

22.4

HYDROCARBON RINGS

Section Review

Objectives

- Identify cyclic ring structures
- Describe bonding in benzene

Vocabulary

- cyclic hydrocarbons
- aromatic compound

Part A Completion

Use this completion exercise to check your understanding of the concepts and terms that are introduced in this section. Each blank can be completed with a term, short phrase, or number.

- Compounds with hydrocarbon rings are called 1 **1.** _____
- hydrocarbons. Benzene is the simplest form of an 2 **2.** _____
- compound. The benzene molecule consists of 3 carbons **3.** _____
- joined in a ring with a 4 atom attached to each carbon. **4.** _____
- Two different structures can be written for benzene in which **5.** _____
- 5 and single bonds alternate. The actual bonding in **6.** _____
- benzene does not alternate between the 6 structures. **7.** _____
- Many substituted benzenes have common names. 7 **8.** _____
- is also called toluene, while the dimethylbenzenes are known as **9.** _____
- 8 . 1,2-disubstitution on a benzene ring is also known as **10.** _____
- 9 disubstitution, while 1,3 is known as 10 , and 1,4 is **11.** _____
- known as 11 disubstitution.

Part B True-False

Classify each of these statements as always true, AT; sometimes true, ST; or never true, NT.

- _____ 12. Aromatic compounds contain 6 carbon atoms.
- _____ 13. Benzene is the simplest arene.
- _____ 14. Compounds that contain rings are aromatic hydrocarbons.
- _____ 15. Another name for 1,3-dimethylbenzene is *m*-xylene.
- _____ 16. Aromatic compounds have pleasant odors.

Part C Matching

Match each description in Column B to the correct term in Column A.

Column A

Column B

- | | |
|-------------------------------|--|
| _____ 17. cyclic hydrocarbons | a. when two or more equally valid structures can be drawn for a molecule |
| _____ 18. resonance | b. group of hydrocarbons that contain a benzene ring or a ring with bonding like that of benzene |
| _____ 19. phenyl group | c. name given to a benzene ring when it is a substituent |
| _____ 20. aromatic compounds | d. organic compounds that contain hydrocarbon rings |

Part D Problems

Answer the following in the space provided.

21. Draw the structural formula for propylbenzene.
22. Draw the structural formula for 3-phenyl-1-butene.

23. Name the following compounds, using the IUPAC system.

