

**Unit 0 – Chapters 1 & 2**

Name \_\_\_\_\_

**Assignment #1**

Period \_\_\_\_\_

For the following general chemistry review questions, 1 – 37 come from chapter 1 and 38 – 80 come from chapter 2.

- \_\_\_\_\_ 1. Which of the following is the correct order of prefixes from smallest to largest?
- a. pico, nano, micro, giga, milli, hecto, peta      c. peta, giga, hecto, pico, nano, micro, milli  
b. pico, nano, micro, milli, hecto, giga, peta      d. pico, nano, peta, giga, hecto, micro, milli
- \_\_\_\_\_ 2. Which of the following is the correct order of the prefixes from the smallest to the largest?
- a. femto, tera, mega, deci, kilo, atto, exa      c. atto, femto, deci, kilo, mega, tera, exa  
b. exa, tera, mega, kilo, deci, femto, atto      d. atto, femto, exa, tera, mega, kilo, deci
- \_\_\_\_\_ 3. Which of the following numbers has 4 significant figures?
- a. 463      c. 1.7000  
b. 4200      d. 0.003840
- \_\_\_\_\_ 4. How many significant figures does the number 1600.0 have?
- a. 2      c. 4  
b. 5      d. 3
- \_\_\_\_\_ 5. Which of the following numbers has the most significant figures?
- a. 2000.00      c. 0.00000730  
b.  $7.63 \times 10^{11}$       d. 726.30
- \_\_\_\_\_ 6. Give the answer to the following operation in correct significant figures.  
 $324.6 \times 815.991 = ?$
- a.  $2.7 \times 10^5$       c.  $2.649 \times 10^5$   
b. 26,487      d. 264,870.68
- \_\_\_\_\_ 7. Give the answer to the following operation in correct significant figures.  
 $6.404 \times 2.91 \times (18.7 - 17.1) = ?$
- a. 29.8      c.  $2.98 \times 10^2$   
b. 29.817      d. 30.
- \_\_\_\_\_ 8. Using the conversion factors in the inside back cover of your textbook, convert 3.5 quarts to microliters.
- a.  $3.3 \times 10^6$  microliters      c. 0.000421 microliters  
b.  $2.6 \times 10^6$  microliters      d. 7206 microliters
- \_\_\_\_\_ 9. Convert 4.2 yards to kilometers.
- a. 75,200 km      c. 0.0038 km  
b. 627 km      d.  $1.2 \times 10^3$  km
- \_\_\_\_\_ 10. If you put 8 gallons of gas in your car and it costs you a total of \$9.20, what is the cost of gas per liter?
- a. \$1.20/liter      c. \$0.30/liter  
b. \$0.76/liter      d. \$0.51/liter

- \_\_\_\_\_ 11. A 5 lb. bag of flour costs \$0.89. What is the cost of the flour per **kilogram**?
- a. \$0.39/kg
  - b. \$0.27/kg
  - c. \$2.10/kg
  - d. \$1.01/kg
- \_\_\_\_\_ 12. During a recent baseball game, a pitcher threw a fastball that had a velocity of 93.7 mph. Calculate the velocity in **meters/sec**.
- a. 55.6 m/sec
  - b. 41.9 m/sec
  - c. 44.0 m/sec
  - d. 49.9 m/sec
- \_\_\_\_\_ 13. If a student weighs 185 lbs, what is his mass in **micrograms**?
- a.  $1.72 \times 10^{10}$  micrograms
  - b.  $8.39 \times 10^{10}$  micrograms
  - c.  $6.72 \times 10^{11}$  micrograms
  - d.  $7.20 \times 10^{15}$  micrograms
- \_\_\_\_\_ 14. Convert 150°F to K.
- a. 339 K
  - b. 72 K
  - c. 152 K
  - d. 50 K
- \_\_\_\_\_ 15. An object weighing 4.0 lbs occupies 1700 mL. What is the density of the object in **g/mL**?
- a. 1.7 g/mL
  - b. 1.3 g/mL
  - c. 2.1 g/mL
  - d. 1.1 g/mL
- \_\_\_\_\_ 16. The density of an object is 1.63 g/mL. Its volume is 0.27 liters. What is the mass of the object?
- a. 440 g
  - b. 420 g
  - c. 410 g
  - d. 430 g
- \_\_\_\_\_ 17. Which of the following is not one of the seven basic SI units?
- a. mass
  - b. volume
  - c. time
  - d. mole
- \_\_\_\_\_ 18. The basic unit for amount of substance is:
- a. mole
  - b. liter
  - c. kilogram
  - d. gram
- \_\_\_\_\_ 19. A picometer is:
- a. greater than a micrometer
  - b. equal to a micrometer
  - c. less than a micrometer
  - d. twice as large as a micrometer
- \_\_\_\_\_ 20. Which of the following units would best describe the distance between two asteroids that are 8 deca-hecto-kilo miles apart?
- a. gigamile
  - b. teramile
  - c. macromile
  - d. megamile
- \_\_\_\_\_ 21. The number of zeroes following and preceding the decimal point for the prefixes femto and exa are:
- a. 18 and 18
  - b. 14 and 18
  - c. 15 and 18
  - d. 15 and 19

- \_\_\_\_\_ 22. Which of the following cannot be an exact number?
- |  |                     |
|--|---------------------|
| a. three eggs                                  | c. 12 roses         |
| b. 12 mL of water measured in a 20-mL cylinder | d. 2400 air flights |
- \_\_\_\_\_ 23. Round 20.589959 to 4, 3, and 2 figures, respectively.
- |                    |                    |
|--------------------|--------------------|
| a. 20.59, 20.5, 20 | c. 20.60, 20.6, 21 |
| b. 20.58, 20.5, 20 | d. 20.59, 20.6, 21 |
- \_\_\_\_\_ 24. Give the answer to the following operation in correct significant figures:  
 $(22.41 + 0.464) \times 999 / 18.465 = ?$
- |                       |                      |
|-----------------------|----------------------|
| a. 1237.32            | c. $1.2 \times 10^4$ |
| b. $1.24 \times 10^3$ | d. 1237              |
- \_\_\_\_\_ 25. Give the answer to the following operation in correct significant figures:  
 $9.99 / 22.41 \times (18.465 \times 0.464) = ?$
- |         |          |
|---------|----------|
| a. 3.82 | c. 3.8   |
| b. 3    | d. 3.819 |
- \_\_\_\_\_ 26. Assume mass and weight to be equivalent (i.e., 28.4 g = 1.00 oz). Calculate the weight of the earth in lbs if its mass is  $3.7 \times 10^{24}$  kg.
- |                             |                             |
|-----------------------------|-----------------------------|
| a. $8.1 \times 10^{24}$ lbs | c. $4.0 \times 10^{20}$ lbs |
| b. $8.3 \times 10^{38}$ lbs | d. $1.7 \times 10^{69}$ lbs |
- \_\_\_\_\_ 27. What are the dimensions, in metric units, for a linebacker who is 6'4" and weighs 245 lbs?
- |                       |                       |
|-----------------------|-----------------------|
| a. 193 cm and 6,900 g | c. 0.193 m and 100 kg |
| b. 1.93 m and 111 kg  | d. 1.11 m and 193 kg  |
- \_\_\_\_\_ 28. A rectangular tile 15 X 18 inches can be converted into square meters by which of the following conversion setups?
- $(15 \text{ in} \times 18 \text{ in})(2.54 \text{ cm}/1 \text{ in})(1 \text{ m}/100 \text{ cm})$
  - $(15 \text{ in} \times 18 \text{ in})(2.54 \text{ cm}/1 \text{ in})^2(1 \text{ m}/100 \text{ cm})$
  - $(15 \text{ in} \times 18 \text{ in})(2.54 \text{ cm}/1 \text{ in})^2(1 \text{ m}/100 \text{ cm})^2$
  - $(15 \text{ in} \times 18 \text{ in})(2.54 \text{ cm}/1 \text{ in})(1 \text{ m}/100 \text{ cm})^2$
- \_\_\_\_\_ 29. A parsec is an astronomical unit of distance. 1 parsec = 3.26 light years (or the distance traveled by light in one year). Light speed = 186,000 miles per second. An object travels 9.6 parsecs. Calculate the distance in **cm**.
- |                            |                            |
|----------------------------|----------------------------|
| a. $2.0 \times 10^{13}$ cm | c. $9.6 \times 10^8$ cm    |
| b. $3.0 \times 10^{19}$ cm | d. $3.7 \times 10^{15}$ cm |
- \_\_\_\_\_ 30. How many cubic feet are there in a cube whose edge is  $6.0 \times 10^{21}$  miles in length?
- |   |   |
|---|---|
| a. $2.2 \times 10^{63}$ ft <sup>3</sup> | c. $1.0 \times 10^{27}$ ft <sup>3</sup> |
| b. $3.2 \times 10^{76}$ ft <sup>3</sup> | d. $3.6 \times 10^{42}$ ft <sup>3</sup> |
- \_\_\_\_\_ 31. 8 quarts = 1 peck, and 4 pecks = 1 bushel. How many quarts are there in a half megabushel?
- |                         |                         |
|-------------------------|-------------------------|
| a. $1.6 \times 10^7$ qt | c. $4.0 \times 10^6$ qt |
| b. $1.3 \times 10^4$ qt | d. $6.5 \times 10^7$ qt |

- \_\_\_\_\_ 32. At what temperature does  $^{\circ}\text{C} = 0.5(^{\circ}\text{F})$ ?
- a.  $^{\circ}\text{C} = 60$  and  $^{\circ}\text{F} = 120$
  - b.  $^{\circ}\text{C} = 160$  and  $^{\circ}\text{F} = 320$
  - c.  $^{\circ}\text{C} = 45$  and  $^{\circ}\text{F} = 90$
  - d.  $^{\circ}\text{C} = 0$  and  $^{\circ}\text{F} = 0$
- \_\_\_\_\_ 33. The average daytime temperature on Earth and Jupiter are  $72^{\circ}\text{F}$  and  $313\text{ K}$ , respectively. Calculate the difference in temperature in  $^{\circ}\text{C}$  between these two planets.
- a.  $18^{\circ}\text{C}$
  - b.  $32^{\circ}\text{C}$
  - c.  $29^{\circ}\text{C}$
  - d.  $193^{\circ}\text{C}$
- \_\_\_\_\_ 34. A column of liquid is found to expand linearly on heating  $5.25\text{ cm}$  for a  $10^{\circ}\text{F}$  rise in temperature. If the initial temperature of the liquid is  $98.6^{\circ}\text{F}$ , what will the final temperature be in  $^{\circ}\text{C}$  if the liquid has expanded by  $18.5\text{ cm}$ ?
- a.  $37.0^{\circ}\text{C}$
  - b.  $72.2^{\circ}\text{C}$
  - c.  $19.6^{\circ}\text{C}$
  - d.  $56.6^{\circ}\text{C}$
- \_\_\_\_\_ 35. Calculate the density, in  $\text{kg/L}$ , of a block of wood  $2.5\text{ feet}$  by  $18\text{ inches}$  by  $1\text{ yard}$  that weighs  $646\text{ lbs}$ .
- a.  $0.92\text{ kg/L}$
  - b.  $9.2\text{ kg/L}$
  - c.  $1.1\text{ kg/L}$
  - d.  $4.8\text{ kg/L}$
- \_\_\_\_\_ 36. The specific gravity of benzene is  $0.865$  and the density of water is  $0.996\text{ g/cm}^3$  at  $25^{\circ}\text{C}$ . Specific gravity is defined as the ratio of the density of some material to the density of some standard material, such as water. Calculate the density of benzene at  $25^{\circ}\text{C}$ .
- a.  $0.865\text{ g/cm}^3$
  - b.  $0.862\text{ g/cm}^3$
  - c.  $1.000\text{ g/cm}^3$
  - d.  $0.996\text{ g/cm}^3$
- \_\_\_\_\_ 37. If the volume occupied by an electron equals that occupied by a proton, what is the ratio of the densities of proton to electron? You can consult your textbook to find the mass of the electron and that of the proton.
- a.  $1840:1$
  - b.  $1:1000$
  - c.  $1000:1$
  - d.  $1.00:1.00$
- \_\_\_\_\_ 38. Which of the following is a pure substance?
- a. an egg
  - b. sea water
  - c. bronze
  - d. copper
- \_\_\_\_\_ 39. Which of the following is a homogeneous mixture?
- a. an egg
  - b. copper
  - c. oil and vinegar
  - d. an unused piece of photocopy paper
- \_\_\_\_\_ 40. Which of the following techniques is the least desirable for separating sand and water?
- a. freezing
  - b. decanting
  - c. evaporation
  - d. extraction
- \_\_\_\_\_ 41. By experiment, it has been found that  $2.18\text{ g}$  of zinc metal combines with oxygen to yield  $2.71\text{ g}$  of zinc oxide. How many grams of oxygen reacted with zinc metal?
- a.  $0.47\text{ grams}$
  - b.  $0.53\text{ grams}$
  - c.  $0.32\text{ grams}$
  - d.  $0.67\text{ grams}$

- \_\_\_\_\_ 42. A sample of  $\text{H}_2\text{SO}_4$  contains 2.02 g of hydrogen, 32.06 g of sulfur, and 65 g of oxygen. How many grams of sulfur and grams of oxygen are present in a second sample of  $\text{H}_2\text{SO}_4$  containing 7.27 g of hydrogen?
- a. 109.6 g sulfur, 200.3 g oxygen      c. 115.4 g sulfur, 230.4 g oxygen  
b. 95.2 g sulfur, 210.2 g oxygen      d. 72.3 g sulfur, 52.0 g oxygen
- \_\_\_\_\_ 43. How many protons, neutrons, and electrons are in the ion  $^{31}\text{P}^{3-}$ ?
- a. 18, 15, 16      c. 16, 15, 18  
b. 15, 16, 18      d. 15, 18, 16
- \_\_\_\_\_ 44. In which family does the element strontium belong?
- a. transition metal      c. halogen family  
b. alkaline earth metal      d. alkali metal
- \_\_\_\_\_ 45. Which of the following elements is a nonmetal?
- a. Br      c. Ge  
b. Es      d. Bi
- \_\_\_\_\_ 46. An element combines with 2 atoms of chlorine to form an ionic compound. The element has 20 neutrons in its most abundant form. What is the formula of this compound?
- a.  $\text{SrCl}_2$       c.  $\text{OCl}_2$   
b.  $\text{MgCl}_2$       d.  $\text{CaCl}_2$
- \_\_\_\_\_ 47. The formula for the compound iron (III) oxide is:
- a.  $\text{FeO}$       c.  $\text{Fe}_3\text{O}_2$   
b.  $\text{Fe}_2\text{O}_3$       d.  $\text{Fe}_3\text{O}_3$
- \_\_\_\_\_ 48. The formula for the permanganate ion is:
- a.  $\text{MnO}_4^-$       c.  $\text{MnSO}_4$   
b.  $\text{MnO}_3^{2-}$       d.  $\text{MnO}$
- \_\_\_\_\_ 49. The formula for the sulfite ion is:
- a.  $\text{SO}_4^{2-}$       c.  $\text{SO}^-$   
b.  $\text{SO}_3^{2-}$       d.  $\text{SO}_2$
- \_\_\_\_\_ 50. The formula for the compound calcium phosphate is:
- a.  $\text{CaPO}_4$       c.  $\text{Ca}_2\text{PO}_4$   
b.  $\text{Ca}_2(\text{PO}_4)_3$       d.  $\text{Ca}_3(\text{PO}_4)_2$
- \_\_\_\_\_ 51. What is the name of the acid  $\text{H}_3\text{PO}_4$ ?
- a. hydroacid      c. hydrogen phosphate acid  
b. phosphorous acid      d. phosphoric acid
- \_\_\_\_\_ 52. The chemical formula for hydrosulfuric acid is:
- a.  $\text{H}_2\text{SO}_4$       c.  $\text{H}_2\text{S}$   
b.  $\text{HSO}_3$       d.  $\text{H}_3\text{S}_2$

- \_\_\_\_\_ 53. The masses of an apple, orange, grape, and banana are 800, 750, 72, and 650 g, respectively. Determine the combined mass of 10 apples, 6 oranges, 20 grapes and 5 bananas.
- a. 17,190 g
  - b. 8,595 g
  - c. 2,272 g
  - d. 95,200 g
- \_\_\_\_\_ 54. The oxides of CO and CO<sub>2</sub> must have the following carbon-to-oxygen mass ratio:
- a. 12:16, 12:32
  - b. 12:12, 12:16
  - c. 12:8, 12:4
  - d. 12:12, 12:24
- \_\_\_\_\_ 55. Every atom contains
- a. as many neutrons as electrons
  - b. as many protons as neutrons
  - c. as many nuclei as neutrons
  - d. as many electrons as protons
- \_\_\_\_\_ 56. The atomic number represents
- a. the number of nuclei in that atom
  - b. the number of protons in that atom
  - c. the number of neutrons in that atom
  - d. the number of electrons in that atom
- \_\_\_\_\_ 57. Which of the following elements has  $Z = 68$  and  $A = 167$ ?
- a. Erbium
  - b. Californium
  - c. Calcium
  - d. Dysprosium
- \_\_\_\_\_ 58. The atomic number and atomic mass, respectively, for Vanadium is:
- a. 23, 51
  - b. 51, 23
  - c. 46, 102
  - d. 46, 51
- \_\_\_\_\_ 59. Atom A has 30 protons, 32 neutrons, and 30 electrons. Atom B has 30 protons, 28 neutrons, and 30 electrons. Atoms A and B are:
- a. isotopes
  - b. isobars
  - c. isomers
  - d. isoneutrons
- \_\_\_\_\_ 60. How many electrons and protons, respectively, are there in  $\text{Ra}^{2+}$ ?
- a. 88, 88
  - b. 86, 88
  - c. 224, 226
  - d. 228, 224
- \_\_\_\_\_ 61. How many total protons are found in two molecules of  $\text{C}_{20}\text{H}_{30}\text{O}$ ?
- a. 102
  - b. 316
  - c. 302
  - d. 600
- \_\_\_\_\_ 62. What is the charge of an ion with 29 protons and 28 neutrons?
- a. 0
  - b. +1
  - c. -3
  - d. unknown
- \_\_\_\_\_ 63. What is the charge of an ion with 38 electrons, 38 neutrons, and 35 protons?
- a. 0
  - b. +3
  - c. -3
  - d. -5

- \_\_\_\_\_ 64. How many electrons does an ion with mass number 210, with 125 neutrons, and a charge of -2 have?
- a. 85
  - b. 83
  - c. 87
  - d. 89
- \_\_\_\_\_ 65. An ion has a charge of +3 and 55 electrons. Which of the following elements can form such an ion?
- a. Th
  - b. Ce
  - c. Mn
  - d. Co
- \_\_\_\_\_ 66. Atom A loses 1 electron and atom B gains 2 electrons. What formula results if these two ions combine to produce a neutral compound?
- a. AB
  - b. A<sub>2</sub>B
  - c. AB<sub>2</sub>
  - d. A<sub>2</sub>B<sub>3</sub>
- \_\_\_\_\_ 67. Which one of the following chemical symbols does NOT represent an element?
- a. SO
  - b. Gd
  - c. Am
  - d. Au
- \_\_\_\_\_ 68. Which of the following symbols represents an element?
- a. IF
  - b. HI
  - c. AU
  - d. C
- \_\_\_\_\_ 69. Which group of elements belongs in the transition metal family?
- a. Ru, C, Hg, Ir
  - b. Pd, Ir, Ac, Re
  - c. Bi, Sc, Pu, Rn
  - d. Ti, Sc, Au, Fr
- \_\_\_\_\_ 70. The SO<sub>4</sub><sup>2-</sup> ion is called
- a. sulfite ion
  - b. sulfate ion
  - c. sulfur tetroxide ion
  - d. sulfur oxide ion
- \_\_\_\_\_ 71. The formula for iron (III) carbonate is:
- a. FeCO<sub>3</sub>
  - b. Fe<sub>2</sub>(CO)<sub>3</sub>
  - c. Fe<sub>2</sub>(CO<sub>3</sub>)<sub>3</sub>
  - d. Fe<sub>3</sub>(CO)<sub>3</sub>
- \_\_\_\_\_ 72. The compound Co<sub>2</sub>(CO<sub>3</sub>)<sub>3</sub> is named:
- a. cobalt (III) carbonate
  - b. cobalt carbonate
  - c. cobalt (II) carbonate
  - d. cobalt carbon trioxide
- \_\_\_\_\_ 73. The ion SCN<sup>-</sup> is named:
- a. sulfocyno ion
  - b. thiocyno ion
  - c. cyano ion
  - d. thiocyanate ion
- \_\_\_\_\_ 74. Which of the following is the formula for barium chloride?
- a. BaCl
  - b. Ba<sub>2</sub>Cl
  - c. Ba<sub>2</sub>Cl<sub>2</sub>
  - d. BaCl<sub>2</sub>

- \_\_\_\_\_ 75. Which one of the following is NOT a polyatomic anion?
- a. sulfate
  - b. hydride
  - c. nitrite
  - d. carbonate
- \_\_\_\_\_ 76. The formula for hydrosulfuric acid is:
- a.  $\text{H}_2\text{S}$
  - b.  $\text{H}_2\text{SO}_3$
  - c.  $\text{H}_2\text{SO}_4$
  - d.  $\text{HSO}_4$
- \_\_\_\_\_ 77. The name for  $\text{BrO}_3^-$  is:
- a. bromite
  - b. perbromate
  - c. bromate
  - d. hypobromite
- \_\_\_\_\_ 78. The oxoacid  $\text{HIO}$  is named:
- a. hypoiodous
  - b. iodic
  - c. iodous
  - d. periodic
- \_\_\_\_\_ 79. What is the formula of ammonium perchlorate?
- a.  $\text{NH}_3\text{ClO}_3$
  - b.  $\text{NH}_4\text{ClO}_4$
  - c.  $\text{NH}_3\text{ClO}$
  - d.  $\text{NH}_3\text{ClO}_2$
- \_\_\_\_\_ 80. When a calcium ion is combined with a sulfate ion, the following neutral compound is produced:
- a.  $\text{CaSO}_4$
  - b.  $\text{CaS}$
  - c.  $\text{Ca}_2(\text{SO}_4)_3$
  - d.  $\text{Ca}(\text{SO}_4)_2$