CHM 151   Quiz 1a   25 Pts   Fall 2006   Name: _Key_____

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

$G = 10^9$, $M = 10^6$, $k = 10^3$, $c = 10^{-2}$, $m = 10^{-3}$, $\mu = 10^{-6}$, 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

1. (6 Pts) A Car is traveling at a rate of 45 km/hr. How fast is the car going in miles per second?

$$\frac{45 \text{ km}}{\text{hr}} \left| \frac{10^3}{k} \right| \frac{1 \text{ in}}{2.54 \times 10^{-2} \text{ m}} \left| \frac{1 \text{ ft}}{12 \text{ in}} \right| \frac{1 \text{ mi}}{5280 \text{ ft}} \left| \frac{\text{hr}}{3600 \text{ s}} \right| = 0.0078 \frac{\text{mi}}{\text{s}}$$

or $7.8 \times 10^{-3} \frac{\text{mi}}{\text{s}}$

2. (4 Pts) Convert each of the following to scientific notation (without the use of prefixes):

a.   47 Giga Mega kilo dollars = $\underset{10^9 \ 10^6 \ 10^3}{47 \times 10^{18}}$ $\left(4.7 \times 10^{19}\right)$ dollars

b. 3.0×10^{10} micrometers (µm) = $\underset{10^{-6}}{3.0 \times 10^4}$ _____ meters

3. (5 Pts) A car engine size is listed as 351 cubic iches (in³). What would its size be in Liters?

$$\frac{351 \text{ in}^3}{} \left| \frac{2.54^3 \text{ cm}^3}{1^3 \text{ in}^3} \right| \frac{1 \text{ mL}}{1 \text{ cm}^3} \left| \frac{10^{-3}}{\text{m}} \right| = 5.75 \text{ L}$$

4. (5 Pts) A certain chemical procedure requires 905.6 cm of iron wire. How many feet of iron wire are required?

$$\frac{905.6 \text{ cm}}{} \left| \frac{1 \text{ in}}{2.54 \text{ cm}} \right| \frac{1 \text{ ft}}{12 \text{ in}} = 29.71 \text{ ft}$$

5.   (5 Pts) A sample of silver ore was found to contain 6.56 % silver by mass. How many grams of silver can be recovered 800.0 kg of ore?

$$\frac{800.0 \times 10^3 \text{ g ore}}{} \left| \frac{6.56 \text{ Ag}}{100 \text{ ore}} \right| = 52480 \text{ g Ag}$$

$$52500 \text{ g Ag}$$

<u>Show All Work To Receive Credit!</u> Conversion factors and prefixes:

$G = 10^9$, $M = 10^6$, $k = 10^3$, $c = 10^{-2}$, $m = 10^{-3}$, $æ = 10^{-6}$, 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

1. (6 Pts) A Car is traveling at a rate of 65 km/hr. How fast is the car going in feet per minute?

$$\frac{65\ km}{hr}\left|\frac{10^3}{k}\right|\frac{in}{2.54\times10^{-2}\ m}\left|\frac{1\ ft}{12\ in}\right|\frac{1\ hr}{60\ min} = 3554\ \frac{ft}{min}$$

$$or\ 3600\ \frac{ft}{min}$$

2. (5 Pts) A sample of silver ore was found to contain 4.86 % silver by mass. How many grams of silver can be recovered 800.0 kg of ore?

$$\frac{800.0\ kg\ ore}{}\left|\frac{10^3}{k}\right|\frac{4.86\ Ag}{100\ ore} = 38880\ g\ Ag$$

$$38900\ g\ Ag$$

3. 5 Pts: A car engine size is listed as 351 cubic inches (in^3). What would its size be in Liters?

$$\frac{351\ in^3}{}\left|\frac{2.54^3\ cm^3}{1^3\ in^3}\right|\frac{1\ mL}{1\ cm^3}\left|\frac{10^{-3}}{m}\right| = 5.75\ L$$

4. (4 Pts) Convert each of the following to scientific notation without the use of prefixes:

$10^9\ 10^{-3}\ 10^{-2}\ 10^3$

a. 47 Giga milli centi kilo dollars = $47\times10^7\ or\ 4.7\times10^8$ dollars

b. 3.0 x 10^{10} $\overset{10^{-3}}{millimeters}$ = 3.0×10^7 _____ meters

5. (5 Pts) A certain chemical procedure requires 552.6 cm of iron wire. How many feet of iron wire are required?

$$\frac{552.6\ cm}{}\left|\frac{1\ in}{2.54\ cm}\right|\frac{1\ ft}{12\ in} = 18.13\ ft$$