CHM 151 Quiz 1a 25 Pts Fall 2019 Name: Key

Show All Work To Receive Credit! Conversion factors and prefixes:

G = 10^9, M = 10^6, k = 10^3, c = 10^{-2}, m = 10^{-3}, μ = 10^{-6}, n = 10^{-9} p = 10^{-12} , 2.54 cm = 1 in, 1 km = 0.6215 mi, 12 in = 1 ft, 5280 ft = 1 mile, 3 feet = 1 yd, 60 sec = 1 min, 1 hr = 60 min, 4 quarts = 1 gal, 2 pints = 1 quart

1. (9 Pts) Perform each of the following conversions. You must show the complete setup.

a. Convert 893 Gg to Mg.

$$893\ \text{Gg} \left| \frac{10^9}{\text{G}} \right| \frac{\text{M}}{10^6} = 893 \times 10^3\ \text{Mg} = 8.93 \times 10^5\ \text{Mg}$$

b. Convert 442 μL to mL

$$442\ \mu\text{L} \left| \frac{10^{-6}}{\mu} \right| \frac{\text{m}}{10^{-3}} = 442 \times 10^{-3}\ \text{or}\ 0.442\ \text{mL}$$

c. Convert 18 miles/hr to km per second.

$$\frac{18\ \text{mi}}{\text{hr}} \left| \frac{1\ \text{km}}{0.6215\ \text{mi}} \right| \frac{\text{hr}}{60\ \text{min}} \left| \frac{1\ \text{min}}{60\ \text{s}} \right| = 0.00804\ \text{or}\ 8.0 \times 10^{-3}\ \text{km/s}$$

2. (6 Pts) Assume each of following numbers are measurements. Perform the indicated operations and then report the answer with the proper number of significant figures.

a. 802 cm + 33.0 cm + 185.65 cm = 1020.65 → 1021 cm (to this place)

b. 19.5 cm x 12.100 cm x 18.145 cm = 4281 → 4280 cm^3 (3 sig figs)

c. $\frac{(28.2 + 15)}{(13.2 \times 2.53)} = \frac{43.2}{(13.2 \times 2.53)} = 1.3$ (1 place; 2 sig figs)

3. (5 Pts) A block of wood measures14 inches by 128 inches by 55 inches. Determine its volume in cubic centimeters (you may ignore significant figures). 2.54 cm = 1 inch

$$14\ \text{in} \times 128\ \text{in} \times 55\ \text{in} \times \frac{2.54^3\ \text{cm}^3}{1^3\ \text{in}^3} = 1,615,109\ \text{cm}^3$$

5. (5 Pts) A sample of copper ore was found to contain 0.055 % copper by mass. How many grams of copper can be recovered 970.0 kg of ore?

$$970.0 \times 10^3\ \text{g ore} \left| \frac{0.055\ \text{Cu}}{100\ \text{ore}} \right. = 533.5\ \text{g Cu}$$

CHM 151 Quiz 1b 25 Pts Fall 2019 Name: Key

Show All Work To Receive Credit! Conversion factors and prefixes:

$G = 10^9$, $M = 10^6$, $k = 10^3$, $c = 10^{-2}$, $m = 10^{-3}$, $\mu = 10^{-6}$, $n = 10^{-9}$, $p = 10^{-12}$, 2.54 cm = 1 in, 1 km = 0.6215 mi, 12 in = 1 ft, 5280 ft = 1 mile, 3 feet = 1 yd, 60 sec = 1 min, 1 hr = 60 min, 4 quarts = 1 gal, 2 pints = 1 quart

1. (9 Pts) Perform each of the following conversions. You must show the complete setup.

a. Convert 558 Mg to mg.

$$\frac{558\ \text{Mg} \mid 10^6 \mid \text{m}}{\text{M} \mid 10^{-3}} = 558 \times 10^9\ \text{mg} \text{ or } 5.58 \times 10^{11}\ \text{mg}$$

b. Convert 333 µL to nL

$$\frac{333\ \mu\text{L} \mid 10^{-6} \mid \text{n}}{\mu \mid 10^{-9}} = 333 \times 10^3\ \text{ng} \text{ or } 3.33 \times 10^5\ \text{mg}$$

c. Convert 81 miles/hr to km per second.

$$\frac{81\ \text{mi} \mid 1\ \text{km} \mid \text{hr} \mid \text{min}}{\text{hr} \mid 0.6215\ \text{mi} \mid 60\ \text{min} \mid 60\ \text{sec}} = 0.0362\ \frac{\text{km}}{\text{s}}$$

2. (6 Pts) Assume each of following numbers are measurements. Perform the indicated operations and then report the answer with the proper number of significant figures.

a. 902.44 cm + 33.0 cm + 125.2 cm = 1060.6 cm (1 place ↓ 1 place ←)

b. 100.5 cm x 12.100 cm x 18.145 cm = 22065 → 22070 cm³ (4 sig figs ← 4 sig figs)

c. $\frac{(23.2 + 95)}{(13.2 \times 2.53)} = \frac{118.2}{(13.2 \times 2.53)} = 3.54$ (3 sig figs) (1 place ←)

3. (5 Pts) A block of wood measures14 inches by 28 inches by 55 inches. Determine its volume in cubic centimeters (you may ignore significant figures). 2.54 cm = 1 inch

$$\frac{14\ \text{in} \times 28\ \text{in} \times 55\ \text{in} \mid 2.54^3\ \text{cm}^3}{1^3\ \text{in}^2} = 353305\ \text{cm}^3$$

5. (5 Pts) A sample of copper ore was found to contain 0.085 % copper by mass. How many grams of copper can be recovered 1070.0 kg of ore?

$$\frac{1070.0 \times 10^3\ \text{g ore} \mid 0.085\ \text{Cu}}{100\ \text{ore}} = 909.5\ \text{g Cu}$$