

LESSON
111

LAB

The Active Life Activity of Metals

Name _____

Date _____ Period _____

Purpose

To discover how metals compare in terms of activity.

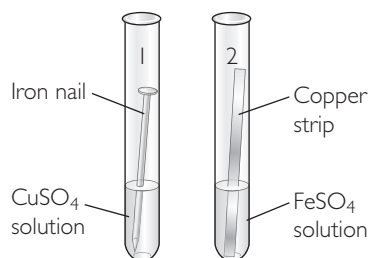
Part I: Copper Versus Iron

Materials

- iron nail (not galvanized)
- copper strips (~3 in. long)
- 2 test tubes
- 1.0 M copper (II) sulfate, 10 mL
- 1.0 M iron (II) sulfate, 10 mL

Predictions and Procedure

1. Examine the drawing of the two test tubes. Do you expect reactions to occur in both test tubes? Why or why not?



2. Label two test tubes 1 and 2. Set them up as shown in the drawing.
3. Set the test tubes aside and observe.

Observations and Analysis

1. What did you observe in test tube 1? What do you suppose happened?

2. What happened in test tube 2? What evidence is there?

3. Write the balanced chemical equation for each reaction that occurred.

4. Write the net ionic equation for each reaction in Question 3. What was oxidized and what was reduced?

5. What ions are present in each test tube?

6. Which substance is more easily oxidized, copper or iron? Explain.

Part 2: Magnesium Versus Copper Versus Zinc

Materials

- magnesium, zinc, and copper strips
- well plate with at least six wells
- tweezers (for handling metal foil)
- 1.0 M zinc nitrate, 1.0 M copper (II) nitrate, and 1.0 M magnesium nitrate in dropper bottles

Procedure and Observations

Use your well plate to test the combination of each metal with each solution. Use tiny amounts. Fill in the data table with R or NR (for reaction or no reaction).

	Mg	Cu	Zn
Zn(NO ₃) ₂			
Cu(NO ₃) ₂			
Mg(NO ₃) ₂			

Analysis

1. Why was it not necessary to pair each metal with its metal nitrate?
2. How could you tell when a substance reacted? What did you observe?
3. Write balanced chemical equations and net ionic equations for all the reactions you observed.
4. Based on your experiment, place the metals in order of their ability to lose electrons easily (to be oxidized). Rank them from most active to least active.
5. **Making Sense** How can you tell when one metal is oxidized more easily than another metal?