

# Chem 30A

## Week 3 Synopsis:

### alkanes, Conformations, Isomers

Goals and Assignments for Oct. 15 through Oct. 19

- TOPICS:**
- Introduction to alkanes and cycloalkanes
  - (Nomenclature)
  - Conformations of alkanes and cycloalkanes
  - Cis,trans isomerism of cycloalkanes
  - Physical properties of alkanes and cycloalkanes
  - Stereoisomerism and chirality

**GOALS:**

- Be able to identify alkyl groups by their common and IUPAC names
- Be able to identify primary, secondary, tertiary and quaternary carbons
- Be able to use the IUPAC rules (those in ch.2!) to name compounds
- Learn the language of molecular conformations (dihedral angles, staggered, eclipsed, gauche, anti-)
- Be able to draw Newman structures and visualize molecules from Newman structures
- Understand graphs of potential energy vs. dihedral angle, and *why* the potential energy depends on dihedral angles. Understand the terms torsional strain and steric strain.
- For cyclic alkanes, be able to relate the degree of strain to the size of the ring.
- For cyclohexane and substituted cyclohexanes, be able to identify axial and equatorial substituents.
- Be able to visualize and draw the chair and boat conformations of cyclohexane, and to identify significant non-bonded interactions.
- Be able to identify cis/trans isomers in substituted cyclohexanes.
- Be able to name alkanes and cycloalkanes and identify constitutional isomers.

**ASSIGNMENTS:**

Readings: Brown & Foote §2.1-2.9, 3.1, 3.2, 3.9

**PROBLEMS**

- ✓ Brown & Foote: Ch. 2: #18, 21-43, 46, 47, 50, 51, 54, 55-58 (do in conjunction with ChemOfficeWorksheet 2).  
**Ch. 3:** #12, 13, 15-18.
- ✓ ChemOffice Worksheet 2: Do on your own, but do not to hand in.

Vining CD: Optional, but strongly suggested: Supporting Concepts modules on nomenclature of alkanes.

**UPCOMING DATES & DEADLINES:**

REVIEW SESSION for Midterm #1 (covering material through October 19):  
**Monday, Oct. 22, 5:30-7 PM in room CS24 (next door to our lecture room)**

MIDTERM #1: **Wednesday, Oct. 24, 9-9:50 AM, room CS 50 (our lecture room).**