Unit 4 – Chapter 4 **Name _____**

Assignment #1 **Period _____**

1) A student wants to prepare 1.00 L of a 1.00 *M* solution of NaOH (molar mass = 40.00 g/mol).
    a. If solid NaOH is available, how would the student prepare this solution?
    b. If 2.00 *M* NaOH is available, how would the student prepare the solution?
    c. To help insure three significant figures in the NaOH molarity, to how many significant figures should the volumes and mass be determined?

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2) A solution of ethanol (C_2H_5OH) in water is prepared by dissolving 75.0 mL of ethanol (density = 0.79 g/cm^3) in enough water to make 250.0 mL of solution. What is the **molarity** of the ethanol in this solution?

3) If 10.0 g of $AgNO_3$ is available, what volume of 0.25 *M* $AgNO_3$ solution can be prepared?

4) How would you prepare 1.00 L of a 0.50 *M* solution of each of the following?
    a. H_2SO_4 from "concentrated" (18 *M*) sulfuric acid
    b. HCl from "concentrated" (12 *M*) reagent
    c. $NiCl_2$ from the salt $NiCl_2 \cdot 6\ H_2O$
    d. HNO_3 from "concentrated" (16 *M*) reagent
    e. Sodium carbonate from the pure solid

5) Calculate the sodium ion concentration when 70.0 mL of 3.0 *M* sodium carbonate is added to 30.0 mL of 1.0 *M* sodium bicarbonate.

6) A stock solution containing Mn^{2+} ions was prepared by dissolving 1.584 g pure manganese metal in nitric acid and diluting to a final volume of 1.000 L. The following solutions were then prepared by dilution:

    For solution A, 50.00 mL of stock solution was diluted to 1000.0 mL.
    For solution B, 10.00 mL of solution A was diluted to 250.0 mL.
    For solution C, 10.00 mL of solution B was diluted to 500.0 mL.

    Calculate the concentrations of the stock solution and solutions A, B, and C.