

CHEMICAL REACTIONS LAB DEMONSTRATIONS

PRODUCTS		
EVIDENCE OF CHEMICAL REACTION		
BALANCED CHEMICAL EQUATION	$\text{Pb}(\text{NO}_3)_2 + \underline{\hspace{2cm}} \qquad \text{PbI}_2 + \underline{\hspace{2cm}}$	
TYPE OF CHEMICAL REACTION		

<u><i>REACTION #4</i></u>	SYMBOL OR FORMULA	APPEARANCE
REACTANT	NaHCO_3	
PRODUCTS		
EVIDENCE OF CHEMICAL REACTION		
CHEMICAL EQUATION	$\underline{\hspace{2cm}} \qquad \text{Na}_2\text{CO}_3 + \text{H}_2\text{O} + \underline{\hspace{2cm}}$	
TYPE OF CHEMICAL REACTION		
<u><i>REACTION #5</i></u>	SYMBOL OR FORMULA	APPEARANCE
REACTANTS		
PRODUCTS		
EVIDENCE OF CHEMICAL REACTION		

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BALANCED CHEMICAL EQUATION	$\text{CuSO}_4 + \text{Zn} \longrightarrow \text{ZnSO}_4 + \underline{\hspace{2cm}}$
TYPE OF CHEMICAL REACTION	

POST LAB QUESTIONS

9. List four evidences that a chemical reaction has occurred.

10. What is the purpose of a catalyst? _____

11. In which demo was a catalyst used? _____

12. What reaction did the catalyst speed up? _____

13. What gases were formed during this demo? _____

14. Describe how you were able to distinguish between CO_2 and O_2 in the demo?

7. What is a precipitate? _____

8.. What precipitate was formed in the demo? _____

Consider the lab results described below:

A student added a piece of Magnesium ribbon to a few milliliters of hydrochloric acid (HCl). A gas was produced. The gas was tested with a burning splint and a popping noise was heard.

9. What gas was produced? _____

10. What were the reactants? _____

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11. What were the products? _____

12. Write the balanced chemical equation for this reaction.

13. What type of reaction was observed? _____

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Upon completion of this lab you will know and be able to:

1. Recognize the reactants and products of a chemical reaction.
2. Identify the type of chemical reaction you observe.
3. Write a word equation for a chemical reaction.
4. Write a balanced chemical equation.

Background Information Use to answer questions and determine reactions.

During a chemical reaction, a chemical change occurs. The evidence of this chemical change may be any one or a combination of the following:

Color change

Temperature change

- The reaction may be *exothermic* or *endothermic*, but this may not be noticed if the temperature change is very small.

Gas formation

- Evidenced by the appearance of bubbles.

Precipitate formation

- Evidenced by the presence of a solid or a cloudy appearance when clear solutions are mixed.

The **reactants** are the chemicals with which you start the reaction.

The **products** are formed after the reaction has occurred.

*It is important to observe carefully
as you attempt a reaction in order to tell if, in fact, a reaction has occurred.*

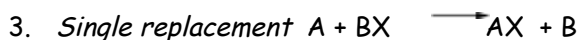
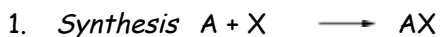
Chemical equations are written to express chemical changes.

The reactants are written to the left of the arrow; the products to the right.

Some reactions do not occur easily and require *heat* or the presence of a *catalyst* before actually occurring.

- A catalyst is a chemical that helps a reaction occur but does not change during the reaction.
- *The catalyst is written above the arrow to show that it is a catalyst.*

There are four general types of reactions;



There are three common gases that may be produced in this lab. The method by which these are identified is described below:

O_2 *A glowing wood splint will burst into flame when exposed to this gas.*

H_2 *A popping noise will be heard when a burning splint is exposed to this gas.*

CO_2 *A burning wood splint goes out when exposed to this gas.*

In this lab you will

- Carry out several reactions,
- Make and record observations
- Write and balance the chemical equations for the reactions you observe.

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- Determine the general type of chemical reaction.

WEAR YOUR GOGGLES AT ALL TIMES!

The order in which you do this lab does not matter. You may begin with any part.

MATERIALS:

PART A

Copper wire
Copper II
Evaporating dish
Bunsen burner
Matches
Tongs

PART B

Test tube
Hydrogen peroxide, H_2O_2
Manganese dioxide, MnO_2
Wood splint
Bunsen burner, matches

PART C

Test tube
Sodium iodide, NaI
Lead II nitrate, $Pb(NO_3)_2$

PART D

large test tube
Baking soda, $NaHCO_3$
test tube tongs
Bunsen burner, matches
Wood splint

PART E

One small test tube
10 ml $CuSO_4$ solution 0.5 M
thermometer
mossy Zinc II, Zn

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WEAR YOUR GOGGLES AT ALL TIMES!

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PROCEDURES

PART A

1. Obtain and observe a small loose "wad" of copper II wire.
2. Record your observations on the data table labeled PART A.
3. Carefully light your Bunsen burner using the proper technique. Raise your hand if you need assistance.
4. Pick up your piece of copper wire with tongs and hold the copper in the flame of the burner for 15 seconds. The copper reacts with oxygen from the air and forms Copper II oxide. Place the product in an evaporating dish and observe the product.
5. Record your observations on the data table labeled PART A.
6. *Place the Cu wire in the garbage can.*

PART B

1. Add 5 ml of hydrogen peroxide, H_2O_2 , to a test tube.
2. Add a few crystals of manganese dioxide, MnO_2 , to serve as a catalyst for the break down of H_2O_2 .
3. In order to prevent the gas produced from escaping, immediately place your thumb over the test tube.
4. Light a splint. Blow it out. Remove your thumb and place glowing splint into the test tube.
5. Record your observations on the data table labeled PART B.
6. *Pour the contents into the beaker marked Part B.*

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PART C

1. Place 2 drops of sodium iodide, NaI, into a test tube.
2. Record your observations of its appearance on the data table labeled Part C.
3. In the same test tube, place 2 drops of Lead II nitrate, $\text{Pb}(\text{NO}_3)_2$.
4. Record your observation of its appearance on the data table marked Part C.
5. Record your observation of the reaction that occurs between the NaI and $\text{Pb}(\text{NO}_3)_2$ on the data table labeled PART C.
6. *Pour the contents of your test tube in the beaker marked Part C.*

PART D

1. In a test tube, place a small scoop of Sodium bicarbonate, NaHCO_3 .
2. Light the Bunsen burner.
3. Hold the test tube with the test tube tongs.
4. Heat the test tube gently in the burning flame until you see condensate form on the sides of the test tube.

DO NOT PLACE FINGER OVER TEST TUBE.

RECALL TEACHER DIRECTIONS FOR GENTLY HEATING THE TEST TUBE!!

DO NOT ALLOW THE TEST TUBE TONGS TO COME INTO CONTACT WITH THE FLAME

5. Light a wooden splint and place the burning splint into the mouth of the test tube.
6. Record your observation on the data table labeled PART D.
7. *Rinse the test tube out in the sink until all of the baking soda is removed.*

PART E

1. In a test tube pour 10 ml of Copper II sulfate CuSO_4 .
2. Place a thermometer into the solution.
3. Record the temperature on the data table labeled Part E
4. Place a small piece of mossy zinc into the solution
5. Record your observation of the appearance of the solution and zinc.
6. *Pour the contents of your test tube into the beaker marked Part E. Wash your hands thoroughly when you complete this part of the lab.*

CHEMICAL REACTIONS LAB DEMONSTRATIONS

DISPOSE OF ALL CHEMICALS AS INSTRUCTED.

YOU ARE RESPONSIBLE FOR CLEANING ALL OF THE TEST TUBES YOU USE.

WHEN THEY ARE CLEAN, PLACE THEM UPSIDE DOWN ON THE TEST TUBE RACK ON YOUR LAB TABLE.

LEAVE YOUR LAB TABLE AS YOU FOUND IT.

IF ANY OF THE LAB MATERIALS NEED TO BE REPLENISHED, PLEASE SEE THE TEACHER.

