

Saitechinfo NEET-JEE Academy

1. Introduction to Thermodynamics

- Definition and scope
- Importance in chemical processes

2. Thermodynamic Terms

- **System and Surroundings**
 - Definition of the system
 - Types of systems: open, closed, isolated
- **State of the System**
 - State variables (pressure, volume, temperature)
- **Properties of the System**
 - Extensive and intensive properties

3. Energy Concepts

- **Internal Energy (U)**
 - Concept and significance in thermodynamics
- **Work (W) and Heat (Q)**
 - Definitions and relationship with energy change

4. First Law of Thermodynamics

- Statement and mathematical form
- Application to chemical reactions
- **Internal Energy and Enthalpy**
 - Relationship between ΔU and ΔH
 - Calculation methods

5. Enthalpy Changes in Reactions

- **Standard Enthalpy Changes**
 - Types of enthalpy changes (formation, combustion, etc.)
- **Hess's Law of Heat Summation**
 - Concept and applications in enthalpy calculations

6. Second Law of Thermodynamics

- Concept of spontaneity
- **Entropy (S)**
 - Definition and role in determining spontaneity
- **Gibbs Free Energy (G)**
 - Relationship with spontaneity and equilibrium
 - Calculation and interpretation of ΔG

7. Applications of Thermodynamics in Chemistry

- **Hess's Law Applications**
- **Gibbs Free Energy and Equilibrium Constant**
 - Connection between ΔG and K
- Examples in various chemical reactions

8. Summary and Key Equations

- Overview of primary laws and equations
- Key thermodynamic concepts