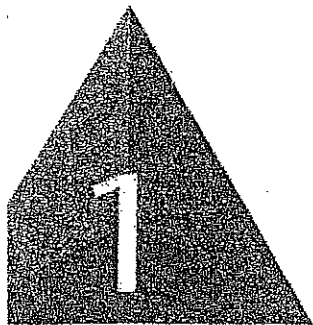


Ch. 1 - 3

Set # 1



1. Which prefix matches the fraction or multiple of a basic unit?
(1) centi, 10^{-2} (2) deci, 10^1 (3) micro, 10^{-3} (4) kilo, 10^4
(a) All (b) 1,3 (c) 2,3 (d) 1
[1-4]
2. Which pair consists of equalities?
(a) -117°C , -179°F (b) -117°C , 390 K
(c) -32°C , 0°F (d) 0°F , 243 K
[1-4]
3. Which pair consists of equalities?
(a) 6×10^{-2} mm, 6×10^{-5} m (b) 3×10^{-4} μg , 3×10^{-7} g
(c) 3×10^{-3} mL, 3 L (d) 7×10^{-2} g/mL, 7×10^{-9} kg/L
[1-4]
4. Which number contains exactly three significant figures?
(a) **370** (b) 0.372 (c) 0.03720 (d) 0.3720
[1-5]
5. How many liters will 1760 g of benzene occupy at 20°C if $d_{20^{\circ}\text{C}} = 0.88$ g/mL?
(a) 0.25 L (b) 0.50 L (c) 1.0 L (d) 2.0 L
[1-4, 1-6]
6. How many grams of sugar are contained in 1.00 L of a sugar solution that has a density of 1.15 g/mL and contains 52.0 percent sugar?
(a) 1150 g (b) 598 g (c) 552 g (d) 115 g
[1-4, 1-6]
7. What is the mass in grams of a 5.0 grain aspirin tablet, given the following Apothecaries' Weight System: 60 grains = 1 dram and 96 drams = 1 lb? (454 g = 1 lb.)
(a) 43 g (b) 38 g (c) 1.4 g (d) 0.39 g
[1-6]

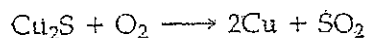
8. What is the correct sum for the following measurements?
 3.65×10^1 cm, 4.26×10^2 cm, 1.32×10^3 cm?
 (a) 9.23×10^1 cm (b) 9.23×10^2 cm (c) 5.95×10^2 cm
 (d) 5.945×10^2 cm
 [1-5]
9. How many significant figures should the answer to the following calculation possess?
 $(2.65)(3.002)(38.26 - 1.2) =$
 (a) 1 (b) 2 (c) 3 (d) 4
 [1-5]
10. Which of the following statements is true, given the following information?
 Density of A = 2.0 g/mL; Density of B = 3.5 g/mL; Density of C = 0.10 g/mL; All densities are at 20°C
 (a) 1 mL of A weighs more than 1 mL of B.
 (b) 10 g of C has a smaller volume than 10 g of B.
 (c) A, B, and C all have densities greater than water at 20°C.
 (d) One liter of B has a greater mass than 1 liter of C.
 [1-4]
11. Which element is correctly named?
 (a) K, phosphorous (b) Si, silver (c) Mg, magnesium
 (d) Sn, silicon
 [2-8]
12. Which of the following is *incorrectly* named?
 (a) H_3PO_4 -phosphoric acid (b) PO_3^{3-} -phosphate ion
 (c) HCl-hydrochloric acid (d) Cl^- -chloride ion
 [2-8]
13. Which of the following is *incorrectly* named?
 (a) CO-carbon monoxide (b) SO_2 -sulfur dioxide
 (c) PCl_3 -phosphorus trichloride (d) N_2O -nitrogen oxide
 [2-8]
14. Which of the following is *incorrectly* named?
 (a) CaCl_2 -calcium chloride (b) Na_3PO_4 -sodium phosphate
 (c) KClO_4 -potassium chlorate (d) $\text{Mg}(\text{NO}_2)_2$ -magnesium nitrite
 [2-8]
15. Which of the following is true about Dalton's Atomic Theory?
 (a) Atoms were viewed as indivisible.
 (b) It was the first statement on the atomic characteristics of matter.
 (c) It was immediately and widely accepted.
 (d) All of his postulates are still true based on today's information.
 [2-1]
16. Which of the following is the atomic mass of silver given the following distribution and masses of naturally occurring isotopes of silver:
 $^{107}_{47}\text{Ag}$: 51.88%, 106.906 amu; and $^{109}_{47}\text{Ag}$: 48.12%, 108.905 amu.
 (a) 107.868 amu (b) 106.926 amu (c) 108.235 amu (d) 108.642 amu
 [2-4]
17. Which is *not* an empirical formula?
 (a) SO_2 (b) N_2O_4 (c) H_2O (d) H_3PO_4
 [2-6]

18. Which of the following is an ionic compound?
(a) CO_2 (b) PCl_3 (c) NO_2 (d) BaCl_2
[2-7]
19. Which of the following is true about $^{63}_{29}\text{Cu}$? It has
(a) 63 protons. (b) 29 electrons. (c) 29 neutrons. (d) 63 neutrons.
[2-3]
20. How many electrons does $^{24}_{12}\text{Mg}^{2+}$ possess?
(a) 10 (b) 12 (c) 14 (d) 24
[2-3]
21. How many carbon atoms are in heptane?
(a) 5 (b) 6 (c) 7 (d) 8
[2.9]
22. Which substance is a carbon-containing compound with five carbons and an alcohol functional group?
(a) pentanol (b) pentane (c) butane (d) butanol
[2.9]
23. The chemical formula of nonane is
(a) $\text{C}_{10}\text{H}_{10}$ (b) $\text{C}_{10}\text{H}_{12}$ (c) C_9H_9 (d) C_9H_{20}
[2.9]
24. The chemical formula of propene is
(a) C_3H_4 (b) C_3H_6 (c) C_3H_8 (d) $\text{C}_3\text{H}_6\text{O}$
[2.9]
25. Which of the following reactions represents a decomposition reaction?
(a) $\text{P}_4\text{O}_{10} + 6\text{H}_2\text{O} \rightarrow 4\text{H}_3\text{PO}_4$ (b) $2\text{NaN}_3 \rightarrow 2\text{Na} + 3\text{N}_2$
(c) $2\text{H}_2\text{O} + \text{O}_2 \rightarrow 2\text{H}_2\text{O}_2$ (d) $\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O}$
[3-2]
26. Which of the following chemical equations is *not* balanced?
(a) $\text{CaF}_2 + \text{H}_2\text{SO}_4 \rightarrow 2\text{HF} + \text{CaSO}_4$
(b) $\text{Ca}_3(\text{PO}_4)_2 + 4\text{H}_3\text{PO}_4 \rightarrow 3\text{Ca}(\text{H}_2\text{PO}_4)_2$
(c) $\text{NaNO}_3 + \text{H}_2\text{SO}_4 \rightarrow \text{Na}_2\text{SO}_4 + 2\text{HNO}_3$
(d) $\text{P}_4\text{O}_6 + 6\text{H}_2\text{O} \rightarrow 4\text{H}_3\text{PO}_3$
[3-1]
27. What is the coefficient in front of MnO_2 when the following equation is balanced?
- $$\text{MnO}_2 + \text{Al} \longrightarrow \text{Mn} + \text{Al}_2\text{O}_3$$
- (a) 1 (b) 2 (c) 3 (d) 4
[3-1]
28. Which of the following contains 6.00×10^{16} atoms?
(a) 6.00×10^{16} H_2O molecules (b) 3.00×10^{16} Cl_2 molecules
(c) 2.00×10^{16} P_4 molecules (d) 1.50×10^6 CaSO_4 empirical units
[3-4]
29. How many atoms are there in 36.20 g of P_4 (mass of one mole $\text{P} = 30.97$ g)
(a) 1.746×10^{22} atoms (b) 1.746×10^{23} atoms
(c) 7.040×10^{22} atoms (d) 7.040×10^{23} atoms
[3-4]
30. What is the mass percentage of Ca in one mole of $\text{Ca}_3(\text{PO}_4)_2$?
(Mass of one mole: Ca, 40.1 g; P, 31.0 g; O, 16.0 g)
(a) 9.9% (b) 20.0% (c) 12.9% (d) 38.8%
[3-4]

31. What is the empirical formula of caffeine if it contains 5.19% H, 28.85% N, 16.48% O, and 49.48% C by weight?

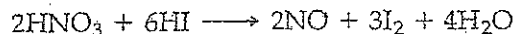
(a) $C_4H_5NO_2$ (b) $C_2H_6NO_2$ (c) C_3H_5NO (d) $C_4H_5N_2O$
[3-5]

32. What is the mass of Cu produced if 10.0 g of Cu_2S reacts with 16.0 g of O_2 as follows: (Mass of one mole: Cu, 63.5 g; O, 16.0 g; S, 32.1 g.)



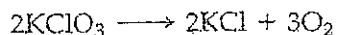
(a) 31.8 g (b) 63.5 g (c) 3.99 g (d) 7.98 g
[3-6, 3-7]

33. What is the percent yield if 25.0 g of I_2 is formed when 130.0 g of HNO_3 reacts with 285.0 g of HI as follows: (Mass of one mole: H, 1.01 g; N, 14.0 g; O, 16.0 g; I, 126.9 g.)



(a) 27.2% (b) 17.6% (c) 8.84% (d) 4.42%
[3-6, 3-7]

34. How many moles of $KClO_3$ are required to produce 2.51 g of O_2 ? (Mass of one mole: K, 39.1 g; Cl, 35.5 g; O, 16.0 g.)



(a) 1.18×10^{-1} mol (b) 5.23×10^{-2} mol (c) 2.35×10^{-1} mol
(d) 1.57×10^{-2} mol
[3-6, 3-7]