

Chapter 9.5

Laws of Definite and Multiple Proportions

Law of definite proportions: in samples of any chemical compound, the masses of the elements are always in the same proportions.

Note: This is consistent with Dalton's atomic theory.

Atoms combine in simple whole-number ratios. If the ratios of the atoms are fixed then the ratio of their masses must be fixed as well.

Law of multiple proportions: 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 small whole numbers.

Sketch Figure 9.16 into your notes. Be sure to write the text that corresponds with the figure.

Copy the example problem on page 291 into your notes. Now try problems 48 and 49.

Practicing Skills: Chemical Names and Formulas

Naming chemical compounds

1. Follow the rules for naming acids when H is the first element in the formula.
 - a. Write the rules for naming acids.
2. If the compound is binary, generally the name ends with the suffix *-ide*. If the compound is a molecular binary compound, use prefixes to indicate the number of atoms.
3. When a polyatomic ion that includes oxygen is in the formula, the compound name generally ends in *-ite* or *-ate*.
4. If the compound contains a metallic cation that can have different ionic charges, use a Roman numeral to indicate the numerical value of the ionic charge in the compound.

Draw figure 9.18

Writing chemical formulas

1. An *-ide* ending generally indicates a binary compound.

2. An *-ite* or *-ate* ending means a polyatomic ion that includes oxygen is in the formula.
3. Prefixes in a name generally indicate that the compound is molecular.
4. A Roman numeral after the name of a cation shows the ionic charge of the cation.

Draw figure 9.18