***Chemistry***

**2: Atoms, Molecules, and Ions**

**2.6: Molecular and Ionic Compounds**

45. Using the periodic table, predict whether the following chlorides are ionic or covalent: KCl, NCl3, ICl, MgCl2, PCl5, and CCl4.

Solution

In general, those elements that are widely separated in the periodic table—that is, at the extreme left and extreme right—will form compounds that are ionic. Those elements that are near one another in the periodic table generally will form covalent compounds. More specifically, when a metal is combined with one or more nonmetals, the compound is usually ionic. Covalent compounds are usually formed by a combination of nonmetals. Ionic: KCl, MgCl2; Covalent: NCl3, ICl, PCl5, CCl4

47. For each of the following compounds, state whether it is ionic or covalent. If it is ionic, write the symbols for the ions involved:

(a) NF3

(b) BaO

(c) (NH4)2CO3

(d) Sr(H2PO4)2

(e) IBr

(f) Na2O

Solution

(a) covalent; (b) ionic, Ba2+, O2–; (c) ionic, ,; (d) ionic, Sr2+, ; (e) covalent; (f) ionic, Na+, O2–

49. For each of the following pairs of ions, write the symbol for the formula of the compound they will form:

(a) Ca2+, S2–

(b), 

(c) Al3+, Br–

(d) Na+, 

(e) Mg2+, 

Solution

(a) CaS; (b) (NH4)2SO4; (c) AlBr3; (d) Na2HPO4; (e) Mg3 (PO4)2

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