Chemistry 470 - “Industrial Chemistry”

Mid-Term Examination Study Guide

Spring, 2010

Catalytic Kinetics

Catalytic vs. Non-Catalytic Kinetics
Reaction Order
  Effect of T
  Effect of P
Steps in Catalytic Reaction
  Adsorption (Heat of Adsorption)
  Surface Reaction
  Desorption
Activation Energy
  True
  Apparent
  Effect of T
Uni-molecular Reactions
  Langmuir Model
  Inhibition
Bi-molecular Reactions
  Langmuir-Hinshelwood Model
  Rideal-Eley Model

Industrial Metallurgy

Iron and Steel
  Blast Furnace
  Basic Oxygen Converter
  Iron-Carbon Phase Diagram
Copper
  Froth Flotation
  Ore Smelting
Aluminum
  Hall-Héroult Process

Inorganic Commodity Chemicals

Sulfuric Acid
  Sulfur Oxidation
  SO$_2$ Oxidation
    Thermodynamics
    Reactor Design
  SO$_3$ Absorption
Phosphoric Acid
  Manufacture
  Uses
Chlorine
  Chlor-Alkali Process
  Mercury Cell
  Diaphragm Cell
  Membrane Cell

Solvay Process

Synthesis Gas Processes

H₂/N₂ and H₂/CO Production
  Desulfurization
  Steam Reforming
    Primary, Secondary
    Catalyst(s)
    Thermodynamics
    Reaction Conditions

Water-Gas Shift
  HT, LT
  Catalysts
  Thermodynamics
  Reaction Conditions

Methanation
  Catalyst
  Reaction Conditions

Ammonia
  Synthesis
    Catalyst
    Thermodynamics
    Reaction Conditions

Oxidation
  Catalyst
  Reaction Conditions
  Nitric Acid

Methanol
  Catalyst
  Thermodynamics
  Reaction Conditions
  Formaldehyde
  Acetic Acid
  Acetic Anhydride