30. Determine the molar mass of each compound listed in item 29. (Hint: See Sample Problem G.)

31. Determine the number of moles of compound in each of the following samples. (Hint: See Sample Problem I.)
a. 4.50 g H_2O
b. 471.6 g $Ba(OH)_2$
c. 129.68 g $Fe_3(PO_4)_2$

32. Determine the percentage composition of each of the following compounds. (Hint: See Sample Problem J.)
a. NaCl
b. $AgNO_3$
c. $Mg(OH)_2$

33. Determine the percentage by mass of water in the hydrate $CuSO_4 \cdot 5H_2O$. (Hint: See Sample Problem K.)

Determining Chemical Formulas

SECTION 4 REVIEW

34. What three types of information are used to find an empirical formula from percentage composition data?

35. What is the relationship between the empirical formula and the molecular formula of a compound?

PRACTICE PROBLEMS

36. Determine the empirical formula of a compound containing 63.50% silver, 8.25% nitrogen, and 28.25% oxygen. (Hint: See Sample Problem L.)

37. Determine the empirical formula of a compound found to contain 52.11% carbon, 13.14% hydrogen, and 34.75% oxygen.

38. What is the molecular formula of the molecule that has an empirical formula of CH_2O and a molar mass of 120.12 g/mol?

39. A compound with a formula mass of 42.08 amu is found to be 85.64% carbon and 14.36% hydrogen by mass. Find its molecular formula.

MIXED REVIEW

40. Chemical analysis shows that citric acid contains 37.51% C, 4.20% H, and 58.29% O. What is the empirical formula for citric acid?

41. Name each of the following compounds by using the Stock system:
a. LiBr
b. $Sn(NO_3)_2$
c. $FeCl_2$
d. MgO
e. KOH
f. Fe_2O_3
g. $AgNO_3$
h. $Fe(OH)_2$
i. CrF_2

42. What is the mass in grams of each of the following samples?
a. 1.000 mol NaCl
b. 2.000 mol H_2O
c. 3.500 mol $Ca(OH)_2$
d. 0.625 mol $Ba(NO_3)_2$

43. Determine the formula mass and molar mass of each of the following compounds:
a. XeF_4
b. $C_{12}H_{24}O_6$
c. Hg_2I_2
d. CuCN

44. Write the chemical formulas for the following compounds:
a. aluminum fluoride
b. magnesium oxide
c. vanadium(V) oxide
d. cobalt(II) sulfide
e. strontium bromide
f. sulfur trioxide

45. How many atoms of each element are contained in a single formula unit of iron(III) formate, $Fe(CHO_2)_3 \cdot H_2O$? What percentage by mass of the compound is water?

46. Name each of the following acids, and assign oxidation numbers to the atoms in each:
a. HNO_2
b. H_2SO_3
c. H_2CO_3
d. HI

47. Determine the percentage composition of the following compounds:
a. NaClO
b. H_2SO_3
c. C_2H_5COOH
d. $BeCl_2$