

Chemical Reaction Lab

SAFETY

- Do NOT look directly at burning magnesium. The intense light may damage your eyes.
- Lead and Copper compounds are toxic, so care should be taken to avoid undue contact with them. Wash hands immediately if contact with skin is made.

PROCEDURE

Reactions 1 & 2:

1. Obtain two test tubes and a test tube rack.
 2. Place a test tube on the far left side of the test tube rack.
 3. Place another test tube on the far right side of the test tube rack.
 4. Add 3 mL of Copper (II) sulfate to the far left test tube. (Reaction 1)
 5. Add 3 mL of Calcium sulfate to the far right test tube. (Reaction 2)
- ***Hint for step 4 & 5: pour reactant into small beaker and then pour into a graduated cylinder.**
6. Record the initial appearances of copper (II) sulfate, calcium sulfate, and zinc in the data table.
 7. Add a piece of zinc to each of the test tubes.
 8. Record observations using at: start, 3 min, 6 min, & 9 min into each of the reactions.
 9. Dispose of each solution in the appropriate waste container.
 10. Rinse each test tube.

Reaction 3:

1. Record the initial appearance of lead (II) nitrate.
2. Record the initial appearance of potassium iodide.
3. Add 1 mL of lead (II) nitrate solution to a clean test tube.
 - a. Use the correctly labeled pipet and graduated cylinder
4. Add 1 mL of potassium iodide solution to the lead (II) nitrate test tube.
 - a. Use the correctly labeled pipet and graduated cylinder
5. Record reaction observations.
6. Dispose of the products as instructed and rinse the test tube.

Reaction 4:

1. Obtain 100 mL & 400 mL beaker
2. Set out a candle on the lab counter
3. Get stop watch ready for timing
4. Light the candle.
5. Start the timer as you cover the candle with a 100 mL beaker.
6. Record the time it takes for the candle to extinguish.
7. Repeat Steps 3-6 using a 400 mL beaker.

Reaction 5:

1. Place a watch glass next to the burner.
2. Examine a piece of magnesium ribbon and record observations.
3. Correctly light the Bunsen burner.
4. Using crucible tongs, hold the ribbon in the burner flame until the magnesium starts to burn.

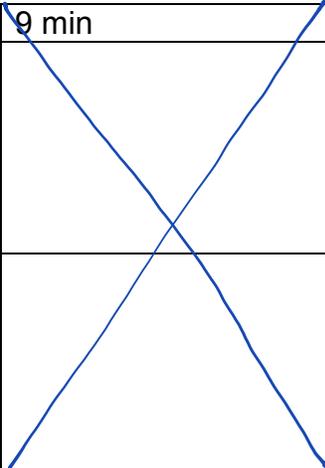
DO NOT LOOK DIRECTLY AT THE BURNING MAGNESIUM
5. Hold the burning magnesium directly over the watch glass.
6. When the ribbon stops burning, place the remains on the watch glass.
7. Turn off the burner. Examine this product thoroughly and record your observations.

OBSERVATIONS

Reactions 1 & 2: Initial Appearance of...

Copper (II) Sulfate	Blue solution
Calcium Sulfate	Colorless solution
Zinc	Shiny, silver metallic luster; round shape

Reactions 1 & 2: Record the appearance of the zinc at each of the following times.

	Start	3 min	6 min	9 min
CuSO_4 Reaction 1	Bubbles; Zn turned black	Bubbles, Zn black in color & smaller in size	Zn smaller in size	
CaSO_4 Reaction 2	No Change	No Change	No change	

Record the appearance of the reactants before and the products after each reaction takes place.

	Before Reaction	After Reaction
Reaction 3	Both are colorless solutions	yellow precipitate formed

Reaction 4	100 mL beaker	400 mL beaker
Candle extinguished time	10 seconds	40 seconds

	Before Reaction	After Reaction
Reaction 5	metallic ribbon, silver in color, bends without breaking	white powder-like solid, very brittle

ANALYSIS:

Reaction 1

•Type of Reaction:

•Indicators of a Chem Rxn:

•Write the Balanced Chem Rxn: $\square \text{CuSO}_4 (\text{aq}) + \square \text{Zn} (\text{s}) \rightarrow$

•Write the Word Equation:

Reaction 2

•Type of Reaction:

•Indicators of a Chem Rxn:

•Write the Balanced Chem Rxn: $\square \text{CaSO}_4 (\text{aq}) + \square \text{Zn} (\text{s}) \rightarrow$

•Write the Word Equation:

Reaction 3

•Type of Reaction:

•Indicators of a Chem Rxn:

•Write the Balanced Chem Rxn: $\square \text{Pb}(\text{NO}_3)_2 (\text{aq}) + \square \text{KI} (\text{aq}) \rightarrow$

•Write the Word Equation:

Reaction 4

•Type of Reaction:

•Indicators of a Chem Rxn:

•Write the Balanced Chem Rxn: $\square \text{C}_{25}\text{H}_{52} (\text{s}) + \square \text{O}_2 (\text{g}) \rightarrow$

•Write the Word Equation: Hydrocarbon (wax) +

Reaction 5

•Type of Reaction:

•Indicators of a Chem Rxn:

•Write the Balanced Chem Rxn: $\square \text{Mg} (\text{s}) + \square \text{O}_2 (\text{g}) \rightarrow$

•Write the Word Equation:

CONCLUSIONS

1. Explain why Reaction 2 did not occur but Reaction 1 did.
2. Will a student observe a reaction if Sr(s) is used instead of Zn (s) in Reaction 1. Why or Why not?
3. Why did the candles go out at different times in Reaction 4?
4. In Reaction 4, what gas filled the beaker, use the correct chemical **NAME**?
5. Is Reaction 4 endothermic or exothermic?
6. If the enthalpy for Reaction 4 is 1308.20 kJ, write the thermochemical equation for this reaction.
7. Is Reaction 5 endothermic or exothermic?
8. If the enthalpy for Reaction 5 is 1204kJ, write the thermochemical equation for this reaction.
9. In Reaction 3, what is the chemical **NAME** for the precipitate that you observed?
- ~~10. Write the net ionic double replacement reaction you observed in this lab; remember to label the reactants and products as solid, liquid, or aqueous solution.~~

OMIT

Extra Credit

In reaction 3, what is the mass of lead (II) iodide, if the mass of potassium iodide is 6.22 grams, lead (II) nitrate is 4.87 grams, and potassium nitrate is 7.41 grams. (hint: law of conservation of matter)