CHM151 Quiz 1a 25 Pts Spring 2009 Name: Key

*****SHOW ALL WORK TO RECEIVE CREDIT*****

$G = 10^9$, $M = 10^6$, $k = 10^3$, $c = 10^{-2}$, $m = 10^{-3}$, $\mu = 10^{-6}$, $n = 10^{-9}$, 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, 1000 mL = 1 L

1. (5 Pts) How many micro (μ) inches are 47 kilometers?

$$47\ \text{km} \left|\frac{10^3}{\text{k}}\right|\frac{\text{c}}{10^{-2}}\left|\frac{1\ \text{in}}{2.54\ \text{cm}}\right|\frac{\mu}{10^{-6}} = 1.85 \times 10^{12}\ \mu\text{in}$$

2. (5 Pts) A car is traveling at a speed of 65 miles/hr. How fast is the car traveling in kilometers per minute?

$$\frac{65\ \text{mi}}{\text{hr}}\left|\frac{5280\ \text{ft}}{\text{mi}}\right|\frac{12\ \text{in}}{1\ \text{ft}}\left|\frac{2.54\ \text{cm}}{1\ \text{in}}\right|\frac{10^{-2}}{\text{c}}\left|\frac{\text{k}}{10^3}\right|\frac{1\ \text{hr}}{60\ \text{min}} = 1.743\ \frac{\text{km}}{\text{min}}$$

$1.7\ \frac{\text{km}}{\text{min}}$

3. (5 Pts) How many cubic inches (in^3) are in 455 cm^3?

$$455\ \text{cm}^3\left|\frac{1^3\ \text{in}^3}{2.54^3\ \text{cm}^3}\right. = 27.76\ \text{in}^3$$

4. (6 Pts) Assume the numbers below are all measurements. Perform the calculations and report the answer with proper number of significant figures.

a. 27.23 cm + 14.001 cm + 183.1 cm = 224.3 cm

to the 0.1 place

b. 14.35 cm x 18.1 cm x 41.22 cm = 10700 cm^3

3 sig. figs.

5. (4 Pts) A sample of silver ore was found to contain 0.45% Ag by mass. How many kilograms of ore would be needed to recover 85 grams of Ag?

$$85\ \text{g Ag}\left|\frac{100\ \text{ore}}{0.45\ \text{Ag}}\right|\frac{\text{k}}{10^3} = 18.9\ \text{kg ore}$$

19 kg ore

$\frac{0.45\ \text{Ag}}{100\ \text{ore}}$ ← ratio

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$G = 10^9$, $M = 10^6$, $k = 10^3$, $c = 10^{-2}$, $m = 10^{-3}$, $\mu = 10^{-6}$, $n = 10^{-9}$, 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, 1000 mL = 1 L

1. (5 Pts) A car is traveling at a speed of 55 miles/hr. How fast is the car traveling in kilometers per minute?

$$\frac{55\ \text{mi}}{1\ \text{hr}} \left| \frac{5280\ \text{ft}}{1\ \text{mi}} \right| \frac{12\ \text{in}}{1\ \text{ft}} \left| \frac{2.54\ \text{cm}}{1\ \text{in}} \right| \frac{10^{-2}}{1\ \text{c}} \left| \frac{1\ \text{k}}{10^3} \right| \frac{1\ \text{hr}}{60\ \text{min}} = 1.47\ \frac{\text{km}}{\text{min}}$$

2. (5 Pts) How many micro (μ) inches are 87 kilometers?

$$\frac{87\ \text{km}}{1\ \text{k}} \left| \frac{10^3}{2.54 \times 10^{-2}\ \text{m}} \right| \frac{\text{in}}{1\ \mu} \left| \frac{\mu}{10^{-6}} \right| = 3.43 \times 10^{12}\ \mu\text{in}$$

c equivalent to c

3. (5 Pts) How many cubic inches (in^3) are in 655 cm^3?

$$\frac{655\ \text{cm}^3}{2.54^3\ \text{cm}^3} \left| \frac{1^3\ \text{in}^3}{} \right| = 39.97\ \text{in}^3$$

$40\ \text{in}^3$

4. (6 Pts) Assume the numbers below are all measurements. Perform the calculations and report the answer with proper number of significant figures.

a. 4.35 cm x 18.1 cm x 41.22 cm = 3250 cm^3

answer will be to 3 sig figures.

b. 27.23 cm + 14.001 cm + 183.1 cm = 224.3 cm

answer will be to the 0.1 place

5. (4 Pts) A sample of silver ore was found to contain 0.45% Ag by mass. How many kilograms of ore would be needed to recover 105 grams of Ag?

$$\frac{105\ \text{g Ag}}{0.45\ \text{Ag}} \left| \frac{100\ \text{ore}}{1\ \text{k}} \right| \frac{1\ \text{k}}{10^3} = 23.3\ \text{kg ore}$$

$\frac{0.45\ \text{Ag}}{100\ \text{ore}}$ ← Ratio