

CHAPTER 2 LEARNING OBJECTIVES

To satisfy the minimum requirements for this course, you should be able to:

Apply the fundamental principles of atomic structure to:

- describe the composition of an atom in terms of protons, neutrons, and electrons
- give the approximate size, relative mass, and charge of a proton, neutron, and electron
- explain the significance of Rutherford's experiment on the scattering of alpha particles in the experimental determination of the nuclear nature of the atom
- define atomic number, mass number, and isotope

Understand the organization of the periodic table and be able to:

- define group (or family) and period
- identify the following groups: 1A (alkali metals); 2A (alkaline earth metals); 7A (halogens); 8A (noble gases)
- identify an element as a metal, nonmetal, or metalloid
- write the symbol and charge for an atom or ion, having been given the number of protons and electrons, and perform the reverse operation
- write the symbol for an isotope given its atomic number and mass number
- predict the charges of monatomic ions (Figure 2.11)

Understand how molecular and empirical formulas are used to convey chemical information and be able to:

- explain the differences among molecular compounds, ionic compounds, acids, and bases
- explain the differences among molecular formulas, empirical formulas, and structural formulas
- write the empirical formula for an ionic compound given the charges of its component ions

Explain how chemicals are systematically named and learn:

- the names and formulas of the common cations and anions listed in General Chemistry Pro-knowledge
- how to name simple ionic compounds, binary molecular compounds, binary acids and oxoacids
- the names of the first ten alkane hydrocarbons (Table 2.8 and General Chemistry Pro-knowledge)

Discuss the general features of hydrocarbons and understand the relationship between straight-chain and branched-chain hydrocarbons