

PX0111Chps01-03

- _____ 1. An *untested* explanation (educated guess) of a series of experimental observations is called _____.
- A) a hypothesis
 - B) a theory
 - C) a law
 - D) an experiment
 - E) the scientific method
- _____ 2. A 19.0-g sample of lithium is completely burned in air to form lithium oxide. The mass of lithium oxide must be
- A) less than 19.0 g.
 - B) greater than 19.0 g.
 - C) equal to 19.0 g.
 - D) all of the above.
 - E) none of the above.
- _____ 3. The state of matter for an object that has both definite volume and definite shape is the
- A) gaseous state.
 - B) solid state.
 - C) mixed state.
 - D) elemental state.
 - E) liquid state.
- _____ 4. Two types of pure substances are
- A) compounds and heterogeneous solutions.
 - B) compounds and elements.
 - C) elements and homogeneous solutions.
 - D) compounds and homogeneous solutions.
 - E) elements and heterogeneous solutions.
- _____ 5. A solution is a
- A) pure element.
 - B) pure mixture.
 - C) heterogeneous mixture.
 - D) homogeneous mixture.
 - E) pure compound.
- _____ 6. Which of the following is a homogeneous mixture?
- A) gasoline
 - B) vegetable oil and water
 - C) sugar dissolved in water
 - D) A and C
 - E) A, B, and C
- _____ 7. All the following are examples of chemical changes except
- A) aging.
 - B) photosynthesis.

- C) fermentation.
- D) perspiration.
- E) respiration.

- _____ 8. Which of the following is an example of a chemical change?
- A) alcohol evaporating
 - B) water boiling
 - C) skin burning in the sun
 - D) iodine vaporizing
 - E) ice melting
- _____ 9. The term that is related to the reproducibility of a measurement or variation of data about an average is
- A) accuracy.
 - B) qualitative.
 - C) quantitative.
 - D) precision.
 - E) property.
- _____ 10. How many significant figures are there in the value 0.0863 m?
- A) 4
 - B) 3
 - C) 2
 - D) 5
 - E) 6
- _____ 11. Express the result of the following calculation in scientific notation: $301 \text{ cm} \times 439 \text{ cm}$
- A) $13.2 \times 10^4 \text{ cm}^2$
 - B) $13.2 \times 10^5 \text{ cm}^2$
 - C) $1.32 \times 10^4 \text{ cm}^2$
 - D) $1.32 \times 10^6 \text{ cm}^2$
 - E) $1.32 \times 10^5 \text{ cm}^2$
- _____ 12. In the area of nano-chemistry, particles defined as nanoparticles range in size from 1-2500 nm. 1 nm is equivalent to $1 \times 10^{-9} \text{ m}$. If the size of the particles that make up a particular material is $6.47 \times 10^{-8} \text{ cm}$, what is this size in nanometers?
- A) 64,700 nm
 - B) 6.47 nm
 - C) 0.647 nm
 - D) 6470 nm
 - E) 647 nm
- _____ 13. Which is the largest mass?
- A) 10 dg
 - B) 10 cg
 - C) 10 pg
 - D) 10 ng

E) 10 mg

- _____ 14. The mass of 59 kg equals
- A) 590 g.
 - B) 5900 g.
 - C) 5.9×10^4 g.
 - D) 0.059 g.
 - E) 0.59 g.
- _____ 15. The melting point of nitrogen is 63 K. What is this temperature in degrees Celsius?
- A) 63°C
 - B) -336°C
 - C) -63°C
 - D) -210.°C
 - E) 483°C
- _____ 16. The melting point of a certain solid is -25°C. This corresponds to
- A) 13°F.
 - B) -32°F.
 - C) -13°F.
 - D) -103°F.
 - E) 18°F.
- _____ 17. What is the volume of a cube that has an edge length of 0.019 m?
- A) 6.9×10^{-3} m³
 - B) 6.9×10^{-3} km³
 - C) 6.9×10^{-3} cm³
 - D) 6.9×10^{-3} mm³
 - E) 6.9 cm³
- _____ 18. In addition to mass, which property of matter must be known to calculate its volume?
- A) specific heat
 - B) temperature
 - C) molecular weight
 - D) density
 - E) pressure
- _____ 19. What volume of a pure liquid (density 0.710 g/mL) has a mass of 0.290 kg?
- A) 4.08×10^2 mL
 - B) 2.45×10^{-3} mL
 - C) 2.06×10^{-1} mL
 - D) 2.45 mL
 - E) 4.08×10^{-1} mL
- _____ 20. What is the mass of NH₃ in a 80.0-cm³ sample that has a density of 0.92 g/cm³ and consists of 20% (by mass) NH₃?
- A) 15 g
 - B) 20 g

- C) 45 g
- D) 74 g
- E) 25 g

_____ 21. The average speed of oxygen molecules at 690°C is 1.60×10^5 cm/s. Which of the following calculations would convert this speed to units of miles per hour?

- A) $\frac{1 \text{ s}}{1.60 \times 10^5 \text{ cm}} \times \frac{2.54 \text{ cm}}{1 \text{ in}} \times \frac{1 \text{ ft}}{12 \text{ in}} \times \frac{1 \text{ mi}}{5280 \text{ ft}} \times \frac{3600 \text{ s}}{1 \text{ h}}$
- B) $\frac{1.60 \times 10^5 \text{ cm}}{1 \text{ s}} \times \frac{1 \text{ in}}{2.54 \text{ cm}} \times \frac{12 \text{ in}}{1 \text{ ft}} \times \frac{5280 \text{ ft}}{1 \text{ mi}} \times \frac{1 \text{ h}}{3600 \text{ s}}$
- C) $\frac{1.60 \times 10^5 \text{ cm}}{1 \text{ s}} \times \frac{1 \text{ in}}{2.54 \text{ cm}} \times \frac{1 \text{ ft}}{12 \text{ in}} \times \frac{1 \text{ mi}}{5280 \text{ ft}} \times \frac{3600 \text{ s}}{1 \text{ h}}$
- D) $\frac{1.60 \times 10^5 \text{ cm}}{1 \text{ s}} \times \frac{2.54 \text{ cm}}{1 \text{ in}} \times \frac{12 \text{ in}}{1 \text{ ft}} \times \frac{5280 \text{ ft}}{1 \text{ mi}} \times \frac{3600 \text{ s}}{1 \text{ h}}$
- E) $\frac{1 \text{ s}}{1.60 \times 10^5 \text{ cm}} \times \frac{2.54 \text{ cm}}{1 \text{ in}} \times \frac{12 \text{ in}}{1 \text{ ft}} \times \frac{5280 \text{ ft}}{1 \text{ mi}} \times \frac{1 \text{ h}}{3600 \text{ s}}$

_____ 22. The enthalpy of combustion of *n*-octane, C₈H₁₈, is -4.79×10^7 J/kg. What is the enthalpy of combustion expressed in kJ/g?

- A) -4.79×10^{10} kJ/g
- B) -4.79×10^7 kJ/g
- C) -4.79×10^3 kJ/g
- D) -4.79×10^1 kJ/g
- E) -4.79×10^4 kJ/g

_____ 23. A sample of milk is found to have arsenic at a concentration of 3.57 μg/L. What is the concentration in ounces per gallon?

$$1 \text{ qt} = 946.4 \text{ mL}$$

$$1 \text{ gal} = 4 \text{ qt}$$

$$16 \text{ oz} = 1 \text{ lb}$$

$$1 \text{ lb} = 0.4536 \text{ kg}$$

- A) 2.68×10^3 oz/gal
- B) 4.77×10^{-7} oz/gal
- C) 2.46 oz/gal
- D) 3.84×10^{-4} oz/gal
- E) 3.32×10^{-8} oz/gal

_____ 24. Which of the following is not a correct name–symbol combination?

- A) cobalt, Co
- B) vanadium, V
- C) neon, Ne
- D) scandium, Sc
- E) titanium, Mg

_____ 25. The names of the elements whose symbols are Si, P, Mn, and S are, respectively,

- A) silicon, phosphorus, manganese, and sulfur.
- B) silicon, potassium, magnesium, and sulfur.
- C) silver, phosphorus, magnesium, and sodium.
- D) silver, potassium, manganese, and sodium.
- E) silicon, potassium, manganese, and sulfur.

_____ 26. Who discovered the nucleus of an atom?

- A) Thomson
- B) de Broglie
- C) Rutherford
- D) Bohr
- E) Heisenberg

_____ 27. The nucleus of a ^{208}Pb nuclide contains

- A) 208 neutrons and 290 electrons.
- B) 82 protons and 208 neutrons.
- C) 208 protons and 126 electrons.
- D) 208 protons, 82 neutrons, and 208 electrons.
- E) 82 protons and 126 neutrons.

_____ 28. If two different nuclides have the same atomic number, it must mean that

- A) they have the same atomic mass.
- B) they have the same mass number.
- C) they have the same number of protons.
- D) they have the same number of electrons.
- E) they have the same number of neutrons.

_____ 29. Which nuclide has the same number of protons as $^{14}_7\text{N}$?

- A) $^{19}_9\text{F}$
- B) $^{15}_8\text{O}$
- C) $^{12}_6\text{C}$
- D) $^{31}_{15}\text{P}$
- E) $^{15}_7\text{N}$

_____ 30. How many protons are there in the chromium-52 nuclide?

- A) 29
- B) 76
- C) 23
- D) 24
- E) 28

_____ 31. Which combination of protons, neutrons, and electrons correctly represents a ^{56}Fe nuclide?

- A) 26 protons, 30 neutrons, 56 electrons
- B) 26 protons, 30 neutrons, 30 electrons
- C) 26 protons, 30 neutrons, 26 electrons
- D) 56 protons, 26 neutrons, 56 electrons

E) 56 protons, 26 neutrons, 26 electrons

32. Which of the following nuclides contains more protons than neutrons?

- A) ${}^1_1\text{H}$
- B) ${}^{19}_9\text{F}$
- C) ${}^{34}_{16}\text{S}$
- D) ${}^{24}_{12}\text{Mg}$
- E) ${}^4_2\text{He}$

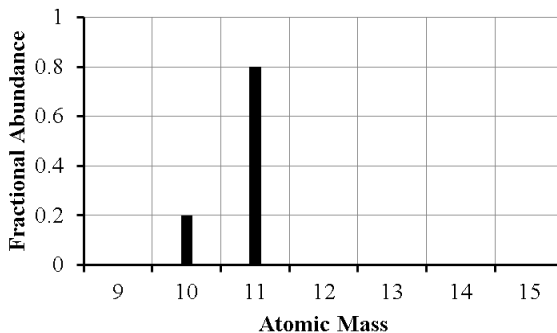
33. Which of the following represents a pair of isotopes?

	<u>Atomic Number</u>	<u>Mass Number</u>
A) I	17	36
II	18	36
B) I	7	15
II	8	15
C) I	17	35
II	17	37
D) I	17	37
II	18	38
E) I	7	16
II	8	17

34. What is the symbol of the nuclide having 15 protons and 16 neutrons?

- A) ${}^{31}_{15}\text{S}$
- B) ${}^{16}_{15}\text{S}$
- C) ${}^{31}_{15}\text{P}$
- D) ${}^{15}_{16}\text{S}$
- E) ${}^{16}_{15}\text{P}$

35. The mass spectrum of an element with two naturally occurring isotopes is shown below. What is the best estimate of the element's atomic mass?



- A) 10 amu
- B) 11 amu
- C) 10.8 amu
- D) 10.2 amu
- E) 10.5 amu

- _____ 36. Naturally occurring element X exists in three isotopic forms: X-28 (27.977 amu, 92.21% abundance), X-29 (28.976 amu, 4.70% abundance), and X-30 (29.974 amu, 3.09% abundance). Calculate the atomic weight of X.
- A) 29.09 amu
 - B) 28.09 amu
 - C) 35.29 amu
 - D) 86.93 amu
 - E) 25.80 amu
- _____ 37. The elements in a row of the periodic table are known as
- A) metals.
 - B) a period.
 - C) metalloids.
 - D) a family.
 - E) a group.
- _____ 38. Which element belongs to the transition metals?
- A) palladium
 - B) sodium
 - C) calcium
 - D) iodine
 - E) helium
- _____ 39. All of the following elements are best classified as metalloids except
- A) Si.
 - B) Te.
 - C) As.
 - D) B.
 - E) Ga.
- _____ 40. A sample of TNT, $C_7H_5N_3O_6$, has 7.68×10^{21} nitrogen atoms. How many hydrogen atoms are there in this sample of TNT?
- A) 1.54×10^{22}
 - B) 10.24×10^{21}
 - C) 1.28×10^{22}
 - D) 7.68×10^{21}
 - E) 1.79×10^{22}
- _____ 41. The species Au^+ , Mg^{2+} , and V^{3+} are all
- A) anions.
 - B) isotopes.
 - C) isoelectronic.

- D) allotropes.
- E) cations.

- ___ 42. The species that is formed when a molecule gains or loses an electron is called
- A) an ion.
 - B) a metalloid.
 - C) an isotope.
 - D) an atom.
 - E) a metal.
- ___ 43. The empirical formula of a salt consisting of Sr^{2+} and NO_2^- ions is
- A) $\text{Sr}^{2+}\text{NO}_2^-$.
 - B) SrNO_2 .
 - C) Sr_2NO_2 .
 - D) $\text{Sr}_2(\text{NO}_2)_3$.
 - E) $\text{Sr}(\text{NO}_2)_2$.
- ___ 44. How many electrons does a barium ion have?
- A) 56
 - B) 8
 - C) 54
 - D) 38
 - E) 2
- ___ 45. The formula for the sulfide ion is
- A) SO_4^{2-} .
 - B) SO_3^{2-} .
 - C) $\text{S}_2\text{O}_3^{2-}$.
 - D) S^{2-} .
 - E) HSO_4^- .
- ___ 46. The formula of the perchlorate ion is
- A) Cl_2O_3^- .
 - B) ClO_2^- .
 - C) CN^- .
 - D) ClO_4^- .
 - E) ClO^- .
- ___ 47. The formulas of the hydroxide ion, the nitrate ion, and the phosphate ion are represented, respectively, as
- A) OH^- , NO_2^- , PO_3^{3-} .
 - B) OH^- , NO_2^- , PO_4^{3-} .
 - C) H^- , NO_2^- , P^{3-} .
 - D) H^- , NO_3^- , P^{3-} .
 - E) OH^- , NO_3^- , PO_4^{3-} .
- ___ 48. What is the name of the compound whose formula is $\text{Al}_2(\text{SO}_4)_3$?
- A) aluminum sulfate
 - B) dialuminum tri(sulfur tetraoxygen)

- C) aluminum sulfide
- D) aluminum persulfate
- E) aluminum sulfite

___ 49. The correct name for FeO is

- A) iron(I) oxide.
- B) iron oxide.
- C) iron monoxide.
- D) iron(II) oxide.
- E) iron(III) oxide.

___ 50. What is the correct formula for bismuth(III) sulfite?

- A) BiSO₃
- B) Bi₂SO₃
- C) Bi₃(SO₃)₂
- D) Bi₂(SO₃)₃
- E) Bi(SO₃)₂

___ 51. The formula for copper(II) phosphate is

- A) Co₃(PO₄)₂.
- B) CuPO₄.
- C) Co₂(PO₄)₃.
- D) Cu₂(PO₄)₃.
- E) Cu₃(PO₄)₂.

___ 52. What is the subscript of potassium in the formula for potassium sulfate?

- A) 2
- B) 5
- C) 3
- D) 4
- E) 1

___ 53. The correct name for LiCl is

- A) monolithium chloride.
- B) lithium chloride.
- C) lithium(I) chloride.
- D) monolithium monochloride.
- E) lithium monochloride.

___ 54. In the following chemical equation, what is the reactant?



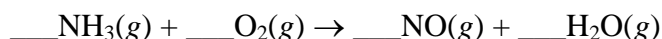
- A) CuSO₄·5H₂O(s)
- B) H₂O(l)
- C) CuO(s)
- D) SO₃(g)
- E) CuSO₄(s)

___ 55. Which is a correct balanced chemical equation corresponding to the following description of a chemical reaction?

Hydrochloric acid reacts with magnesium metal to produce aqueous magnesium chloride and hydrogen gas.

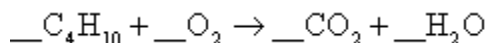
- A) $2\text{HCl}(aq) + \text{Mg}(s) \rightarrow \text{MgCl}_2(aq) + 2\text{H}(g)$
- B) $2\text{HCl}(aq) + \text{Mg}(s) \rightarrow \text{MgCl}_2(aq) + \text{H}_2(g)$
- C) $2\text{HCl}(aq) + \text{Mg}(s) \rightarrow \text{MgCl}(aq) + \text{H}_2(g)$
- D) $2\text{HCl}(aq) + \text{Mg}(aq) \rightarrow \text{MgCl}_2(s) + \text{H}_2(g)$
- E) $\text{HCl}(aq) + \text{Mg}(s) \rightarrow \text{MgCl}(aq) + \text{H}(g)$

___ 56. When the following equation is balanced with lowest whole-number coefficients, what is the coefficient for $\text{NO}(g)$?



- A) 3
- B) 2
- C) 5
- D) 4
- E) 1

___ 57. The complete combustion of butane, C_4H_{10} , yields carbon dioxide and water:



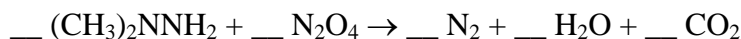
The smallest whole-number coefficient of oxygen in the balanced equation is

- A) 12.
- B) 14.
- C) 10.
- D) 11.
- E) 13.

___ 58. All the following may change during a chemical reaction except

- A) the total volume of the system.
- B) the density of the system.
- C) the temperature of the system.
- D) the total number of atoms in the system.
- E) the total number of molecules in the system.

___ 59. When the equation



is balanced, the sum of all the coefficients (simplest whole number) is

- A) 13.
- B) 12.
- C) 9.
- D) 10.
- E) 11.

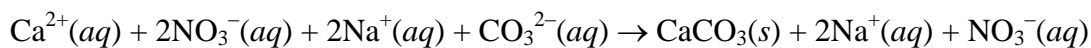
___ 60. Which one of the following equations is properly balanced?

- A) $\text{Sn} + 4\text{HNO}_3 \rightarrow \text{SnO}_2 + 4\text{NO}_2 + 2\text{H}_2\text{O}$
- B) $2\text{Na}_2\text{SO}_4 + 3\text{Bi}(\text{NO}_3)_3 \rightarrow \text{Bi}_2(\text{SO}_4)_3 + 9\text{NaNO}_3$
- C) $\text{CH}_3\text{CHO} + 3\text{O}_2 \rightarrow 2\text{CO}_2 + 2\text{H}_2\text{O}$
- D) $\text{NH}_4\text{NO}_3 \rightarrow 2\text{H}_2\text{O} + \text{N}_2$
- E) $\text{Na}_2\text{CO}_3 + 2\text{H}_2\text{SO}_4 \rightarrow \text{Na}_2\text{SO}_4 + 2\text{H}_2\text{O} + \text{CO}_2$

_____ 61. Which of the following chemical equations is not balanced?

- A) $\text{NH}_4\text{NO}_3 \rightarrow \text{N}_2\text{O} + 2\text{H}_2\text{O}$
- B) $\text{C}_{12}\text{H}_{22}\text{O}_{11} \rightarrow 12\text{C} + 11\text{H}_2\text{O}$
- C) $2\text{NH}_4\text{SCN} + \text{Ba}(\text{OH})_2 \cdot 8\text{H}_2\text{O} \rightarrow 2\text{NH}_3 + 10\text{H}_2\text{O} + \text{Ba}(\text{SCN})_2$
- D) $(\text{NH}_4)_2\text{Cr}_2\text{O}_7 \rightarrow \text{N}_2\text{O} + \text{Cr}_2\text{O}_3 + 4\text{H}_2\text{O}$
- E) $2\text{Mg} + \text{CO}_2 \rightarrow 2\text{MgO} + \text{C}$

_____ 62. Identify the spectator ions in the following reaction.



- A) NO_3^{-} and CO_3^{2-}
- B) Ca^{2+} and Na^{+}
- C) Ca^{2+} and CO_3^{2-}
- D) Ca^{2+} and NO_3^{-}
- E) Na^{+} and NO_3^{-}

_____ 63. What precipitate forms when aqueous solutions of calcium bromide and potassium phosphate are mixed?

- A) $(\text{KBr})_2(\text{s})$
- B) $\text{Ca}_3(\text{PO}_4)_2(\text{s})$
- C) $\text{CaPO}_4^{-}(\text{s})$
- D) $\text{KBr}(\text{s})$
- E) $\text{CaPO}_4(\text{s})$

_____ 64. Which *net ionic equation* best represents the reaction that occurs when an aqueous solution of lithium nitrate is mixed with an aqueous solution of ammonium bromide?

- A) $\text{Li}^{+}(\text{aq}) + \text{Br}^{-}(\text{aq}) \rightarrow \text{LiBr}(\text{s})$
- B) $\text{NH}_4^{+}(\text{aq}) + \text{NO}_3^{-}(\text{aq}) \rightarrow \text{NH}_4\text{NO}_3(\text{aq})$
- C) $\text{NH}_4\text{Br}(\text{aq}) + \text{LiNO}_3(\text{aq}) \rightarrow \text{LiBr}(\text{s}) + \text{NH}_4\text{NO}_3(\text{aq})$
- D) No net reaction occurs.
- E) $\text{Li}^{+}(\text{aq}) + \text{NH}_4\text{Br}(\text{aq}) \rightarrow \text{LiBr}(\text{s}) + \text{NH}_4^{+}(\text{aq})$

_____ 65. Which of the following combinations will produce a precipitate?

1. $\text{AgNO}_3(\text{aq})$ and $\text{HCl}(\text{aq})$
2. $\text{HCl}(\text{aq})$ and $\text{Na}_2\text{CO}_3(\text{aq})$
3. $\text{NaOH}(\text{aq})$ and $\text{K}_3\text{PO}_4(\text{aq})$

- A) 1 only
- B) 2 only
- C) 3 only

- D) 2 and 3
- E) 1, 2, and 3

___ 66. Which of the following are classified as precipitation reactions?

1. $\text{AgNO}_3(aq) + \text{HCl}(aq) \rightarrow \text{AgCl}(s) + \text{HNO}_3(aq)$
2. $2\text{Mg}(s) + \text{O}_2(g) \rightarrow 2\text{MgO}(s)$
3. $\text{Zn}(s) + 2\text{Ag}^+(aq) \rightarrow 2\text{Ag}(s) + \text{Zn}^{2+}(aq)$

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

___ 67. Aqueous solutions of sodium sulfide and copper(II) chloride are mixed together. Which statement is correct?

- A) CuS will precipitate from solution.
- B) NaCl will precipitate from solution.
- C) No precipitate will form.
- D) Both NaCl and CuS will precipitate from solution.
- E) No reaction will occur.

___ 68. What products result from mixing aqueous solutions of $\text{Cu}(\text{C}_2\text{H}_3\text{O}_2)_2(aq)$ and $\text{Rb}_3\text{PO}_4(aq)$?

- A) $\text{Cu}_2\text{PO}_4(s)$ and $\text{Rb}_3(\text{C}_2\text{H}_3\text{O}_2)_2(aq)$
- B) $\text{Cu}_3(\text{PO}_4)_2(s)$ and $\text{RbC}_2\text{H}_3\text{O}_2(s)$
- C) $\text{CuP}(s)$, $\text{CO}_2(g)$, $\text{H}_2\text{O}(l)$, $\text{RbOH}(aq)$, and $\text{PH}_3(g)$.
- D) $\text{CuPO}_4(s)$ and $\text{Rb}_3(\text{C}_2\text{H}_3\text{O}_2)_2(aq)$
- E) $\text{Cu}_3(\text{PO}_4)_2(s)$, $\text{Rb}^+(aq)$, and $\text{C}_2\text{H}_3\text{O}_2^-(aq)$

___ 69. Which of the following is not a strong acid in aqueous solution?

- A) HBr
- B) HClO_4
- C) HF
- D) HI
- E) HCl

___ 70. Which of the following is a strong acid in aqueous solution?

- A) $\text{HOCH}_2\text{CH}_2\text{OH}$
- B) $\text{Ba}(\text{OH})_2$
- C) CH_3COOH
- D) NH_3
- E) HClO_4

___ 71. Which of the following is a weak electrolyte in aqueous solution?

- A) $\text{Mg}(\text{OH})_2$
- B) NH_3
- C) LiOH

- D) RbOH
- E) Sr(OH)₂

- ___ 72. What is the net ionic equation for the acid–base reaction that occurs when acetic acid and sodium hydroxide solutions are mixed?
- A) $\text{HC}_2\text{H}_3\text{O}_2(aq) + \text{OH}^-(aq) \rightarrow \text{C}_2\text{H}_3\text{O}_2^-(aq) + \text{H}_2\text{O}(l)$
 - B) $\text{H}^+(aq) + \text{OH}^-(aq) \rightarrow \text{H}_2\text{O}(l)$
 - C) $\text{H}_3\text{O}^+(aq) + \text{OH}^-(aq) \rightarrow 2\text{H}_2\text{O}(l)$
 - D) $\text{C}_2\text{H}_3\text{O}_2^-(aq) + \text{H}^+(aq) + \text{Na}^+(aq) + \text{OH}^-(aq) \rightarrow \text{Na}^+(aq) + \text{C}_2\text{H}_3\text{O}_2^-(aq) + \text{H}_2\text{O}(l)$
 - E) $\text{HC}_2\text{H}_3\text{O}_2(aq) + \text{NaOH}^-(aq) \rightarrow \text{NaC}_2\text{H}_3\text{O}_2^-(aq) + \text{H}_2\text{O}(l)$
- ___ 73. Which of the following salts may be obtained by the reaction of a weak acid with a strong base?
- A) LiClO₄
 - B) NaCl
 - C) K₂SO₃
 - D) MgCl₂
 - E) NH₄F
- ___ 74. The net ionic equation for the reaction between aqueous ammonia and hydrobromic acid is
- A) $\text{HBr}(aq) + \text{NH}_3(aq) \rightarrow \text{NH}_4\text{Br}(aq)$.
 - B) $\text{H}^+(aq) + \text{OH}^-(aq) \rightarrow \text{H}_2\text{O}(l)$.
 - C) $\text{HBr}(aq) + \text{OH}^-(aq) \rightarrow \text{Br}^-(aq) + \text{H}_2\text{O}(l)$.
 - D) $\text{H}^+(aq) + \text{NH}_3(aq) \rightarrow \text{NH}_4^+(aq)$.
 - E) $\text{H}^+(aq) + \text{Br}^-(aq) + \text{NH}_3(aq) \rightarrow \text{NH}_4^+(aq) + \text{Br}^-(aq)$.
- ___ 75. Which of the following concerning oxidation-reduction reactions is/are correct?
1. Oxidation-reduction reactions always form gaseous products.
 2. At least one substance is oxidized and one substance is reduced in an oxidation-reduction reaction.
 3. The species that is oxidized loses one or more electrons in an oxidation-reduction reaction.
- A) 1 only
 - B) 2 only
 - C) 3 only
 - D) 1 and 3
 - E) 2 and 3
- ___ 76. Which of the following chemical reactions is an oxidation–reduction reaction?
- A) $\text{Zn}(s) + \text{S}(s) \rightarrow \text{ZnS}(s)$
 - B) $\text{H}_2\text{SO}_4(aq) + 2\text{NaOH}(aq) \rightarrow \text{Na}_2\text{SO}_4(aq) + 2\text{H}_2\text{O}(l)$
 - C) $\text{NaOH}(aq) + \text{HCl}(aq) \rightarrow \text{NaCl}(aq) + \text{H}_2\text{O}(l)$
 - D) $\text{AgNO}_3(aq) + \text{NaCl}(aq) \rightarrow \text{AgCl}(s) + \text{NaNO}_3(aq)$
 - E) $\text{CO}_2(aq) + \text{H}_2\text{O}(aq) \rightarrow \text{H}_2\text{CO}_3(aq)$
- ___ 77. What is the oxidation number of each O in BaFeO₄?
- A) +6

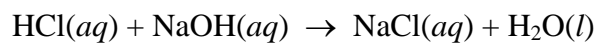
- B) +2
- C) -2
- D) +3
- E) 0

- ___ 78. What is the oxidation number of each H in $\text{NH}_4(\text{H}_2\text{PO}_4)$?
- A) -3
 - B) -2
 - C) +1
 - D) +5
 - E) 0
- ___ 79. The oxidation numbers of nitrogen in N_2O and N_2F_4 are, respectively,
- A) -2 and +2.
 - B) -2 and -3.
 - C) +1 and +2.
 - D) +1 and -1.
 - E) +1 and -3.
- ___ 80. The oxidation number of barium in BaO is
- A) +1.
 - B) +4.
 - C) -1/2.
 - D) +2.
 - E) -2.
- ___ 81. What is the reduction half-reaction for the reaction of zinc with hydrochloric acid?
- $$\text{Zn}(s) + 2\text{H}^+(aq) + 2\text{Cl}^-(aq) \rightarrow \text{Zn}^{2+}(aq) + 2\text{Cl}^-(aq) + \text{H}_2(g)$$
- A) $\text{Zn}(s) \rightarrow \text{Zn}^{2+}(aq) + 2e^-$
 - B) $2\text{H}^+(aq) + 2e^- \rightarrow \text{H}_2(g)$
 - C) $2\text{H}^+(aq) + 2e^-(aq) \rightarrow \text{H}_2(g) + 2\text{Cl}^-(aq)$
 - D) $2\text{H}^+(aq) + 2\text{Cl}^-(aq) \rightarrow \text{H}_2(g) + 2e^- + 2\text{Cl}^-(aq)$
 - E) $\text{Zn}(s) \rightarrow \text{Zn}^{2+}(aq) + 2\text{Cl}^-(aq) + 2e^-$
- ___ 82. All of the following reactions can be described as displacement reactions except
- A) $\text{Zn}(s) + \text{FeCl}_2(aq) \rightarrow \text{ZnCl}_2(aq) + \text{Fe}(s)$.
 - B) $\text{C}_6\text{H}_6(l) + \text{Cl}_2(g) \rightarrow \text{C}_6\text{H}_5\text{Cl}(l) + \text{HCl}(g)$.
 - C) $2\text{Na}(s) + 2\text{H}_2\text{O}(l) \rightarrow 2\text{NaOH}(aq) + \text{H}_2(g)$.
 - D) $\text{Cu}(s) + 2\text{AgNO}_3(aq) \rightarrow \text{Cu}(\text{NO}_3)_2(aq) + 2\text{Ag}(s)$.
 - E) $\text{CuSO}_4(aq) + \text{Fe}(s) \rightarrow \text{Cu}(s) + \text{FeSO}_4(aq)$.
- ___ 83. All of the following reactions are called combination reactions except
- A) $\text{BaO}(s) + \text{SO}_2(g) \rightarrow \text{BaSO}_3(s)$.
 - B) $\text{C}_6\text{H}_{10}(l) + \text{Br}_2(l) \rightarrow \text{C}_6\text{H}_{10}\text{Br}_2(l)$.
 - C) $\text{Br}_2(l) + \text{H}_2\text{O}(l) \rightarrow \text{HOBr}(aq) + \text{HBr}(aq)$.
 - D) $\text{CaCl}_2(s) + 6\text{H}_2\text{O}(l) \rightarrow \text{CaCl}_2 \cdot 6\text{H}_2\text{O}(s)$.
 - E) $3\text{H}_2(g) + \text{N}_2(g) \rightarrow 2\text{NH}_3(g)$.

- _____ 84. All of the following reactions are described as decomposition reactions except
- A) $\text{PCl}_5(l) \rightarrow \text{PCl}_3(g) + \text{Cl}_2(g)$.
 - B) $2\text{CH}_3\text{OH}(l) + 3\text{O}_2(g) \rightarrow 2\text{CO}_2(g) + 4\text{H}_2\text{O}(g)$.
 - C) $\text{NH}_4\text{HS}(s) \rightarrow \text{NH}_3(g) + \text{H}_2\text{S}(g)$.
 - D) $(\text{NH}_4)_2\text{Cr}_2\text{O}_7(s) \rightarrow \text{N}_2(g) + 4\text{H}_2\text{O}(g) + \text{Cr}_2\text{O}_3(s)$.
 - E) $2\text{CO}_2(g) \rightarrow 2\text{CO}(g) + \text{O}_2(g)$.
- _____ 85. A student must prepare 5.00 L of 0.100 M Na_2CO_3 (106 g/mol). Which is the best procedure for preparing this solution?
- A) Measure 53.0 g Na_2CO_3 and add 5.00 kg of H_2O .
 - B) Measure 10.6 g Na_2CO_3 and add 5.00 kg of H_2O .
 - C) Measure 53.0 g Na_2CO_3 and add H_2O until the final homogeneous solution has a volume of 5.00 L.
 - D) Measure 10.6 g Na_2CO_3 and add H_2O until the final homogeneous solution has a volume of 5.00 L.
 - E) Measure 53.0 g Na_2CO_3 and add 5.00 L of H_2O .
- _____ 86. What is the molarity of an NaI solution that contains 7.3 g of NaI in 28.0 mL of solution?
- A) 1.7 M
 - B) 0.049 M
 - C) 0.0038 M
 - D) 0.00019 M
 - E) 0.26 M
- _____ 87. A 29.0-g sample of NaOH is dissolved in water, and the solution is diluted to give a final volume of 1.60 L. The molarity of the final solution is
- A) 18.1 M.
 - B) 0.453 M.
 - C) 0.725 M.
 - D) 0.0552 M.
 - E) 0.862 M.
- _____ 88. How many grams of lithium nitrate, LiNO_3 (68.9 g/mol), are required to prepare 342.6 mL of a 0.783 M LiNO_3 solution?
- A) 0.00389 g
 - B) 18.5 g
 - C) 0.0541 g
 - D) 30.1 g
 - E) 0.00635 g
- _____ 89. How many moles of KOH are present in 25.4 mL of 0.965 M KOH?
- A) 2.63×10^{-2} mol
 - B) 26.3 mol
 - C) 2.45×10^{-2} mol
 - D) 24.5 mol
 - E) 0.965 mol

- _____ 90. In order to dilute 35.5 mL of 0.533 *M* HCl to 0.100 *M*, the volume of water that must be added is
- A) 28.8 mL.
 - B) 6.66 mL.
 - C) 1.89×10^2 mL.
 - D) 1.50×10^{-3} mL.
 - E) 1.54×10^2 mL.

- _____ 91. The reaction of HCl with NaOH is represented by the equation



What volume of 0.631 *M* HCl is required to titrate 15.8 mL of 0.321 *M* NaOH?

- A) 3.20 mL
- B) 1.58 mL
- C) 8.04 mL
- D) 15.8 mL
- E) 31.1 mL

PX0111Chps01-03

Answer Section

- ANS: A PTS: 1 DIF: easy REF: 1.2
OBJ: Understand how the scientific method is an approach to performing science.
TOP: general concepts | scientific method
- ANS: B PTS: 1 DIF: easy REF: 1.3
OBJ: Apply the law of the conservation of mass. (Example 1.1)
TOP: general concepts | matter
- ANS: B PTS: 1 DIF: easy REF: 1.4
OBJ: Compare and contrast the three common states of matter: solid, liquid, and gas.
TOP: general concepts | matter KEY: states of matter
MSC: general chemistry
- ANS: B PTS: 1 DIF: easy REF: 1.4
OBJ: Describe the classifications of matter: elements, compounds, and mixtures (heterogeneous and homogeneous). TOP: general concepts | matter KEY: states of matter
MSC: general chemistry
- ANS: D PTS: 1 DIF: easy REF: 1.4
OBJ: Describe the classifications of matter: elements, compounds, and mixtures (heterogeneous and homogeneous). TOP: general concepts | matter KEY: states of matter
MSC: general chemistry
- ANS: D PTS: 1 DIF: moderate REF: 1.4
OBJ: Describe the classifications of matter: elements, compounds, and mixtures (heterogeneous and homogeneous). TOP: general concepts | matter KEY: states of matter
MSC: general chemistry
- ANS: D PTS: 1 DIF: easy REF: 1.4
OBJ: Understand the difference between chemical changes (chemical reactions) and physical changes. TOP: general concepts | matter
KEY: physical and chemical change MSC: general chemistry
- ANS: C PTS: 1 DIF: easy REF: 1.4
OBJ: Understand the difference between chemical changes (chemical reactions) and physical changes. TOP: general concepts | matter
KEY: physical and chemical change MSC: general chemistry
- ANS: D PTS: 1 DIF: easy REF: 1.5
OBJ: Define and use the terms precision and accuracy when describing measured quantities.
TOP: general concepts | measurement KEY: accuracy and precision
MSC: general chemistry
- ANS: B PTS: 1 DIF: easy REF: 1.5
OBJ: Learn the rules for determining significant figures in reported measurements.
TOP: general concepts | measurement
- ANS: E PTS: 1 DIF: easy REF: 1.5
OBJ: Know how to represent numbers using scientific notation.
TOP: general concepts | measurement KEY: significant figures | scientific notation
MSC: general chemistry
- ANS: C PTS: 1 DIF: easy REF: 1.6

- OBJ: Become familiar with the SI (metric) system of units including the SI prefixes.
TOP: general concepts | measurement
13. ANS: A PTS: 1 DIF: easy REF: 1.6
OBJ: Become familiar with the SI (metric) system of units including the SI prefixes.
TOP: general concepts | measurement KEY: SI unit | prefixes
MSC: general chemistry
14. ANS: C PTS: 1 DIF: easy REF: 1.6
OBJ: Become familiar with the SI (metric) system of units including the SI prefixes.
TOP: general concepts | measurement KEY: SI unit | prefixes
MSC: general chemistry
15. ANS: D PTS: 1 DIF: easy REF: 1.6
OBJ: Convert from one temperature scale to another. (Example 1.3)
TOP: general concepts | measurement KEY: SI unit | temperature
MSC: general chemistry
16. ANS: C PTS: 1 DIF: easy REF: 1.6
OBJ: Convert from one temperature scale to another. (Example 1.3)
TOP: general concepts | measurement KEY: SI unit | temperature
MSC: general chemistry
17. ANS: E PTS: 1 DIF: easy REF: 1.7
OBJ: Define and provide examples of derived units.
TOP: general concepts | measurement KEY: SI unit | volume
MSC: general chemistry
18. ANS: D PTS: 1 DIF: easy REF: 1.7
OBJ: Use density to relate mass and volume. (Example 1.5)
TOP: general concepts | measurement KEY: SI unit | density
MSC: general chemistry
19. ANS: A PTS: 1 DIF: easy REF: 1.7
OBJ: Use density to relate mass and volume. (Example 1.5)
TOP: general concepts | measurement KEY: SI unit | density
MSC: general chemistry
20. ANS: A PTS: 1 DIF: difficult REF: 1.7
OBJ: Use density to relate mass and volume. (Example 1.5)
TOP: general concepts | measurement KEY: SI unit | density
MSC: general chemistry
21. ANS: C PTS: 1 DIF: moderate REF: 1.8
OBJ: Apply dimensional analysis to solving numerical problems.
TOP: general concepts | measurement KEY: factor label method
MSC: general chemistry
22. ANS: D PTS: 1 DIF: easy REF: 1.8
OBJ: Convert from one metric unit to another metric unit. (Example 1.6)
TOP: general concepts | measurement KEY: factor label method
MSC: general chemistry
23. ANS: B PTS: 1 DIF: moderate REF: 1.8
OBJ: Convert from any unit to another unit. (Example 1.8)
TOP: general concepts | measurement KEY: factor label method
MSC: general chemistry

24. ANS: E PTS: 1 DIF: easy REF: 2.1
 OBJ: Recognize the atomic symbols of the elements.
 TOP: early atomic theory | atomic theory of matter
25. ANS: A PTS: 1 DIF: easy REF: 2.1
 OBJ: Recognize the atomic symbols of the elements.
 TOP: early atomic theory | atomic theory of matter KEY: atomic symbol
 MSC: general chemistry
26. ANS: C PTS: 1 DIF: easy REF: 2.2
 OBJ: Describe Rutherford's experiment that led to the nuclear model of the atom.
 TOP: early atomic theory | atomic theory of matter
 KEY: structure of the atom | nuclear model of atom MSC: general chemistry
27. ANS: E PTS: 1 DIF: easy REF: 2.3
 OBJ: Define atomic number, mass number, and nuclide.
 TOP: early atomic theory | atomic theory of matter KEY: atomic symbol
 MSC: general chemistry
28. ANS: C PTS: 1 DIF: easy REF: 2.3
 OBJ: Define atomic number, mass number, and nuclide.
 TOP: early atomic theory | atomic theory of matter KEY: nuclear structure
 MSC: general chemistry
29. ANS: E PTS: 1 DIF: easy REF: 2.3
 OBJ: Write the nuclide symbol for a given nuclide.
 TOP: early atomic theory | atomic theory of matter KEY: nuclear structure
 MSC: general chemistry
30. ANS: D PTS: 1 DIF: easy REF: 2.3
 OBJ: Write the nuclide symbol for a given nuclide.
 TOP: early atomic theory | atomic theory of matter KEY: atomic symbol
 MSC: general chemistry
31. ANS: C PTS: 1 DIF: easy REF: 2.3
 OBJ: Write the nuclide symbol for a given nuclide.
 TOP: early atomic theory | atomic theory of matter KEY: atomic symbol
 MSC: general chemistry
32. ANS: A PTS: 1 DIF: moderate REF: 2.3
 OBJ: Write the nuclide symbol for a given nuclide.
 TOP: early atomic theory | atomic theory of matter
33. ANS: C PTS: 1 DIF: easy REF: 2.3
 OBJ: Define and provide examples of isotopes of an element.
 TOP: early atomic theory | atomic theory of matter KEY: isotope
 MSC: general chemistry
34. ANS: C PTS: 1 DIF: moderate REF: 2.3
 OBJ: Write the nuclide symbol of an element. (Example 2.1)
 TOP: early atomic theory | atomic theory of matter KEY: atomic symbol
 MSC: general chemistry
35. ANS: C PTS: 1 DIF: moderate REF: 2.4
 OBJ: Describe how a mass spectrometer can be used to determine the fractional abundance of the isotopes of an element.
 TOP: early atomic theory | atomic theory of matter

36. ANS: B PTS: 1 DIF: moderate REF: 2.4
OBJ: Determine the atomic mass of an element from the isotopic masses and fractional abundances. (Example 2.2) TOP: early atomic theory | atomic theory of matter
KEY: atomic weight MSC: general chemistry
37. ANS: B PTS: 1 DIF: easy REF: 2.5
OBJ: Identify periods and groups on the periodic table.
TOP: early atomic theory | periodic table KEY: period MSC: general chemistry
38. ANS: A PTS: 1 DIF: easy REF: 2.5
OBJ: Locate the alkali metal and halogen groups on the periodic table.
TOP: early atomic theory | periodic table
39. ANS: E PTS: 1 DIF: easy REF: 2.5
OBJ: Recognize the portions of the periodic table that contain the metals, nonmetals, and metalloids (semimetals). TOP: early atomic theory | periodic table
KEY: metalloid MSC: general chemistry
40. ANS: C PTS: 1 DIF: easy REF: 2.6
OBJ: Determine whether a chemical formula is also a molecular formula.
TOP: early atomic theory | chemical substance KEY: chemical formula
MSC: general chemistry
41. ANS: E PTS: 1 DIF: easy REF: 2.6
OBJ: Define ion, cation, and anion. TOP: early atomic theory | chemical substance
42. ANS: A PTS: 1 DIF: easy REF: 2.6
OBJ: Define ion, cation, and anion. TOP: early atomic theory | chemical substance
43. ANS: E PTS: 1 DIF: moderate REF: 2.6
OBJ: Write an ionic formula, given the ions.
TOP: early atomic theory | chemical substance
44. ANS: C PTS: 1 DIF: easy REF: 2.8
OBJ: Learn the rules for predicting the charges of monatomic ions in ionic compounds.
TOP: early atomic theory | chemical substance
KEY: chemical formula | ionic substance MSC: general chemistry
45. ANS: D PTS: 1 DIF: easy REF: 2.8
OBJ: Apply the rules for naming monatomic ions.
TOP: early atomic theory | chemical substance
KEY: nomenclature of simple compound | ionic compound MSC: general chemistry
46. ANS: D PTS: 1 DIF: easy REF: 2.8
OBJ: Learn the names and charges of common polyatomic ions.
TOP: early atomic theory | chemical substance
KEY: nomenclature of simple compound | ionic compound MSC: general chemistry
47. ANS: E PTS: 1 DIF: easy REF: 2.8
OBJ: Learn the names and charges of common polyatomic ions.
TOP: early atomic theory | chemical substance
KEY: nomenclature | ionic compound MSC: general chemistry
48. ANS: A PTS: 1 DIF: easy REF: 2.8
OBJ: Name an ionic compound from its formula. (Example 2.4)
TOP: early atomic theory | chemical substance
KEY: nomenclature of simple compound | ionic compound MSC: general chemistry

49. ANS: D PTS: 1 DIF: easy REF: 2.8
OBJ: Name an ionic compound from its formula. (Example 2.4)
TOP: early atomic theory | chemical substance
KEY: nomenclature of simple compound | ionic compound MSC: general chemistry
50. ANS: D PTS: 1 DIF: moderate REF: 2.8
OBJ: Write the formula of an ionic compound from its name. TOP: chemical formulas
51. ANS: E PTS: 1 DIF: easy REF: 2.8
OBJ: Write the formula of an ionic compound from its name. (Example 2.5)
TOP: early atomic theory | chemical substance
KEY: nomenclature of simple compound | ionic compound MSC: general chemistry
52. ANS: A PTS: 1 DIF: easy REF: 2.8
OBJ: Write the formula of an ionic compound from its name. (Example 2.5)
TOP: early atomic theory | chemical substance
KEY: nomenclature of simple compound | ionic compound MSC: general chemistry
53. ANS: B PTS: 1 DIF: easy REF: 2.8
OBJ: Name a binary compound from its formula. (Example 2.6)
TOP: early atomic theory | chemical substance
KEY: nomenclature of simple compound | ionic compound MSC: general chemistry
54. ANS: A PTS: 1 DIF: easy REF: 2.9
OBJ: Identify the reactants and products in a chemical equation.
TOP: early atomic theory | chemical equation KEY: writing equation
MSC: general chemistry
55. ANS: B PTS: 1 DIF: moderate REF: 2.9
OBJ: Write chemical equations using appropriate phase labels, symbols of reactions conditions, and the presence of a catalyst. TOP: early atomic theory | chemical equation
KEY: balancing chemical equation MSC: general chemistry
56. ANS: D PTS: 1 DIF: moderate REF: 2.10
OBJ: Master techniques for balancing chemical equations. (Example 2.12)
TOP: early atomic theory | chemical equation
KEY: balancing chemical equation MSC: general chemistry
57. ANS: E PTS: 1 DIF: moderate REF: 2.10
OBJ: Master techniques for balancing chemical equations. (Example 2.12)
TOP: early atomic theory | chemical equation
KEY: balancing chemical equation MSC: general chemistry
58. ANS: D PTS: 1 DIF: easy REF: 2.10
OBJ: Master techniques for balancing chemical equations. (Example 2.12)
TOP: early atomic theory | chemical equation
KEY: balancing chemical equation MSC: general chemistry
59. ANS: B PTS: 1 DIF: difficult REF: 2.10
OBJ: Master techniques for balancing chemical equations. (Example 2.12)
TOP: early atomic theory | chemical equation
KEY: balancing chemical equation MSC: general chemistry
60. ANS: A PTS: 1 DIF: easy REF: 2.10
OBJ: Determine if a chemical reaction is balanced.
TOP: early atomic theory | chemical equation
KEY: balancing chemical equation MSC: general chemistry

61. ANS: D PTS: 1 DIF: easy REF: 2.10
OBJ: Determine if a chemical reaction is balanced.
TOP: early atomic theory | chemical equation
KEY: balancing chemical equation MSC: general chemistry
62. ANS: E PTS: 1 DIF: easy REF: 4.2
OBJ: From the complete ionic equation, write the net ionic equation.
TOP: chemical reactions | ions in aqueous solution
KEY: ionic equation | net ionic equation MSC: general chemistry
63. ANS: B PTS: 1 DIF: moderate REF: 4.2
OBJ: Write net ionic equations. (Example 4.2)
TOP: chemical reactions | ions in aqueous solution
64. ANS: D PTS: 1 DIF: moderate REF: 4.2
OBJ: Write net ionic equations. (Example 4.2)
TOP: chemical reactions | types of chemical reactions KEY: precipitation reaction
MSC: general chemistry
65. ANS: A PTS: 1 DIF: moderate REF: 4.3
OBJ: Recognize precipitation (exchange) reactions.
TOP: chemical reactions | types of chemical reactions
66. ANS: A PTS: 1 DIF: moderate REF: 4.3
OBJ: Recognize precipitation (exchange) reactions.
TOP: chemical reactions | types of chemical reactions
67. ANS: A PTS: 1 DIF: easy REF: 4.3
OBJ: Decide whether a precipitation reaction will occur. (Example 4.3)
TOP: chemical reactions | types of chemical reactions KEY: precipitation reaction
MSC: general chemistry
68. ANS: E PTS: 1 DIF: difficult REF: 4.3
OBJ: Determine the product of a precipitation reaction.
TOP: chemical reactions | types of chemical reactions
69. ANS: C PTS: 1 DIF: easy REF: 4.4
OBJ: Learn the common strong acids and strong bases.
TOP: chemical reactions | types of chemical reactions
KEY: acid-base reaction | strong acid MSC: general chemistry
70. ANS: E PTS: 1 DIF: easy REF: 4.4
OBJ: Learn the common strong acids and strong bases.
TOP: chemical reactions | types of chemical reactions
71. ANS: B PTS: 1 DIF: easy REF: 4.4
OBJ: Distinguish between a strong base and a weak base and the solutions they form.
TOP: chemical reactions | types of chemical reactions
KEY: acid-base reaction | weak base MSC: general chemistry
72. ANS: A PTS: 1 DIF: easy REF: 4.4
OBJ: Write an equation for a neutralization reaction. (Example 4.5)
TOP: chemical reactions | types of chemical reactions
KEY: acid-base reaction | neutralization reaction MSC: general chemistry
73. ANS: C PTS: 1 DIF: moderate REF: 4.4
OBJ: Write an equation for a neutralization reaction. (Example 4.5)

- TOP: chemical reactions | types of chemical reactions
KEY: acid-base reaction | neutralization reaction MSC: general chemistry
74. ANS: D PTS: 1 DIF: moderate REF: 4.4
OBJ: Write an equation for a neutralization reaction. (Example 4.5)
TOP: chemical reactions | types of chemical reactions
KEY: acid-base reaction | neutralization reaction MSC: general chemistry
75. ANS: E PTS: 1 DIF: moderate REF: 4.5
OBJ: Define an oxidation-reduction reaction.
TOP: chemical reactions | types of chemical reactions
76. ANS: A PTS: 1 DIF: easy REF: 4.5
OBJ: Define an oxidation-reduction reaction.
TOP: chemical reactions | types of chemical reactions
KEY: oxidation-reduction reaction MSC: general chemistry
77. ANS: C PTS: 1 DIF: moderate REF: 4.5
OBJ: Learn the oxidation-number rules.
TOP: chemical reactions | types of chemical reactions
78. ANS: C PTS: 1 DIF: moderate REF: 4.5
OBJ: Assign oxidation numbers. (Example 4.7)
TOP: chemical reactions | types of chemical reactions
79. ANS: C PTS: 1 DIF: moderate REF: 4.5
OBJ: Assign oxidation numbers. (Example 4.7)
TOP: chemical reactions | types of chemical reactions
KEY: oxidation-reduction reaction | oxidation number MSC: general chemistry
80. ANS: D PTS: 1 DIF: difficult REF: 4.5
OBJ: Assign oxidation numbers. (Example 4.7)
TOP: chemical reactions | types of chemical reactions
KEY: oxidation-reduction reaction | oxidation number MSC: general chemistry
81. ANS: B PTS: 1 DIF: easy REF: 4.5
OBJ: Write the half-reactions of an oxidation-reduction reaction.
TOP: chemical reactions | types of chemical reactions
KEY: oxidation-reduction reaction MSC: general chemistry
82. ANS: B PTS: 1 DIF: moderate REF: 4.5
OBJ: Recognize combination reactions, decomposition reactions, displacement reactions, and combustion reactions.
TOP: chemical reactions | types of chemical reactions
KEY: oxidation-reduction reaction | common oxidation-reduction reactions
MSC: general chemistry
83. ANS: C PTS: 1 DIF: moderate REF: 4.5
OBJ: Recognize combination reactions, decomposition reactions, displacement reactions, and combustion reactions.
TOP: chemical reactions | types of chemical reactions
KEY: oxidation-reduction reaction | common oxidation-reduction reactions
MSC: general chemistry
84. ANS: B PTS: 1 DIF: easy REF: 4.5
OBJ: Recognize combination reactions, decomposition reactions, displacement reactions, and combustion reactions.

- TOP: chemical reactions | types of chemical reactions
KEY: oxidation-reduction reaction | common oxidation-reduction reactions
MSC: general chemistry
85. ANS: C PTS: 1 DIF: moderate REF: 4.7
OBJ: Define molarity or molar concentration of a solution.
TOP: chemical reactions | working with solutions KEY: concentration
MSC: general chemistry
86. ANS: A PTS: 1 DIF: easy REF: 4.7
OBJ: Calculate the molarity from mass and volume. (Example 4.9)
TOP: chemical reactions | working with solutions KEY: concentration
MSC: general chemistry
87. ANS: B PTS: 1 DIF: easy REF: 4.7
OBJ: Calculate the molarity from mass and volume. (Example 4.9)
TOP: chemical reactions | working with solutions KEY: concentration
MSC: general chemistry
88. ANS: B PTS: 1 DIF: moderate REF: 4.7
OBJ: Use molarity as a conversion factor. (Example 4.10)
TOP: chemical reactions | working with solutions KEY: concentration
MSC: general chemistry
89. ANS: C PTS: 1 DIF: moderate REF: 4.7
OBJ: Use molarity as a conversion factor. (Example 4.10)
TOP: chemical reactions | working with solutions KEY: concentration
MSC: general chemistry
90. ANS: E PTS: 1 DIF: moderate REF: 4.8
OBJ: Perform calculations associated with dilution.
TOP: chemical reactions | working with solutions KEY: diluting solutions
MSC: general chemistry
91. ANS: C PTS: 1 DIF: moderate REF: 4.10
OBJ: Calculate the volume of reactant solution needed to perform a reaction. (Example 4.13)
TOP: chemical reactions | quantitative analysis KEY: volumetric analysis
MSC: general chemistry