CHM 151 Quiz 1a 25 Pts Fall 2011 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, 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. (6 Pts) Perform each of the following conversions. You must show the complete setup.

a. Convert 95 **ng** to pg. $\frac{95\,\text{ng}}{1}\left|\frac{10^{-9}}{\text{n}}\right|\frac{\text{p}}{10^{-12}} = 95\times10^{3}\,\text{pg}$ or 95000 pg

b. Convert 805 **μL to mL.** $\frac{805\,\mu\text{L}}{1}\left|\frac{10^{-6}}{\mu}\right|\frac{\text{m}}{10^{-3}} = 805\times10^{-3}\,\text{mL}$ or 0.805 mL

2. (4 Pts) Assume each of following numbers are measurements. Perform the indicated operations and then report the answer with the **proper number of significant figures**.

gives 3 sig Fig.

a. $\frac{(6.354+99)}{2.35x12.11} =$ 3.70202.. ⟹ 3.70

b. 10.25 cm x 2.10 cm x 18.145 cm = 390.5711.. (391) cm^3

3. (5 Pts) A poster measures 22 in by 36 in. Determine its area in square centimeters (cm^2) (you may ignore significant figures on this one).

$\frac{22\,\text{in}}{1\,\text{in}}\left|\frac{2.54\,\text{cm}}{1\,\text{in}}\right|\frac{36\,\text{in}}{1\,\text{in}}\left|\frac{2.54\,\text{cm}}{1\,\text{in}}\right. = 5109\,\text{cm}^2$

4. (5 Pts) A car is traveling at a rate of 65 miles per hour. Determine its speed in kilometers per **minute**. (You may ignore significant figures)?

$\frac{65\,\text{mi}}{1\,\text{hr}}\left|\frac{5280\,\text{ft}}{1\,\text{mi}}\right|\frac{12\,\text{in}}{1\,\text{ft}}\left|\frac{2.54\,\text{cm}}{1\,\text{in}}\right|\frac{10^{-2}}{\text{c}}\left|\frac{\text{k}}{10^{3}}\right|\frac{1\,\text{hr}}{60\,\text{min}} = 1.74\,\frac{\text{km}}{\text{min}}$

5. (5 Pts) A sample of silver ore was found to contain 1.45 % silver by mass. How many mg of silver can be recovered 900.0 kg of ore?

$\frac{900.0\,\text{kg ore}}{1}\left|\frac{10^{3}}{\text{k}}\right|\frac{1.45\,\text{Ag}}{100\,\text{ore}}\left|\frac{\text{m}}{10^{-3}}\right. = 13{,}050{,}000\,\text{mg Ag} = 1.305\times10^{7}\,\text{mg Ag}$

$\frac{1.45\,\text{Ag}}{100\,\text{ore}}$

CHM 151 Quiz 1b 25 Pts Fall 2011 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, 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. (6 Pts) Perform each of the following conversions. You must show the complete setup.

a. Convert 95 **ng** to **μg**. $95\ \text{ng} \left|\frac{10^{-9}}{\text{n}}\right|\frac{\mu}{10^{-6}} = 95\times10^{-3}\ \mu\text{g}$ or $0.095\ \mu\text{g}$

b. Convert 805 **nL to pL.** $805\ \text{nL} \left|\frac{10^{-9}}{\text{n}}\right|\frac{\text{p}}{10^{-12}} = 805\times10^{3}\ \text{pL}$

2. (4 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. $\dfrac{(26.354+89)}{3.35\times12.11} =$ 2.843... ⇒ 2.84

b. 1.25 cm x 12.10 cm x 18.145 cm = 274.44... ⇒ 274 cm^3

3. (5 Pts) A poster measures 42 in by 56 in. Determine its area in square centimeters (cm^2) (you may ignore significant figures on this one).

$42\ \text{in} \left|\frac{2.54\ \text{cm}}{1\ \text{in}}\right| 56\ \text{in} \left|\frac{2.54\ \text{cm}}{1\ \text{in}}\right| = 15174\ \text{cm}^2$

4. (5 Pts) A car is traveling at a rate of 55 miles per hour. Determine its speed in kilometers per **minute**. (You may ignore significant figures)? ↙ C

$55\ \text{mi} \left|\frac{5280\ \text{ft}}{\text{mi}}\right| \frac{12\ \text{in}}{1\ \text{ft}} \left|\frac{2.54\times10^{-2}\ \text{m}}{\text{in}}\right| \frac{\text{k}}{10^3} \left|\frac{\text{hr}}{60\ \text{min}}\right| = 1.48\ \frac{\text{km}}{\text{min}}$

5. (5 Pts) A sample of silver ore was found to contain 3.35 % silver by mass. How many mg of silver can be recovered 735.0 Mg of ore?

$735.0\ \text{Mg ore} \left|\frac{10^6}{\text{M}}\right| \frac{\text{m}}{10^{-3}} \left|\frac{3.35\ \text{Ag}}{100\ \text{ore}}\right| = 2.46\times10^{10}\ \text{mg}$