Types of Chemical Reactions

Name: _____

Purpose: To observe different chemical reactions and to write balanced equations for those reactions.

Procedure:

A. Synthesis

1. Use a piece of sandpaper to make a piece of Copper wire shiny. Observe and record appearance.
2. Using crucible tongs, hold the wire in the hottest part of the burner flame for 1 – 2 minutes. Examine the wire and note any change in its appearance.
3. Place an evaporating dish handy on the lab table. Holding a piece of magnesium ribbon with the crucible tongs, hold the sample in the flame until the magnesium starts to burn. Move the ribbon over the evaporating dish but try not to look directly at the light. When the burning stops, place whatever is left in the dish and observe the product.

B. Decomposition

1. Place 2 heaping microspatulas of $CuCO_3$ in a clean dry test tube. Note the appearance of the sample.
2. Using test tube holders, heat the test tube strongly in the flame for about 3 minutes.
3. Light a wooden splint and place it in the mouth of the test tube to test for the presence of CO_2 gas. (CO_2 will put the flame out.) Note any change in appearance of the material in the test tube.

C. Single Replacement

1. Stand a clean test tube in a rack. Add a piece of mossy zinc to the test tube.
2. CAREFULLY add 2 to 3 full droppers of 6 M HCl. CAUTION: Handle acid with care. It can cause painful burns!
3. QUICKLY, using a test tube holder, invert a second clean, dry test tube over the mouth of the first test tube. Remove the test tube after about 30 seconds and QUICKLY place a burning wooden splint into the mouth of the upside down test tube to test for the presence of H_2 gas. (A "pop" indicates the presence of H_2 gas.) Note the appearance of the substance in the first test tube.
4. Observe the reaction on the teacher's table. Note the appearance of the starting reactants and the products.

D. Double Replacement

1. Note the appearance of the bottles of solutions of $CuCl_2$ and K_2CO_3. In the well plate, add a few drops of each into one well. Observe what happens and note any changes to the mixture.
2. Rinse the well plate and test tubes with water and clean up all equipment.
3. Bring a clean test tube to the teacher's table. Add 2 full droppers of Na_2SO_3 solution to the test tube. Ask your teacher to add HCl. Carefully WAFT some of the gas toward your nose. DO NOT SMELL THE GAS DIRECTLY. Record your observations.

Data and Conclusions: Complete a similar data table for your report. Based on your observations and knowledge of writing equations, predict and write a balanced equation for the reactions.

Sample	Before Reaction	After Reaction	Balanced Equation
Cu (and O_2 from the air)			
Mg (and O_2 from the air)			
$CuCO_3$			
Zn + HCl			
$AgNO_3$ + Cu			
$CuCl_2 + K_2CO_3$			
Na_2SO_3 + HCl			