Chapter 1-2 Review

Matching

D 1. organic chemistry
B 2. inorganic chemistry
C 3. analytical chemistry
A 4. physical chemistry
E 5. biochemistry

6. Theory
B 7. Observation
D 8. Hypothesis
A 9. Scientific method
C 10. Experiment
F 11. Scientific law

E 12. Elements
B 13. Mass
A 14. Phase
F 15. Chemical symbol
D 16. Mixture
C 17. Matter

a. branch of chemistry that involves the theories and experiments that describe the behavior of chemicals.
b. branch of chemistry that is primarily the study of all substances that do not contain carbon.
c. field of chemistry that is concerned with the composition of matter.
d. the study of essentially all substances containing carbon.
e. field of study that is concerned with the chemistry of living things.
a. a logical approach to the solution of a scientific problem
b. Information obtained directly by using your senses
c. a method of testing a hypothesis
d. a proposed explanation or reason for what is observed.
e. A broad and extensively tested explanation of why experiments give certain results
f. Describes a natural phenomenon but does not explain it.
a. Part of a system having uniform composition and properties
b. Amount of matter an object contains
c. Anything that has mass and takes up space.
d. A physical bled of two or more substance
e. Simplest form of matter that can exist under normal laboratory conditions
f. One or two letter designation for an element.
18. Classify each of the following terms as qualitative or quantitative.
   a. a cold shower _______ qual _______
   b. a dozen eggs _______ quant _______
   c. nine innings _______ quant _______
   d. a tall building _______ qual _______

19. Express the following numbers in scientific notation
   a. \( 10^1 \times 10^3 \)
   b. \( 450000 = 4.5 \times 10^5 \)
   c. \( 0.00000982 = 9.82 \times 10^{-6} \)
   d. \( 0.0650 = 6.50 \times 10^{-2} \)

20. State whether each of the following is heterogeneous or homogeneous.
   a. Oxygen dissolved in water _______ homogeneous _______
   b. Carbon mixed in sand _______ heterogeneous _______
   c. Filtered apple juice _______ homogeneous _______
   d. Vegetable soup _______ heterogeneous _______
   e. Salt _______ pure _______
   f. Vinegar _______ mix _______

22. Classify each change as chemical or physical
   a. Melting butter _______ P _______
   b. Shattering a window _______ P _______
   c. Burning gasoline _______ C _______
   d. Boiling water _______ P _______
   e. Tarnishing of a silver spoon _______ C _______
   f. Mixing Kool-Aid mix and water together _______ P _______

23. Give the number of significant figures in the following measurements.
   a. \( 3.85 \times 10^{-3} \) dm _______ 3 _______
   b. \( 17.30 \) cm\(^2\) _______ 4 _______
   c. \( 0.0037 \) g _______ 2 _______
   d. \( 250 \) mL _______ 2 _______
   e. \( 3.05 \) L _______ 3 _______
   f. \( 40.0 \) mg _______ 3 _______

24. Perform the following calculations and answer to the correct number of significant figures and appropriate units.
   a. \( 37.2 \) mL + \( 18.0 \) mL + \( 380 \) mL = _______ 410 mL _______ (+mcky)
   b. \( 0.57 \) cm \times 0.86 cm \times 17.1 \) cm = _______ 8.4 cm\(^3\) _______
   c. \( 8.13 \times 10^4 / 3.8 \times 10^2 \) = _______ 210 _______
Show the formula and set-up for each math problem. Final answers should be rounded to the correct number of significant figures and have appropriate units.

25. A type of wood known as white pine has a density of 0.50 g/cm³. What is the mass of a block of white pine that has the dimensions 5.0 cm by 10.0 cm by 2000.0 cm?

\[ d = \frac{m}{V} \]
\[ 0.50 = \frac{x}{100000} \]
\[ V = L \times W \times H \]
\[ V = 5 \times 10 \times 2000 \]
\[ V = 100000 \text{ cm}^3 \]
\[ x = \frac{50000}{5.0 \times 10^5} \text{ g} \]

26. A piece of ice (frozen water) has a mass of 9.2 g and a volume of 10.0 cm³.
   a. What is the density of the ice?

\[ d = \frac{m}{V} \]
\[ d = \frac{9.2}{100} = 0.092 \text{ g/cm}^3 \]

b. What is the density of water?
   c. Would this ice float in water? yes
   d. Would the ice float in gasoline? (d = 0.7 g/cm³) no, it has a higher density.

27. What is the volume, in cm³, of a sample of mercury that has a mass of 2000.0 g? (d = 13.6 g/cm³)

\[ d = \frac{m}{V} \]
\[ 13.6 = \frac{2000.0}{x} \]
\[ x = 147 \text{ cm}^3 \]

28. Joshua uses his thermometer and finds the boiling point of ethyl alcohol to be 75°C. He looks in a reference book and finds that the true boiling point of ethyl alcohol is 80°C. What is his percent error?

\[ \% \text{ error} = \frac{| \text{act} - \text{theo} |}{\text{theo}} \times 100 = \frac{|75 - 80|}{80} \times 100 = 6.25 \% \text{ error} \]

29. What is the length of the stick?

8.34 cm