Name _____ **Date** _____ **Period**_____

TYPES OF CHEMICAL REACTIONS — C405 Chemistry

OBJECTIVE

1. Perform and observe four chemical reactions
2. Identify the products of each reaction
3. Write and balance chemical equations for each reaction

MATERIALS

wooden splint
15×180 mm test tube
evaporating dish
watch glass
crucible tongs
ring stand
buret clamp (or test tube holder)
Bunsen burner
sodium hydrogen carbonate
0.5M copper (II) sulfate
0.1M iron (III) chloride (pipette)
1.0M sodium carbonate (pipette)
plug of steel wool
copper foil
spatula

PROCEDURE

READ ALL THE CAUTIONS IN THE LABORATORY EXERCISE. GOGGLES AND APRONS ARE REQUIRED THROUGHOUT THE ENTIRE LABORATORY PROCEDURE.

PART A : Synthesis/Combination Reaction

1. Obtain a strip of copper foil. Record a description of the reactant in the Data Table.
2. Using crucible tongs, heat a strip of copper foil in the inner cone of the Bunsen burner flame. Note any changes in the copper.
3. Allow the metal to cool in an evaporating dish and use a spatula to scrape some of the product from the foil. Make observations in the Data Table.

PART B : Decomposition Reaction

1. Place approximately 1 gram of sodium hydrogen carbonate in a 15×180 mm test tube. Record a description of the reactant in the Data Table.
2. Clamp the tube in a buret clamp (or test tube holder) attached to a ring stand and heat the tube gently with your Bunsen burner. Hold a burning splint in the mouth of the test tube. Record your observations.

PART C : Single Replacement Reaction

1. Place a small piece of steel wool (iron) in a clean test tube. Obtain 10mL of 0.5M copper (II) sulfate. Record a description of the reactants in the Data Table.
2. Add approximately 10mL of 0.5M copper (II) sulfate to the test tube containing the steel wool. Note your observations in the Data Table.

PART D : Double Replacement Reaction

1. Obtain a micropipette of 0.1 M iron (III) chloride solution and a micropipette of 1.0 M sodium

carbonate. Record a description of the two reactant solutions in the Data Table.

2. Place two drops of iron (III) chloride on a watch glass. Add two drops of sodium carbonate. Record your observations of the result.

CLEAN ALL GLASSWARE AND EQUIPMENT/WASH OFF YOUR LABORATORY TABLE. PLEASE RETURN MATERIALS AS DIRECTED BY THE TEACHER. WASH YOUR HANDS THOROUGHLY WITH SOAP AND WATER BEFORE LEAVING THE LAB ROOM.

OBSERVATIONS- DATA TABLE

Description of reactant(s)	***Observations during reaction***	***Description of product(s)***
PART A		
PART B		
PART C		
PART D		

Write a balanced chemical equation for each of the reactions performed.

Part A _____(__) + _____(__) ➜ _____ (__)

Part B _____ (__) ➜ _____ (__) + _____ (__) + _____ (__)

Part C _____(__) + _____(__) ➜ _____ (__) + _____ (__)

Part D _____(__) + _____(__) ➜ _____ (__) + _____ (__)

INFERENCES AND RELATED QUESTIONS

1. Part B: The decomposition of sodium hydrogen carbonate results in three products. One of these is a solid; two are gases. One of the gases is steam, $H_2O(g)$. Was there any evidence that steam was actually produced?

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_____

_____

2. Part B: How did you know that carbon dioxide was produced from the decomposition reaction ?

_____

_____

3. Part C: How did you know that the copper (II) sulfate reacted with the steel wool ?

_____

_____

_____

4. Part D: How did you know that the iron (III) chloride and sodium carbonate solutions reacted?

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