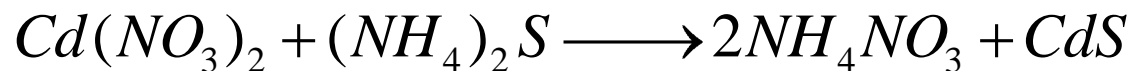


Pg. 100 #69



cadmium nitrate + ammonium sulfide \longrightarrow *ammonium nitrate*
+ cadmium sulfide

Pg. 100 #70

$$(227 \text{ g insecticide})(0.05) = 11 \text{ g rotenone}$$

$$\frac{11}{344.0 \frac{\text{g}}{\text{mol}}} = 0.028 \text{ mol} \times (6.022 \times 10^{23}) = 1.7 \times 10^{22} \text{ molecules}$$

Pg. 100 #71

$$300. \text{ mg} \times 2 \text{ tablets} = 600. \text{ mg} = 0.600 \text{ g } C_7H_5BiO_4$$

$$\frac{0.600 \text{ g } C_7H_5BiO_4}{(12.0)(7) + (1.01)(5) + 209.0 + (16.0)(4)} = 0.00166 \text{ mol}$$

$$\% Bi = \frac{209.0}{(12.0)(7) + (1.01)(5) + 209.0 + (16.0)(4)} = 57.7\%$$

$$(0.577)(0.600 \text{ g}) = 0.346 \text{ g } Bi$$

Pg. 100 #72

$$\frac{0.050 \text{ g } \text{SnF}_2}{(118.7) + 2(19.0)} = 3.2 \times 10^{-4} \text{ mol } \text{SnF}_2$$

$$3.2 \times 10^{-4} \text{ mol } \text{SnF}_2 \times \frac{1 \text{ Sn}^{+2}}{1 \text{ molecule}} = 3.2 \times 10^{-4} \text{ mol } \text{Sn}^{+2} \text{ ions} = 1.9 \times 10^{20} \text{ molecules}$$

$$3.2 \times 10^{-4} \text{ mol } \text{SnF}_2 \times \frac{2 \text{ F}^{-1}}{1 \text{ molecule}} = 6.4 \times 10^{-4} \text{ mol } \text{F}^{-1} \text{ ions} = 3.8 \times 10^{20} \text{ molecules}$$

Pg. 100 #73

0.75 g

$$(21)(12.0) + (22)(1.01) + (2)(14.0) + (2)(16.0)$$

$$= 0.0022 \text{ mol}$$

Pg. 100 #74

$$\frac{0.394 \text{ g Mn}}{54.9 \frac{\text{g}}{\text{mol}} \text{ Mn}} = 0.00718 \text{ mol Mn} \div 0.00718 = 1$$

$$\frac{1.006 \text{ g CO}}{28.0 \frac{\text{g}}{\text{mol}} \text{ CO}} = 0.0359 \text{ mol Mn} \div 0.00718 = 5$$

$\text{Mn}(\text{CO})_5$ has a mass of 194.9 g (empirical)

$\text{Mn}_2(\text{CO})_{10}$ has a mass of 389.9 g (molecular)

Pg. 100 #75

$$\frac{2.0 \text{ g}}{397.2 \frac{\text{g}}{\text{mol}}} = 0.0050 \text{ mol}$$

Pg. 100 #76

$$0.673 \text{ g } N \times \frac{1 \text{ mol}}{14.0} = 0.0481 \text{ mol } N$$

$$1.00 \text{ g } M \times \frac{1 \text{ mol}}{x} = 0.144 \text{ mol } M$$

$$x = 6.94 \frac{\text{g}}{\text{mol}} = \text{Li}$$

Pg. 100 #77

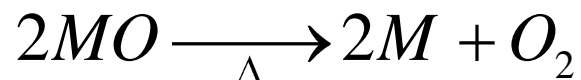
$1.00 \text{ mol } S$

$24.1 \times 10^{23} \text{ atoms } F = 4.00 \text{ mol } F$

$71.0 \text{ g } Cl_2 \div 35.5 \frac{\text{g}}{\text{mol}} = 2.00 \text{ mol } Cl$

SF_4Cl_2

Pg. 100 #78



$$\frac{4.062}{4.386} = \%M = 92.6\% \quad \therefore 7.4\%O$$

$$\frac{0.324 \text{ g}}{16.0 \frac{\text{g}}{\text{mol}}} = 0.0203 \text{ mol } O$$

$$\frac{4.062}{x} = 0.0203 \text{ mol } M$$

$$M = 200.0 \text{ g or mercury}$$

Pg. 100 #79

$$0.33\% \text{ Fe and hemoglobin} = 6.8 \times 10^4 \frac{\text{g}}{\text{mol}}$$

$$(0.0033)(6.8 \times 10^4) = 220 \text{ g}$$

$$\frac{220 \text{ g}}{55.8 \frac{\text{g}}{\text{mol}}} = 4.0 \text{ mol} = 2.4 \times 10^{24} \text{ atoms}$$

Pg. 100 #80

- a. 29.0 g
- b. 3.0 g
- c. 28.0 g
- d. 27.6 g
- e. 28.0 formula units

Ranking from least to greatest:

e, b, d, c, a

Pg. 100 #81

$$(28.3 \text{ g})(1.0 \times 10^6) = 2.83 \times 10^{-5} \text{ g}$$

$$\frac{2.83 \times 10^{-5} \text{ g}}{322.0 \frac{\text{g}}{\text{mol}}} = 8.79 \times 10^{-8} \text{ mol}$$

Pg. 100 #82

$$C_{16}H_{15}Cl_3O_2 = 345.5 \frac{g}{mol}$$

$$C = \frac{192 g}{345.5 \frac{g}{mol}} = 55.6\%$$

$$H = \frac{15.0 g}{345.5 \frac{g}{mol}} = 4.34\%$$

$$Cl = \frac{106.5 g}{345.5 \frac{g}{mol}} = 30.8\%$$

$$O = \frac{32.0 g}{345.5 \frac{g}{mol}} = 9.26\%$$

$$\frac{1.00}{0.454kg} = \frac{\text{your mass}}{x}$$

$7.5x = \text{fatal dosage}$

Pg. 100 #83

$$\frac{0.454 \text{ g DDT}}{354.5 \frac{\text{g}}{\text{mol}}} = 1.28 \text{ mol DDT}$$

$$\% \text{ Cl} = 50.1\% \quad (0.501)(454) = 227 \text{ g Cl}$$

Pg. 100 #84

$$\frac{0.060 \text{ g}}{176.0 \frac{\text{g}}{\text{mol}}} = 3.4 \times 10^{-4} \text{ mol}$$

$$\frac{1.00 \text{ g}}{176.0 \frac{\text{g}}{\text{mol}}} = 0.00568 \text{ mol}$$

$$0.00568 \text{ mol} \times 6 = 0.0341 \text{ mol O} = 2.05 \times 10^{22} \text{ atoms}$$

Pg. 100 #85

$$\frac{1.056 \text{ g}}{63.5 \frac{\text{g}}{\text{mol}}} = 0.0166 \text{ mol Cu}$$

$$\frac{0.266 \text{ g}}{16.0 \frac{\text{g}}{\text{mol}}} = 0.0166 \text{ mol O}$$

CuO

Pg. 100 #86

$$23.5 \text{ kg} = 23500 \text{ g}$$

$$(0.788)(23500) = 18518 \text{ g Sn}$$

$$\% \text{ Sn} = 78.8\%$$

Pg. 100 #87



$$\% Fe = 46.5\%$$

$$(15.8 \text{ kg})(0.465) = 7.35 \text{ kg } Fe$$

Pg. 101 #88

$$(.0675)(1000 \text{ kg}) = 67.5 \text{ kg} = 67500 \text{ g}$$

$$\frac{\textit{Ti}}{\textit{FeTiO}_3} = \frac{47.9}{55.8 + 47.9 + 3(16.0)} = \frac{67500}{x}$$

$$x = 214000 \text{ g} = 214 \text{ kg}$$

Pg. 101 #89

$$(.106)(454 \text{ g}) = 48.1 \text{ g}$$

$$\frac{Sb}{Sb_2S_3} = \frac{2(121.8)}{2(121.8) + 3(32.1)} = \frac{48.1}{x}$$

$$x = 67.1 \text{ g}$$

Pg. 101 #90

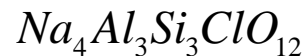
$$(0.1898)(100.0 \text{ g}) = 18.98 \text{ g Na} \times \frac{1 \text{ mol Na}}{23.0 \text{ g}} = 0.8252 \text{ mol} \div 0.207 = 4$$

$$(0.167)(100.0 \text{ g}) = 16.7 \text{ g Al} \times \frac{1 \text{ mol Al}}{27.0 \text{ g}} = 0.619 \text{ mol} \div 0.207 = 3$$

$$(0.1739)(100.0 \text{ g}) = 17.39 \text{ g Si} \times \frac{1 \text{ mol Si}}{28.1 \text{ g}} = 0.6185 \text{ mol} \div 0.207 = 3$$

$$(0.0732)(100.0 \text{ g}) = 7.32 \text{ g Cl} \times \frac{1 \text{ mol Cl}}{35.5 \text{ g}} = 0.207 \text{ mol} \div 0.207 = 1$$

$$(0.3961)(100.0 \text{ g}) = 39.61 \text{ g O} \times \frac{1 \text{ mol O}}{16.0 \text{ g}} = 2.48 \text{ mol} \div 0.207 = 12$$



Pg. 101 #91

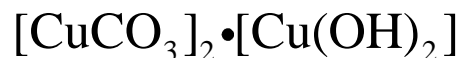
Since CuCO_3 contains all of the carbon and Cu(OH)_2 contains all of the hydrogen, we will use those elements to determine the mass of CuCO_3 and Cu(OH)_2 in 100 g of the mineral.

$$\frac{6.97}{x} = \frac{12.0 \text{ g}}{123.5 \text{ g}} = \frac{C}{\text{CuCO}_3} \quad x = 71.7 \text{ g}$$

$$\frac{0.58}{x} = \frac{2.0 \text{ g}}{97.5 \text{ g}} = \frac{H}{\text{Cu(OH)}_2} \quad x = 28.2 \text{ g}$$

$$71.7 \text{ g} \div 123.5 \frac{\text{g}}{\text{mol}} = 0.581 \text{ mol CuCO}_3 \div 0.289 = 2$$

$$28.2 \text{ g} \div 97.5 \frac{\text{g}}{\text{mol}} = 0.289 \text{ mol Cu(OH)}_2 \div 0.289 = 1$$



Pg. 101 #92

$$V = (0.0550)(1.25)(1.25) = 0.0859 \text{ cm}^3$$

$$m = dV = (8.908)(0.0859) = 0.765 \text{ g Ni}$$

$$0.765 \text{ g Ni} \times \frac{1 \text{ mol Ni}}{58.7 \text{ g}} = 0.0130 \text{ mol Ni}$$

$$1.261 \text{ g} - 0.765 \text{ g} = 0.496 \text{ g F}$$

$$0.765 \text{ g Ni} \times \frac{1 \text{ mol Ni}}{58.7 \text{ g}} = 0.0130 \text{ mol Ni} \div 0.0130 = 1$$

$$0.496 \text{ g F} \times \frac{1 \text{ mol F}}{19.0 \text{ g}} = 0.0261 \text{ mol Ni} \div 0.0130 = 2$$

NiF_2 is nickel(II) fluoride.

Pg. 101 #93

$$V = (0.0450)(1.50)(1.95) = 0.132 \text{ cm}^3$$

$$m = dV = (2.699)(0.132) = 0.356 \text{ g Al}$$

$$0.356 \text{ g Al} \times \frac{1 \text{ mol Al}}{27.0 \text{ g}} = 0.0132 \text{ mol Al} \times \frac{6.022 \times 10^{23}}{1 \text{ mol Al}} = 7.94 \times 10^{21} \text{ atoms}$$

$$3.51 \text{ g} - 0.356 \text{ g} = 3.15 \text{ g Br}$$

$$\left(\frac{3.15 \text{ g Br}}{3.51 \text{ g compd}} \right) \times 533 \frac{\text{g}}{\text{mol}} = 478 \text{ g Br} \div 79.9 \frac{\text{g}}{\text{mol}} = 6$$

$$\left(\frac{0.356 \text{ g Al}}{3.51 \text{ g compd}} \right) \times 533 \frac{\text{g}}{\text{mol}} = 54.0 \text{ g Al} \div 27.0 \frac{\text{g}}{\text{mol}} = 2$$

Al_2Br_6 is aluminum bromide.

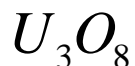
Pg. 101 #94a

$$0.169 \text{ g } U \times \frac{1 \text{ mol } U}{238.0 \text{ g}} = 7.10 \times 10^{-4} \text{ mol } U$$

$$0.199 - 0.169 = 0.030 \text{ g } O$$

$$0.030 \text{ g } O \times \frac{1 \text{ mol } O}{16.0 \text{ g}} = 1.88 \times 10^{-3} \text{ mol } O \div 7.10 \times 10^{-4} = 2.66 \times 3 = 8$$

$$0.169 \text{ g } U \times \frac{1 \text{ mol } U}{238.0 \text{ g}} = 7.10 \times 10^{-4} \text{ mol } U \div 7.10 \times 10^{-4} = 1 \times 3 = 3$$



$$0.199 \text{ g } U_3O_8 \times \frac{1 \text{ mol } U_3O_8}{842.0 \text{ g}} = 2.36 \times 10^{-4} \text{ mol}$$

Pg. 101 #94bc

Since the molar mass of uranium is so close to 238, U-238 must be the most abundant isotope.

$$0.865 - 0.679 = 0.186 \text{ g water}$$

$$0.679 \text{ g } \text{UO}_2(\text{NO}_3)_2 \times \frac{1 \text{ mol } \text{UO}_2(\text{NO}_3)_2}{394.0 \text{ g}} = 0.00172 \text{ mol} \div 0.00172 = 1$$

$$0.186 \text{ g water} \times \frac{1 \text{ mol water}}{18.0 \text{ g}} = 0.0103 \text{ mol} \div 0.00172 = 6$$

