

PHOTOGRAPHERS' FORMULARY

FORMULARY POP LEAD-GOLD COMBINED TONER FIXER

1-liter kit

These directions assume the user is familiar with the Formulary instruction for Printing-Out-Paper (POP) (Catalog number 07-0110). The chemicals in this kit are intended to replace both the toner and the fixer of the standard POP process. Care must be used with this combined treatment to ensure complete fixing has taken place

CHEMICALS CONTAINED IN THIS KIT

Your kit contains the following chemicals:

Chemical	Amount
Sodium thiosulfate, pentahydrate	200 g
alum (potassium alum)	15 g
lead acetate	2 g
Gold chloride, 1% solution	50 ml

CHEMICAL SAFETY

All chemicals are dangerous and must be treated with respect. Please read all the chemical warnings on each package). This kit contains two chemicals that need special attention: lead acetate and gold chloride. **Consult with local sewer and water authorities regarding proper disposal of darkroom chemicals in your area**

Lead Acetate is a heavy metal salt which can accumulate in the system and, this case, lead to lead poisoning. Do not breathe the dust of this compound when mixing the solution and take special care that none of the compound is inadvertently ingested. Use rubber gloves when working with solutions containing lead acetate.

If you should spill a solution of lead acetate on your skin, wash thoroughly with soap and water.

Gold chloride is a caustic and can cause skin burns. In dilute solution, gold chloride will stain the skin purple. The stain is due to gold metal banded to the protein of the skin and cannot be chemically removed. The only procedure for removing these spots is to let them wear off. If you are concerned with finger stains, we strongly urge you to use rubber gloves, such as Playtex gloves, when working with this toner.

The user assumes all risks upon accepting these chemicals. IF FOR ANY REASON YOU DO NOT WISH TO ASSUME ALL RISKS, PLEASE RETURN THE CHEMICALS WITHIN 30 DAYS FOR A FULL REFUND.

MIXING THE SOLUTIONS

Overview

Stock Solution A will be prepared and, just prior to use, combined with the gold chloride solution (Solution B) to make the working solution.

The gold chloride solution needs no preparation. The preparation of Solution A, however, is rather involved. To prepare Solution A, you will first dissolve each of the three chemicals in separate volumes of water. Two of the solutions will be heated to boiling and combined while hot. After cooling, the solution containing the third chemical will be added. The combined mixture is then allowed to stand for several days and finally filtered.

A detailed procedure follows.

Solution A (The Thiosulfate-alum-lead Solution)

You will need a 1-liter storage container and three mixing bowls. Two of the mixing bowls will have to be able to withstand heating to the boiling point of water. Since all of the solutions will be combined into one of these two bowls, make sure one of them has a capacity of at least 2 liters. The third mixing bowl will not be heated and can have a capacity of about 100 ml.

Solution 1 (The Thiosulfate Solution)

Use a mixing bowl that can be heated.

Chemical	Amount
Distilled water (52°C/125°F)	700 ml
Sodium thiosulfate, pentahydrate	200 g

Place the warm water in the mixing bowl and add the solid thiosulfate. Stir the mixture to dissolve the solid. The large crystals of the thiosulfate dissolve slowly. Stir the solution for about 5 minutes, let it stand and occasionally stir it. The solid will not dissolve unless it is stirred.

Solution 2 (The Alum Solution)

Chemical	Amount
Distilled water (52°C/125°F)	150 ml
Alum (potassium alum)	15 g

Place the hot water in the mixing bowl and add the alum. Stir the solution to dissolve the solid.

Solution 3 (The Lead Acetate Solution)

You will not need to heat this solution. However, the mixing bowl must be thoroughly cleaned with soap and hot water after use or discarded.

Chemical	Amount
Distilled water (52°C/125°F)	150 ml
Lead acetate	2 g

Place the hot water in the mixing bowl and add the lead acetate. Discard the lead acetate shipping bag in the trash. Stir the solution to dissolve as much of the solid as possible. Commercial lead acetate always contains some insoluble lead salts; therefore, not all of the solid will dissolve. Disregard any of the solid that does not dissolve because, in the final step, Solution A will be filtered to remove any insoluble material.

Combining the Solutions

Heat Solution 1 (The Thiosulfate Solution) and Solution 2 (The Alum Solution) to just boiling and then combine them in the larger of the two mixing bowls. Allow the combined mixture to cool to room temperature before proceeding. Disregard any precipitate that should form.

To the cool combined solution, add Solution 3 (The Lead Acetate Solution). Stir the mixture to ensure it is homogeneous. Ignore any precipitate that should form. Cover the mixing bowl with any convenient cover to minimize evaporation and allow the solution to stand for 2-3 days. During this period any precipitate that formed will settle.

Filtering the Solution

The final step in the preparation of Solution A is filtration. You will need a funnel and some white porous paper. Fold the paper into a cone so that it will fit into the funnel. Place the funnel along with the filtering paper on the storage bottle and pour the solution into the cone in small portions. The amount of time the filtration will take depends upon the porosity of the paper you use.

Solution B

Your kit contains 50 ml of 1% gold chloride solution to be used as Solution B. No additional preparation is needed.

CAPACITY OF THE WORKING SOLUTION

The capacity of the toner-fixer is about 8 8x10 (or 32 4x5) prints per 100 ml of working solution.

MIXING THE WORKING SOLUTION

To prepare the working solution, mix 20 parts of Solution A with 1 part of Solution B (The Gold Chloride Solution). Stir the mixed solution to ensure it is homogeneous before using. Mix only enough working solution for a single session. It will not store after it has been used.

Approximate Volume Desired

Chemical	Parts	100 ml	200 ml	300 ml
Stock Solution A	20	100 ml	200 ml	300 ml
Stock Solution B	1	5 ml	10 ml	15 ml

USING THE TONER-FIXER

You tone for 5-10 minutes at 20°C (68°F). Should the print be toned to a satisfactory level before 5 minutes, the print will probably not be completely fixed. To be on the safe side, rinse the print and continue fixing the print in a fixing bath containing 50 g of sodium thiosulfate, pentahydrate (not contained in this kit) in 500 ml of water.

After using toner-fixer (or the continuation fixer), wash the print for at least 1 hour in running water. At this stage of process, the POP-print paper is quite fragile and can be easily abraded.

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