

AMLT23 THERMODYNAMICS

UNIT-1 CONCEPT OF THERMODYNAMICS

- 1.1 System, surrounding, closed system, open system, isolated system.
- 1.2 Properties of system, isothermal process, adiabatic process,
- 1.3 Isochoric process, isobaric process, quasistatic process, internal energy, state of a system,
- 1.4 1st law of thermodynamics, reversible, irreversible process,
- 1.5 Work done in isothermal reversible process for ideal real gases,
- 1.6 Enthalpy and its physical significance,
- 1.7 Relation between internal energy and enthalpy,
- 1.8 C_p and C_v and its relation,
- 1.9 Kirchhoff's equation, adiabatic changes.

UNIT-2 SECOND LAW OF THERMODYNAMICS

- 2.1 Carnot cycle, Carnot theorem,
- 2.2 Joule- Thomson and throttling process and its application for vander Waals gases,
- 2.3 Clausius inequality, entropy and its characteristic and expression.,
- 2.4 Entropy change, in reversible and irreversible cyclic process,
- 2.5 Entropy relation with internal energy and enthalpy.

UNIT-3 TEMPERATURE DEPENDENCE OF ENTROPY

- 3.1 Entropy of an ideal gas and mixture of gases,
- 3.2 Gibb's free energy and Helmholtz free energy,
- 3.3 Mathematical expression for ideal and real gases,
- 3.4 Standard and free energy,
- 3.5 Gibbs-Helmholtz equation, Maxwell relations.

UNIT-4 CONDITION OF SPONTANEITY AND EQUILIBRIUM

- 4.1 Nernst heat theorem, the third law of thermodynamics.,
- 4.2 Partial molal quantities, chemical potential,
- 4.3 Gibbs-Duham relation,
- 4.4 Effect of pressure and temperature on chemical potential.

UNIT-5 PARTIAL HEAT CAPACITY

- 5.1 partial molal volume, activity and activity coefficient, fugacity,
- 5.2 Nernst distribution law, Raoult's law.
- 5.3 Clapeyron equation, clausius-clapeyron equation,
- 5.4 Relation between the entropy and the chemical constant.

Reference Books:

1. Thermodynamics for chemists- S. Glasstone.
2. Thermodynamics – P.C. Rakshit. 3. Thermodynamics- Zeemansky