

CH 251, Fall 2008 - Exam #2 Review Sheet

Chapter 4 - Alkanes: Nomenclature, Conformational Analysis, Intro to Synthesis

Types of alkanes (linear, branched, cyclic)

Nomenclature

- alkanes (base names up to 10 carbons)
- branched side chains (systematic method)
- branched side chains (isopropyl, tert-butyl, sec-butyl, isobutyl)
- alkyl halides
- alcohols
- cycloalkanes (including bicyclic systems)
- alkenes (including cis/trans isomerism and cyclic alkenes)
- alkynes

Classification of hydrogens, alkyl halides, and alcohols as 1°, 2°, 3°

Physical properties of alkanes (minor topic)

Sigma bonds and bond rotation (recall no free rotation about pi bonds)

Newman projections (anti, gauche, syn, eclipsed, staggered)

Rotational energy diagrams

Draw 3D pictures - wedge/hatch and Newman projections

- staggered/eclipsed, anti/gauche
- van der Waals strain (steric hindrance)

Cycloalkanes

- basics of ring strain/which rings are strained and which aren't
- conformations of cyclopropane, cyclobutane, cyclopentane
- cyclohexane conformations
- chair vs boat/axial vs equatorial/"ring flips"/1,3-diaxial interactions
- (steric repulsion)/disubstituted and polysubstituted
- cyclohexanes/Newman projections/cis and trans
- stereoisomers (cis and trans again)/relative stabilities

Chapter 5 - Stereochemistry

- Chirality/symmetry/stereogenic centers/chirality centers
- R-S nomenclature
- identical/enantiomers/diastereomers/meso/racemic
- optical activity
- resolution of enantiomers