

CHAPTER OVERVIEW

3: FUNCTIONAL GROUPS AND NOMENCLATURE

learning objectives

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

- use R groups to draw generic functional groups - refer to section 3.1
- name alkanes, cycloalkanes, alkenes, alkynes, alkyl halides, ethers, alcohols, amines, benzene and its derivatives, aldehydes, ketones, amines, carboxylic acids, and carboxylic acid derivatives using IUPAC (systematic) and selected common name nomenclature - refer to sections 3.2 - 3.14
- draw the structure of alkanes, cycloalkanes, alkenes, alkynes, alkyl halides, ethers, alcohols, amines, benzene and its derivatives, aldehydes, ketones, amines, carboxylic acids, and carboxylic acid derivatives from the IUPAC (systematic) and selected common names - refer to sections 3.2 - 3.14
- classify alkyl halides, alcohols and amines - refer to sections 3.5, 3.8, and 3.12 respectively.

A Pearl of Wisdom: Most common names were derived from older systems of nomenclature that some may argue were "not systematic at all". However, it is helpful to note that the older systems of nomenclature were often based on shared structural features and/or chemical reactivity. Learning carefully selected common names can offer insights into chemical reactivity and structural patterns. Additionally, there are some common names that are so prevalent, they need to be memorized.

Please note: The nomenclature for organic compounds with sulfur and phosphorus are introduced so that students can interpret a given name and draw the correct structure. Derivation of names can be required by the professor and requires additional instruction.

[3.1: Generic \(Abbreviated\) Structures \(aka R Groups\)](#)

[3.2: Overview of the IUPAC Naming Strategy](#)

[3.3: Alkanes](#)

[3.4: Cycloalkanes](#)

[3.5: Haloalkane - Classification and Nomenclature](#)

[3.6: Alkenes](#)

[3.7: Alkynes](#)

[3.8: 3.8 Alcohols - Classification and Nomenclature](#)

[3.9: Ethers, Epoxides and Sulfides](#)

[3.10: Benzene and its Derivatives](#)

[3.11: Aldehydes and Ketones](#)

[3.12: Amines - Classification and Nomenclature](#)

[3.13: Carboxylic Acids](#)

[3.14: The Carboxylic Acid Derivatives](#)

[3.15: Additional Exercises](#)

[3.16: Solutions to Additional Exercises](#)

[3.17: Appendix - IUPAC Nomenclature Rules](#)

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