Ch.11-Q2W6- Chemical quantities

True/False
Indicate whether the statement is true or false.

____ 1. The percent yield is the maximum amount of product that can be produced from a given amount of reactant.

____ 2. The molecular formula for a compound is the formula with the smallest whole-number mole ratio of the elements.

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 3. How many moles of carbon dioxide is produced when 10.4 mol of propane gas is burned in excess oxygen?
a. 0.288 mol
b. 3.46 mol
c. 31.2 mol
d. 52.0 mol

____ 4. How many grams of water are produced when 2.50 mol oxygen reacts with hydrogen?
a. 0.277 g
b. 22.5 g
c. 45.0 g
d. 90.0 g

____ 5. What is the mass of potassium chloride when 2.50 g of potassium reacts with excess of chlorine gas?
a. 4.77 g
b. 8.57 g
c. 9.52 g
d. 728 g

____ 6. Calculate the mass of citric acid when 2.60 mol of sucrose gas reacts with oxygen.
a. 0.769 g
b. 1.30 g
c. 999 g
d. 499 g

____ 7. Hydrofluoric acid reacts with 31.3 g of silica to produce hexafluorosilicic acid. Determine the percent yield of H_2SiF_6 if the actual yield is 60.3 g.
a. 0.818%
b. 12.2%
c. 31.8%
d. 81.8%

____ 8. Copper reacts with 36.7 g of silver nitrate to produce copper(II) nitrate and silver. Determine the theoretical yield of $Cu(NO_3)_2$ if the actual yield is 31.29 g.
a. 0.773 g
b. 12.9 g
c. 77.3 g
d. 40.5 g

Completion
Complete each statement.

9. Nitrogen acts as a(n) _____ reactant in the production of ammonia.

10. The mass in atomic mass units of one molecule of a compound is the _____ of the compound.

11. The volume occupied by one mole of a gas at standard temperature and pressure is the _____ of the gas.

12. The _____ of a compound expresses the smallest whole number ratio of the atoms in the compound.

13. A unit of measure used to count the number of atoms, molecules, or formula units of a substance is the _____.

14. The relationship among the pressure, volume, temperature, and number of particles in a gas is the _____.
15. The mass in atomic mass units of one formula unit of a compound is the _____ of the compound.
16. The number of items contained in one mole of any substance is called the _____.
17. The mass of one mole of an element or compound is its _____.
18. The study of relationships between measurable quantities, such as mass and volume, and the number of atoms in chemical reactions is known as _____.
19. The formula NaCl is an example of a(n) _____.
20. There are 6.02×10^{23} paper clips in a _____ of paper clips.
21. The numerical value of the _____ is 6.02×10^{23}.
22. The amount of product of a chemical reaction can be predicted by _____.
23. The compounds CH_2O and $C_6H_{12}O_6$ have the same _____.

Matching

Match each item with the correct item below.

a. formula mass
b. ideal gas law
c. study that relates mass to number of particles
d. percent yield
e. one molecule or one mole
f. 6.02×10^{23}
g. 0.10 mole
h. molar mass
i. molar volume
j. 0.25 mole
k. 8.31 kPa · L/mol · K
l. atomic mass unit
m. empirical formula

____ 24. Avogadro constant
____ 25. CO_2
____ 26. *R*
____ 27. 2 g of H_2
____ 28. u
____ 29. 58.5 u of NaCl
____ 30. NaCl
____ 31. 22.4 L
____ 32. $PV = nRT$
____ 33. ratio of mass of product obtained to mass expected
____ 34. stoichiometry
____ 35. 24.5 g of H_2SO_4
____ 36. 2.24 L of a gas at STP

Short Answer

37. What is stoichiometry?

38. What is a mole ratio?

39. Balance the following equation and determine the possible mole ratios.
$H_2S + O_2 \rightarrow SO_2 + H_2O$

40. What information do you need to determine the chemical formula of an unknown compound?

41. Why is it inaccurate to say "CO is 50 percent oxygen"?

42. When 0.500 mole of sodium is produced according to the reaction $2NaN_3(s) \rightarrow 3N_2(g) + 2Na(s)$, how many moles of nitrogen gas are also produced?

43. A bottle contains 6.23 g of copper turnings. The mass of a length of magnesium ribbon is 6.23 g. Are there more copper atoms or more magnesium atoms present?

44. A balloon is filled with helium gas. Another balloon, of the same size, is filled with nitrogen gas. Explain why the ratio of the masses of the two samples is the same as the ratio of their molar masses.

45. Carbon dioxide gas and hydrogen gas react to form methanol gas. Assuming the process is 100 percent efficient, how many liters of each reactant are needed to obtain 0.500 L of methanol? The reaction is $CO_2(g) + 3H_2(g) \rightarrow CH_3OH(g) + H_2O(g)$.

46. How many chlorine molecules are in 35.5 g of chlorine gas?

47. How many atoms are there in 106.2 g of potassium?

48. What is the molar mass of ammonium sulfate?

49. What is the mass in grams of 0.30 mol of $NaHCO_3$?

50. Calcium oxide can be prepared by heating calcium metal in oxygen according to the reaction: $2Ca + O_2 \rightarrow 2CaO$. How much calcium would be needed to make 15.0 g of calcium oxide?

51. Hydrogen gas reacts with copper(II) oxide to form copper metal and water vapor according to the reaction: $CuO + H_2 \rightarrow Cu + H_2O$. What mass of copper is produced if 255 L of hydrogen at STP are used up in this reaction?

A chemical plant is being designed to manufacture ethanol (ethyl alcohol; C_2H_5OH) by treating ethylene (ethene; C_2H_4) gas with water, using phosphoric acid as a catalyst. Answer the following questions about this process.

52. Write the chemical equation that represents the reaction by which ethanol is formed.

53. Suppose that ethylene is to be supplied to the reaction chamber at the rate of 100.0 L per minute at 300.0ºC and 7.00×10^3 kPa. At what rate in moles per minute is ethylene being supplied to the reaction chamber?

54. What is the anticipated rate in grams per minute at which ethanol will be formed under the conditions described above?

55. In the first pass of ethene through the reaction chamber, the actual rate of production of ethanol is 271 g/min. What is the percent yield for the reaction?

56. If the unused ethene is passed through the reaction chamber again, 12.8 moles of ethanol are produced, compared to a theoretical yield of 13.2 moles. What is the percent yield?

57. What are the molar masses of the following substances: osmium, fluorine, cobalt(II) nitrate, and nitrogen trichloride?

58. Determine the number of atoms in each sample: 62.1 g titanium, Ti; 9.24 g neon, Ne; and 879 g lead, Pb.

59. Without calculating, decide whether 15.0 g of magnesium or 15.0 g of manganese represents the greater number of atoms. Verify your answer by calculating.

60. Determine the number of units in this sample. Identify the unit as a formula unit or a molecule. 58.0 g chromium(III) sulfate, $Cr_2(SO_4)_3$

61. Hydrocortisone acetate, $C_{23}H_{32}O_6$, is used to treat skin irritations. What is the molecular mass of hydrocortisone acetate? What is its molar mass?

62. What volume of hydrogen gas can be produced by reacting 3.86 g of aluminum in excess hydrochloric acid at 21.0ºC and 102 kPa? The reaction is $2Al(s) + 6HCl(aq) \rightarrow 2AlCl_3(aq) + 3H_2(g)$.

63. What is the volume of 0.625 mol of nitrogen at 74.2 kPa and 85ºC?

64. Toluene, C_7H_8, is one of the components of gasoline. Write the balanced chemical equation for the combustion of toluene to form carbon dioxide gas and water vapor. If 5.00 moles of toluene burn, how many moles of oxygen are consumed? How many moles of carbon dioxide are produced? How many grams of water vapor are produced?

65. When a solution of 15.0 g of lead(II) nitrate in 100 g of water is mixed with a solution of 12.5 g of potassium iodide in 100 g of water, a double displacement reaction occurs. The balanced chemical equation is shown below. Which is the limiting reactant? How many grams of precipitate will form?

    $Pb(NO_3)_2(aq) + 2KI(aq) \rightarrow 2KNO_3(aq) + PbI_2(s)$

66. What is the molecular formula of each of the following compounds: a) empirical formula: C_4H_3O; molar mass: 268 g/mol, b) empirical formula: $C_3H_5O_4$; molar mass: 210 g/mol, c) empirical formula: $C_{11}H_{11}N_2O$; molar mass: 374 g/mol?

67. Without calculating, which of the following compounds has the greater percentage of oxygen: $FePO_4$ or $Fe_3(PO_4)_2$? How do you know?

68. An oxide of manganese is 72.0 percent manganese by mass. The molar mass of the oxide is 229 g/mol. What is the formula of the compound?

69. Determine the percent fluorine in the following fluoride of chromium.

    chromium(II) fluoride, CrF_2

70. Methylal is a compound that is used in perfumery. Methylal is 47.3 percent C, 10.6 percent H, and 42.1 percent O. The molar mass is approximately 76 g/mol. What is the molecular formula of methylal?

Problem

71. Phosphorus pentachloride is formed when 17.2 g of chlorine gas react with 23.2 g of solid phosphorus (P_2). Determine the reactant that is in excess.

72. In a reaction, 82.00 g of sodium reacts with 74.00 g of ferric oxide to form sodium oxide and iron metal. Calculate the mass of solid iron produced.

73. In a reaction, 10.76 g of $CaCO_3$, 10.51 g of HCl, and excess water produced 10.26 g of $CaCl_2 \cdot 6H_2O$. Calculate the theoretical yield of calcium chloride hexahydrate.

74. What is the percent yield for a reaction if the theoretical yield of C_6H_{12} is 21 g and the actual yield recovered is only 3.8 g?

75. Determine the empirical formula for succinic acid that is composed of 40.60% carbon, 5.18% hydrogen, and 54.22% oxygen.

76. Ascorbic acid is used to improve the nutrient content of crops. It is composed of 36.20% carbon, 4.90% hydrogen, and 48.90% oxygen. The molar mass of ascorbic acid is 176.0 g/mol. Determine the empirical and molecular formulas for ascorbic acid.

Nitrogen and oxygen combine with each other to form a series of compounds. This chart summarizes laboratory research done on this series of compounds. From the data supplied, calculate the empirical and molecular formulas for each oxide listed.

Compound	Percentage Nitrogen	Percentage Oxygen	Molecular Mass
A	63.6	36.4	44.01 u
B	30.4	69.6	46.00 u
C	36.9	63.1	76.01 u
D	25.9	74.1	108.01 u
E	46.7	53.3	30.01 u

77. Compound A is _____.

78. Compound C is _____.

79. Compound D is _____.

80. Compound E is _____.

Ch.11-Q2W6- Chemical quantities
Answer Section

TRUE/FALSE

1. ANS: F
   The percent yield is the ratio of the actual yield to the theoretical yield, and is expressed as a percent.

   PTS: 1 DIF: 1 REF: Page 421
   OBJ: 12.2.2 Determine mole ratios from formulas for compounds.
   TOP: Determine mole ratios from formulas for compounds. KEY: Theoretical yield
   MSC: 1
   NOT: /T/ The theoretical yield is the maximum amount of product that can be produced from a given amount of reactant. /F/ Correct!
2. ANS: F
   The empirical formula for a compound is the formula with the smallest whole-number mole ratio of the elements.

   PTS: 1 DIF: 1 REF: Page 428
   OBJ: 12.2.3 Identify formulas of compounds by using mass ratios.
   TOP: Identify formulas of compounds by using mass ratios. KEY: Empirical formula
   MSC: 1
   NOT: /T/ The molecular formula specifies the actual number of atoms of each element in one molecule or formula unit of the substance. /F/ Correct!

MULTIPLE CHOICE

3. ANS: C
   The equation for the combustion of propane is $C_3H_8(g) + 5O_2(g) \rightarrow 3CO_2(g) + 4H_2O(l)$.

	Feedback
A	Divide the unknown moles of carbon dioxide by the known moles of propane.
B	Multiply the known number of moles of propane by the mole ratio.
C	Correct!
D	Balance the equation correctly.

   PTS: 1 DIF: 2 REF: Page 409
   OBJ: 12.1.3 Solve stoichiometric problems using molar mass.
   TOP: Solve stoichiometric problems using molar mass.
   KEY: Stoichiometric mole-to-mole conversion MSC: 3
4. ANS: D
   The balanced chemical equation is $2\,H_2 + O_2 \rightarrow 2H_2O$.

	Feedback
A	Multiply the number of moles of water by the molar mass of water.
B	Multiply the number of moles by the mole ratio.
C	Balance the equation correctly.

D	Correct!

PTS: 1 DIF: 3 REF: Page 409
OBJ: 12.1.3 Solve stoichiometric problems using molar mass.
TOP: Solve stoichiometric problems using molar mass.
KEY: Stoichiometric mole-to-mass conversion MSC: 3

5. ANS: A
The balanced chemical equation is $2K + Cl_2 \rightarrow 2KCl$.

	Feedback
A	Correct!
B	Calculate the mass of KCl using the molar mass as a conversion factor.
C	Balance the equation correctly.
D	Convert the grams of KCl to moles using the inverse of molar mass as the conversion factor.

PTS: 1 DIF: 3 REF: Page 409
OBJ: 12.1.3 Solve stoichiometric problems using molar mass.
TOP: Solve stoichiometric problems using molar mass.
KEY: Stoichiometric mass-to-mass conversion MSC: 3

6. ANS: D
The molar mass of citric acid is 192.044 g.

	Feedback
A	Divide the unknown moles by the known moles.
B	Multiply the known number of moles by the mole ratio and the molar mass.
C	Balance the equation correctly.
D	Correct!

PTS: 1 DIF: 2 REF: Page 409
OBJ: 12.1.3 Solve stoichiometric problems using molar mass.
TOP: Solve stoichiometric problems using molar mass.
KEY: Stoichiometric mole-to-mass conversion MSC: 3

7. ANS: D

$$\text{percent yield} = \frac{\text{actual yield}}{\text{theoretical yield}} \times 100\%$$

	Feedback
A	Multiply the yield by 100 to calculate the percent yield.
B	Divide the actual yield by the theoretical yield.
C	The molar mass is incorrect.
D	Correct!

PTS: 1 DIF: 3 REF: Page 421
OBJ: 12.2.2 Determine mole ratios from formulas for compounds.
TOP: Determine mole ratios from formulas for compounds. KEY: Percent yield
MSC: 3

8. ANS: D

$$\text{percent yield} = \frac{\text{actual yield}}{\text{theoretical yield}} \times 100\%$$

	Feedback
A	Multiply the number of moles by the molar mass to obtain the theoretical yield.
B	The mole ratio is incorrect.
C	The molar mass is incorrect.
D	Correct!

PTS: 1 DIF: 3 REF: Page 421
OBJ: 12.2.2 Determine mole ratios from formulas for compounds.
TOP: Determine mole ratios from formulas for compounds. KEY: Percent yield
MSC: 3

COMPLETION

9. ANS: excess

PTS: 1 DIF: 2 REF: Page 414
OBJ: 12.2.1 Predict quantities of reactants and products in chemical reactions.
TOP: Predict quantities of reactants and products in chemical reactions.
KEY: Excess reactant MSC: 1

10. ANS: molecular mass

PTS: 1 DIF: B OBJ: 12-2

11. ANS: molar volume

PTS: 1 DIF: B OBJ: 12-1

12. ANS: empirical formula

PTS: 1 DIF: B OBJ: 12-6

13. ANS: mole

PTS: 1 DIF: B OBJ: 12-1

14. ANS: ideal gas law

PTS: 1 DIF: B OBJ: 12-5

15. ANS: formula mass

PTS: 1 DIF: B OBJ: 12-6

16. ANS: Avogadro constant

PTS: 1 DIF: B OBJ: 12-1

17. ANS: molar mass

PTS: 1 DIF: B OBJ: 12-1

18. ANS: stoichiometry

PTS: 1 DIF: B OBJ: 12-2

19. ANS: empirical formula

    PTS: 1 DIF: B OBJ: 12-6
20. ANS: mole

    PTS: 1 DIF: B OBJ: 12-1
21. ANS: Avogadro constant

    PTS: 1 DIF: B OBJ: 12-1
22. ANS: stoichiometry

    PTS: 1 DIF: B OBJ: 12-4
23. ANS: empirical formula

    PTS: 1 DIF: B OBJ: 12-6

MATCHING

24. ANS: F PTS: 1 DIF: B OBJ: 12-1
25. ANS: E PTS: 1 DIF: B OBJ: 12-1
26. ANS: K PTS: 1 DIF: B OBJ: 12-5
27. ANS: H PTS: 1 DIF: B OBJ: 12-1
28. ANS: L PTS: 1 DIF: B OBJ: 12-2
29. ANS: A PTS: 1 DIF: B OBJ: 12-2
30. ANS: M PTS: 1 DIF: B OBJ: 12-6
31. ANS: I PTS: 1 DIF: B OBJ: 12-5
32. ANS: B PTS: 1 DIF: B OBJ: 12-5
33. ANS: D PTS: 1 DIF: B OBJ: 12-4
34. ANS: C PTS: 1 DIF: B OBJ: 12-3
35. ANS: J PTS: 1 DIF: A OBJ: 12-1
36. ANS: G PTS: 1 DIF: B OBJ: 12-1

SHORT ANSWER

37. ANS:
    Stoichiometry is a study of quantitative relationships between the amounts of reactants used and the products formed by a chemical reaction.

    PTS: 1 DIF: 1 REF: Page 404
    OBJ: 12.1.1 Compare and contrast the mole as a number and the mole as a mass.
    TOP: Compare and contrast the mole as a number and the mole as a mass.
    KEY: Stoichiometry MSC: 1
38. ANS:
    A mole ratio is the ratio between the numbers of moles of any two substances in a balanced chemical equation.

    PTS: 1 DIF: 1 REF: Page 405
    OBJ: 12.1.2 Relate counting particles to weighing samples of substances.

TOP: Relate counting particles to weighing samples of substances.
KEY: Mole ratio MSC: 1

39. ANS:
The balanced chemical equation is:
$2H_2S + 3O_2 \rightarrow 2SO_2 + 2H_2O$
The possible mole ratios are:

$$\frac{2\ \text{mol}\ H_2S}{3\ \text{mol}\ O_2} \quad \frac{2\ \text{mol}\ H_2S}{2\ \text{mol}\ H_2O} \quad \frac{2\ \text{mol}\ H_2S}{2\ \text{mol}\ SO_2}$$

$$\frac{3\ \text{mol}\ O_2}{2\ \text{mol}\ H_2S} \quad \frac{2\ \text{mol}\ H_2O}{2\ \text{mol}\ H_2S} \quad \frac{2\ \text{mol}\ SO_2}{2\ \text{mol}\ H_2S}$$

$$\frac{2\ \text{mol}\ SO_2}{2\ \text{mol}\ H_2O} \quad \frac{2\ \text{mol}\ SO_2}{3\ \text{mol}\ O_2} \quad \frac{3\ \text{mol}\ O_2}{3\ \text{mol}\ H_2O}$$

$$\frac{2\ \text{mol}\ H_2O}{2\ \text{mol}\ SO_2} \quad \frac{3\ \text{mol}\ O_2}{2\ \text{mol}\ SO_2} \quad \frac{3\ \text{mol}\ H_2O}{3\ \text{mol}\ O_2}$$

PTS: 1 DIF: 2 REF: Page 405
OBJ: 12.1.2 Relate counting particles to weighing samples of substances.
TOP: Relate counting particles to weighing samples of substances.
KEY: Mole ratio MSC: 3

40. ANS:
You need the empirical formula and the molar mass.

PTS: 1 DIF: B OBJ: 12-5

41. ANS:
It is not stated how the 50 percent is measured. In a sample of CO gas, 50 percent of the atoms are oxygen, but about 57 percent of the mass is oxygen.

PTS: 1 DIF: B OBJ: 12-5

42. ANS:
0.750 moles N_2 gas

PTS: 1 DIF: B OBJ: 12-4

43. ANS:
more magnesium atoms

PTS: 1 DIF: B OBJ: 12-2

44. ANS:
By Avogadro's principle, each has the same number of particles. The masses of the samples are in the same ratio as the masses of a nitrogen molecule and a helium atom, which is the ratio of the molar masses.

PTS: 1 DIF: B OBJ: 12-6

45. ANS:
0.500 L of carbon dioxide gas and 1.5 L of hydrogen gas

PTS: 1 DIF: B OBJ: 12-4

46. ANS:
half a mole or 3.01×10^{23} Cl_2 molecules

PTS: 1 DIF: B OBJ: 12-3

47. ANS:
16.4×10^{23} atoms

PTS: 1 DIF: B OBJ: 12-3

48. ANS:
132.16 g

PTS: 1 DIF: B OBJ: 12-3

49. ANS:
25.2 g

PTS: 1 DIF: B OBJ: 12-3

50. ANS:
10.7 g

PTS: 1 DIF: A OBJ: 12-4

51. ANS:
723 g

PTS: 1 DIF: A OBJ: 12-4

52. ANS:
$C_2H_4 + H_2O \rightarrow C_2H_5OH$

PTS: 1 DIF: B OBJ: 12-1

53. ANS:
147 mol/min

PTS: 1 DIF: B OBJ: 12-4

54. ANS:
6.77×10^3 g/min

PTS: 1 DIF: A OBJ: 12-3

55. ANS:
4.00 percent

PTS: 1 DIF: B OBJ: 12-4

56. ANS:
97.0 percent

PTS: 1 DIF: B OBJ: 12-5

57. ANS:
190.2 g/mol, 38.0 g/mol, 183.0 g/mol, and 120.4 g/mol

PTS: 1 DIF: B OBJ: 12-1

58. ANS:
7.81×10^{23} atoms, 2.76×10^{23} atoms, 2.55×10^{24} atoms

PTS: 1 DIF: B OBJ: 12-2

59. ANS:
Mg: 3.72×10^{23} atoms; Mn: 1.64×10^{23} atoms

PTS: 1 DIF: B OBJ: 12-2

60. ANS:
8.90×10^{22} formula units

PTS: 1 DIF: B OBJ: 12-2

61. ANS:
404.5 u; 404.5 g/mol

PTS: 1 DIF: B OBJ: 12-1

62. ANS:
5.14 L

PTS: 1 DIF: B OBJ: 12-4

63. ANS:
25.1 L

PTS: 1 DIF: B OBJ: 12-3

64. ANS:
$C_7H_8(l) + 9O_2(g) \rightarrow 7CO_2(g) + 4H_2O(g)$; 45.0 mol O_2 are consumed; 35.0 mol CO_2 are produced; 360 g H_2O vapor are produced.

PTS: 1 DIF: A OBJ: 12-4

65. ANS:
KI is limiting; 17.4 g

PTS: 1 DIF: A OBJ: 12-4

66. ANS:
a) $C_{16}H_{12}O_4$, b) $C_6H_{10}O_8$, c) $C_{22}H_{22}N_4O_2$

PTS: 1 DIF: B OBJ: 12-3

67. ANS:
The phosphate ion contains oxygen, and in $FePO_4$ there is one phosphate ion for every iron ion, while in $Fe_3(PO_4)_2$ there are only two phosphate ions for every three iron ions, so $FePO_4$ has a greater percentage of oxygen.

PTS: 1 DIF: B OBJ: 12-6

68. ANS:
Mn_3O_4

PTS: 1 DIF: B OBJ: 12-6

69. ANS:
42.2%

PTS: 1 DIF: B OBJ: 12-5

70. ANS:

$C_3H_8O_2$

PTS: 1 DIF: B OBJ: 12-6

PROBLEM

71. ANS:
Phosphorus is the reactant that is in excess.

PTS: 1 DIF: 3 REF: Page 414
OBJ: 12.2.1 Predict quantities of reactants and products in chemical reactions.
TOP: Predict quantities of reactants and products in chemical reactions.
KEY: Excess reactant MSC: 3
NOT: The actual ratio is less than the required ratio. The number of moles of chlorine needed in the reaction is 10, but only 1.29 moles of chlorine gas are available. Thus, chlorine acts as the limiting reactant and phosphorus as the excess reactant.

72. ANS:
51.36 g

PTS: 1 DIF: 3 REF: Page 415
OBJ: 12.2.1 Predict quantities of reactants and products in chemical reactions.
TOP: Predict quantities of reactants and products in chemical reactions.
KEY: Product mass calculation MSC: 3
NOT: First, calculate the actual ratio. Then, convert the number of moles of ferric oxide to the number of moles of iron.

73. ANS:
23.56 g

PTS: 1 DIF: 3 REF: Page 421
OBJ: 12.2.2 Determine mole ratios from formulas for compounds.
TOP: Determine mole ratios from formulas for compounds. KEY: Theoretical yield
MSC: 3
NOT: The theoretical yield is calculated by multiplying the number of moles of calcium chloride hexahydrate by the molar mass.

74. ANS:
18%

PTS: 1 DIF: 3 REF: Page 421
OBJ: 12.2.2 Determine mole ratios from formulas for compounds.
TOP: Determine mole ratios from formulas for compounds. KEY: Percent yield
MSC: 3 NOT: Percent yield = (actual yield/theoretical yield) * 100

75. ANS:
$C_2H_3O_2$

PTS: 1 DIF: 3 REF: Page 428
OBJ: 12.2.3 Identify formulas of compounds by using mass ratios.
TOP: Identify formulas of compounds by using mass ratios. KEY: Empirical formula
MSC: 3

76. ANS:
The empirical formula of ascorbic acid is $C_3H_4O_3$.

The molecular formula of ascorbic acid is $C_6H_8O_6$.

PTS: 1 DIF: 3 REF: Page 428 | Page 429
OBJ: 12.2.3 Identify formulas of compounds by using mass ratios.
TOP: Identify formulas of compounds by using mass ratios. KEY: Molecular formula
MSC: 3

77. ANS:
N_2O (Empirical and molecular formulas are the same.)

PTS: 1 DIF: B OBJ: 12-5

78. ANS:
N_2O_3 (Empirical and molecular formulas are the same.)

PTS: 1 DIF: B OBJ: 12-5

79. ANS:
N_2O_5 (Empirical and molecular formulas are the same.)

PTS: 1 DIF: B OBJ: 12-5

80. ANS:
NO (Empirical and molecular formulas are the same.)

PTS: 1 DIF: B OBJ: 12-5