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

Read

Organic Chemistry, W. Ogilvie et al. 1st Edition – 2018 – Nelson Ltd.

- Functional Group List – Learn to recognize – Please see Green Handout – also p 76 of text
- Periodic Table – http://www.ptable.com/#Writeup/Wikipedia - know 1st 10 elements (up through Neon) – atomic numbers, atomic weights (2 significant figures), electron configuration
- Relative Strength of Acids and Bases – page 257 (reference only)
- Chapter 2 –Review naming alkanes, alkyl halides (haloalkanes)
- Chapter 3 – Nomenclature and Conformations of Alkanes (Isomerism and Conformations)
- Chapter 19 – Radical Reactions - Halogenation of Alkanes only sections 19.1 to 19.5

Problems:

Do **Not** turn in, answers available in "Study Guide Student Solutions Manual " W. Ogilvie et al.

- **Chapter 2:** review 2.16; 2.23 to 2.25; 2.41
- **Chapter 3:** 3.1 to 3.3; 3.5; 3.7; 3.9; 3.11; 3.13; 3.16 to 3.18; 3.22; 3.23
- **Chapter 19:** 19.1; 19.11

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 CO_2 and H_2O

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