Cultural Chemistry
In class worksheet
01/28/09

This is an in-class practice sheet—you will not turn it in.

1. How many significant figures are in each of the following:

A) 12 2 B)1098 4 C)2001 4

D) 2.001×10^{-5} 4 E) 0.00480 3 F)0.00000101 3

2. Round off each of the following numbers to three significant figures, and write the answer is standard scientific notation.

A) 312.54 3.13×10^{2} B) 0.00031254 3.13×10^{-4} C) 31.254×10^{-3} 3.13×10^{-2}

D) 0.31254 3.13×10^{-1} E) 31,254,000 3.13×10^{7}

3. Carry out the following operations and express the answer with the appropriate number of significant figures.

A) $0.102 \times 0.0821 \times 27 = 2.261 \rightarrow 2.3$ (2 sig figs)

B) $0.1654 + 2.07 - 2.114 = 0.124 = 0.12$ (2 sig figs)

C) $\frac{9.5 + 4.1 + 2.8 + 3.175}{4} = 4.89375 = 4.9$ (2 sig figs)

(Assume this is an average of 4 numbers—and 4 is exact)

4. (12 pts.) Perform the following operations, being careful about *significant digits*. Use scientific notation where appropriate.

A) Convert 87.3 L to mL $87.3\,L \times \frac{1000\,mL}{1\,L} = 8.73 \times 10^{4}\,mL$

B) Convert 3.400 inches to m. (Conversion factor 1 in= 2.54 cm; this is exact.)

$(3.400\ inches)\left(\frac{2.54\,cm}{1\,in}\right)\left(\frac{1\,m}{100\,cm}\right) = 8.636 \times 10^{-2}$

C) Convert a density of 456 kg/m^3 to g/cm^3

$\left(456\ \frac{kg}{m^3}\right)\left(\frac{1000\,g}{1\,kg}\right)\left(\frac{1\,m}{100\,cm}\right)\left(\frac{1\,m}{100\,cm}\right)\left(\frac{1\,m}{100\,cm}\right) = 0.456\ g/cm^3$