Homework #1 (10 points)

Problem #1 Density (2pt)

To determine the volume of an irregularly shaped glass vessel, the vessel is weighed empty (121.3g) and when filled with the carbon tetrachloride (283.2 g). What is the volume capacity of the vessel, in milliliters, given that the density of carbon tetrachloride is 1.59g /mL?

283.2g − 121.3g = 161.9g

161.9g / 1.59g/cm³ V = 101.8cm³

Problem #2 Temperature Scales (2pt)

We wish to mark off a thermometer in both Celsius and Fahrenheit temperatures. On the Celsius scale, the lowest temperature is at -10 ^{0}C, and the highest temperature mark at 50 ^{0}C. What are the equivalent Fahrenheit temperatures?

Use conversion formula: °C = 5/9 x (°F – 32).

Problem #3 Units of Measurement (2pt)

useful information:

1 in =2. 54 cm;

1pound (lb) = 453.6 g;

1 qt = 0.9464 L

a) Perform the following conversions:

0.127 L = …. mL? 127 mL

14.7 mL = …. L? 0.0147 L

782 cm^3 = …L? 0.782 L

1.57 kg = …g? 1570 g

745 g = …kg? 0.745 kg

2757 mm = …cm? 275.7 cm

b) Perform the following conversions from non-SI to SI units:

68.4 in = …cm? 173.736 cm

1.42 lb = …g? 644.112 g

3.72 qt = …mL? 3520.13 mL

Problem #4 Significant Figures (2pt)

Express each of following to four significant figures:

a) 4271.5 4271
b) 344.03 344.0
c) 257,000 2.570×10^5
d) 55,700 5.570×10^4
e) 7.312×10^4 7.312×10^4
f) 4.0357×10^{-4} 4.034×10^{-4}

Problem #5 Significant figures (2pt)

Express each answer in exponential form and with the appropriate numbers of significant figures:

a) O.406 x 0.0023 =? 9.3×10^{-4}
b) 0.1357 x16.80 x 0.096 =? 0.218850
c) 0.458 + 0.12 – 0.037 =? 0.541
d) 32.18 + 0.055 – 1.652 =? 30.583