

LESSON
112

LAB

Current Events

Electrochemical Cell

Name _____

Date _____ Period _____

Purpose

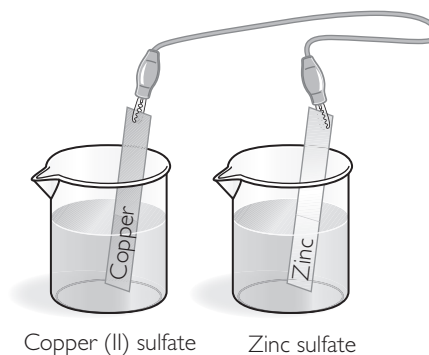
To explore how to get electrical energy from a redox reaction.

Materials

- zinc strip, copper strip
- 250 mL beakers (2)
- 500 mL beaker
- 2 connecting wires with alligator clips
- tiny LED light bulb
- 1.0 M copper (II) sulfate, 100 mL
- 1.0 M zinc sulfate, 100 mL
- 20 mL saturated potassium nitrate (KNO_3) solution (for salt bridge)
- 2 strips of filter paper, ~1 in. wide and ~6 in. long (for salt bridge)
- pair of surgical gloves (for handling salt bridge)

Procedure

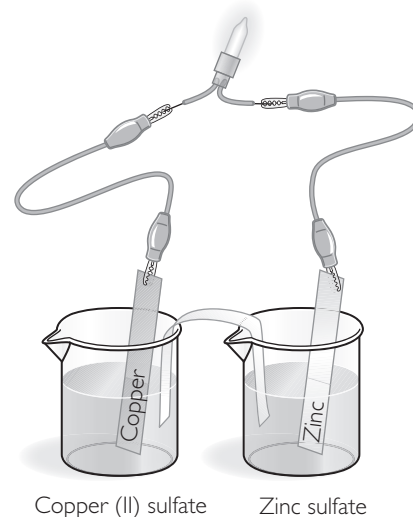
1. Carefully pour 100 mL of CuSO_4 into one beaker and 100 mL of ZnSO_4 into another beaker.
2. Make a salt bridge. Place a piece of folded filter paper in the bottom of an empty 500 mL beaker. Pour a little KNO_3 into the beaker to soak the filter paper thoroughly. Set aside for later.
3. Set the zinc strip in the ZnSO_4 solution. Set the copper strip in the CuSO_4 solution. Attach the connecting wire, as shown in the illustration.



Observations and Analysis

1. What ions are present in the two beakers?
2. Are any reactions taking place? If so, what are they? If not, why not?
3. In order to make the reaction happen, you must create an ionic bridge, or salt bridge, between the two beakers so the electric current can flow. Use gloves to place your salt bridge with one end in each solution. What do you observe?
4. Which substance is being oxidized? Reduced? How do you know?

5. Which is the more active metal? Explain.
6. Connect the tiny LED light bulb using both sets of alligator clips, as shown in the diagram.
7. What do you observe when the LED light is in place? What does that prove?
8. Label the place on the illustration where you think oxidation is taking place with an O. Label the place on the illustration where you think reduction is taking place with an R.
9. What substances are produced by the reaction?
10. If you know which is the more active metal, you can figure out the direction in which the electrons are moving. Explain why this is true.



11. What direction are electrons traveling through the LED light bulb? Draw an arrow on the diagram for Question 6 and label it “current.”
12. Is it possible to reverse the reaction? Explain how you might do this.
13. **Making Sense** Explain where the electricity is coming from in the electrochemical cell you created.
14. **If You Finish Early** Draw a diagram showing how you would set up an electrochemical cell using two completely different metals. Show the two half reactions for your cell. Label where reduction is taking place.