

AMCH12 CHEMICAL ENGINEERING THERMODYNAMICS-I

UNIT-1 INTRODUCTION

- 1.1 What is thermodynamics?
- 1.2 Macroscopic & Microscopic approaches,
- 1.3 International System of Units.

UNIT-2 P-V-T RELATION OF FLUIDS

- 2.1 Phase, Ideal gas law,
- 2.2 Vander Waals equation of state,
- 2.3 Benedict-Weff-Rubin equation of state,
- 2.4 Redlich Kwong equation of state,
- 2.5 Virial equation of state,
- 2.6 Generalized equations of state, Soave-Redlich Kwong equation of state,
- 2.7 Peng-Robinson equation of state

UNIT-3 FIRST LAW OF THERMODYNAMICS AND ITS APPLICATIONS

- 3.1 First law of Thermodynamics,
- 3.2 Control-Mass analyses, Constant volume Processes,
- 3.3 Constant-Pressure Process, Adiabatic Process, Constant temperature Process,
- 3.4 Polytropic Process, Control volume analysis, Theottling Process,
- 3.5 Chemically reacting Systems.

UNIT-4 SECOND LAW OF THERMODYNAMICS AND ITS APPLICATIONS

- 4.1 Limitations of the first law,
- 4.2 Heat engine & heat Pump, Second law of Thermodynamics,
- 4.3 Criterion for irreversibility,
- 4.4 Carnot cycle & Carnot theorems,
- 4.5 Entropy and its calculations,
- 4.6 Principle of Entropy increase, second law of thermodynamics for a control volume,
- 4.7 Isentropic efficiency.

UNIT-5 THERMODYNAMIC PROPERTY RELATIONS

- 5.1 Maxwell relations,
- 5.2 Internal energy,
- 5.3 Enthalpy, partial derivatives method for enthalpy, entropy,
- 5.4 Partial derivatives method for entropy,
- 5.5 Jacobian methods, Joule Thompson Coefficient

Reference Books:

1. Chemical Engineering Thermodynamics Author RAO
2. A Textbook of Chemical Engineering Thermodynamics (English, Paperback, Narayanan K. V.)