

# Contents

## *Preface*

### **Chapter Separation Techniques**

#### **1:**

- 1.1 Introduction
- 1.2 Test of Purity of a Substance
- 1.3 Physical and Chemical Changes
- 1.4 Separation of Mixtures
- 1.5 Filtration
- 1.6 Evaporation
- 1.7 Distillation
- 1.8 Sublimation
- 1.9 Crystallization
- 1.10 Precipitation
- 1.11 Chromatography

*Chapter Summary*

*Assessment*

### **Chapter Particulate Nature of Matter**

#### **2:**

- 2.1 Introduction
- 2.2 Evidences for the Particulate Nature of Matter
- 2.3 Particle Size
- 2.4 Dalton's Atomic Theory
- 2.5 Particles of Matter
- 2.6 Atomic Structure
- 2.7 Atomic Numbers
- 2.8 Mass Number
- 2.9 Isotopy
- 2.10 Relative Atomic Mass
- 2.11 Relative Molecular Mass
- 2.12 Modification of Dalton's Atomic Theory
- 2.13 Symbols of the Elements

*Chapter Summary*

*Assessment*

### **Chapter Laws of Chemical Combination**

#### **3:**

- 3.1 Empirical and Molecular Formulae

- 3.2 The Law of Conservation of Mass
- 3.3 The Law of (Definite Proportions) Constant Composition
- 3.4 The Law of Multiple Proportions

*Chapter Summary*

*Assessment*

## **Chapter Chemical Bonding**

**4:**

- 4.1 Introduction
- 4.2 Electronic Configuration of Atoms and the Periodic Table of Elements
- 4.3 Electrovalent (Ionic) Bonding
- 4.4 Covalent Bonding
- 4.5 Co-ordinate Covalent (Dative) Bond
- 4.6 Electron Dot Diagrams
- 4.7 Metallic Bonding

*Chapter Summary*

*Assessment*

## **Chapter Chemical Equations**

**5:**

- 5.1 Introduction
- 5.2 What is Chemical Equation?
- 5.3 What you must know to be able to write a balanced equation
- 5.4 Combining Powers of Ions and Radicals
- 5.5 Names and formulae of some common chemical compounds
- 5.6 Writing the formulae of compounds by using the combining Power of elements, Ions and Radicals
- 5.7 Some common chemical reactions
- 5.8 Writing and balancing of chemical equations

*Chapter Summary*

*Assessment*

## **Chapter The Gaseous State**

**6:**

- 6.1 Introduction
- 6.2 The Kinetic Theory of Gases
- 6.3 Boyle's Law
- 6.4 Charles' Law
- 6.5 The General Gas Equation
- 6.6 Dalton's Law of Partial Pressures
- 6.7 Graham's Law of Diffusion
- 6.8 Gay Lussac's Law of combining volumes
- 6.9 Avogadro's Law
- 6.10 Relationship between molar mass and vapour density
- 6.11 The Mole, Avogadro number and Gram Molecular volume

*Chapter Summary*

*Assessment*

## **Chapter    Acids, Bases and Salts**

**7:**

- 7.1 Introduction
- 7.2 Properties of Acids
- 7.3 Acids and Hydroxonium Ions
- 7.4 Basicity of Acids
- 7.5 Strong and Weak Acids
- 7.6 Methods of Preparation of Acids
- 7.7 Uses of Acids
- 7.8 Properties of Bases
- 7.9 Classification of Bases
- 7.10 General Methods of Preparing Bases
- 7.11 Acid-Base Indicator
- 7.12 Salts
- 7.13 Properties of Salts
- 7.14 Methods of Preparation of Salts
- 7.15 Efflorescence, Hygroscopy and Deliquescence

*Chapter Summary*

*Assessment*

## **Chapter    Carbon and its compounds**

**8:**

- 8.1 Introduction
- 8.2 Allotropes of Carbon
- 8.3 Properties of Carbon
- 8.4 Coal
- 8.5 Distillation of Coal
- 8.6 Products of Destructive Distillation of Coal
- 8.7 Producer Gas and Water Gas
- 8.8 Carbon (IV) Oxide
- 8.9 Carbon (II) Oxide
- 8.10 Trioxocarbonate (IV) Salts
- 8.11 Hydrogen Trioxocarbonates (IV)
- 8.12 The Carbon Cycle

*Chapter Summary*

*Assessment*

*Project — Experimental Project*

## **Chapter    Petroleum**

**9:**

- 9.1 Introduction to Hydrocarbon Chemistry
- 9.2 Classification of Hydrocarbons
- 9.3 Alkanes
- 9.4 Alkenes
- 9.5 Alkynes
- 9.6 Straight and branched hydrocarbon chains

- 9.7 Open chain (Aliphatic) and cyclic (ringed) hydrocarbons
- 9.8 Aromatic hydrocarbons-Benzene
- 9.9 Origin of Petroleum
- 9.10 Petroleum as a Complex mixture of Hydrocarbons
- 9.11 Refining of Petroleum
- 9.12 Nature and Uses of Petroleum Fractions
- 9.13 Octane number (Octane Rating) of Gasoline
- 9.14 Upgrading the Quantity and Quality of Petrol from **Crude Oil**
- 9.15 Treatment Processes

*Chapter Summary*

*Assessment*

*Literature Project – Petroleum Exploration in Nigeria*

*Experimental Project - Crude oil*

## **Chapter 10: The Chemical Industry**

- 10.1 Raw Materials of the chemical industry
- 10.2 Inorganic Raw Materials
- 10.3 Organic Raw Materials
- 10.4 Divisions of the Chemical Industry
- 10.5 Fine chemicals
- 10.6 Fertilizers
- 10.7 Plastics
- 10.8 Foods and Beverages
- 10.9 Pharmaceuticals
- 10.10 Glass
- 10.11 Paints
- 10.12 Cement
- 10.13 Ceramics
- 10.14 Soaps and Detergents

*Chapter Summary*

*Assessment*

*Experimental Project — Analysis of Materials*

**Approximate Relative Atomic Mass**

**Logarithms**

**Antilogarithms**

**Glossary**

**Answers to Assessment Questions**

**Index**