

Chapter 9 Carbon Chemistry

Section 9.1 Carbon Compounds**(pages 262–269)**

This section describes different forms of carbon that exist in nature. It also discusses saturated and unsaturated hydrocarbons. It explains the formation of fossil fuels and describes the products of their combustion.

Reading Strategy (page 262)

Previewing Before you read, use the models in Figure 2 to describe the arrangement of carbon atoms in each form of carbon. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

Forms of Carbon	
Diamond	Rigid, three-dimensional network
Graphite	Widely spaced layers
Buckminsterfullerene	Hollow spheres with a surface of carbon atoms arranged in alternating hexagons and pentagons

1. The two elements that all organic compounds contain are carbon and _____ . Circle the correct answer.

hydrogen oxygen nitrogen

2. Circle the letter of the approximate percentage of all known compounds that are organic compounds.

a. 30 percent
b. 60 percent
 c. 90 percent

Forms of Carbon (page 263)

3. Circle the letter of each form of carbon.

a. soot b. diamonds c. fullerenes

4. A network solid is a solid in which all the atoms are linked by covalent bonds.

Saturated Hydrocarbons (pages 264–265)

5. Is the following sentence true or false? A hydrocarbon is an organic compound that contains carbon, hydrogen, and oxygen. false

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6. The number of carbon atoms and how they are arranged determine the properties of a hydrocarbon.
7. Circle the letter of the correct answer. What does a structural formula show that a molecular formula does not?
- the type of atoms in the compound
 - the number of atoms in a molecule of the compound
 - the arrangement of atoms in the compound
8. Define isomers. Isomers are compounds that have the same molecular formula but different structural formulas.

Unsaturated Hydrocarbons (page 266)

9. Circle the letter of each type of unsaturated hydrocarbon.
- a. alkene b. alkane c. alkyne
10. Circle the letter of the most reactive type of hydrocarbon.
- alkanes
 - alkynes
 - aromatic hydrocarbons

Fossil Fuels (page 267–268)

11. Define fossil fuels. Fossil fuels are mixtures of hydrocarbons that formed from the remains of plants or animals.
12. Circle the letter of each fossil fuel.
- a. coal b. natural gas c. ferns

Combustion of Fossil Fuels (pages 268–269)

13. Circle the letter of each primary product of the complete combustion of fossil fuels.
- a. carbon dioxide b. sulfur dioxide c. water
14. When an insufficient amount of oxygen is available for complete combustion of a fossil fuel, one product of the combustion reaction is the deadly gas _____. Circle the correct answer.
- carbon dioxide carbon monoxide carbonic acid