

Understanding Concepts

1. Set up a chart to compare metals and nonmetals with respect to the following:

- (a) lustre
- (b) conductivity
- (c) location in the periodic table
- (d) state at room temperature
- (e) numbers of electrons in the outer orbit
- (f) tendency to gain or lose electrons
- (g) charges of ions formed
- (h) other properties
- (i) examples

2. What element is located in the metallic area of the periodic table, but has mainly nonmetallic properties?

3. How many electrons are found in each of the first three orbits for the first twenty elements?

4. Draw Bohr diagrams for the following:

- (a) a boron atom
- (b) a chlorine atom
- (c) a nitrogen atom
- (d) a beryllium atom

5. What kind of arrangement of electrons in the outer orbit does a stable ion have?

6. (a) Draw Bohr diagrams for the stable ion formed by each of the atoms in question 4.

(b) State the number of electrons gained or lost to form each ion.

(c) State the ionic charge on each of the ions.

(d) Name the noble gas that has the same number of electrons as each ion.

7. A new element, ontarium (On), has been formed. We know that it is a halogen.

(a) How many electrons does it have in its outer orbit?

(b) What will be the name of the compound it forms with sodium?

(c) What will be the name of the compound it forms with calcium?

(d) Predict the formulas of the compounds named in (b) and (c).

8. Atoms and ions are described as isoelectronic if they have the same number of electrons. Name the noble gas that is isoelectronic with each of the following stable ions:

(a) Li^+

(b) F^-

(c) Ca^{2+}

(d) S^{2-}

(e) Br^-

(f) Rb^+