

Chem 261
Assignment & Lecture Outline 2:
Alkanes & Alkyl Halides – Isomerism & Conformations, Halogenation

Read

Organic Chemistry, Solomons, Fryle & Snyder 12th Edition (Electronic)

- Functional Group List – Learn to recognize – Please see Green Handout – also p 76 of text
- Periodic Table – Inside Front Cover - know 1st 10 elements (up through Neon)
- Relative Strength of Acids and Bases – Inside Front cover (reference only)
- Chapter 4 – Nomenclature and Conformations of Alkanes (Isomerism and Conformations)
- Chapter 10 – Radical Reactions (Halogenation of Alkanes, Thermodynamics & Kinetics)

Problems:

Do **Not** turn in, answers available in "Study Guide Student Solutions Manual " Solomons, Fryle, Snyder

- **Chapter 4:** 4.1 to 4.3 to 4.6; 4.8a-d; 4.13; 4.16-4.18; 4.23a-h; 4.24a-c and f
- **Chapter 10:** 10.1; 10.2; 10.4; 10.6 to 10.8; 10.15

Lecture Outline # 2

I. Introduction

- A. Formula Conventions
- B. Nomenclature
 - 1. Common Names
 - 2. International Systems – IUPAC
 - 3. Cycloalkanes

II. Sources of Alkanes and Physical Properties

- A. Sources of Hydrocarbons
- B. Physical Properties – boiling point, melting point, solubility
- C. Combustion to CO₂ and H₂O

III. Conformation of Molecules

- A. Non-bonded Interactions in Open-chain hydrocarbons
 - 1. Ethane
 - 2. Butane
- B. Cycloalkane Conformation
 - 1. Cyclopropane
 - 2. Cyclohexane

3. Other cycloalkanes

- C. Substituted Cycloalkanes and Geometrical Isomerism

1. Monosubstituted Cycloalkanes – Conformation
2. Disubstituted Cycloalkanes – Isomerism
3. Polycyclic Cycloalkanes

IV. Chemical Properties of Alkanes

- A. General Properties and Reaction Mechanisms

- B. Halogenation of Alkanes

1. Methane Halogenation
 - a) Mechanism of Chlorination
 - b) Reaction Rates and Transition States
 - c) Reactions with Different Halogens
2. Halogenation of Higher Alkanes and Stability of Radicals
 - a) Inductive Effects
 - b) Hammond Postulate

V. Introduction to Alkyl Halides

- A. Nomenclature

- B. General Properties