
Chapter 3. Conformations of Alkanes and Cycloalkanes. This Chapter deals with the shapes of linear and cyclic alkanes. The shape of a molecule is an important feature of its structure and, therefore, plays a crucial role in determining the physical and chemical properties of a molecule. Molecular shape depends on both the way that the atoms in a molecule are bonded to one another and the way that the atoms can position themselves in space relative to one another. Determination of the shape of a molecule through investigation of rotations about a single bond is termed conformational analysis. Molecular models are important for learning how to visualize the shape of molecules. Students are urged to obtain a set of "ball and stick" molecular models or ChemOffice Ltd. molecular modeling computer software (or both). If you plan to go on in chemistry, you will use molecular models quite often.

Assignment for Chapter 3:

Readings: 3.1-3.4, 3.6-3.14, 3.17
In Chapter Problems: 3.4, 3.5, 3.6, 3.8, 3.10
After Chapter Problems: 3.16, 3.17, 3.23, 3.24, 3.37, 3.38

Recommended: Visit the slide show on Chapter 3 on the web. The following modules are on the computers in 310 Havemeyer:

ChemTV
- #06 Ethane Conformations
- #07 Butane Conformations
- #10 Cycloalkanes
- #11 Cyclohexanes

Organic Reaction Mechanisms
- Alkanes: Conformational Analysis

Chapter 4. Alcohols and Alkyl Halides.

This Chapter deals with two functional groups: the hydroxy group (OH), which is characteristic of a family called alcohols, and the halide group (F, Cl, Br, I) which is characteristic of a family called alkyl halides. The previous Chapters introduced us to the structure and dynamics of organic molecules; Chapter 4 introduces us to the reactions of organic molecules. We shall learn to understand reactions through the use of the functional group concept and through the principles of reaction mechanisms.

We've indicated that reactions can be viewed at a very fundamental level as being driven by the simple tendency of positively polarized atoms to begin bonding with negatively polarized atoms. The principles of acid-base concepts (making and breaking bonds to protons) will be reviewed to gain some intuition about chemical reactivity in making and breaking bonds to carbon. We'll learn how to synthesize some simple functional groups and how to analyze the mechanism of some fundamental reactions.
Assignment for Chapter 4:

Read all.
In chapter problems: 4.12, 4.14, 4.16, 4.17, 4.19
After chapter problems: 4.27, 4.28, 4.29, 4.30, 4.31, 4.32, 4.34, 4.35, 4.41, 4.45, 4.46.

Recommended: Visit the slide show on Chapter 4 on the web. The following modules are on the computers in 310 Havemeyer:

ChemTV
- #12 SN2 Mechanism
- #13 SN1 Mechanism
- #17 Free Radical Halogenation

Organic Reaction Mechanisms
- Alcohols and Ethers
  a) preparation of alcohol from halide, SN2; b) preparation of alcohol from halide; c) SN1 reaction of alcohol from HBr
- Alkanes
  a) methane with Chlorine; b) general reaction, methane with X2
- Carbocations
  a) rearrangement with hydride shift; b) stablization mechanisms


This Chapter deals with one of the carbon-carbon (C=C) double bonds as a functional group. We'll discuss the structure of the C=C bond, a stereochemical isomerization resulting from its structure, and how to synthesize C=C bonds.

Assignment for Chapter 5

Read all.
In chapter problems: 5.8, 5.11, 5.12, 5.13, 5.14, 5.15, 5.16-5.20
After chapter problems: 5.25, 5.26, 5.28, 5.29, 5.30, 5.31, 5.32, 5.33, 5.35, 5.37, 5.39, 5.40, 5.41, 5.42

Recommended: Visit the slide show on Chapter 3 on the web. The following modules are on the computers in 310 Havemeyer:

ChemTV:
- #15 E2 reactions
- #16 E1 reactions

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Organic Reaction Mechanisms:
- Elimination Reactions
  a) dehydration of n-butyl alcohol; b) E1 mechanism; c) E2 mechanism; d) proton loss from carbocations
- Carbocations
  a) rearrangement with hydride shift; b) rearrangement forming an alkene