

Listed below are the major topics of chapters 4-5. Keep in mind that this is only a review sheet. We've covered more material and more details than can be confined to a single page.

Chapter 4: general molecular formula for alkanes; names of the first 10 alkanes; IUPAC nomenclature rules for alkanes; alkyl groups; nomenclature for alkyl halides, alcohols, alkenes, alkynes, cycloalkanes; what are conformations?; staggered vs eclipsed; perspective and sawhorse drawings; Newman projections; dihedral angle; energy diagrams for rotation about a single bond; distinction between torsional strain and steric repulsion; conformations of butane; anti; gauche; generate conformations of a given molecule and make predictions about their relative energies; cycloalkanes; cis versus trans; angle strain; what is the preferred conformation of cyclopentane, why?; chair conformations of cyclohexane; axial versus equatorial; boat, twist, half-chair conformations of cyclohexane; chair inversion; substituted cyclohexanes; what determines a group's preference for axial versus equatorial?; predict which chair conformation is more stable; predict whether a cis or trans substituted cyclohexane is more stable

Chapter 5: identify whether a molecule is chiral or achiral; identify enantiomers, diastereomers, meso compounds; properties of enantiomers; racemic mixture; what is a chirality center?; R and S nomenclature for absolute configuration (Cahn-Ingold-Prelog rules); why is plane polarized light a useful tool?; optical activity, dextrorotatory, levorotatory; relationship of observed rotation and specific rotation; is there a relationship between R and S and (+) and (-)?; what is the max possible number of stereoisomers for a molecule with n chirality centers and m alkenes capable of E/Z?; stereoisomerism in alkenes; cis/trans and E/Z nomenclature for alkenes; stereoisomerism in rings; Fischer projections

You are not responsible for the following sections: 4.14, 4.15, 4.16, 5.9B, 5.10, 5.15, 5.16, 5.17