

8.1

MOLECULAR COMPOUNDS

27219

Section Review

Objectives

- Distinguish molecular compounds from ionic compounds
- Identify the information a molecular formula provides

Vocabulary

- covalent bond
- diatomic molecule
- molecular compound
- molecular formula

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.

- Every substance is either an element or a(n) 1. compound.
- A compound is either 2. molecular or ionic in nature. Most molecular compounds are composed of two or more 3. non-metal atoms. Molecules consisting of two atoms are 4. diatomic. The chemical formula of a molecular compound is a 5. molecular formula. Molecular compounds tend to have 6. lower melting and boiling points, while ionic compounds tend to have 7. high melting and boiling points. A molecular formula shows how many 8. atoms of each element a molecule contains, but it does not indicate the 9. structure or charge or lowest whole # ratio of the molecule.

Part B True-False

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

NT or ST 10. A diatomic molecule contains two or three atoms.

NT 11. Molecular compounds have relatively high boiling points.

AT 12. The molecular structure of carbon dioxide is one carbon atom with two oxygen atoms on opposite sides of it.

NT 13. Covalent bonds exist when combining atoms give up or accept electrons.

ST 14. A molecule contains two atoms.

Part C Matching

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

- | Column A | Column B |
|---------------------------------|---|
| <u>F</u> 15. molecule | a. compound composed of molecules |
| <u>A</u> 16. molecular compound | b. a molecule consisting of two atoms |
| <u>D</u> 17. covalent bond | c. shows the kinds and numbers present in a molecule of a compound |
| <u>B</u> 18. diatomic molecule | d. joins atoms held together by sharing electrons |
| <u>C</u> 19. molecular formula | e. an electrically neutral group of atoms joined together by covalent bonds |

Part D Questions and Problems

Answer the following in the space provided.

20. A compound has a boiling point of 40°C. Is this compound most likely an ionic or a molecular compound?
molecular 40°C is low. $\frac{9}{5}(40) + 32 = 104^\circ\text{F}$
21. Identify the number and kinds of atoms present in a molecule of each compound.
- a. butane (C₄H₁₀) 4 Carbon 10 Hydrogen
- b. fluorobenzene (C₆H₅F) 6 Carbon 5 H 1 F
22. Classify each particle as an atom or a molecule.
- | | | | |
|--------------------|-----------------|--------------------|-----------------|
| a. CH ₄ | <u>molecule</u> | d. He | <u>atom</u> |
| b. Ne | <u>atom</u> | e. CO ₂ | <u>molecule</u> |
| c. O ₂ | <u>molecule</u> | | |