

## Pre-AP Chemistry I/Chemistry I Unit 7—Chemical Reactions

### Investigation of Chemical Reactions

#### Introduction

Antoine Lavoisier, in the eighteenth century, formulated the law of conservation of mass, which states that matter can neither be created nor destroyed. During a chemical reaction, the bonds of the reactants are broken and rearranged to form new substances. Because matter must be conserved, these new substances, or products, must contain the same number and type of atoms as the reactants.

#### Purpose

In this investigation, you will learn about chemical reactions and experience several types of chemical reactions

#### Procedure for Part A

1. Obtain a sample amount of Copper (II) Chloride,  $\text{CuCl}_2$ .
2. Place aluminum foil into a small plastic cup.
3. Place the Copper (II) Chloride into a small plastic cup lined with aluminum foil.
4. Add approximately 20 mL of water to the cup.
5. Observe the chemical reaction for fifteen minutes.
6. Write observations into the data table as the chemical reaction progresses.
7. Dispose of liquid in the sink.
8. Throw out foil in the trash.
9. Rinse out the plastic cup and leave on the lab table to dry.

#### Procedure for Part B

1. Obtain a sample amount of Potassium Iodide, KI.
2. Place Potassium Iodide, KI, into the Ziploc Bag.
3. Add 12 mL of water into Ziploc Bag and seal.

4. Mix the water and Potassium Iodide until all the Potassium Iodide is dissolved.
5. Obtain a sample amount of Lead (II) Nitrate,  $\text{Pb}(\text{NO}_3)_2$ , in a Dixie Cup.
6. Add 12 mL of water into the Dixie Cup and stir gently.
7. Carefully open the Ziplock Bag.
8. Place Dixie Cup of Lead (II) Nitrate into the bag and close it.
9. Spill the Dixie Cup into the Potassium Iodide solution.
10. Observe the reaction.
11. Filter off the liquid through the funnel system on your table.
12. Observe the filtration.
13. Dispose of liquid into waste bottle on the table.
14. Place the filter paper with the solid into the trash can.
15. Dispose of Ziploc Bag into the trash can.

#### Questions

1. What type of reaction is performed in Procedure A?
2. What is the balanced chemical reaction for Procedure A?
3. What happened in the reaction for Procedure A?
4. What type of reaction is Procedure B?
5. Based on the reaction for Procedure B, please write the balanced molecular ionic equation, solubility rules, state of matter for each compound in the reaction, the balanced complete ionic equation, the balanced net ionic equation, and spectator ions.
6. Do you think all the chemical reactions in each experiment fulfilled the Law of Conservation of Matter? Explain your reasoning.