CHEMISTRY 263 - Section A2

Lecture Outline 5 and Assignment 5

TR 12:30-13:50 **November 2016**

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Assignment 5: Amines, Alkaloids, Introduction to Amino Acids

Read: TWG Solomons and CB Fryhle "Organic Chemistry" 11th Edition (2014)

Functional Group List on pp 76 and
Periodic Table Inside front Cover (One page back from Inside Back Cover earlier Editions)
Strength of Acids and Bases on Inside Front Cover - same table page 111 (page 101 9th Edition & page 105 - 8th Edition)

Chapter 20 – Amines

Chapter 24 – Amino Acids and Proteins – Read for general background

Problems: answers in "Solutions Manual for Organic Chemistry" for Solomons.

Chapter 20 20.1 to 20.7; 20.10; 20.13; 20.14; 20.19; 20.20

Lecture Outline 5: Amines, Alkaloids, Introduction to Amino Acids

I. Structure and Nomenclature of Amines
- A. Nomenclature
  - 1. Common names - heterocyclic amines
  - 2. Systematic (IUPAC)
- B. Basicity of Amines and Physical Properties

II. Preparation of Amines
- A. Nucleophilic Substitution Reactions (S_N2) on Alkyl Halides and Sulfonates
- B. Reduction of Nitro Compounds
- C. Reductive Amination of Imines Derived from Ketones and Other Amines
- D. Reduction of Alkyl Cyanides (Nitriles) or Amides
- E. Hofmann Degradation of Amides
- F. Gabriel Synthesis

III. Reactions of Amines
- A. Acid-Base Reactions
- B. Alkylation
- C. Acylation (Ammonolysis of Carboxylic Acid Derivatives to Form Amides)
- D. Reaction with Nitrous Acid
  - 1. Aliphatic Amines
  - 2. Aromatic Amines - Reactions of Diazonium Salts
    - a. Replacement reactions
    - b. Coupling reactions

IV. Some Alkaloids in Nature and Their Importance

V. General Structure and Properties of Amino Acids and Peptides,