

## Disappearing Aluminum Rod

### *Preparer's Version*

#### **Introduction**

The “Disappearing Aluminum Rod” demonstration showcases a striking single replacement redox reaction in which a rolled piece of aluminum foil is submerged into a saturated solution of cupric chloride ( $\text{CuCl}_2$ ). Upon contact, a vigorous and exothermic reaction rapidly unfolds, characterized by bubbling, color change, heat generation, and the apparent dissolution of the aluminum rod.

#### **Safety Hazards**

- Personal Protective Equipment:
  - Safety glasses/goggles
  - Nitrile gloves
  - Chemical & flame retardant lab coat
- Physical Hazards
  - Copper(II) chloride is toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment, and is hygroscopic (absorbs moisture from the air).
- Chemical Hazards
  - Copper(II) chloride may cause serious eye damage, skin irritation, and is harmful if swallowed or in contact with skin.

#### **Materials**

- 500mL beaker
- 50mL Copper(II) chloride solution
- Aluminum foil rod

#### **Safety Data Sheet(s)**

- [Copper\(II\) chloride](#)
- [Aluminum foil](#)

### **Procedure**

1. Measure 757.0 g of copper(II) chloride dihydrate and add it to 1.000 L of deionized water. Stir until fully dissolved. This will come out to an approximately 4.44M solution.
2. Take a piece of aluminum foil, approximately one square-foot, and loosely roll and crumple it into a rod shape. Do not roll too tightly.

### **Tips & Tricks**

- Do not roll the rod too tightly; allowing some space will help the solution react with more surface area more quickly.

### **Clean-Up Procedures**

1. Allow the flask to cool and the reaction to stop on its own before cleaning.
2. Fill a carboy or waste bottle with a volume of deionized water equal to or greater than the volume of liquid in the flask. This will be to dilute the products.
3. Pour the liquid waste into the carboy or waste bottle of deionized water.
4. Rinse the labware thoroughly with deionized water at least three times, emptying the runoff into the waste stream.
5. Clean thoroughly with laboratory detergent.
6. Leave the carboy or waste bottle open in a fume hood for at least several hours to prevent any residual gas generation from compromising the waste container by building pressure.