Unit 4 – Chapter 4: Types of Reactions **Name _____**

Take Home Quiz: Solutions, Dilutions, Stoichiometry, Limiting Reagents **Period _____**

1) a. How many grams of potassium dichromate, $K_2Cr_2O_7$, need to be dissolved to achieve a total volume of 50.0 mL of 0.360 molar solution?

b. 4.28 grams of ammonium sulfate, $(NH_4)_2SO_4$, is mixed to a total volume of 300 mL of solution. What is the molarity of this solution?

c. How many **mL** of solution are made when 2.25 g of copper (II) sulfate, $CuSO_4$, is used to make a 0.238 *M* solution?

2) a. What volume of a 14.8 *M* stock solution is needed to make 100.0 mL of a 0.250 *M* dilution?

b. What is the molarity of a solution if 10.0 mL of a 14.8 *M* solution is diluted to a final volume of 250.0 mL?

3) a. How much of a 10.0 *M* stock solution is needed to create 0.350 L of a 0.400 *M* solution?

b. 500.0 mL of a dilute solution is generated by using 25 mL of a 10.0 *M* stock solution. What is the concentration of the new solution?

4) What is the molarity of solution if 1.049 grams of acetic acid, CH_3COOH, is added to a volume totaling 20.00 mL of solution?

5) 0.020 L of a 0.100 *M* silver nitrate, $AgNO_3$, solution completely reacts with aluminum chloride to for silver chloride and aluminum nitrate. How many grams of aluminum chloride are required for the reaction to occur?

$$3\ AgNO_{3(aq)} + AlCl_{3(aq)} \rightarrow 3\ AgCl_{(s)} + Al(NO_3)_{3(aq)}$$

6) How many grams of NaOH are required to completely react with 25.0 mL of a 0.500 *M* $Cd(NO_3)_{2(aq)}$ solution if the reaction reacts completely? The products are cadmium hydroxide and sodium nitrate (hint: write and balance the equation first!).

7) 150 mL of a 0.20 *M* iron (II) sulfate solution is mixed with 100 mL of a 0.60 *M* lithium hydroxide solution. How many grams of iron (III) hydroxide are produced?

$$Fe_2SO_{4(aq)} + 6\ LiOH_{(aq)} \rightarrow 3\ Li_2SO_{4(s)} + 2\ Fe(OH)_{3(s)}$$