

Yining Ge
Wet Plate Collodion Process

If 169 Years Ago - Putney Under COVID-19

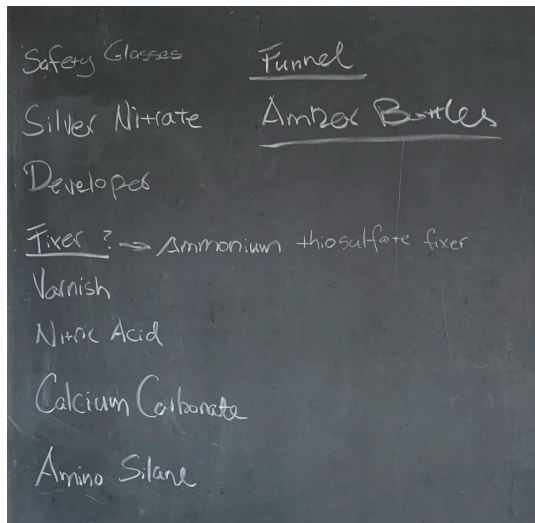
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Proposal

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Material

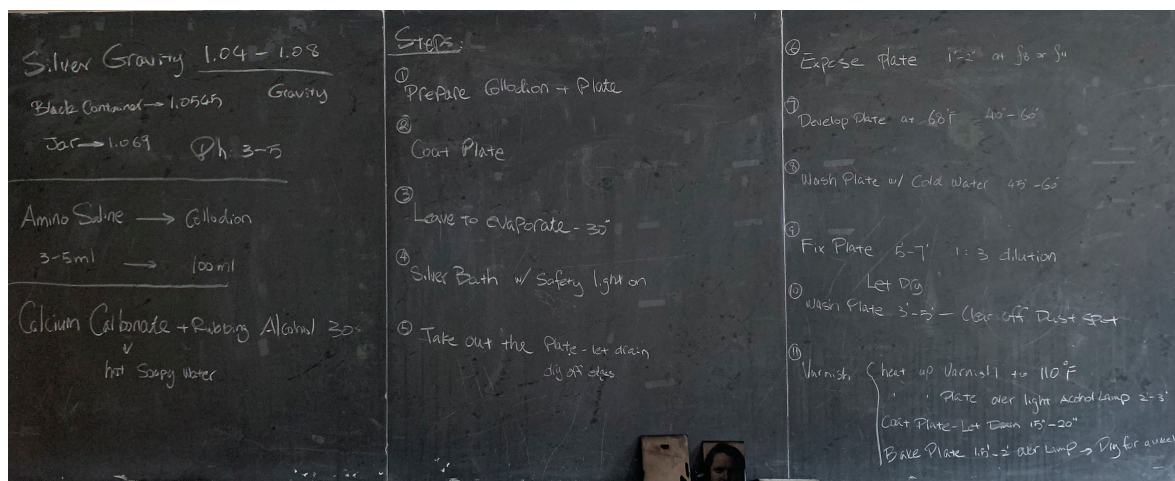


- Safety Glasses
- Masks
- Gloves
- Silver Nitrate
- Developer
- Fixer
- Sandanic Varnish
- Nitric Acid
- Calcium Carbonate
- Amino Silane
- Camera+ Shutter Release
- Beakers in different sizes
- Clean Mason Jars

Safety Precautions

*A lot of the materials are harmful chemicals and compounds. To prevent any injury, please wear appropriate laboratory safety gear. You should ALWAYS work in a ventilated space. All the chemicals should be stored near any heat source.

Procedure



1. Preparation

a. Collodion

i. The Salted Collodion solution that comes from Bostick & Sullivan is ready to use if you are coating aluminum plates. However, if you are using glass plates, the suggestion is to add 3-5 ml of Amino Silane to 100 ml Salted Collodion to increase adhesion.

ii. Disposal

Outdoors, away from buildings and animals, pour the unused salted Collodion solution in a shallow glass or ceramic dish for evaporation. Rinse the storage bottle with 50-100 ml of Isopropyl Alcohol, adding that solution to the dish. Allow the solution to evaporate for 24-48 hours. A brown or yellow crust of hard nitrocellulose will form in the dish. Wrap this crust in a plastic bag and discard with your regular trash.

The above method works well with smaller quantities of Collodion. Check with your local solid waste department or fire department for the proper disposal of large amounts of Collodion and Ether.

b. Plate

i. Aluminum plates

For aluminum plates, the only thing you need to do is to peel off the plastic layer on the plate.

ii. Glass plates

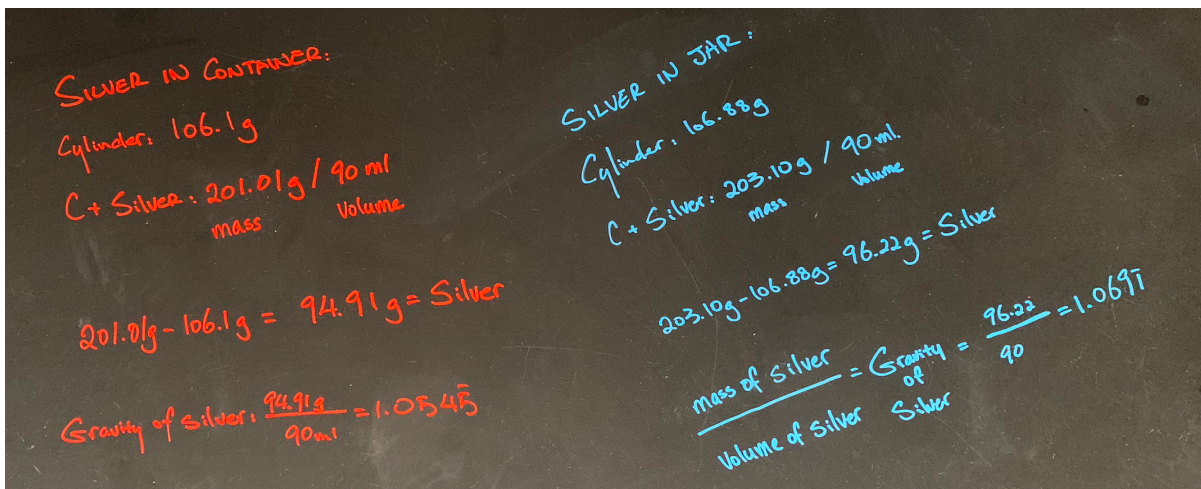
For glass plates use Calcium Carbonate to clean the surface of the plate

c. Silver Nitrate (we have a black container and a jar)

i. Test pH

The pH level of the silver bath should remain around pH 4. You can add Nitric Acid 7% to adjust the pH level. (Nitric Acid fumes are extremely irritating to the eyes and lungs. Using a respirator gas mask would help reduce the risk of injury)

- ii. Adjust pH
To 1000ml Silver Nitrate 10% solution, add 16 drops Nitric Acid 7%
- iii. Test Gravity
 - *the gravity should remain between 1.04 to 1.08
 - 1. Check the gravity of the silver bath
 - 2. Take the mass of an empty graduated cylinder
 - 3. Pour in a sample of the liquid - fill the cylinder fairly full to minimize
 - 4. Read the volume of liquid on the graduated cylinder in milliliters (same as cubic centimeters)
 - 5. Take the mass of the graduated cylinder and liquid in grams
 - 6. Subtract the mass of the cylinder itself your result from step 4 to get the mass of liquid in grams
 - 7. Mass of liquid in grams/volume of liquid in milliliters = specific gravity of sample fluid
- iv. Adjust Gravity (If the gravity is below 1.04)
 1. Carefully add Silver Nitrates crystals to the bath a few times at a time
 2. Wait until the crystal is fully dissolved
 3. Retest the gravity
 4. Repeat the last two steps
 5. Stop when the gravity reaches 1.06-1.07



- v. Maintaining the Bath
 1. Sunning Silver Nitrate
 - a. Pour bath into an open wide mouth container
 - b. Mark the volume of the solution
 - c. Place the container in direct and bright sunlight for 48-72 hours
 - d. After sunning, add cold distilled water into the container to replace the solution that evaporated

- e. Filter out particles at the bottom of the container using a coffee filter
- f. Check pH and Gravity
- 2. Boiling Silver Nitrate
 - a. Pour bath into a beaker
 - b. Place the beaker on a scientific hotplate
 - c. Set the hotplate to medium-high
 - d. Let the solution boil for at least 15 minutes
 - e. Check pH and Gravity
- d. Developer
 - The developer that comes from Bostick & Sullivan is not ready to use.
 - i. Tintypes
 - Mix 1 part Wet Plate Developer with 3 parts of water.
 - ii. Glass Negatives
 - Mix 1 part Wet Plate Developer with 5 parts of water.
- e. Fixer
 - i. Mix 1 part *Sprint* concentrated fixer with 3 parts water.

2. Pouring Plate

*collodion is not light-sensitive, the following process can be done under room light
 When you are pouring the plate, pour a generous amount at once. The surface tension normally will keep the collodion from dripping off. In case some drip off, keep a tray or bottle for the collodion to drop into. If it does start to drip off, just keep going. After the collodion has covered the entire plate, drain the extra back into the bottle. Then allow the plate to evaporate, you can use the following table as guidance.

Evaporation time:

4"x5"	→	30 seconds
5"x7"	→	45 seconds
8"x10"	→	60 seconds
12"x20"	→	75-90 seconds

3. Coating Plate in Silver bath

*turn the light off if you completed the previous step under room light. You need to use safelights for coating the plate with silver.
 Gently place the coated plate on the dipper. Place the dipper into the box and allow the plate to sensitize for 5 minutes.

4. Negative Carrier

Remove the plate from the tank and allow the excess solution to drain. Wipe off the extra solution from the back of the plate to prevent contamination.

5. Exposure

*make sure you have a shutter release attached to the camera

Set the shutter speed to T or B, which allows you to control the time greater than 1 second.

Exposure times vary greatly. In bright sunlight, I found that exposures are in the 8-11 second range at f11 or f16, depending on the subject matter.

6. Developer

*temperature does not matter, but the solution is best-kept room temperature

Develop your plate for 40-60 seconds. Development time should remain consistent.

7. Water Bath

Remove the plate from the developer and allow the excess developer to drain. Place the plate into a water bath with steady flowing cold water for 1 minute.

8. Fixer

Let the plate sit in the fixer for 5-7 minutes.

9. Water Bath

Wash the plate for 3-5 minutes then let dry.

10. Varnish

*Sandarac Varnish is highly flammable, so keep away from flames

- a. Heat up the varnish to 110 °F or 43.3 °C in a hot water bath
- b. Use a hairdryer to warm up/ clean the plate
- c. Pour the varnish over the plate and let it sit for a few seconds
- d. Allow the excess varnish to drain for 15-20 seconds
- e. Hold the plate, varnish side up, over a flame
- f. Keep moving the plate
- g. Keep doing this until there is a thin wisp of smoke coming off the plate

*if your plate catches the flames, just blow it out quickly

- h. The varnish will be dry enough to move, but would not be hardened for a week (do not touch the surface before the varnish fully hardens).

Q & A

- Why is there nothing showing up on the plate?
 - Check the exposure time! The plate is dark when it is underexposed and light when overexposed.
 - The actual image would not appear after you fix it. So, do not throw away the plate or do anything to your plate before fixing it.



- Why are there blue marks on the plate?
 - Blue marks appear when your plates are overexposed, which means you either have a longer exposure time than you needed or the developing time is too long. The marks tend to exist in places where the sky or the highlight of the images are.



- Can I reuse the plates?
 - If you are using glass plates, you can easily clean off the collodion and silver by soaking the plate in hot soapy water.
 - If you are using metal plates, unfortunately, trying to clean off the surface would be wasting your time.
- Why would the sleeve leave a mark on the plate when pulling out?
 - You might notice this when collodion on the plate has dried off. Try to reduce the time between sensitizing and developing the plate.

