# CHAPTER HIGHLIGHTS

## History of the Periodic Table

**Vocabulary**
periodic law
periodic table
lanthanide
actinide

- The periodic law states that the physical and chemical properties of the elements are periodic functions of their atomic numbers.
- The periodic table is an arrangement of the elements in order of their atomic numbers so that elements with similar properties fall in the same column.
- The columns in the periodic table are referred to as groups.

## Electron Configuration and the Periodic Table

**Vocabulary**
alkali metals
alkaline-earth metals
transition elements
main-group elements
halogens

- The rows in the periodic table are called periods.
- Many chemical properties of the elements can be explained by the configurations of the elements' outermost electrons.
- The noble gases exhibit unique chemical stability because their highest occupied levels have an octet of electrons, $ns^2np^6$ (with the exception of helium, whose stability arises from its highest occupied level being completely filled with two electrons, $1s^2$).
- Based on the electron configurations of the elements, the periodic table can be divided into four blocks: the *s* block, the *p* block, the *d* block, and the *f* block.

## Electron Configuration and Periodic Properties

**Vocabulary**
atomic radius
ion
ionization
ionization energy
electron affinity
cation
anion
valence electrons
electronegativity

- The groups and periods of the periodic table display general trends in the following properties of the elements: electron affinity, electronegativity, ionization energy, atomic radius, and ionic radius.
- The electrons in an atom that are available to be lost, gained, or shared in the formation of chemical compounds are referred to as valence electrons.
- In determining the electron configuration of an ion, the order in which electrons are removed from the atom is the reverse of the order given by the atom's electron-configuration notation.