

Part A: Intro to Organic Chem

1. Organic Chemistry is the study of compounds that contain _____.
2. Carbon with its 4 valence electrons forms _____ bonds.
3. Hydrocarbons are organic compounds that contain only _____ and _____.
4. What are the differences for the hydrocarbons listed below?
 - a. Alkanes
 - b. Alkenes
 - c. Alkynes
 - d. Aromatics

What are the generic formulas for the hydrocarbons a-c listed above?

Part B: Drawing Organic Compounds and Identifying Isomers

5. Draw the molecule C_5H_{12} . Draw the structural form, the condensed form and the skeleton form below.

Is there another way (or ways) to draw C_5H_{12} in which the atoms are connected differently? Does C_5H_{12} have structural isomers? Draw the structural isomers on the next page.

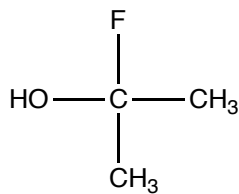
Structural isomers for pentane, C_5H_{12} :

6. Draw the molecule C_3H_6 . Draw the structural form, the condensed form and the skeleton form below.

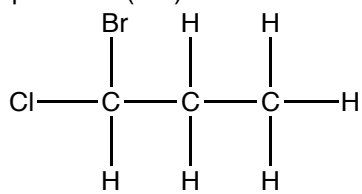
7. Draw the molecule C_3H_4 . Draw the structural form, the condensed form and the skeleton form below.

Part C: Optical Isomers of Organic Compounds

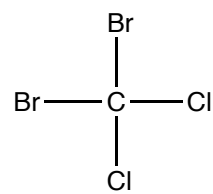
8. Which of the following compounds is(are) chiral?



A

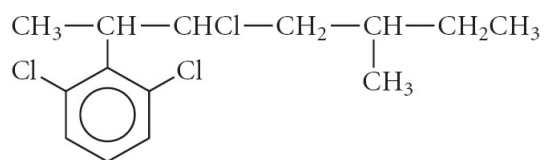


B

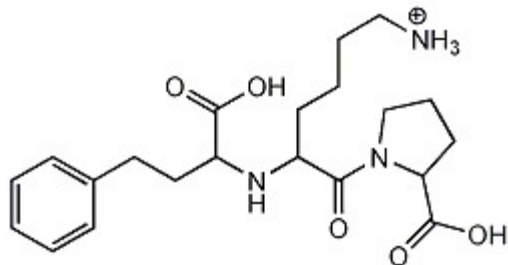


C

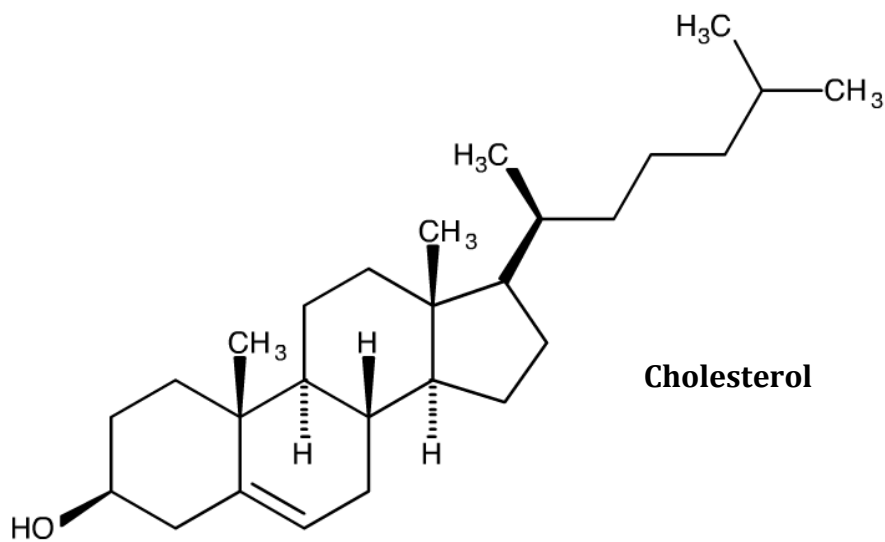
9. How many of the carbons in the following compound are chiral center(s)?



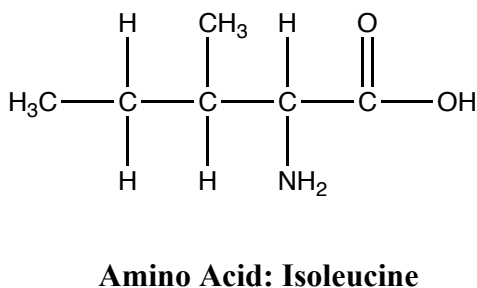
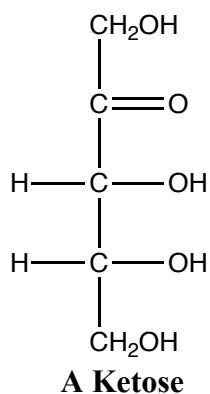
10. How many chiral carbon atoms can you find in the molecule below? A little challenging because the skeleton of the structure is shown.



11. This one is hard but good practice! Below is the skeleton structure for cholesterol. There are 8 chiral carbons. Can you find all of them?



12. Many biologically active molecules are chiral. Two examples are naturally occurring amino acids (the building blocks of proteins) and sugars and ketoses (a type of monosaccharide), which are important fuel molecules and nucleic acid building blocks. How many chiral centers can you find in the ketose and amino acid listed below?



13. If you have time, draw all the isomers for hexane.

There are five structural isomers of C₆H₁₄:

