Answer Key

Chapter 1 and 2 Review

Give the number of sig figs for each value:

45.07	0.00356	7000	700.
4	3	1	3

100.0	3.00×10^5	9659	6.0×10^{-9}
4	3	4	2

Calculate the following problems:

35.0mL + 36.65mL + 0.78mL

$$\begin{array}{rr} 35.0 & mL \\ 36.65 & mL \\ + \quad 0.78 & mL \\ \hline 72.43 & \sim \boxed{72.4\,mL} \end{array}$$

$6.0g \times 10.3_g \times 4.57_g$

$6.0_g \times 10.3_g \times 4.57_g = 282.426$

$\sim \boxed{2.8 \times 10^2\ g}$

$\frac{M}{V}$

A rock has a mass of 245g and a volume of $60cm^3$. What is its density?

$$D = \frac{m}{v} = \frac{245_g}{60\,cm^3} = 4.08$$

$\sim \boxed{4\ g/cm^3}$

$m = 245_g$

$v = 60\ cm^3$

An object with a mass of 25.3g is placed in water. The volume of the water started at 15.0 mL. When the object was added, the ending volume was measured at 18.0 mL. What is the density of the object?

$D = \frac{m}{V}$

$m = 25.3\,g$

$V = 18.0\,mL - 15.0\,mL = 3.0\,mL$

$\frac{25.3\,g}{3.0\,mL} = 8.4\,g/mL$

The density of acetone is 0.784g/mL. If acetone has a mass of 142g, what is its volume of the liquid in liters?

$D = 0.784\,g/mL$

$m = 142\,g$

$V = ?\,L$

$D = \frac{m}{V}$ $\cdot V$

$\frac{m}{D} = \frac{VD}{D}$

$V = \frac{m}{D}$

$\frac{142\,g}{0.784\,g/mL} = 181\,mL$

$\frac{181\,mL}{1000\,mL} \left| \frac{1\,L}{} \right. = 0.181\,L$

Copper-63 has an atomic mass of 62.93 amu and a percent abundance of 30.9%. Copper-35 has an atomic mass of 64.93 amu with a percent abundance of 69.1%. What is the average atomic mass?

Cu-63: $62.93\ amu \times 0.309 = 19.4$

Cu-35: $64.93\ amu \times 0.691 = 44.9$

$+$

64.3 amu

Determine the number of protons, neutrons, and electrons in the following elements:

$^{24}Mg^{2+}$ more + → less e^-

$^{80}Br^{1-}$ more negative → more e^-

$p = 12$ $n = 12$ $e^- = 10$

$24 - 12 = 12$ $12 - 2 = 10$

$p = 35$ $n = 45$ $e^- = 36$

$80 - 35 = 45$ $35 + 1 = 36$

Name the following compounds:

Sn^{2+} Cl^-

$NaNO_3$ — Sodium nitrate

CaI_2 — Calcium iodide

$SnCl_2$ — Tin (II) chloride

Sn^{4+} O^{2-}

SnO_2 — Tin (IV) oxide

N_2H_4 — dinitrogen tetrahydride

× NH_4Cl — ammonium chloride

P_2O_5 — diphosphorus pentaoxide → pentoxide

H_3PO_4 — -ate → -ic — phosphoric acid

HBr — -ide → hydro + -ic — hydrobromic acid

Give the chemical formula for the following compounds:

Na^+ Cl^-

sodium chloride — $NaCl$

K^+ PO_4^{3-}

potassium phosphate — K_3PO_4

Ni^{2+} SO_4^{2-}

nickel (II) sulfate — $NiSO_4$

Li^+ S^{2-}

lithium sulfide — Li_2S

diphosphorus pentasulfide — P_2S_5

chlorine trifluoride — ClF_3

Cu^{2+} CO_3^{2-}

copper (II) carbonate — $CuCO_3$

chloric acid — -ic → -ate — $HClO_3$

ClO_3^-

chlorate

nitrous acid — -ous → -ite — HNO_2

nitrite

NO_2^-