Chapter 7 Electron Structure of the Atom
Learning Objectives

Introduction

- Describe the different types of light that you see in your environment.

7.1 Electromagnetic Radiation and Energy

- Describe properties of light (electromagnetic radiation) including wavelength, frequency, and energy.
- Put types of visible light in order of increasing wavelength, frequency, or energy.
- Explain relationships among wavelength, frequency, energy, Plank's constant, and the speed of light.
- Determine quantities (energy, frequency, and wavelengths) for various forms of electromagnetic radiation using appropriate units.
- Distinguish between continuous and line (emission) spectra.

7.2 The Bohr Model of the Hydrogen Atom

- Describe the behavior of an electron in a hydrogen atom
- Explain the significance of quantization of energy.
- Explain the role of atomic spectra in the development of the modern model of the atom.
- Explain the origin of the four lines that appear in the visible spectrum for hydrogen.

7.3 The Modern Model of the Atom

- Describe the ground state distribution of electrons in an atom in terms of orbitals, sublevels, and principle energy levels using appropriate rules/principles.
- Write the notation for the complete electronic configuration of any atom.

7.4 Periodicity of Electron Configurations

- Describe how the arrangement of electrons in atoms relates to the arrangement of elements in the periodic table.
- Write the notation for the abbreviated electronic configuration of any atom.

7.5 Valence Electrons for the Main-Group Elements

- Identify the chemically important electrons in an atom.
- Distinguish between core and valence electrons in an atom.
- Determine the number of valence electrons in an atom of a main-group element.

7.6 Electron Configurations for Ions

- Describe how the electron arrangements in ions differ from the electron arrangements in atoms.
- Identify atoms and ions that are isoelectronic.
- Write the notation for the complete or abbreviated electronic configuration of any monatomic ion.

7.7 Periodic Properties of Atoms

- Explain how properties of atoms are related to their electron arrangements.
- Describe and explain periodic trends in atomic radius.
- Describe and explain periodic trends in sizes of ions.