

LAB: Types of Chemical Reactions

Background:

Although countless chemical reactions exist, nearly all of them can be classified into a few specific categories. In this experiment, you will learn to differentiate five general types of chemical reactions. From observations, you will identify the products of each reaction and determine the type of reaction that has taken place. Write the five different types of reactions you will be identifying in your lab book.

Objective: To observe chemical reactions of different types; classify chemical reactions according to type; write balanced chemical equations for each reaction.

Materials:

Goggles	ring stand	test tube clamp
2 small test tubes	3 medium test tubes	1 pipet dropper
test tube rack	crucible tongs	bunsen burner
watch glass	sand paper	scoopula
Iron nail	magnesium ribbon	3% H ₂ O ₂
0.1 M Cu(NO ₃) ₂	wood splints	3.0 M HCl
0.1 M NaOH	0.1 M Ba(NO ₃) ₂	matches
manganese IV oxide (MnO ₂)		

Safety precautions: HCl (hydrochloric acid) is corrosive and can cause burns.

Procedure:

1. Iron nail and copper (II) nitrate solution. Fill half a small test tube with the copper (II) nitrate solution. Add 1 sanded iron nail to the solution. After 5 minutes record your observations.
2. Barium nitrate (Ba(NO₃)₂) and sodium hydroxide solutions (NaOH). Put 2 mL of barium nitrate solution into a small test tube. Add 5-10 drops of sodium hydroxide solution to the test tube. Record your observations.
3. Magnesium metal and hydrochloric acid. Fill 1/4 a medium-sized test tube with 3.0M hydrochloric acid. Place the test tube in the rack and add a piece of magnesium ribbon. Quickly place the other medium sized test tube over the other to collect the gas that evolves. Light the wood splint and place it in the mouth of the test tube with the collected gas. Record your observations.
4. Action of catalyst on hydrogen peroxide. Add 2 mL (1/4 of test tube) of the 3% hydrogen peroxide solution to a medium-sized test tube. Add a small amount of manganese IV oxide (MnO₂) to the H₂O₂. Observe. Light a wood splint and blow it out. Place the burning ember near (or in) the mouth of the test tube. Observe.
5. Place a second piece of magnesium ribbon in your crucible tongs and light it on fire. Collect the ashes in the watch glass.

Dispose of the solutions in the waste beakers at your lab stations.