Homework Set 2 Solutions
(Distributed 9/7/16; Due on 9/14/16)

Finish Chapter 2 and read Chapter 3 in Zumdahl and complete the listed questions from the text: **Chapter 2: 75, 89, 91, 106; Chapter 3: 17, 29, 38, 49, 50;** as well as the following problems:

<u>**Please Show All of your Work and units.**</u>

A. What is the density of the sulfuric acid used in lead acid car batteries in grams per mL if a 5.000 mL sample has a mass of 9.272 g?

$$\text{\textbf{Density}} = \frac{mass}{volume} = \frac{9.272\ g}{5.000\ mL} = \textbf{1.854 g/mL}$$

B. Solve the following temperature conversions:
(a) $-78°F =$ ___**−61**___ °C   **(b)** 399 K = ___**126**___ °C
(c) 11 °C = ___**284**___ K   **(d)** 114 K = ___**−159**___ °C
(e) 14 °C = ___**57**___ °F

C. Characterize each of the following operations as either a chemical or a physical change:
      (a) fireworks exploding   ***chemical***
      (b) toast burning   ***chemical***
      (c) Breaking a glass window   ***physical***

D. Identify each of the substances listed as a gas, liquid or solid (G, L, S). Is it pure or a mixture? If it is a mixture, identify as either homogeneous or heterogeneous:
(i) black coffee ***homogeneous liquid***   (ii) toothpaste ***heterogeneous liquid***

(iii) aluminum ***foil***   ***solid, pure***   (iv) baking soda ***solid, pure***

E. Blood is a heterogeneous mixture of red blood cells, white blood cells, plasma, platelets and other types of cells. What types of techniques can separate blood into its individual components?

Centrifugation, which separates the different components on the basis of mass or weight, is accomplished by rapidly spinning a sample of blood and the denser, heavier components move outward and settle at the bottom of the tube.

<u>***Problems from Zumdahl:***</u>

Chapter 2:

75. a. 7.2°C b. 46°C c. −23°C d. 5500°C

89 Density = $\dfrac{\text{mass}}{\text{volume}}$ = 3.12 g/mL 3.12 g/mL x 125 mL = 390 g;

85.0 g /3.12 g/mL = 27.2 mL

91. Density = $\dfrac{\text{mass}}{\text{volume}}$ = $\dfrac{929\text{ g}}{1000.\text{ mL}}$ = 0.929 g/mL

106 2.45 ∈/kg x $1.20/∈ x 2.12 lb/kg = $0.87

142. 72 months x 1 year/12 mos = 6 years

3.5 years x 12 mos/year = 42 months

Chapter 3:

17 a. chemical   b. physical   c. chemical   d. physical
e. chemical   f. physical   g. chemical   h. chemical
i. physical   j. chemical   k. chemical

29 a. mixture   b. mixture   c. pure   d. mixture

38 a. compound, pure   b. element, pure   c. homogeneous mixture

49 a. physical   b. chemical   c. physical   d. chemical
e. chemical   f. chemical   g. chemical   h. physical
i. chemical   j. physical   k. chemical

50 . heterogeneous   b. heterogeneous   c. homogeneous
d. heterogeneous   e. heterogeneous