

Activity 16: Functional Groups

Learning Objectives

Part 1 *Identify the functional groups in the hydrocarbon families*

Part 2 *Recognize and identify common organic functional groups in a molecule*

Part 1. Meet the Hydrocarbons

Estimated Completion Time 45 Minutes

Instructor Information

The purpose of this activity is to *introduce* basic organic functional groups to the students, focusing on hydrocarbons. These groups are reinforced in future activities as biomolecules are introduced.

ANSWERS TO QUESTIONS

Part 1. Meet the Hydrocarbons

1. a. inorganic b. organic c. organic d. inorganic
2. All the molecules contain only hydrogen and carbon.
3. Carbon–carbon and carbon–hydrogen bonds are nonpolar; therefore, all the molecules in the set are nonpolar.
4. The information states that the functional group is the reactive part of the molecule and that nonpolar molecules are not very reactive, so the conclusion is that hydrocarbons are not very reactive.

5.

Family	Molecule Number(s)
Alkane	I, VII
Alkene	II, VI
Aromatic	IV
Alkyne	III, V

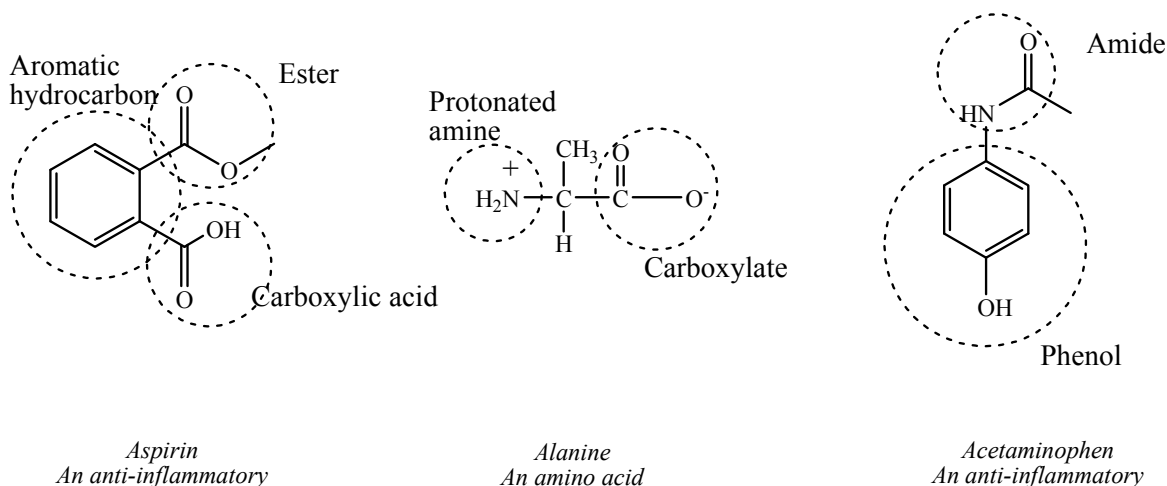
6. Molecule IV has all trigonal planar carbons, so the molecule itself is trigonal planar.
7. Both representations at the left show that each of the carbons in the benzene ring contain a double bond. Because it is not possible to distinguish which bonds are where, the representation at the right can be used to show that all the carbons are part of double bonds.

Activity 16: Skill Development—Meet the Hydrocarbons

- a. alkene, alkyne b. aromatic c. all alkene d. alkyne
- C_6H_{12} . The formula for a cycloalkane has two fewer Hs because the ends are bonded together.

Part 2. Identifying Functional Groups

1.



2. The local anesthetics all contain a nonpolar portion, a carbonyl group linking the central part of the molecule (either amide or ester), and an amino group on one end.

Activity 16: Skill Development—Identifying Functional Groups

