

## 15

**IONIC BONDING AND IONIC COMPOUNDS**  
**PRACTICE PROBLEMS**

Read each question or statement and respond in your notebook.

**SECTION 15.1 ELECTRON CONFIGURATION IN IONIC BONDING**

- For each element below, state (i) the number of valence electrons in the atom, (ii) the electron dot formula, and (iii) the chemical symbol(s) for the most stable ion.
  - Ba
  - I
  - K
- How many valence electrons does each atom have?
  - gallium
  - fluorine
  - selenium
- Write the electron configuration for each of the following atoms and ions.
  - Ca
  - chlorine atom
  - $\text{Na}^+$
  - phosphide ion
  - $\text{O}^{2-}$
- What is the relationship between the group number of the representative elements and the number of valence electrons?
- How many electrons will each element gain or lose in forming an ion? State whether the resulting ion is a cation or anion.
  - strontium
  - aluminum
  - tellurium
  - rubidium
  - bromine
  - phosphorous

**SECTION 15.2 IONIC BONDS**

- Use electron dot structures to predict the formula of the ionic compounds formed when the following elements combine.
  - sodium and bromine
  - sodium and sulfur
  - calcium and iodine
  - aluminum and oxygen
  - barium and chlorine
- Name the compounds formed when the following elements combine.
  - magnesium and oxygen
  - sodium and fluorine
  - lithium and hydrogen
- Which of these combinations of elements are most likely to react to form ionic compounds?
  - sodium and magnesium
  - barium and sulfur
  - potassium and iodine
  - oxygen and argon
- What is the meaning of coordination number?
- How is the coordination number determined?

## SECTION 15.3 BONDING IN METALS

1. What is a metallic bond?
2. How is the electrical conductivity of a metal explained by metallic bonds?
3. Are metals crystalline? Explain.
4. Give three possible crystalline arrangements of metals. Describe each.
5. What is an alloy?
6. Name the principal elements present in each of the following alloys.
  - a. brass
  - b. bronze
  - c. stainless steel
  - d. sterling silver
  - e. cast iron
  - f. spring steel