Chemical Symbols and Formulas

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CHAPTER 1

Chemical Symbols and Formulas

Learning Objectives

- Define chemical symbol.
- Define chemical formula.
- Give the Latin name for elements that use the Latin name for their symbol.

How do chess players monitor their moves in a game?

Suppose you were walking along and noticed a piece of paper on the ground with markings on it. You pick it up and see the paper in the picture above.To most people, these notes are meaningless (maybe they're a secret spy code). But to a chess player, these symbols tell the story of a chess game. Each abbreviation describes a chess piece or a move during the game. The use of special symbols allows us to "see" the game without having to read a wordy and possibly incomplete description of what happened.

FIGURE 1.1
Chess game.

Chemical Symbols and Formulas

In order to illustrate chemical reactions and the elements and **compounds** involved in them, chemists use symbols and formulas. A **chemical symbol** is a one-or two-letter designation of an element. Some examples of chemical symbols are "O" for oxygen, "Zn" for zinc, and "Fe" for iron. The first letter of a symbol is always capitalized. If the symbol contains two letters, the second letter is lower case. The majority of elements have symbols that are based on their English names. However, some of the elements that have been known since ancient times have maintained symbols that are based on their Latin names, as shown in **Table** 1.1.

TABLE 1.1: Symbols and Latin Names for Elements

Chemical Symbol	Name	Latin Name

TABLE 1.1: (continued)

Na	sodium	natrium
K	potassium	kalium
Fe	iron	ferrum
Cu	copper	cuprum
Ag	silver	argentum
Sn	tin	stannum
Sb	antimony	stibium
Au	gold	aurum
Pb	lead	plumbum

Compounds are combinations of two or more elements. A **chemical formula** is an expression that shows the elements in a compound and the relative proportions of those elements. Water is composed of hydrogen and oxygen in a two to one ratio. The chemical formula for water is H_2O. Sulfuric acid is one of the most widely produced chemicals in the Unites States and is composed of the elements hydrogen, sulfur, and oxygen. The chemical formula for sulfuric acid is H_2SO_4.

Summary

- A chemical symbol is a one- or two-letter designation of an element.
- Compounds are combinations of two or more elements.
- A chemical formula is an expression that shows the elements in a compound and the relative proportions of those elements.
- Many elements have symbols that derive from the Latin name for the element.

Vocabulary

- **chemical formula:** An expression that shows the elements in a compound and the relative proportions of those elements.
- **chemical symbol:** A one- or two-letter designation of an element.
- **compound:** Are combinations of two or more elements.

References

1. Roland Scheicher. http://commons.wikimedia.org/wiki/File:Immortal_game.jpg . Public Domain