CHM 151 Quiz 1a 25 Pts Spring 2008 Name: Key

Conversion factors: k = 10^3 c = 10^{-2} m = 10^{-3} μ = 10^{-6} n = 10^{-9} hr = 60 min. 1 min = 60 sec.
1 mile = 5280 ft 1 ft = 12 inches 2.54 cm = 1 inch

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

1. (6 Pts) A car is traveling at speed of 28 miles per hour. Determine its speed in km per second.

$$\frac{28\ \text{mi}}{1\ \text{hr}} \left| \frac{5280\ \text{ft}}{1\ \text{mi}} \right| \frac{12\ \text{in}}{1\ \text{ft}} \left| \frac{2.54\times10^{-2}\ \text{m}}{1\ \text{in}} \right| \frac{\text{k}}{10^3} \left| \frac{\text{hr}}{60\ \text{min}} \right| \frac{\text{min}}{60\ \text{s}} = 1.25\times10^{-2}\ \frac{\text{km}}{\text{hr}}$$

or 0.0125 km/hr
0.013

2. (5 Pts) Determine how many micro (μ) inches there are in 427 milli inches.

$$\frac{427\ \text{m in}}{1} \left| \frac{10^{-3}}{\text{m}} \right| \frac{\mu}{10^{-6}} = 427000 = 4.27\times10^5\ \mu\text{in}$$

3. (5 Pts) How many meters (expressed in scientific notation with no prefixes) are in 43 centi milli micro meters?

43 c m μ meter

$43\times10^{-2}\times10^{-3}\times10^{-6}$ meters $= 43\times10^{-11}$ or 4.3×10^{-10} meters

4. (5 Pts) A car has 3.0 liter engine. Determine its displacement volume in cubic inches?

1 mL = 1 cm^3 = 1×10^{-3} L or 1000 mL = 1 L

$$\frac{3.0\ \text{L}}{1} \left| \frac{1000\ \text{mL}}{1\ \text{L}} \right| \frac{1\ cm^3}{1\ \text{mL}} \left| \frac{1^3\ in^3}{2.54^3\ cm^3} \right| = 183\ in^3$$

180 in^3

5. (4 Pts) An ore sample was found to contain 0.45 % Au by mass. How many grams of Au can be recovered from 250 kg of ore?

$$\frac{250\times10^3\ \text{g ore}}{1} \left| \frac{0.45\ \text{Au}}{100\ \text{ore}} \right| = 1125\ \text{g Au}$$

1100 g Au

CHM 151 Quiz 1b 25 Pts Spring 2008 Name: Key

Conversion factors: k = 10^3 c = 10^{-2} m = 10^{-3} μ = 10^{-6} n = 10^{-9} hr = 60 min. 1 min = 60 sec.
1 mile = 5280 ft 1 ft = 12 inches 2.54 cm = 1 inch

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

1. (6 Pts) A car is traveling at speed of 43 miles per hour. Determine its speed in cm per second.

$$\frac{43\ \text{mi}}{1\ \text{hr}} \left| \frac{5280\ \text{ft}}{1\ \text{mi}} \right| \frac{12\ \text{in}}{1\ \text{ft}} \left| \frac{2.54\ \text{cm}}{1\ \text{in}} \right| \frac{1\ \text{hr}}{60\ \text{min}} \left| \frac{1\ \text{min}}{60\ \text{sec}} \right. = 1922 \frac{\text{cm}}{\text{s}}$$

or $1900 \frac{\text{cm}}{\text{s}}$

or $1.9 \times 10^3 \frac{\text{cm}}{\text{s}}$

2. (5 Pts) Determine how many micro (μ) inches there are in 107 milli inches.

$$\frac{107\ \text{min}}{1\ \text{m}} \left| \frac{10^{-3}}{1\ \text{m}} \right| \frac{\mu}{10^{-6}} = 1.07 \times 10^5\ \mu\text{in}$$

3. (5 Pts) How many meters (expressed in scientific notation with no prefixes) are in 873 centi milli micro meters?

873 c m μ meters

$873 \times 10^{-2} \times 10^{-3} \times 10^{-6}$ meters $= 873 \times 10^{-11} = 8.73 \times 10^{-9}$ m

4. (5 Pts) A car has 4.0 liter engine. Determine its displacement volume in cubic inches?

$$\frac{4.0\ \text{L}}{1\ \text{L}} \left| \frac{1000\ \text{mL}}{1\ \text{mL}} \right| \frac{1\ \text{cm}^3}{2.54^3\ \text{cm}^3} \left| \frac{1^3\ \text{in}^3}{} \right. = 244\ \text{in}^3$$

240 in^3

or $\frac{4.0\ \text{L}}{10^{-3}} \left| \frac{1\ \text{m}}{1\ \text{mL}} \right| \frac{1\ \text{cm}^3}{2.54^3\ \text{cm}^3} \left| \frac{1^3\ \text{in}^3}{} \right. =$

5. (4 Pts) An ore sample was found to contain 0.65 % Au by mass. How many grams of Au can be recovered from 350 kg of ore?

$$\frac{350 \times 10^3\ \text{g ore}}{100\ \text{ore}} \left| \frac{0.65\ \text{Au}}{} \right. = 2275\ \text{g Au} \Rightarrow 2300\ \text{g Au}$$

or $\frac{350\ \text{kg ore}}{1\ \text{k}} \left| \frac{10^3}{1\ \text{k}} \right| \frac{0.65\ \text{Au}}{100\ \text{ore}} =$