

Types of Chemical Reactions Lab**Introduction**

In this unit, you have studied various types of chemical reactions. Now you will transfer this theoretical knowledge of chemical reactions to the laboratory. In this activity you will observe and predict products for four types of chemical reactions: synthesis, combustion, single replacement, and double replacement.

Prelab Questions:

Write the complete balanced equation (including (g), (s), (aq), (l)) for the following reactions. If a reaction will not occur, write NO REACTION.

1. aqueous magnesium nitrate is placed with solid aluminum:
 $\text{___Mg(NO}_3\text{)}_2\text{(aq) + ___Al(s) } \rightarrow$
2. aqueous barium hydroxide is added to aqueous potassium sulfate:
 $\text{___Ba(OH)}_2\text{(aq) + K}_2\text{SO}_4\text{(aq) } \rightarrow$
3. solid barium oxide is heated:
 $\text{___BaO(s) } \rightarrow$
4. solid calcium is added to nitrogen gas
 $\text{___Ca(s) + ___N}_2\text{(g) } \rightarrow$
5. solid lithium reacts with oxygen gas:
 $\text{___Li(s) + ___O}_2\text{(g) } \rightarrow$
6. aqueous zinc chloride is added to solid sodium:
 $\text{___ZnCl}_2\text{(aq) + ___Na(s) } \rightarrow$

Safety

Wear goggles and aprons at all times. Use care with ALL chemicals, sulfuric acid is extremely corrosive. All chemicals are harmful if ingested or if they come into contact with skin or eyes. Wash hands when lab is complete lab.

Procedures

1. Properly light a Bunsen burner. In the data table record the complete balanced equation for this reaction of methane along with your observations for this experiment.
2. Obtain a small amount of iron filings (just enough to fit on a wooden splint). Carefully sprinkle the powder into the flame. There must be enough of the metal exposed to the air (oxygen) for the reaction to occur. Record your data. Clean your lab table when you are finished.
3. Place a small amount of aqueous potassium iodide into a clean test tube. Add a small amount of aqueous lead (II) nitrate. In the data table, record the complete balanced equation for this reaction along with your observations for this experiment. Using soap and a test tube brush clean the test tube.
4. Obtain a piece of magnesium from your teacher. Using a clean graduated cylinder, measure approximately 10mL of aqueous copper (II) sulfate and pour into a clean beaker or test tube. Drop the magnesium into the copper (II) sulfate solution. Record your data. Using soap and a test tube brush clean the beaker or test tube.
5. Obtain a piece of magnesium from your teacher. Using a clean graduated cylinder, measure approximately 2mL of hydrochloric acid and pour into a clean test tube. Drop the magnesium into the hydrochloric acid. Touch the outside of the test tube and observe any temperature change.
6. Place a small amount of aqueous cobalt (II) chloride into a clean test tube. Add a small amount of aqueous sodium carbonate. Record your data. Using soap and a test tube brush clean the test tube. Write your favorite game (video, sport, board..) next to you name.

Clean lab area and leave clean equipment in tub for the next class to use.

Data (Include (s), (l), (g), or (aq) for each reactant and product. Balance all equations)

Procedure #	Type of Reaction	Balanced Chemical Equation	Observations
1		___CH ₄ (g) + ___O ₂ (g) →	
2		___Fe(s) + ___O ₂ (g) →	
3		___KI(aq) + ___Pb(NO ₃) ₂ →	
4		___Mg(s) + ___CuSO ₄ (aq) →	
5		___Mg(s) + ___HCl(aq) →	
6		___CoCl ₂ (aq) + ___Na ₂ CO ₃ (aq) →	

Conclusion Questions

1. Predict the products of each of the above reactions and balance each equation in the data table.
2. Give the correct name of the precipitate formed in procedure 3.
3. Give the correct name of the precipitate formed in procedure 6.
4. Write the net ionic equation for the double replacement reaction from procedure 3.
5. If in procedure 5 you used silver instead of magnesium what would have happened? Explain.
6. If in procedure 6 you used potassium chloride instead of cobalt (II) chloride what would have happened? Explain.