

## CHAPTER OVERVIEW

### 2: STRUCTURE AND PROPERTIES OF ORGANIC MOLECULES

#### LEARNING OBJECTIVES

After reading this chapter and completing ALL the exercises, a student can **be able to**

- define the terms "sterics" and "electrostatics" - refer to section 2.1
- write and interpret molecular orbital (MO) diagrams - refer to section 2.2
- predict the hybridization and geometry of atoms in a molecule - refer to section 2.3
- draw accurate 3-D representations of molecules with approximate bond angles - refer to section 2.3
- recognize conjugated pi bond systems - refer to section 2.4
- recognize that benzene is aromatic - refer to section 2.4
- identify the orbitals occupied by lone pair electrons - refer to section 2.5
- distinguish between bonds that can rotate and those that cannot - refer to section 2.6
- recognize the relationships between constitutional (structural) isomers, conformational isomers, and geometric isomers - refer to section 2.7
- apply the homologous series to organic molecules with 1-10 carbons - refer to section 2.8
- classify hydrocarbons as saturated or unsaturated - refer to section 2.8
- classify hydrocarbons as alkanes, alkenes, alkynes, cycloalkanes, or aromatics (arenes) - refer to section 2.8
- recognize and classify the common functional groups of organic chemistry (alkanes, alkenes, alkynes, alkyl halides, alcohols, amines, ethers, aldehydes, ketones, carboxylic acids, esters, and amides - refer to section 2.9
- determine the dominant intermolecular forces (IMFs) of organic compounds - refer to section 2.10
- predict the relative boil points of organic compounds - refer to section 2.11
- predict whether a mixture of compounds will form homogeneous or heterogeneous solution - refer to section 2.12
- distinguish between organic compounds that are H-bond donors versus H-bond acceptors - refer to section 2.13
- apply the terms sterics and electrostatics to organic compounds - refer to sections 2.1- 2.13

[2.1: Pearls of Wisdom](#)

[2.2: Molecular Orbital \(MO\) Theory \(Review\)](#)

[2.3: Hybridization and Molecular Shapes \(Review\)](#)

[2.4: 2.4 Conjugated Pi Bond Systems](#)

[2.5: Lone Pair Electrons and Bonding Theories](#)

[2.6: Bond Rotation](#)

[2.7: Isomerism Introduction](#)

[2.8: Hydrocarbons and the Homologous Series](#)

[2.9: Organic Functional Groups](#)

[2.10: Intermolecular Forces \(IMFs\) - Review](#)

[2.11: Intermolecular Forces and Relative Boiling Points \(bp\)](#)

[2.12: Intermolecular Forces and Solubilities](#)

[2.13: Additional Practice Problems](#)

[2.14: Organic Functional Groups- H-bond donors and H-bond acceptors](#)

[2.15: Solutions to Additional Exercises](#)

[2.16: Additional Exercises](#)

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