

9.5

THE LAWS GOVERNING FORMULAS AND NAMES

Section Review

Objectives

- Define the laws of definite proportions and multiple proportions
- Apply the rules for writing chemical formulas by using a flowchart
- Apply the rules for naming chemical compounds by using a flowchart

Vocabulary

- law of definite proportions
- law of multiple proportions

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. [Use Figure 9.20 to complete this exercise.]

- The law of 1 states that in samples of any chemical compound, the masses of the elements are always in the same 2. The law of 3 states that whenever the same two elements form more than one compound, the different masses of one element that combine with the same mass of the other element are in the ratio of 4 numbers.
- H_3PO_4 is a(n) 5. It is called 6.
- CCl_4 is not a(n) 7. It contains two elements, so it is a 8 compound. It does not contain a metal, so it is a binary 9 compound. The compound is called 10.
- $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2$ is not a(n) 11. It contains more than two 12. $\text{C}_2\text{H}_3\text{O}_2^-$ is a polyatomic 13. Pb is a Group 14 metal. The compound is called 15.
1. _____
 2. _____
 3. _____
 4. _____
 5. _____
 6. _____
 7. _____
 8. _____
 9. _____
 10. _____
 11. _____
 12. _____
 13. _____
 14. _____
 15. _____

Part B True-False

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

- _____ 16. Roman numerals are used when naming Group B metal cations.
- _____ 17. Names of compounds containing polyatomic anions end in *-ide*.
- _____ 18. Prefixes are used when naming binary ionic compounds.
- _____ 19. Compounds containing two elements are called binary compounds.

Part C Questions and Problems

Answer the following in the space provided.

20. Name the following compounds.

- a. $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_4$ _____
- b. HF _____
- c. P_2O_5 _____
- d. LiBr _____

21. Write formulas for the following compounds.

- a. phosphorus pentachloride _____
- b. iron(II) oxide _____
- c. nitric acid _____
- d. potassium chloride _____
- e. calcium nitrate _____