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CLASS 11
CHEMISTRY
SYLLABUS
2022-23

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SYLLABUS

PART-I

UNIT-1: SOME BASIC CONCEPTS OF CHEMISTRY

1.1. Importance of Chemistry
1.2. Nature of Matter
  1.2.1. States of Matter
  1.2.2. Classification of Matter
1.3. Properties of Matter and Their Measurement
  1.3.1. Physical and chemical properties
  1.3.2. Measurement of physical properties
  1.3.3. The International System of Units (SI)
  1.3.4. Mass and Weight
  1.3.5. Volume
  1.3.6. Density
  1.3.7. Temperature
1.4. Uncertainty in Measurement
  1.4.1. Scientific Notation
  1.4.2. Significant Figures
  1.4.3. Dimensional Analysis
1.5. Laws of Chemical Combinations
  1.5.1. Law of Conservation of Mass
  1.5.2. Law of Definite Proportions
  1.5.3. Law of Multiple Proportions
  1.5.4. Gay Lussac's Law of Gaseous Volumes
  1.5.5. Avogadro's Law
1.6. Dalton's Atomic Theory
1.7. Atomic and Molecular Masses
  1.7.1. Atomic Mass
  1.7.2. Average Atomic Mass
  1.7.3. Molecular Mass
  1.7.4. Formula Mass
1.8. Mole Concept and Molar Masses
1.9. Percentage Composition
  1.9.1. Empirical Formula for Molecular Formula
1.10. Stoichiometry and Stoichiometric Calculations
  1.10.1. Limiting Reagent
  1.10.2. Reactions in Solutions
    1. Mass per cent
    2. Mole Fraction
    3. Molarity
    4. Molality

UNIT-2: STRUCTURE OF ATOM

2.1. Discovery of Sub-Atomic Particles
- 2.1.1. Discovery of Electron
- 2.1.2. Charge to Mass Ratio of Electron
- 2.1.3. Charge on the Electron
- 2.1.4. Discovery of Protons and Neutrons

2.2. Atomic Models
- 2.2.1. Thomson Model of Atom
- 2.2.2. Rutherford's Nuclear Model of Atom
- 2.2.3. Atomic Number and Mass Number
- 2.2.4. Isobars and Isotopes
- 2.2.5. Drawbacks of Rutherford Model

2.3. Developments Leading to The Bohr's Model of Atom
- 2.3.1. Wave Nature of Electromagnetic Radiation
- 2.3.2. Particle Nature of Electromagnetic Radiation: Planck's Quantum Theory
  - Photoelectric Effect
  - Dual Behaviour of Electromagnetic Radiation
- 2.3.3. Evidence for the quantized* Electronic Energy Levels: Atomic spectra
  - Emission and Absorption Spectra
  - Line Spectrum of Hydrogen

2.4. Bohr's Model for Hydrogen Atom
- 2.4.1. Explanation of Line Spectrum of Hydrogen
- 2.4.2. Limitations of Bohr's Model

2.5. Towards Quantum Mechanical Model of The Atom
- 2.5.1. Dual Behaviour of Matter
- 2.5.2. Heisenberg's Uncertainty Principle
  - Significance of Uncertainty Principle
  - Reasons for the Failure of the Bohr Model

2.6. Quantum Mechanical Model of Atom
- 2.6.1. Orbitals and Quantum Numbers
- 2.6.2. Shapes of Atomic Orbitals
- 2.6.3. Energies of Orbitals
- 2.6.4. Filling of Orbitals in Atom
  - Aufbau Principle
  - Pauli Exclusion Principle
  - Hund's Rule of Maximum Multiplicity
- 2.6.5. Electronic Configuration of Atoms
- 2.6.6. Stability of Completely Filled and Half-Filled Subshells

UNIT-3: CLASSIFICATION OF ELEMENTS AND PERIODICITY IN PROPERTIES

3.1. Why Do We Need to Classify Elements?
3.2. Genesis of Periodic Classification
3.3. Modern Periodic Law and The Present Form of The Periodic Table
3.4. Nomenclature of Elements with Atomic Numbers > 100
3.5. Electronic Configurations of Elements and The Periodic Table
  (a) Electronic Configurations in Periods
  (b) Group-Wise Electronic Configurations
3.6. Electronic Configurations and Types of Elements: *s*-, *p*-, *d*-, *f*- Blocks
  3.6.1. The s-Block Elements
  3.6.2. The p-Block Elements
  3.6.3. The d-Block Elements (Transition Elements)
  3.6.4. The f-Block Elements (Inner-Transition Elements)
  3.6.5. Metals, Non-metals and Metalloids
3.7. Periodic Trends in Properties of Elements
  3.7.1. Trends in Physical Properties
  (a) Atomic Radius
  (b) Ionic Radius
  (c) Ionization Enthalpy
  (d) Electron Gain Enthalpy
  (e) Electronegativity
  3.7.2. Periodic Trends in Chemical
  (a) Periodicity of Valence or Oxidation States
  (b) Anomalous Properties of Second Period Elements
  3.7.3. Periodic Trends and Chemical Reactivity

UNIT-4: CHEMICAL BONDING AND MOLECULAR STRUCTURE

4.1. Kössel-Lewis Approach to Chemical Bonding
- 4.1.1. Octet Rule
- 4.1.2. Covalent Bond
- 4.1.3. Lewis Representation of Simple Molecules (the Lewis Structures)
- 4.1.4. Formal Charge
- 4.1.5. Limitations of the Octet Rule

4.2. Ionic or Electrovalent Bond
- 4.2.1. Lattice Enthalpy

4.3. Bond Parameters
- 4.3.1. Bond Length
- 4.3.2. Bond Angle
- 4.3.3. Bond Enthalpy
- 4.3.4. Bond Order
- 4.3.5. Resonance Structures
- 4.3.6. Polarity of Bonds

4.4. The Valence Shell Electron Pair Repulsion (VSEPR) Theory

4.5. Valence Bond Theory
- 4.5.1. Orbital Overlap Concept
- 4.5.2. Directional Properties of Bonds
- 4.5.3. Overlapping of Atomic Orbitals
- 4.5.4. Types of Overlapping and Nature of Covalent Bonds
  - (i) Sigma(σ) bond
    - s-s overlapping
    - s-p overlapping
    - p–p overlapping
  - (ii) pi(π) bond
- 4.5.5. Strength of Sigma and pi Bonds

4.6. Hybridisation
- 4.6.1. Types of Hybridisation
  - (i) sp hybridisation
  - (ii) sp^2 hybridisation
  - (iii) sp^3 hybridisation
- 4.6.2. Other Examples of sp^3, sp^2 and sp Hybridisation
  - sp^3 Hybridisation in C_2H_6 molecule
  - sp^2 Hybridisation in C_2H_4
  - sp Hybridisation in C_2H_2

4.6.3. Hybridisation of Elements involving d Orbitals
(i) Formation of PCl_5 (sp_3d hybridisation)
(ii) Formation of SF_6 (sp_3d_2 hybridisation)

4.7. Molecular Orbital Theory
4.7.1. Formation of Molecular Orbitals Linear Combination of Atomic Orbitals (LCAO)
4.7.2. Conditions for the Combination of Atomic Orbitals
4.7.3. Types of Molecular Orbitals
4.7.4. Energy Level Diagram for Molecular Orbitals
4.7.5. Electronic Configuration and Molecular Behaviour
- Stability of Molecules
- Bond order
- Nature of the bond
- Bond-length
- Magnetic nature

4.8. Bonding in Some Homonuclear Diatomic Molecules
(1) Hydrogen molecule (H_2)
(2) Helium molecule (He_2)
(3) Lithium molecule (Li_2)
(4) Carbon molecule (C_2)
(5) Oxygen molecule (O_2)

4.9. Hydrogen Bonding
4.9.1. Cause of Formation of Hydrogen Bond
4.9.2. Types of H-Bonds
- Intermolecular hydrogen bond
- Intramolecular hydrogen bond

UNIT-5: STATES OF MATTER

5.1. Intermolecular Forces
- 5.1.1. Dispersion Forces or London Forces
- 5.1.2. Dipole - Dipole Forces
- 5.1.3. Dipole–Induced Dipole Forces

5.2. Thermal Energy

5.3. Intermolecular Forces v/s Thermal Interactions

5.4. The Gaseous State

5.5. The Gas Laws
- 5.5.1. Boyle's Law (Pressure – Volume Relationship)
- 5.5.2. Charles' Law (Temperature – Volume Relationship)
- 5.5.3. Gay Lussac's Law (Pressure- Temperature Relationship)
- 5.5.4. Avogadro Law (Volume – Amount Relationship)

5.6. Ideal Gas Equation
- 5.6.1. Density and Molar Mass of a Gaseous Substance
- 5.6.2. Dalton's Law of Partial Pressures

5.7. Kinetic Energy and Molecular Speeds

5.8. Kinetic Molecular Theory of Gases

5.9. Behaviour of Real Gases: Deviation from Ideal Gas Behaviour

5.10. Liquefaction of Gases

5.11. Liquid State
- 5.11.1. Vapour Pressure
- 5.11.2. Surface Tension
- 5.11.3. Viscosity

UNIT-6: THERMODYNAMICS

6.1. Thermodynamic Terms
- 6.1.1. The System and the Surroundings
- 6.1.2. Types of the System
  1. Open System
  2. Closed System
  3. Isolated System
- 6.1.3. The State of the System.
- 6.1.4. The Internal Energy as a State Function
  - (a) Work
  - (b) Heat
  - (c) The General Case

6.2. Applications
- 6.2.1 Work
- 6.2.2 Enthalpy, H
  - (a) A Useful New State Function
  - (b) Extensive and Intensive Properties
  - (c) Heat Capacity
  - (d) The Relationship between C_p and C_V for an Ideal Gas

6.3. Measurement of ΔU and ΔH: Calorimetry
- (a) ΔU Measurements
- (b) ΔH Measurements

6.4. Enthalpy Change, $\mathbf{\Delta}_r H$ of a Reaction – Reaction Enthalpy
- (a) Standard Enthalpy of Reactions
- (b) Enthalpy Changes during Phase Transformations
- (c) Standard Enthalpy of Formation
- (d) Thermochemical Equations
- (e) Hess's Law of Constant Heat Summation

6.5. Enthalpies for Different Types of Reactions
- (a) Standard Enthalpy of Combustion (symbol: $\Delta_c H^{\Theta}$)
- (b) Enthalpy of Atomization (symbol: $\Delta_{\alpha} H^{\Theta}$)
- (c) Bond Enthalpy (symbol: $\Delta_{bond} H^{\Theta}$)
- (d) Lattice Enthalpy
- (e) Enthalpy of Solution (symbol: $\Delta_{sol} H^{\Theta}$)
- (f) Enthalpy of Dilution

6.6. Spontaneity
- (a) Is Decrease in Enthalpy a Criterion for Spontaneity?
- (b) Entropy and Spontaneity
- (c) Gibbs Energy and Spontaneity
- (d) Entropy and Second Law of Thermodynamics
- (e) Absolute Entropy and Third Law of Thermodynamics

6.7. Gibbs Energy Change and Equilibrium

UNIT-7: EQUILIBRIUM

7.1. Equilibrium in Physical Processes
- 7.1.1 Solid-Liquid Equilibrium
- 7.1.2 Liquid-Vapour Equilibrium
- 7.1.3 Solid – Vapour Equilibrium
- 7.1.4 Equilibrium Involving Dissolution of Solid or Gases in Liquids
  - Solids in liquids
  - Gases in liquids
- 7.1.5 General Characteristics of Equilibria Involving Physical Processes

7.2. Equilibrium in Chemical Processes – Dynamic Equilibrium

7.3. Law of Chemical Equilibrium and Equilibrium Constant

7.4. Homogeneous Equilibria
- 7.4.1 Equilibrium Constant in Gaseous Systems

7.5. Heterogeneous Equilibria

7.6. Applications of Equilibrium Constants
- 7.6.1 Predicting the Extent of a Reaction
- 7.6.2 Predicting the Direction of the Reaction
- 7.6.3 Calculating Equilibrium Concentrations

7.7. Relationship between Equilibrium Constant K, Reaction Quotient Q and Gibbs Energy G

7.8. Factors Affecting Equilibria
- 7.8.1 Effect of Concentration Change
  - Effect of Concentration – An experiment
- 7.8.2 Effect of Pressure Change
- 7.8.3 Effect of Inert Gas Addition
- 7.8.4 Effect of Temperature Change
  - Effect of Temperature – An experiment
- 7.8.5 Effect of a Catalyst

7.9. Ionic Equilibrium in Solution

7.10. Acids, Bases and Salts
- 7.10.1 Arrhenius Concept of Acids and Bases
- 7.10.2 The Brönsted-Lowry Acids and Bases
- 7.10.3 Lewis Acids and Bases

7.11. Ionization of Acids and Bases
- 7.11.1 The Ionization Constant of Water and its Ionic Product
- 7.11.2 The pH Scale

7.11.3 Ionization Constants of Weak Acids
7.11.4 Ionization of Weak Bases
7.11.5 Relation between Ka and Kb
7.11.6 Di- and Polybasic Acids and Di- and Polyacidic Bases
7.11.7 Factors Affecting Acid Strength
7.11.8 Common Ion Effect in the Ionization of Acids and Bases
7.11.9 Hydrolysis of Salts and the pH of their Solutions

7.12. Buffer Solutions
7.12.1 Designing Buffer Solution
- Preparation of Acidic Buffer

7.13. Solubility Equilibria of Sparingly Soluble Salts
7.13.1 Solubility Product Constant
7.13.2 Common Ion Effect on Solubility of Ionic Salts

PART-II

UNIT-8: REDOX REACTIONS

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8.2 Redox Reactions in Terms of Electron Transfer Reactions
8.2.1 Competitive Electron Transfer Reactions
8.3 Oxidation Number
8.3.1 Types of Redox Reactions
1 Combination reactions
2 Decomposition reactions
3 Displacement reactions
(a) Metal displacement
(b) Non-metal displacement
4 Disproportionation reactions
8.3.2 Balancing of Redox Reactions
(a) Oxidation Number Method
(b) Half Reaction Method
8.3.3 Redox Reactions as the Basis for Titrations
8.3.4 Limitations of Concept of Oxidation Number
8.4 Redox Reactions and Electrode Processes

UNIT-9: HYDROGEN

9.1 Position of Hydrogen in the Periodic Table
9.2 Dihydrogen, H_2
- 9.2.1 Occurrence
- 9.2.2 Isotopes of Hydrogen

9.3 Preparation of Dihydrogen, H_2
- 9.3.1 Laboratory Preparation of Dihydrogen
- 9.3.2 Commercial Production of Dihydrogen

9.4 Properties of Dihydrogen
- 9.4.1 Physical Properties
- 9.4.2 Chemical Properties
- 9.4.3 Uses of Dihydrogen

9.5 Hydrides
- 9.5.1 Ionic or Saline Hydrides
- 9.5.2 Covalent or Molecular Hydride
- 9.5.3 Metallic or Non-stoichiometric (or Interstitial) Hydrides

9.6 Water
- 9.6.1 Physical Properties of Water
- 9.6.2 Structure of Water
- 9.6.3 Structure of Ice
- 9.6.4 Chemical Properties of Water
  - (1) Amphoteric Nature:
  - (2) Redox Reactions Involving Water
  - (3) Hydrolysis Reaction
  - (4) Hydrates Formation
- 9.6.5 Hard and Soft Water
- 9.6.6 Temporary Hardness
- 9.6.7 Permanent Hardness

9.7 Hydrogen Peroxide (H_2O_2)
- 9.7.1 Preparation
- 9.7.2 Physical Properties
- 9.7.3 Structure
- 9.7.4 Chemical Properties
- 9.7.5 Storage
- 9.7.6 Uses

9.8 Heavy Water, D_2O
9.9 Dihydrogen as a Fuel

UNIT-10: THE *s*-BLOCK ELEMENTS

10.1 Group 1 Elements: Alkali Metals
- 10.1.1 Electronic Configuration
- 10.1.2 Atomic and Ionic Radii
- 10.1.3 Ionization Enthalpy
- 10.1.4 Hydration Enthalpy
- 10.1.5 Physical Properties
- 10.1.6 Chemical Properties
- 10.1.7 Uses

10.2 General Characteristics of the Compounds of the Alkali Metals
- 10.2.1 Oxides and Hydroxides
- 10.2.2 Halides
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10.3 Anomalous Properties of Lithium
- 10.3.1 Points of Difference between Lithium and other Alkali Metals
- 10.3.2 Points of Similarities between Lithium and Magnesium

10.4 Some Important Compounds of Sodium
- Sodium Carbonate (Washing Soda), $Na_2CO_3 \cdot 10H_2O$
- Sodium Chloride, NaCl
- Sodium Hydroxide (Caustic Soda), NaOH
- Sodium Hydrogen Carbonate (Baking Soda), $NaHCO_3$

10.5 Biological Importance of Sodium and Potassium

10.6 Group 2 Elements: Alkaline Earth Metals
- 10.6.1 Electronic Configuration
- 10.6.2 Atomic and Ionic Radii
- 10.6.3 Ionization Enthalpies
- 10.6.4 Hydration Enthalpies
- 10.6.5 Physical Properties
- 10.6.6 Chemical Properties
- 10.6.7 Uses

10.7 General Characteristics of Compounds of the Alkaline Earth Metals

10.8 Anomalous Behaviour of Beryllium
- 10.8.1 Diagonal Relationship between Beryllium and Aluminium

10.9 Some Important Compounds of Calcium
- Calcium Oxide or Quick Lime, CaO
- Calcium Hydroxide (Slaked lime), $Ca(OH)_2$
- Calcium Carbonate, $CaCO_3$
- Calcium Sulphate (Plaster of Paris), $CaSO_4 \cdot ½\ H_2O$

10.10 Biological Importance of Magnesium and Calcium

UNIT-11: THE *p*-BLOCK ELEMENTS

11.1 Group 13 Elements: The Boron Family
- 11.1.1 Electronic Configuration
- 11.1.2 Atomic Radii
- 11.1.3 Ionization Enthalpy
- 11.1.4 Electronegativity
- 11.1.5 Physical Properties
- 11.1.6 Chemical Properties
  - Oxidation state and trends in chemical reactivity
    - (i) Reactivity Towards Air
    - (ii) Reactivity Towards Acids and Alkalies
    - (iii) Reactivity Towards Halogens

11.2 Important Trends and Anomalous Properties of Boron

11.3 Some Important Compounds of Boron
- 11.3.1 Borax
- 11.3.2 Orthoboric acid
- 11.3.3 Diborane, B_2H_6

11.4 Uses of Boron and Aluminium and their Compounds

11.5 Group 14 Elements: The Carbon Family
- 11.7.1 Electronic Configuration
- 11.7.2 Covalent Radius
- 11.7.3 Ionization Enthalpy
- 11.7.4 Electronegativity
- 11.7.5 Physical Properties
- 11.7.6 Chemical Properties
  - Oxidation states and trends in chemical reactivity
    - (i) Reactivity towards oxygen
    - (ii) Reactivity towards water
    - (iii) Reactivity towards halogen

11.6 Important Trends and Anomalous Behaviour of Carbon

11.7 Allotropes of Carbon
- 11.7.1 Diamond
- 11.7.2 Graphite
- 11.7.3 Fullerenes
- 11.7.4 Uses of Carbon

11.8 Some Important Compounds of Carbon and Silicon
- 11.8.1 Carbon Monoxide
- 11.8.2 Carbon Dioxide
- 11.8.3 Silicon Dioxide, SiO_2
- 11.8.4 Silicones
- 11.8.5 Silicates
- 11.8.6 Zeolites

UNIT-12: ORGANIC CHEMISTRY – SOME BASIC PRINCIPLES AND TECHNIQUES

12.1 General Introduction
12.2 Tetravalence of Carbon: Shapes of Organic Compounds
- 12.2.1 The Shapes of Carbon Compounds
- 12.2.2 Some Characteristic Features of p-Bonds

12.3 Structural Representations of Organic Compounds
- 12.3.1 Complete, Condensed and Bond-Line Structural Formulas
- 12.3.2 Three-Dimensional Representation of Organic Molecules

12.4 Classification of Organic Compounds
- I Acyclic or Open Chain Compounds
- II Cyclic or Closed Chain or Ring Compounds
  - (a) Alicyclic Compounds
  - (b) Aromatic Compounds
- Benzenoid Aromatic Compounds
- Non-Benzenoid Compound

- 12.4.1 Functional Group
- 12.4.2 Homologous Series

12.5 Nomenclature of Organic Compounds
- 12.5.1 The IUPAC System of Nomenclature
- 12.5.2 IUPAC Nomenclature of Alkanes
- 12.5.3 Nomenclature of Organic Compounds having Functional Group(s)
- 12.5.4 Nomenclature of Substituted Benzene Compounds

12.6 Isomerism
- 12.6.1 Structural Isomerism
  - (i) Chain Isomerism
  - (ii) Position Isomerism
  - (iii) Functional Group Isomerism
  - (iv) Metamerism
- 12.6.2 Stereoisomerism

12.7 Fundamental Concepts in Organic Reaction Mechanism
- 12.7.1 Fission of a Covalent Bond
- 12.7.2 Substrate and Reagent
- 12.7.3 Electron Movement in Organic Reactions
- 12.7.4 Electron Displacement Effects in Covalent Bonds
- 12.7.5 Inductive Effect
- 12.7.6 Resonance Structure
- 12.7.7 Resonance Effect
  - (i) Positive Resonance Effect (+R effect)
  - (ii) Negative Resonance Effect (- R effect)
- 12.7.8 Electromeric Effect (E effect)
- 12.7.9 Hyperconjugation
- 12.7.10 Types of Organic Reactions and Mechanisms

12.8 Methods of Purification of Organic Compounds
- 12.8.1 Sublimation
- 12.8.2 Crystallisation
- 12.8.3 Distillation
- 12.8.4 Differential Extraction
- 12.8.5 Chromatography

12.9 Qualitative Analysis of Organic Compounds
- 12.9.1 Detection of Carbon and Hydrogen
- 12.9.2 Detection of Other Elements
  - (A) Test for Nitrogen
  - (B) Test for Sulphur
  - (C) Test for Halogens
  - (D) Test for Phosphorus

12.10 Quantitative Analysis
- 12.10.1 Carbon and Hydrogen
- 12.10.2 Nitrogen
  - (i) Dumas method:
  - (ii) Kjeldahl's method
- 12.10.3 Halogens
- 12.10.4 Sulphur
- 12.10.5 Phosphorus
- 12.10.6 Oxygen

UNIT-13: HYDROCARBONS

13.1 Classification

13.2 Alkanes
- 13.2.1 Nomenclature and Isomerism
- 13.2.2 Preparation
  1. From unsaturated hydrocarbons
  2. From alkyl halides
  3. From carboxylic acids
- 13.2.3 Properties
  - Physical properties
  - Chemical properties
    1. Substitution reactions
       - Halogenation
       - Mechanism
    2. Combustion
    3. Controlled oxidation
    4. Isomerisation
    5. Aromatization

6 Reaction with steam
7 Pyrolysis

13.2.4 Conformations
1 Sawhorse projections
2 Newman projections

13.3 Alkenes
13.3.1 Structure of Double Bond
13.3.2 Nomenclature
13.3.3 Isomerism
13.3.4 Preparation
13.3.5 Properties
- Physical properties
- Chemical properties
- Addition reaction of HBr to symmetrical alkenes
- Addition reaction of HBr to unsymmetrical alkenes (Markovnikov Rule)
- Mechanism
- Anti Markovnikov addition or peroxide effect or Kharash effect

13.4 Alkynes
13.4.1 Nomenclature and Isomerism
13.4.2 Structure of Triple Bond
13.4.3 Preparation
13.4.4 Properties
- Physical properties
- Chemical properties

13.5 Aromatic Hydrocarbon
13.5.1 Nomenclature and Isomerism
13.5.2 Structure of Benzene
- Resonance and stability of benzene

13.5.3 Aromaticity
13.5.4 Preparation of Benzene
13.5.5 Properties
- Physical properties
- Chemical properties
- Electrophilic substitution reactions
- Mechanism of electrophilic substitution reactions
- Addition reactions

13.5.6 Directive influence of a functional group in monosubstituted benzene

13.6 Carcinogenicity and Toxicity

UNIT-14: ENVIRONMENTAL CHEMISTRY

14.1 Environmental Pollution
14.2 Atmospheric Pollution
- 14.2.1 Tropospheric Pollution
  - 1 Gaseous air pollutants
    - (a) Oxides of Sulphur
    - (b) Oxides of Nitrogen
    - (c) Hydrocarbon
    - (d) Oxides of Carbon
      - (i) Carbon monoxide
      - (ii) Carbon dioxide
        - Global Warming and Greenhouse Effect
        - Acid rain
  - 2 Particulate Pollutants
    - Smog
    - Formation of photochemical smog
    - Effects of photochemical smog
    - How can photochemical smog be controlled?
- 14.2.2 Stratospheric Pollution
  - Formation and Breakdown of Ozone
  - The Ozone Hole
  - Effects of Depletion of the Ozone Layer

14.3 Water Pollution
- 14.3.1 Causes of Water Pollution
- 14.3.2 International Standards for Drinking Water

14.4 Soil Pollution
- 14.4.1 Pesticides

14.5 Industrial Waste
14.6 Strategies to control Environmental Pollution
- 14.6.1 Waste Management
  - Collection and Disposal

14.7 Green Chemistry
- 14.7.1 Introduction
- 14.7.2 Green Chemistry in day-to-day Life
  - (i) Dry Cleaning of Clothes
  - (ii) Bleaching of Paper
  - (iii) Synthesis of Chemicals
  - (iv) Green Solution' to Clean Turbid Water

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