

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.
 - Ba
 - I
 - K
- How many valence electrons does each of the following atoms have?
 - gallium
 - fluorine
 - selenium
- Write the electron configuration for each of the following atoms and ions.
 - Ca
 - chlorine atom
 - Na^+
 - phosphide ion
 - 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 an anion.
 - strontium
 - aluminum
 - tellurium
 - rubidium
 - bromine
 - phosphorus
- Give the name and symbol of the ion formed when
 - a chlorine atom gains one electron.
 - a potassium atom loses one electron.
 - an oxygen atom gains two electrons.
 - a barium atom loses two electrons.
- How many electrons are lost or gained in forming each of the following ions?
 - Mg^{2+}
 - Br^-
 - Ag^+
 - Fe^{3+}
- Classify each of the following as a cation or an anion.
 - Na^+
 - Cu^{2+}
 - I^-
 - O^{2-}
 - Ca^{2+}
 - Cs^+

SECTION 7.2 IONIC BONDS AND IONIC COMPOUNDS

- 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
- 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 7.3 BONDING IN METALS

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