

Workshop 4: Patina Workshop

Learning Objectives

- To witness the oxidation process that turns copper object green
- To understand how a patina is formed on top of an object
- To understand that copper corrosion is caused by a chemical reaction

Curricular Tie-ins:

This patina workshop is a useful tool to help students to understand the process of copper corrosion by simulating copper oxidation. Understanding the process of corrosion will help students accurately recognize the chemistry of the patina formed on a copper object.

- Students will be able to answer the following questions:
 - What type of chemical reaction occurs on copper that causes an apple green patina to form?
 - Why is understanding this reaction useful in technical art history?
 - How can the addition of a patina to the surface change the interpretation of an object?

Supplies:

- Clean workspace
- Mylar, newspaper (to protect work surface, if necessary)
- Paper towels
- Zip-loc sandwich size bag
- About 3.5x4 inch piece of cardstock
- Apron
- Nitrile gloves
- Safety glasses
- 2x2 inch copper coupon
- Sandpaper (medium and coarse grit)
- Empty film cannister
- Paint brush
- Centrifuge tubes
- 2tbsp medicine dispenser cups
- About 1 tsp of cupric Chloride [copper (II) chloride]
- Ammonium chloride

Pre-Class

1. Prepare film cannister with cupric chloride
 - Add cupric chloride to each film canister
2. Add ammonium chloride to around the 1mL line of the centrifuge tube
 - Every film cannister should get a tube of ammonium chloride

Steps:

1. Using the sandpaper, scratch the surface of copper coupon
2. Place copper on cardstock card
3. Add about 1 ounce of water to the film cannister using the medicine cup
4. Stir the mixture using a paint brush

5. Add the entire tube of ammonium chloride, stir
6. Brush a layer of copper solution, allow to dry
7. Repeat adding enough layers of copper to cause the surface of the copper to form an apple green coating (patina)
8. To dispose of copper solution:
 - Put paper towels into a zip-loc bag
 - Pour solution onto paper towels, allow to dry
 - Throw away the dried paper towels and bag

Tips:

- Wear clothes that you do not mind getting dirty
- Keep solution away from eyes
- Do not drink solution
- Brush thin layers of copper solution on to copper coupon

Safety:

- Wear gloves and safety glasses
- If dye gets in to eye or on skin flush thoroughly with water
- Do not eat or drink copper solution
- Exercise care with sandpaper
- Follow proper disposal instruction at the end of the workshop