

Title: Single Replacement Reaction

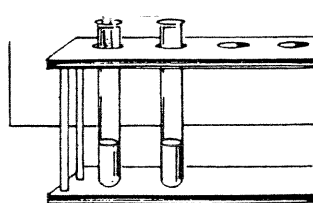


Background Information: A single replacement reaction is a reaction in which a free element replaces a part of a compound. In this lab you will observe two different single replacement reactions.

Purpose: To observe two different single replacement reactions.

Materials:

Hydrochloric acid
Zinc
Copper sulfate
Two test tubes
Wood splints
Graduated cylinder
Matches
Two watch glasses
Goggles



Caution: Copper sulfate is an irritant and poison. Avoid contact with the hands, eye, and mouth. Hydrochloric acid is a corrosive liquid that can burn the hands, skin, or eyes.

Procedure:

Part A

1. Measure out 5ml of copper sulfate solution. Pour this into a test tube. Record the physical properties of the copper sulfate solution in your data chart. The physical properties should include the color and state of matter.
2. Obtain a piece of zinc. Record the physical properties of the zinc in your data chart. The physical properties should include color, texture, and state of matter.
3. Add the zinc to the test tube with copper sulfate solution. (Do part B while you are waiting for the reaction to take place)
4. After thirty minutes observe the copper sulfate solution and zinc. Note the new color of the solution.
5. A dark reddish-brown deposit should appear on the zinc square. This new substance is copper. Record its physical properties in your data chart.
6. The other new substance formed is still dissolved in solution. Pour 1ml of this solution into a watch glass. Put the watch glass in an appropriate place to sit overnight.
7. Deposit your remaining materials in an appropriate container.
8. Wash and dry your glassware.

Part B

1. Wear goggles.
2. Measure out 5ml of hydrochloric acid. Pour this into a test tube. Record the physical properties of hydrochloric acid in your data chart.
3. Obtain a piece of zinc. Record the physical properties of zinc in your data chart.

4. Add the zinc to the test tube with hydrochloric acid. Observe what takes place.
5. After one minute bring flaming wooden splint to the mouth of the test tube. The new gas formed is hydrogen gas. Record its physical properties in the data chart.
6. The other new product formed is still dissolved in solution. Pour 1ml of this solution into a watch glass. Place the watch glass in an appropriate place to sit overnight.
7. Deposit remaining materials in an appropriate container.
8. Wash and dry your glassware.

Day 2

Part A:

9. Observe the new substance formed on the watch glass. This new substance is zinc sulfate. Record its physical properties in your data chart.
10. Wash and dry your watch glass.

Part B:

11. Observe the new substance formed on the watch glass. This new substance is zinc chloride. Record its physical properties in your data chart.
12. Wash and dry your watch glass.

Data Chart:

Substance Physical Properties

Part A: *

Copper sulfate

Zinc

Copper

Zinc sulfate

Part B: *

Hydrochloric acid

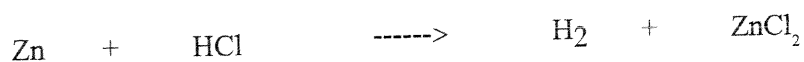
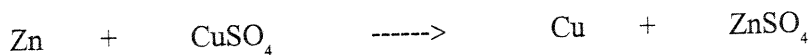
Zinc

Hydrogen

Zinc Chloride

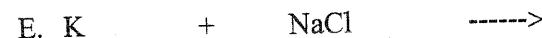
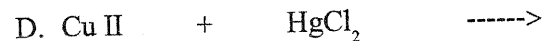
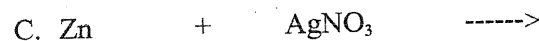
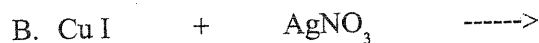
Questions:

1. What indicated that a chemical reaction took place when zinc and copper sulfate were combined?
2. What indicated that a chemical reaction took place when zinc and hydrochloric acid were combined?
3. Name the reactants in Part A:
4. Name the products in Part A:
5. Name the reactants in Part B:
6. Name the products in Part B:
7. What new elements were formed in Part A? In Part B?
8. What new compounds were formed in Part A? In Part B?
9. What happened when a flaming splint was brought to the mouth of the test tube in Part B?
10. Complete and balance the chemical equations below that represent the chemical reactions, which took place:



11. What is a single replacement reaction?

12. Complete and balance the following single replacement reactions:



13. Write the names of the reactants and products for the equations listed in question number 12:

	Reactants		Products	
A.	_____	_____	_____	_____
B.	_____	_____	_____	_____
C.	_____	_____	_____	_____
D.	_____	_____	_____	_____
E.	_____	_____	_____	_____
F.	_____	_____	_____	_____
G.	_____	_____	_____	_____
H.	_____	_____	_____	_____
I.	_____	_____	_____	_____
J.	_____	_____	_____	_____

Conclusion: