X0211F15:Ch 4 - 6
Name_____

____ 1. The hydrocarbon heptane has the structural formula $CH_3(CH_2)_5CH_3$. What is the molecular mass of this hydrocarbon?
A) 100.2 amu.
B) 0.009980 amu.
C) 86.17 amu.
D) 0.01160 amu.
E) 110.2 amu.

____ 2. What is the molar mass of zinc sulfate heptahydrate, $ZnSO_4 \cdot 7H_2O$?
A) 180. g/mol
B) 288 g/mol
C) 384 g/mol
D) 162 g/mol
E) 582 g/mol

____ 3. A 1.067 g sample of an element contains 5.062×10^{21} atoms. What is the element symbol?
A) I
B) Ag
C) La
D) Pd
E) Rh

____ 4. What is the mass in grams of one propene, C_3H_6, molecule?
A) 6.99×10^{-23} g
B) 2.53×10^{25} g
C) 44.0 g
D) 42.0 g
E) 1.99×10^{-23} g

____ 5. What is the mass in grams of 0.699 mol of glucose, $C_6H_{12}O_6$?
A) 0.00388 g
B) 67.1 g
C) 126 g
D) 21.0 g
E) 258 g

____ 6. Calculate the number of moles of bromine present in 14.5 mL of $Br_2(l)$, whose density is 3.12 g/mL.
A) 3.53 mol
B) 0.181 mol
C) 0.566 mol
D) 0.091 mol
E) 0.283 mol

____ 7. How many moles of hexachlorobenzene, C_6Cl_6, are in 2.31 g of C_6Cl_6?

A) 0.0167 mol
B) 0.0108 mol
C) 6.58×10^2 mol
D) 0.0321 mol
E) 0.00811 mol

____ 8. What is the percentage by mass of hydrogen in the insecticide Lindane, $C_6H_6Cl_6$?
A) 20.0 %
B) 1.20 %
C) 47.2 %
D) 8.80 %
E) 2.08 %

____ 9. How many grams of hydrogen atoms are present in 18.4 g of water?
A) 37.1 g
B) 1.02 g
C) 2.06 g
D) 1.96 g
E) 12.3 g

____ 10. A 4.043 g sample of a compound containing only carbon, hydrogen, and oxygen is burned in an excess of dioxygen, producing 9.191 g CO_2 and 3.762 g H_2O. What percent by mass of oxygen is contained in the original sample?
A) 27.54 %
B) 37.96 %
C) 12.73 %
D) 13.43 %
E) 6.939 %

____ 11. Of the following, the only empirical formula is
A) C_4H_{10}.
B) C_4H_6.
C) C_5H_{14}.
D) H_2O_2.
E) O_2.

____ 12. Analysis of a compound showed that it contained 76.0 % fluorine atoms and 24.0 % carbon atoms by mass. What is its empirical formula?
A) CF_2
B) C_2F_3
C) CF_3
D) C_2F_5
E) CF

____ 13. A sample of an oxide of antimony (Sb) contained 39.5 g of antimony combined with 13.0 g of oxygen. What is the simplest formula for the oxide?
A) SbO_2
B) SbO

C) Sb_2O_3
D) Sb_2O
E) Sb_2O_5

____ 14. A particular compound contains, by mass, 41.4 % carbon, 3.47 % hydrogen, and 55.1 % oxygen. A 0.050-mol sample of this compound weighs 5.80 g. The molecular formula of this compound is
A) $C_3H_3O_3$.
B) C_3H_3O.
C) CHO.
D) $C_4H_4O_4$.
E) $C_5H_5O_5$.

____ 15. The balanced chemical equation for the combustion of methane is:

$$CH_4(g) + 2\ O_2(g) \rightarrow CO_2(g) + 2\ H_2O(g)$$

Which of the following statements concerning this chemical equation is/are correct?

1. One gram of methane gas reacts with two grams of dioxygen gas, producing one gram of carbon dioxide gas and two grams of gaseous water.
2. One mole of methane gas reacts with two moles of dioxygen gas, producing one mole of carbon dioxide gas and two moles of gaseous water.
3. One molecule of methane gas reacts with two molecules of dioxygen gas, producing one molecule of carbon dioxide gas and two molecules of gaseous water.

A) 1 only
B) 2 only
C) 2 and 3
D) 1 and 3
E) 1,2 and 3

____ 16. Balance the following expression:

__ CH_3CH_2COOH + __ O_2 $\rightarrow$ __ CO_2 + __ H_2O

How many moles of O_2 are required for the complete combustion of 8 mol of propanoic acid?
A) 5 mol
B) 30 mol
C) 28 mol
D) 37 mol
E) 2 mol

____ 17. $2KHCO_3(s) \rightarrow K_2CO_3(s) + CO_2(g) + H_2O(l)$

How many moles of potassium carbonate will be produced if 454 g of potassium hydrogen carbonate are heated?
A) 2.27 mol
B) 3.29 mol
C) 11.4 mol
D) 227 mol

E) 4.54 mol

____ 18. Calculate the number of moles of O_2 required to react with phosphorus to produce 4.76 g of P_4O_6. (Molar mass P_4O_6 = 219.9 g/mol)
A) 0.0216 mol
B) 0.149 mol
C) 0.0649 mol
D) 0.0433 mol
E) 0.130 mol

____ 19. Elemental sulfur can be converted to sulfur dioxide by combustion in air. Sulfur dioxide will react with water to form sulfurous acid (see balanced equation below).

$$SO_2(g) + H_2O(l) \rightarrow H_2SO_3(l)$$

What mass of sulfur dioxide is needed to prepare 36.86 g of $H_2SO_3(l)$?
A) 28.77 g
B) 47.23 g
C) 0.5754 g
D) 0.4491 g
E) 36.86 g

____ 20. Pure copper may be produced by the reaction of copper(I) sulfide with oxygen gas as follows:

$$Cu_2S(s) + O_2(g) \rightarrow 2Cu(s) + SO_2(g)$$

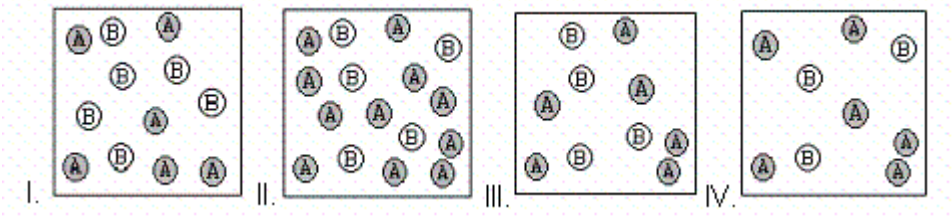
What mass of copper(I) sulfide is required in order to prepare 0.610 kg of copper metal?
A) 0.610 kg
B) 0.305 kg
C) 0.459 kg
D) 1.53 kg
E) 0.764 kg

____ 21. The balanced equation for the combustion of ethanol is

$$2C_2H_5OH(g) + 7O_2(g) \rightarrow 4CO_2(g) + 6H_2O(g)$$

How many grams of dioxygen are required to burn 5.9 g of C_2H_5OH?
A) 14 g
B) 21 g
C) 4.1 g
D) 38 g
E) 55 g

____ 22. A chemical reaction has the equation: $2A + B \rightarrow C$. In which case is B the limiting reactant?



A) II
B) I
C) III
D) IV
E) none of these

____ 23. A 15-g sample of lithium is reacted with 15 g of fluorine to form lithium fluoride: $2Li + F_2 \rightarrow 2LiF$. After the reaction is complete, what will be present?
A) 0.789 mol of lithium fluoride only
B) 2.16 mol of lithium fluoride only
C) 2.16 mol of lithium fluoride and 0.395 mol of fluorine
D) 0.789 mol of lithium fluoride and 1.37 mol of lithium
E) none of these

____ 24. When 20.0 g C_2H_6 and 60.0 g O_2 react to form CO_2 and H_2O, how many grams of water are formed?
A) 14.5 g
B) 58.0 g
C) 18.0 g
D) 20.0 g
E) none of these

____ 25. Pure copper may be produced by the reaction of copper(I) sulfide with oxygen gas as follows:

$Cu_2S(s) + O_2(g) \rightarrow 2Cu(s) + SO_2(g)$

If the reaction of 0.630 kg of copper(I) sulfide with excess oxygen produces 0.190 kg of copper metal, what is the percent yield?
A) 75.5 %
B) 39.9 %
C) 30.2 %
D) 151 %
E) 37.8 %

____ 26. For an ideal gas, which of the following statements is true?
A) V is inversely proportional to n at constant P and T.
B) P is inversely proportional to T at constant n and V.
C) P is inversely proportional to n at constant V and T.
D) P is inversely proportional to V at constant n and T.
E) V is inversely proportional to T at constant n and P.

____ 27. How many moles of gas are in a gas sample occupying 1.48 L at 591 mmHg and 302 K?
A) 35.3 mol
B) 0.0464 mol
C) 21.5 mol
D) 0.00381 mol
E) 2.90 mol

____ 28. The density of O_2 gas at 4°C and 1.57 atm is

A) 153 g/L.
B) 35.2 g/L.
C) 2.21 g/L.
D) 68.8 g/mL.
E) 0.453 g/L.

____ 29. The density of a gas is 1.96 g/L at STP. What is its molar mass?
A) 65.2 g/mol
B) 58.9 g/mol
C) 11.4 g/mol
D) 22.4 g/mol
E) 43.9 g/mol

____ 30. It is found that at 27°C and 1.14 atm pressure, 2.22 L of gas has a mass of 3.49 g. Its molar mass is
A) 46.2 g/mol.
B) 34.0 g/mol.
C) 29.4 g/mol.
D) 30.6 g/mol.
E) 39.8 g/mol.

____ 31. An excess of sodium hydroxide is treated with 2.4 L of dry hydrogen iodide gas measured at STP. What is the mass of sodium iodide is formed?
A) 1.20 g
B) 32.1 g
C) 16.1 g
D) 19 g
E) 360 g

____ 32. A high temperature reaction vessel is charged with 0.5860 mol of iron powder and 35.1 L of oxygen gas at standard temperature at pressure. On heating, the iron and oxygen react according to the balanced reaction below.

$$4Fe(s) + 3O_2(g) \rightarrow \ 2Fe_2O_3(s)$$

After the reaction vessel is cooled, and assuming the reaction goes to completion, what volume of oxygen remains?
A) 25.3 L
B) 35.1 L
C) 17.6 L
D) 9.84 L
E) 0.293 L

____ 33. What volume of ammonia gas, measured at 660.3 mmHg and 58.2°C, is required to produce 6.46 g of ammonium sulfate according to the following balanced chemical equation?

$2NH_3(g) + H_2SO_4(aq) \rightarrow (NH_4)_2SO_4(s)$

A) 0.000781 L
B) 0.00312 L

C) 0.765 L
D) 11.9 L
E) 3.06 L

____ 34. The following equation represents the partial combustion of methane, CH_4.

$$2CH_4(g) + 3O_2(g) \rightarrow 2CO(g) + 4H_2O(g)$$

At constant temperature and pressure, what is the maximum volume of carbon monoxide that can be obtained from 3.39×10^2 L of methane and 1.70×10^2 L of oxygen?
A) 5.09×10^2 L
B) 3.39×10^2 L
C) 1.19×10^3 L
D) 1.13×10^2 L
E) 6.78×10^2 L

____ 35. Which of the following is <u>not</u> a postulates of the kinetic molecular theory of gases?
A) The gas molecules are in constant motion.
B) At a constant temperature, each molecule has the same kinetic energy.
C) The collisions between molecules are elastic.
D) Particles interact by attraction or repulsion forces.
E) The speed of gas particles in motion is directly proportional to their Kinetic Energy Content.

____ 36. Calculate the root-mean-square velocity for the O_2 molecules in a sample of O_2 gas at 24.3°C. (R = 8.3145 J/K·mol)
A) 15.22 m/s
B) 137.6 m/s
C) 277.9 m/s
D) 481.4 m/s
E) 9.167×10^{26} m/s

____ 37. Which of the following gases will have the slowest rate of effusion at constant temperature?
A) H_2
B) F_2
C) Ne
D) SO_3
E) CF_4

____ 38. If 250 mL of methane, CH_4, effuses through a small hole in 28 s, the time required for the same volume of helium to pass through the hole under the same conditions will be
A) 56 s.
B) 7 s.
C) 1.8 s.
D) 14 s.
E) 112 s.

____ 39. If q = –91 kJ for a certain process, that process
A) requires a catalyst.

B) is exothermic.
C) occurs rapidly.
D) is endothermic.
E) cannot occur.

____ 40. What is the change in internal energy of the system (ΔU) if 10 kJ of heat energy is absorbed by the system and 70 kJ of work is done by the system for a certain process?
A) –60 kJ
B) 80 kJ
C) 10 kJ
D) 60 kJ
E) –80 kJ

____ 41. At constant pressure, the sign of q for the process $CO_2(s) \rightarrow CO_2(g)$ is expected to be
A) positive, and the process is exothermic.
B) negative, and the process is exothermic.
C) impossible to predict.
D) positive, and the process is endothermic.
E) negative, and the process is endothermic.

____ 42. H_2 and F_2 react according to the following equation, forming HF.

$H_2(g) + F_2(g) \rightarrow 2HF(g)$; $\Delta H° = –271$ kJ

If $H_2(g)$ and $F_2(g)$ were mixed in a thermally insulated vessel, the reaction that occurred would be
A) endothermic, and the temperature of the reaction system would fall.
B) We could not tell unless the original and final temperatures were given.
C) exothermic, and the temperature of the reaction system would fall.
D) exothermic, and the temperature of the reaction system would rise.
E) endothermic, and the temperature of the reaction system would rise.

____ 43. How much heat is gained by copper when 51.8 g of copper is warmed from 15.5°C to 76.4°C? The specific heat of copper is 0.385 J/(g • °C).
A) 3.09×10^2 J
B) 29.41 J
C) 23.45 J
D) 1.21×10^3 J
E) 1.52×10^3 J

____ 44. Exactly 105.2 J will raise the temperature of 10.0 g of a metal from 25.0°C to 60.0°C. What is the specific heat capacity of the metal?
A) 0.301 J/(g • °C)
B) 3.33 J/(g • °C)
C) 29.3 J/(g • °C)
D) 25.2 J/(g • °C)
E) none of these

____ 45. A 42.9-g sample of cobalt (s = 0.421 J/(g • °C)), initially at 157.2°C, is placed in an insulated vessel containing 120.9 g of water (s = 4.18 J/(g • °C)), initially at 19.2°C. Once equilibrium is reached, what is the final temperature of the metal–water mixture? Neglect the heat capacity of the vessel.

A) 24.0°C
B) 55.3°C
C) 14.1°C
D) 88.2°C
E) 31.8°C

____ 46. When 7.13 g of methane (CH_4) is burned in a bomb calorimeter (heat capacity = 2.677×10^3 J/°C), the temperature rises from 24.00 to 27.08°C. How much heat is absorbed by the calorimeter?

$CH_4(g) + 2O_2(g) \rightarrow CO_2(g) + 2H_2O(l)$; $\Delta H° = -1283.8$ kJ

A) 562 kJ
B) 3.66×10^3 kJ
C) 8.24 kJ
D) 571 kJ
E) 1.28×10^3 kJ

____ 47. When 50.0 mL of 1.20 M of HCl(aq) is combined with 50.0 mL of 1.30 M of NaOH(aq) in a coffee-cup calorimeter, the temperature of the solution increases by 8.01°C. What is the change in enthalpy for this balanced reaction?

$$HCl(aq) + NaOH(aq) \rightarrow NaCl(aq) + H_2O(l)$$

Assume that the solution density is 1.00 g/mL and the specific heat capacity of the solution is 4.18 J/g·°C.

A) –55.8 kJ
B) 55.8 kJ
C) 51.5 kJ
D) –51.5 kJ
E) –26.8 kJ

____ 48. What is $\Delta H°$ for the following phase change?

$KCl(s) \rightarrow KCl(l)$

Substance	$\Delta H°_f$ (kJ/mol)
KCl(s)	–436.68
KCl(l)	–421.79

A) 858.47 kJ
B) 14.89 kJ
C) –858.47 kJ
D) –14.89 kJ
E) 0 kJ

____ 49. What is $\Delta H°$ of the following reaction?

$CO_2(g) + 2CH_4(g) \rightarrow C_3H_8(g) + O_2(g)$

Substance	$\Delta H°_f$ (kJ/mol)
$CO_2(g)$	–393.5
$CH_4(g)$	–74.9
$C_3H_8(g)$	–104.7

A) –348.4 kJ
B) –573.1 kJ
C) 438.6 kJ
D) 348.4 kJ
E) –648.0 kJ

____ 50. Calculate the change in enthalpy when 52.0 g of solid chromium at 25°C and 1 atm pressure is oxidized. ($\Delta H°_f$ for $Cr_2O_3(s)$ is –1135 kJ/mol.)
$4Cr(s) + 3O_2(g) \rightarrow 2Cr_2O_3(s)$

A) –1135 kJ
B) –284 kJ
C) –568 kJ
D) +1135 kJ
E) +568 kJ

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Answer Section

1. ANS: A PTS: 1 DIF: easy REF: 3.1
   OBJ: Calculate the formula mass from a formula.
   TOP: stoichiometry | mass and moles of substance
2. ANS: B PTS: 1 DIF: easy REF: 3.2
   OBJ: Understand how the molar mass is related to the formula weight of a substance.
   TOP: stoichiometry | mass and moles of substance KEY: formula mass
   MSC: general chemistry
3. ANS: A PTS: 1 DIF: moderate REF: 3.2
   OBJ: Understand how the molar mass is related to the formula weight of a substance.
   TOP: stoichiometry | determining chemical formulas
4. ANS: A PTS: 1 DIF: easy REF: 3.2
   OBJ: Calculate the mass of atoms and molecules. (Example 3.3)
   TOP: stoichiometry | mass and moles of substance KEY: mole | mole calculations
   MSC: general chemistry
5. ANS: C PTS: 1 DIF: easy REF: 3.2
   OBJ: Convert from moles of substance to grams of substance. (Example 3.4)
   TOP: stoichiometry | mass and moles of substance KEY: mole | mole calculations
   MSC: general chemistry
6. ANS: E PTS: 1 DIF: moderate REF: 3.2
   OBJ: Convert from grams of substance to moles of substance. (Example 3.5)
   TOP: stoichiometry | mass and moles of substance KEY: mole | mole calculations
   MSC: general chemistry
7. ANS: E PTS: 1 DIF: easy REF: 3.2
   OBJ: Convert from grams of substance to moles of substance. (Example 3.5)
   TOP: stoichiometry | mass and moles of substance KEY: mole | mole calculations
   MSC: general chemistry
8. ANS: E PTS: 1 DIF: easy REF: 3.3
   OBJ: Calculate the percentage composition of the elements in a compound. (Example 3.7)
   TOP: stoichiometry | determining chemical formulas
9. ANS: C PTS: 1 DIF: easy REF: 3.3
   OBJ: Calculate the mass of an element in a given mass of compound. (Example 3.8)
   TOP: stoichiometry | mass and moles of substance KEY: mole | mole calculations
   MSC: general chemistry
10. ANS: A PTS: 1 DIF: moderate REF: 3.4
    OBJ: Calculate the percentage of C, H, and O from combustion data.
    TOP: stoichiometry | determining chemical formulas
11. ANS: C PTS: 1 DIF: easy REF: 3.5
    OBJ: Define empirical formula. TOP: stoichiometry | determining chemical formulas
    KEY: empirical formula MSC: general chemistry
12. ANS: A PTS: 1 DIF: moderate REF: 3.5
    OBJ: Determine the empirical formula of a binary compound from the masses of its elements. (Example 3.10) TOP: stoichiometry | determining chemical formulas

KEY: empirical formula MSC: general chemistry

13. ANS: E PTS: 1 DIF: moderate REF: 3.5
OBJ: Determine the empirical formula of a binary compound from the masses of its elements. (Example 3.10) TOP: stoichiometry | determining chemical formulas
KEY: empirical formula MSC: general chemistry

14. ANS: D PTS: 1 DIF: moderate REF: 3.5
OBJ: Determine the empirical formula from the percentage composition. (Example 3.11)
TOP: stoichiometry | determining chemical formulas KEY: molecular formula
MSC: general chemistry

15. ANS: C PTS: 1 DIF: easy REF: 3.6
OBJ: Relate the coefficients in a balanced chemical equation to the number of molecules or moles (molar interpretation). TOP: stoichiometry | stoichiometry calculation
KEY: molar interpretation MSC: general chemistry
NOT: REVISED

16. ANS: C PTS: 1 DIF: easy REF: 3.6
OBJ: Relate the coefficients in a balanced chemical equation to the number of molecules or moles (molar interpretation). TOP: stoichiometry | stoichiometry calculation
KEY: molar interpretation MSC: general chemistry

17. ANS: A PTS: 1 DIF: moderate REF: 3.7
OBJ: Relate the quantities of reactant to the quantity of product. (Example 3.13)
TOP: stoichiometry | stoichiometry calculation KEY: amounts of substances
MSC: general chemistry

18. ANS: C PTS: 1 DIF: moderate REF: 3.7
OBJ: Relate the quantities of reactant to the quantity of product. (Example 3.13)
TOP: stoichiometry | stoichiometry calculation KEY: amounts of substances
MSC: general chemistry

19. ANS: A PTS: 1 DIF: moderate REF: 3.7
OBJ: Relate the quantities of reactant to the quantity of product. (Example 3.13)
TOP: stoichiometry | stoichiometry calculation

20. ANS: E PTS: 1 DIF: easy REF: 3.7
OBJ: Relate the quantities of reactant to the quantity of product. (Example 3.13)
TOP: stoichiometry | stoichiometry calculation KEY: amounts of substances
MSC: general chemistry

21. ANS: A PTS: 1 DIF: moderate REF: 3.7
OBJ: Relate the quantities of two reactants or two products. (Example 3.14)
TOP: stoichiometry | stoichiometry calculation

22. ANS: A PTS: 1 DIF: easy REF: 3.8
OBJ: Understand how a limiting reactant or limiting reagent determines the moles of product formed during a chemical reaction and how much excess reactant remains.
TOP: stoichiometry | stoichiometry calculation KEY: limiting reactant
MSC: general chemistry

23. ANS: D PTS: 1 DIF: difficult REF: 3.8
OBJ: Calculate with a limiting reactant involving masses. (Example 3.16)
TOP: stoichiometry | stoichiometry calculation KEY: limiting reactant
MSC: general chemistry

24. ANS: E PTS: 1 DIF: moderate REF: 3.8
OBJ: Calculate with a limiting reactant involving masses. (Example 3.16)
TOP: stoichiometry | stoichiometry calculation KEY: limiting reactant
MSC: general chemistry
25. ANS: E PTS: 1 DIF: difficult REF: 3.8
OBJ: Determine the percentage yield of a chemical reaction.
TOP: stoichiometry | stoichiometry calculation KEY: limiting reactant
MSC: general chemistry
26. ANS: D PTS: 1 DIF: easy REF: 5.3
OBJ: Learn the ideal gas law equation. TOP: phases | gas KEY: ideal gas law
MSC: general chemistry
27. ANS: B PTS: 1 DIF: easy REF: 5.3
OBJ: Use the ideal gas law. (Example 5.6) TOP: phases | gas
KEY: ideal gas law | calculations with the ideal gas law MSC: general chemistry
28. ANS: C PTS: 1 DIF: moderate REF: 5.3
OBJ: Calculate gas density. (Example 5.7) TOP: phases | gas
KEY: ideal gas law | gas density MSC: general chemistry
29. ANS: E PTS: 1 DIF: easy REF: 5.3
OBJ: Determine the molecular mass of a vapor. (Example 5.8) TOP: phases | gas
KEY: ideal gas law | gas density MSC: general chemistry
30. ANS: B PTS: 1 DIF: moderate REF: 5.3
OBJ: Determine the molecular mass of a vapor. (Example 5.8) TOP: phases | gas
KEY: ideal gas law | calculations with the ideal gas law MSC: general chemistry
31. ANS: C PTS: 1 DIF: easy REF: 5.4
OBJ: Solving stoichiometry problems involving gas volumes. (Example 5.9)
TOP: phases | gas
32. ANS: A PTS: 1 DIF: easy REF: 5.4
OBJ: Solving stoichiometry problems involving gas volumes. (Example 5.9)
TOP: phases | gas
33. ANS: E PTS: 1 DIF: moderate REF: 5.4
OBJ: Solving stoichiometry problems involving gas volumes. (Example 5.9)
TOP: phases | gas KEY: ideal gas law | stoichiometry and gas volumes
MSC: general chemistry
34. ANS: D PTS: 1 DIF: difficult REF: 5.4
OBJ: Solving stoichiometry problems involving gas volumes. (Example 5.9)
TOP: phases | gas
35. ANS: B PTS: 1 DIF: easy REF: 5.6
OBJ: List the five postulates of the kinetic theory. TOP: phases | gas
KEY: kinetic theory of an ideal gas | postulates of kinetic theory
MSC: general chemistry
36. ANS: D PTS: 1 DIF: easy REF: 5.7
OBJ: Calculate the rms speed of gas molecules. (Example 5.12)
TOP: phases | gas KEY: molecular speed MSC: general chemistry
37. ANS: E PTS: 1 DIF: easy REF: 5.7
OBJ: Calculate the ratio of effusion rates of gases. (Example 5.13)

TOP: phases | gas KEY: molecular speed | effusion MSC: general chemistry

38. ANS: D PTS: 1 DIF: moderate REF: 5.7
OBJ: Calculate the ratio of effusion rates of gases. (Example 5.13)
TOP: phases | gas KEY: molecular speed | effusion MSC: general chemistry

39. ANS: B PTS: 1 DIF: easy REF: 6.3
OBJ: Distinguish between an exothermic process and an endothermic process.
TOP: thermochemistry | heats of reaction KEY: heat | heat of reaction
MSC: general chemistry

40. ANS: A PTS: 1 DIF: moderate REF: 6.2
OBJ: Express the first law of thermodynamics mathematically.
TOP: thermochemistry | heats of reaction

41. ANS: D PTS: 1 DIF: easy REF: 6.3
OBJ: Distinguish between an exothermic process and an endothermic process.
TOP: thermochemistry | heats of reaction KEY: heat | heat of reaction
MSC: general chemistry

42. ANS: C PTS: 1 DIF: easy REF: 6.3
OBJ: Distinguish between an exothermic process and an endothermic process.
TOP: thermochemistry | heats of reaction KEY: enthalpy | enthalpy of reaction
MSC: general chemistry

43. ANS: D PTS: 1 DIF: moderate REF: 6.6
OBJ: Calculate using this relation between heat and specific heat. (Example 6. 5)
TOP: thermochemistry | heats of reaction KEY: calorimetry | measuring heats of reaction
MSC: general chemistry

44. ANS: A PTS: 1 DIF: easy REF: 6.6
OBJ: Calculate using this relation between heat and specific heat. (Example 6. 5)
TOP: thermochemistry | heats of reaction KEY: calorimetry | specific heat
MSC: general chemistry

45. ANS: A PTS: 1 DIF: difficult REF: 6.6
OBJ: Calculate using this relation between heat and specific heat. (Example 6. 5)
TOP: thermochemistry | heats of reaction KEY: calorimetry | specific heat
MSC: general chemistry

46. ANS: C PTS: 1 DIF: difficult REF: 6.6
OBJ: Calculate the enthalpy of reaction from calorimetric data (its temperature change and heat capacity). TOP: thermochemistry | heats of reaction
KEY: calorimetry | heat capacity MSC: general chemistry

47. ANS: A PTS: 1 DIF: moderate REF: 6.6
OBJ: Calculate the enthalpy of reaction from calorimetric data (its temperature change and heat capacity). TOP: thermochemistry | heats of reaction

48. ANS: B PTS: 1 DIF: moderate REF: 6.8
OBJ: Calculate the heat of a phase transition using standard enthalpies of formation for the different phases. (Example 6.8) TOP: thermochemistry | heats of reaction
KEY: standard enthalpies of formation MSC: general chemistry

49. ANS: C PTS: 1 DIF: easy REF: 6.8
OBJ: Calculate the heat (enthalpy) of reaction from the standard enthalpies of formation of the substances in the reaction. (Example 6.9) TOP: thermochemistry | heats of reaction

KEY: standard enthalpies of formation MSC: general chemistry

50. ANS: C PTS: 1 DIF: moderate REF: 6.8
OBJ: Calculate the heat (enthalpy) of reaction from the standard enthalpies of formation of the substances in the reaction. (Example 6.9) TOP: thermochemistry | heats of reaction
KEY: standard enthalpies of formation MSC: general chemistry