

# **SSLC CHEMISTRY FULL STUDY GUIDE 2026**

*Complete Detailed Notes for Model Exam Preparation*

## UNIT 1: MOLE CONCEPT & GAS LAWS

The mole concept is the foundation of numerical chemistry. One mole is defined as the amount of substance containing  $6.022 \times 10^{23}$  particles. This number is called Avogadro Number. The particles may be atoms, molecules, or ions.

- 1 mole =  $6.022 \times 10^{23}$  particles
- Molar mass = Atomic or molecular mass expressed in grams
- Moles = Given mass / Molar mass
- Mass = Moles  $\times$  Molar mass
- Molecules = Moles  $\times$   $6.022 \times 10^{23}$

### ***Gas at STP:***

At STP (Standard Temperature and Pressure), 1 mole of any gas occupies 22.4 L.

### ***Important Gas Laws:***

- Boyle's Law: At constant temperature,  $P_1V_1 = P_2V_2$
- Charles' Law: At constant pressure,  $V_1/T_1 = V_2/T_2$  (Temperature in Kelvin)
- Kelvin conversion:  $K = ^\circ\text{C} + 273$

## UNIT 2: ORGANIC CHEMISTRY

Organic chemistry deals with carbon compounds. Carbon forms four covalent bonds and can form long chains and branched structures. Hydrocarbons are compounds containing only carbon and hydrogen.

- Alkanes:  $C_nH_{2n+2}$  (single bond)
- Alkenes:  $C_nH_{2n}$  (double bond)
- Alkynes:  $C_nH_{2n-2}$  (triple bond)
- Functional groups determine properties of compounds
- -CHO (Aldehyde),  $>C=O$  (Ketone), -COOH (Carboxylic acid), -OH (Alcohol)

### ***Homologous Series:***

A homologous series is a group of organic compounds having the same functional group and general formula. Consecutive members differ by  $-CH_2$ .

## UNIT 3: PERIODIC TABLE & ELECTRON CONFIGURATION

The periodic table arranges elements based on increasing atomic number. Elements are arranged in periods and groups.

- s block: Groups 1 and 2
- p block: Groups 13 to 18
- d block: Groups 3 to 12
- Ionisation enthalpy increases across a period
- Ionisation enthalpy decreases down a group
- Electronic configuration follows Aufbau principle

## UNIT 4: ELECTROCHEMISTRY

Electrochemistry deals with the relationship between electricity and chemical reactions. Galvanic cells convert chemical energy into electrical energy. Electrolytic cells convert electrical energy into chemical energy.

- Oxidation occurs at Anode
- Reduction occurs at Cathode
- Reactivity series helps predict displacement reactions
- $\text{Zn} \rightarrow \text{Zn}^{2+} + 2\text{e}^-$  is an oxidation reaction

## UNIT 5: METALS & METALLURGY

Metals are extracted from ores. The process includes concentration, roasting or calcination, and reduction. Blast furnace is used to extract iron.

- Calcination: Heating ore in absence of air
- Roasting: Heating ore in presence of air
- Flux removes impurities as slag
- Coke acts as reducing agent in blast furnace

## UNIT 6: INDUSTRIAL CHEMISTRY

Industrial chemistry focuses on large scale production of chemicals. Important processes include Chlor-alkali process and Haber process.

- Chlor-alkali process produces NaOH, Cl<sub>2</sub>, H<sub>2</sub>
- Haber process:  $\text{N}_2 + 3\text{H}_2 \rightleftharpoons 2\text{NH}_3$
- Methanol produced from CO + H<sub>2</sub>
- Ethanoic acid produced industrially