y?
- b. What will be the formula of the chloride of element Y?

LONG ANSWER QUESTIONS

18. Write correct formula using positive and negative ions and write their names.

	Cl ⁻	SO ₄ ²⁻	NO ₃ ⁻	PO ₄ ³⁻	CO ₃ ²⁻	O ²⁻	OH ⁻	P ³⁻	S ²⁻
Na ⁺									
Mg ²⁺									
Al ³⁺									
Cu ²⁺									
Zn ²⁺									

NUMERICALS (Mole Concept)

- Calculate the number of Sodium ions in 53g of Na₂CO₃.
- Calculate the numbers of sodium atoms in 0.2 moles of sodium element.
- Calculate the number of iron atoms and number of moles in a piece of iron weighing 2.8 g (Given Atomic mass of iron = 56u).
- Express the following into moles
 - 14.7g H₂SO₄
 - 2.2g CO₂
 - 3.15g HNO₃
 - 6.44g NaOH
- Express the following into grams:
 - 0.7 moles of H₂O
 - 4.0 moles of HNO₃
 - 3.77 mole of HCl
 - 8.75 mole of CaSO₄
- How many molecules of water are present in 10 grams of water? (Given N_a=6.022×10²³)
- If 2g of carbon contains x atoms, what will be the number of atoms in 2g of magnesium? (C=12u, Mg=24u)
- Convert 12.044 × 10²³ molecules of sulphur dioxide into moles.