

CHAPTER 7 LEARNING OBJECTIVES

1. Perform calculations using the relationship $\lambda \cdot \nu = c$ and $E = h \cdot \nu$.
2. Explain Planck's quantum theory.
3. Explain the photoelectric effect.
4. Calculating wavelengths and energies of electronic transitions of the Balmer series for hydrogen from the emission spectrum.
5. Describe atomic orbitals and electron density for atoms.
6. Use the four quantum numbers used to describe electrons in an atom and the shapes of the *s*, *p*, and *d* orbitals.
7. Understand Heisenberg's Uncertainty Principle.
8. Describe the Pauli exclusion principle and Hund's rule and using them to write the ground state electronic configuration for any element or ion.
9. Explain the relative sizes of atoms based on their positions in the periodic table.
10. Describe how the radii of ions relate to those of atoms (Figure 7.23).
11. Explain the concept of an isoelectronic series and the changes in ionic radius within such a series.
12. Define ionization energy and electron affinity.
13. Explain the observed changes in values of the successive ionization energies for a given atom (Table 7.8).
14. Describe the first ionization energies among the elements, as shown in Figure 7.24.
15. Discuss lattice energy and the energy changes that occur during the formation of an ionic compound from its elements.

Review the "In Closing" and "Key Terms" sections of Chapter 7 (pages 323-325).