2.13 A chemist finds that 30.82 g of nitrogen will react with 17.60, 35.20, 70.40, or 88.00 g of oxygen to form four different compounds. (**a**) Calculate the mass of oxygen per gram of nitrogen in each compound. (**b**) How do the numbers in part (a) support Dalton's atomic theory?

2.23 Consider an atom of ^{10}B. (**a**) How many protons, neutrons, and electrons does this atom contain? (**b**) What is the symbol of the atom obtained by adding one proton to ^{10}B? (**c**) What is the symbol of the atom obtained by adding one neutron to ^{10}B? (**d**) Are either of the atoms obtained in parts (b) and (c) isotopes of ^{10}B? If so which one?

2.27 *How many protons, neutrons, and electrons are in the following atoms?* (**a**) ^{40}Ar, (**b**) ^{65}Zn, (**c**) ^{70}Ga, (**d**) ^{80}Br, (**e**) ^{184}W, (**f**) ^{243}Am.

2.41 For each of the following elements, write its chemical symbol, locate it in the periodic table, give its atomic number, and indicate whether it is a metal, metalloid, or nonmetal: (**a**) chromium, (**b**) helium, (**c**) phosphorus, (**d**) zinc, (**e**) magnesium, (**f**) bromine, (**g**) arsenic.

2.63 Complete the table by filling in the formula for the ionic compound formed by each pair of cations and anions, as shown for the first pair.

Ion	K^+	NH_4^+	Mg^{2+}	Fe^{3+}
Cl^-	KCl			
OH^-				
CO_3^{2-}				
PO_4^{3-}				