

**7**

**IONIC AND METALLIC BONDING**

**Practice Problems**

In your notebook, answer the following.

**SECTION 7.1 IONS**

- For each element below, state (i) the number of valence electrons in the atom, (ii) the electron dot structure, and (iii) the chemical symbol(s) for the most stable ion.
  - a. Ba  $2/\ddot{\text{Ba}}/\text{Ba}^{2+}$
  - b. I  $7/\ddot{\text{I}}/\text{I}^-$
  - c. K  $1/\ddot{\text{K}}/\text{K}^+$
- How many valence electrons does each of the following atoms have?
  - a. gallium  $3$
  - b. fluorine  $7$
  - c. selenium  $6$
- Write the electron configuration for each of the following atoms and ions.
  - a. Ca  $[\text{Ar}]4s^2$
  - b. chlorine atom  $[\text{Ne}]3s^23p^5$
  - c.  $\text{Na}^+$   $[\text{Ne}]$
  - d. phosphide ion  $[\text{Ar}]$
  - e.  $\text{O}^{2-}$   $[\text{Ne}]$
- What is the relationship between the group number of the representative elements and the number of valence electrons? Equal
- How many electrons will each element gain or lose in forming an ion? State whether the resulting ion is a cation or an anion.
  - a. strontium lose 2/C
  - b. aluminum lose 3/C
  - c. tellurium gain 2/A
  - d. rubidium lose 1/C
  - e. bromine gain 1/A
  - f. phosphorus gain 3/A
- Give the name and symbol of the ion formed when
  - a. a chlorine atom gains one electron.  $\text{Cl}^-$
  - b. a potassium atom loses one electron.  $\text{K}^+$
  - c. an oxygen atom gains two electrons.  $\text{O}^{2-}$
  - d. a barium atom loses two electrons.  $\text{Ba}^{2+}$
- How many electrons are lost or gained in forming each of the following ions?
  - a.  $\text{Mg}^{2+}$  2 lost
  - b.  $\text{Br}^-$  1 gained
  - c.  $\text{Ag}^+$  1 lost
  - d.  $\text{Fe}^{3+}$  3 lost
- Classify each of the following as a cation or an anion.
  - a.  $\text{Na}^+$  C
  - b.  $\text{Cu}^{2+}$  C
  - c.  $\text{I}^-$  A
  - d.  $\text{O}^{2-}$  A
  - e.  $\text{Ca}^{2+}$  C
  - f.  $\text{Cs}^+$  C

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