Merging Metals: THE SCIENCE BEHIND THE MAGIC

by Holly Aubart

I had once seen jewelry that looked like it had been dipped in copper, and I needed to know the secrets of this craft. My husband, along with the graces of modern technology, helped me discover the specialized process that is electroforming. Whether collecting organic materials in the woods for my jewelry, receiving naturally shed feathers, or foraging for bark from ancient trees and wasps nests from my mother's farm in northern Wisconsin, the following words come to mind: beautiful, enduring, and unpredictable. Like nature and life, my pieces are unpredictable and that is demonstrated in the splendor of electroforming. When I began electroforming, I made many happy "mistakes," but after two years of practice, dedication, and determination, my pieces reflect their origins. I have discovered a creative outlet that incorporates both natural treasure hunting and patient dexterity. Each design, distinctive and unique, cannot be replicated and represents nature both physically and symbolically. I like to think of myself as a modern-day alchemist.

Supplies

- 3-amp rectifier: w/ alligator clip leads (Tekpower)
- Baking soda: 1 tsp.
- Bus bar
- Cabochons: labradorite; raw amethyst; rutilated quartz
- Clasp: lobster-claw, antique copper
- Clay wood epoxy
- Copper-conductive paint: (Glass Diversions)
- Copper electroforming solution: (Rio Grande - Midas Bright)
- Distilled water
- Drill
- Frisket: (Grafix - Incredible White Mask)
- Jump rings: antique copper
- Liver of sulfur: ¼ tsp.
- Mason jars: wide mouth, quart size (3)
- Necklace chain: antique copper
- Paintbrushes
- Patina: blue (Modern Masters)
- Pliers: flat-nosed
- Protective gear
- Rotary tool w/ 428 polisher accessory: (Dremel)
- Sealer: (Everbrite - ProtectaClear)
- Tree bark/Twisted tree branch
- Varnish: water-based
- Wire: copper, 10- & 26-ga.
- Wire cutters

Technique

Prepping the Pendant

1. Drill holes in the bark/branch where the necklace chain will attach.
2. Varnish the bark/branch to seal it, and let dry for several hours.
3. Position the cabochon onto the bark/branh and use adhesive clay or wood epoxy to adhere. Let dry for several hours.
4. Brush frisket onto the stone to protect against the electroforming solution.
5. Paint thin coats of conductive paint onto the bark/branch. Let dry six to eight hours.
6. Place jump rings through the drilled holes.

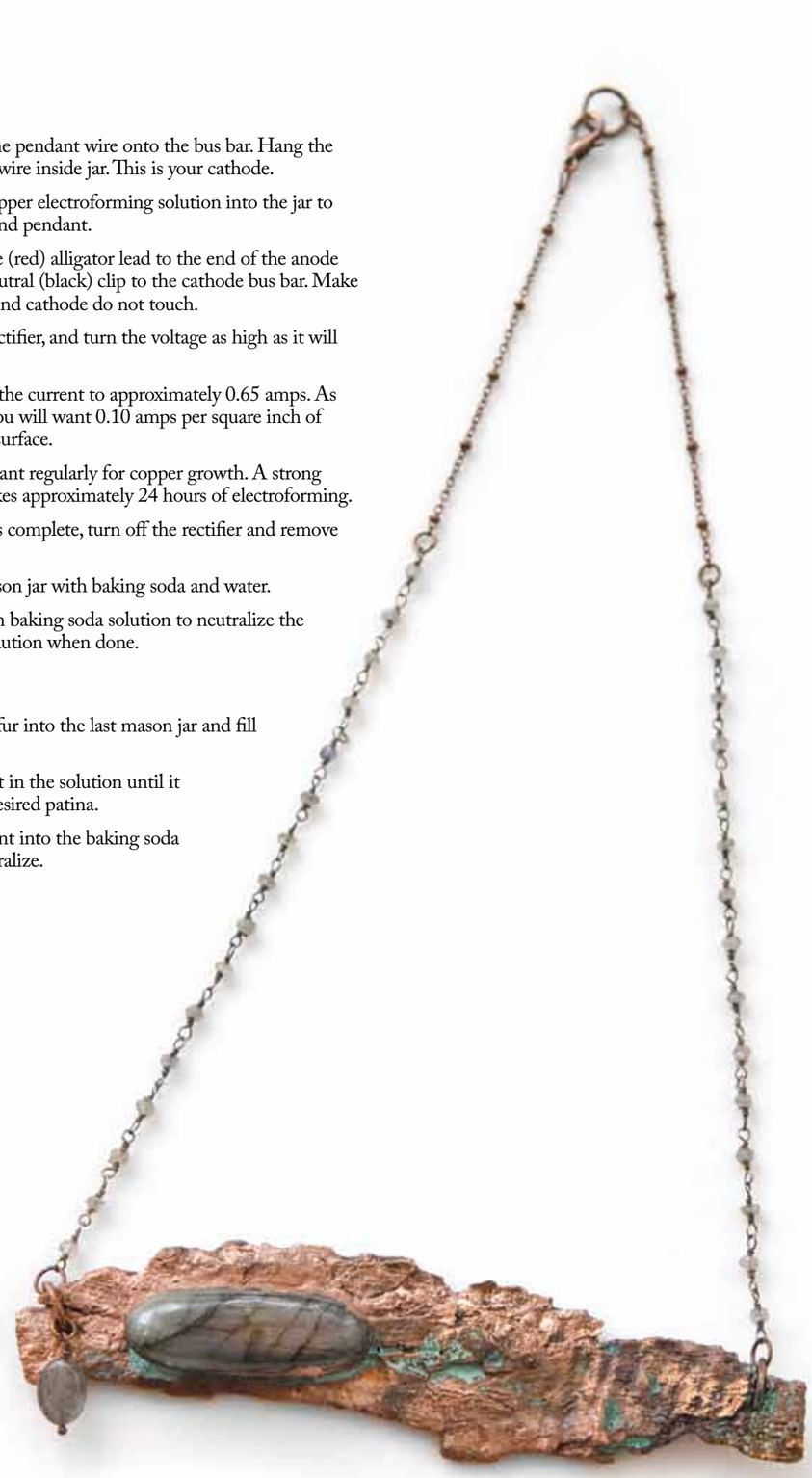
Electroforming the Pendant

1. Create an anode by coiling 10-gauge wire around the inside of one of the mason jars. Leave approximately 2 inches of wire sticking out over the top of the jar.
2. Cut a 6-inch piece of 10-gauge wire for a bus bar to rest across the jar mouth.
3. Cut a 12-inch piece of 26-gauge wire to hold the pendant. Thread wire through jump rings, and wrap around the pendant twice and back up the jump rings so both wire ends are on the same side. Form a hook or loop in the wire 2 inches from the pendant by twisting the wire. ↔

4. Hook or loop the pendant wire onto the bus bar. Hang the pendant on the wire inside jar. This is your cathode.
5. Pour enough copper electroforming solution into the jar to cover the coils and pendant.
6. Clip the positive (red) alligator lead to the end of the anode coil. Clip the neutral (black) clip to the cathode bus bar. Make sure the anode and cathode do not touch.
7. Power on the rectifier, and turn the voltage as high as it will go.
8. Slowly increase the current to approximately 0.65 amps. As a general rule, you will want 0.10 amps per square inch of electroforming surface.
9. Check the pendant regularly for copper growth. A strong copper "skin" takes approximately 24 hours of electroforming.
10. When growth is complete, turn off the rectifier and remove the leads.
11. Fill another mason jar with baking soda and water.
12. Place pendant in baking soda solution to neutralize the acid. Reserve solution when done.

Creating Patina

1. Pour liver of sulfur into the last mason jar and fill with hot water.
2. Dip the pendant in the solution until it develops your desired patina.
3. Place the pendant into the baking soda solution to neutralize.



4. Rinse the pendant with water and then set on cloth to dry.
5. Brush blue patina onto the pendant to develop a blue patina. Let dry for several hours.
6. Brush on sealer and let cure for four days.
7. Attach necklace chain to jump rings, and attach a lobster claw clasp.

Tips

- Electroforming solution is extremely acidic! You must use protective gear such as gloves, goggles, and an apron. The solution is reusable. Just filter it with coffee filters and pour it back into the original bottle. Clean jars and coils with a ScotchBrite pad and distilled water.
- If the pendant develops a dull salmon color, increase the electrical current and re-process. Polishing with a Dremel will give the pendant a new penny-like shine.
- The 26-gauge wire will need to touch conductive paint to develop the copper skin, but if you see lines on the finished pendant, the wire was wrapped too tight.
- Experiment with all kinds of household objects with varying pH levels to create different patinas, such as vinegar, ammonia, salt, or hard-boiled eggs.

Holly Aubart has lived all over the United States but currently resides in western North Carolina. For more information, visit mergingmetals.com, mergingmetals.etsy.com, *Instagram (@mergingmetals), and Facebook (MergingMetals). Holly welcomes email at* mergingmetals@gmail.com.