

## 14

## CHEMICAL PERIODICITY

## PRACTICE PROBLEMS

In your notebook, write solutions for each of the following problems.

**SECTION 14.1 CLASSIFICATION OF THE ELEMENTS**

1. Use the periodic table to write the electron configuration for silicon.
2. Use the periodic table to write the electron configuration for iodine.
3. Which family of elements is characterized by an  $s^2p^3$  configuration?
4. Name the element that matches the following description:
  - a. one that has 5 outer electrons on the third period of the periodic table
  - b. one with a  $4s^24p^5$  electron configuration
  - c. the 4<sup>th</sup> period Group 6A element
5. Identify the elements that have the following outer electron configurations?
  - a.  $2s^22p^4$
  - b.  $4s^2$
  - c.  $3d^{10}4s^2$
6. What is the common characteristic of the electron configurations of the elements Ne and Ar? In which Group would you find them?
7. Why would you expect lithium (Li) and sulfur (S) to have different chemical and physical properties?
8. What characterizes silver (Ag) and iron (Fe) as transition metals?

**SECTION 14.2 PERIODIC TRENDS**

1. Explain why a magnesium atom is smaller than atoms of both sodium and calcium.
2. Predict the size of the astatine (At) atom compared to that of tellurium (Te).
3. Would you expect a  $\text{Cl}^-$  ion to be larger or smaller than an  $\text{Mg}^{2+}$  ion? Explain.
4. Which effect on atomic size is more significant, the nuclear charge or the energy level that electrons are filling? Explain.
5. Explain why the sulfide ion ( $\text{S}^{2-}$ ) is larger than the chloride ion ( $\text{Cl}^-$ ).
6. Compare the ionization energy of sodium to that of potassium.
7. Explain the difference in ionization energy between lithium and beryllium.
8. Will the electronegativity of barium be larger or smaller than that of strontium?
9. What is the most likely ion for magnesium to become when it bonds with other atoms?
10. Arrange oxygen, fluorine, and sulfur in order of increasing electronegativity.