CHEMISTRY 112 **Wednesday, December 5th, 2012**
Miss Marks

Lab Experiment – Exploring the Five Types of Chemical Reactions

Overview: This experiment will help to solidify your understanding of the five major reaction types in chemistry (combination, combustion, decomposition, single and double replacement reactions). Using what you have learned thus far in Chapter 11, you will predict the products of eight chemical reactions before carrying out these reactions in the lab. This will strengthen your ability to convert between chemical reactions and chemical equations, a fundamental skill in chemistry.

Pre-Lab Preparation: Before entering the lab, complete the following pre-lab exercise. For each of the reactions below, first predict the products of the reaction, and then write a balanced chemical equation for the reaction. Be sure to specify the states of matter for all products and identify the reaction type. All reactants are aqueous solutions unless otherwise specified. This information should be summarized in a table like the one shown below.

1. strontium chloride & sodium sulfate
2. chlorine & sodium bromide
3. calcium chloride & sodium carbonate
4. silver nitrate & copper metal
5. cobalt (II) chloride & sodium hydroxide
6. zinc metal & hydrochloric acid
7. sodium hydroxide & copper (II) nitrate
8. sodium acetate & hydrochloric acid

For each chemical reaction, draw and complete the table below on your own paper:

Experiment #1	Strontium chloride + sodium sulfate →
Balanced Chemical Equation	
Reaction Type	
Observations	

Analysis/Conclusion: The following questions should be addressed (answered) in your lab write-up:

1. Explain the word "precipitate" and the role it plays in determining the direction of a chemical reaction?
2. Write the net ionic equation for reactions 1, 3, 5, 7.
3. Based on the products that you observed what can you say about the accuracy of the solubility table that we used to predict the states of the products formed?
4. Why is it important to be able to chemically decompose compounds?
5. Give an example of a combination reaction that occurs naturally.

Procedure: A description of each experiment can be found below. Be sure to follow the appropriate safety procedures when dealing with chemicals. Lab glasses should be worn at **all times** during the experiment.

Experiment 1: Add 3 drops of the strontium chloride solution to a well. Add 3 drops of sodium sulfate solution and observe.
Experiment 2: Add a dropper full of chlorine water to a well. Add several drops of sodium bromide solution and observe.
Experiment 3: Add about 3 drops of a calcium chloride solution to a well. Add 3 drops of sodium carbonate solution and observe.
Experiment 4: Observe the copper and silver nitrate solution and the reaction that is underway. Make note of all observations. **CAUTION** – silver nitrate will stain your skin.
Experiment 5: Add about 3 drops of cobalt (II) chloride solution to a well. Add 3 drops of sodium hydroxide solution and observe.
Experiment 6: Place the zinc in a well. Add several drops of hydrochloric acid and observe the surface of the metal. Remove the metal and rinse the liquid down the drain.
Experiment 7: Add about 3 drops of a sodium hydroxide solution to a well. Add 3 drops of copper (II) nitrate solution and observe.
Experiment 8: Add about 3 droppers full of each of the hydrochloric acid and sodium acetate solution to a test tube. Stopper the test tube and invert it. Using the proper technique, check for changes in odour.

Following the lab experiment, you will write a lab report to be passed in on **Thursday, December 13th, 2012**. Your report must be completed on looseleaf paper. **Total value: 25pts**.

1) Title – Name of the experiment, your name, your partner(s) names, the date the lab was performed **(0.5 pt)**
2) Objective – A brief statement indicating the purpose of the lab experiment. **(0.5 pt)**
3) Data and Results Table – Prepared neatly and accurately **before** the lab and complete with observations following the lab. **(12 pts)**
4) Analysis/Conclusion – Questions written out with correct answers. **(10 pts)**
5) Overall – Neatness, organization, etc. **(2 pts)**