

Increased longevity and color change are two major reasons for toning black and white prints.. Some toners such as Gold Chloride or Selenium toner along with properly fixed and washed prints will increase the life of the photographic print dramatically. Photographic prints can be toned almost any color of the rainbow using a variety of toners. Multi-toned or split toned prints are also possible using partial toning techniques and rubber cement and fisket masking techniques.

****Safety while using or making photographic toners is essential. Ventilation is very important. Do not use these chemicals in a poorly ventilated room. You must wear gloves, use a respirator, wear an apron and use eye protection. Some of the chemicals used for toners are the most toxic of the photographic chemistry you may be exposed to. Take care.*****

The following recipes came from a variety of sources. Check the links page for sites that have other recipes.

Selenium Toner

For archival purposes and to deepen the blacks

Use Kodak Selenium Toner: 25 to 50 milliliters

Add to: 1 liter of working solution of Hypo Clearing Agent

Add (optional) : 20 grams of Kodalk

For fiberbase paper use two fixing baths. Transfer the fixed print directly to the Selenium toner. Do not rinse between fix and toner. If a print is dry, briefly soak it in fixer then transfer it to the toner. Tone the print approximately five minutes @68°F or until it looks right. For an exaggerated purplish tone... leave in the toner longer.

Rinse for 1 minute.

Agitate in a tray of Hypo Clearing Agent for 2 minutes

Wash as normal

Sepia Sulfide 221 Toner

Sepia Sulfide is a classic bleach and redevelopment toner that produces rich permanent sepia-brown tones. Most types of paper tone well with this process, including resin coated paper. Different brands of paper will give you different tones, therefore it is advised you test the paper you are using before toning a print. Oriental VC Plus developed in G.262 toned slightly red, whereas prints developed in GAF-125 became a deeper, richer brown. The bleach contains potassium ferricyanide that changes the metallic silver to a silver salt. After bleaching the print is then redeveloped in sodium sulfide. The end result can give the impression of a print made in the late 1800's.

CHEMICAL SAFETY

SODIUM SULFIDE is not Sodium Sulphite. Sodium Sulphite, a preservative used in almost all photographic developers, is considered to be a bland chemical. Sodium Sulfide is a powerful fogging agent, is used mainly in toning bath and is a dangerous chemical if used incorrectly. Sodium Sulfide should be used with considerable care. Do not allow it to come into contact with acidic solutions. Sodium Sulfide (as a solid or in solutions will react with acid to form hydrogen sulfide, a foul smelling and poisonous gas. Hydrogen sulfide gas will fog photographic emulsions so keep paper and film isolated when toning. Sodium Sulfide and its solutions are caustic. Do not allow them to come into contact with the skin as they can cause a chemical burn. If contact should occur, wash the area first with cold water followed by soap and water. Dispose of solid Sodium Sulfide or a solution of Sodium Sulfide down a drain. First run cold tap water down the drain for a few minutes to make sure no acid remains in the drain trap, place the solid or pour the liquid into the drain. Run tap water down the drain for at least 5 minutes.

POTASSIUM FERRICYANIDE: In spite of the fact that this compound contains cyanide, it is not particularly toxic. The reason is that the cyanide groups bind to the iron atom and are not free to act as a poison. The cyanide groups can be released as hydrogen cyanide gas if the Potassium Ferricyanide is placed in a strong acid solution. Dispose of excess Potassium Ferricyanide down the drain with excessive amounts of water.

MIXING THE SOLUTIONS

CAUTION: Never use metal utensils or containers in the preparation of or in the use of toning solutions.

BLEACH SOLUTION

Chemical Amount Units
Water (125°F/52°C) 750 ml
Potassium Ferricyanide 50 g
Potassium Bromide 10 g
Sodium Carbonate (mono) 20 g
Cold water to make 1000 ml

Place the warm water in a mixing container and add the Potassium Ferricyanide. Stir the solution until the solid completely dissolves. Add each chemical in the order given above, stirring the solution after adding each until it is completely dissolved. Finally add cold water to bring the final volume of the solution up to 1000 ml. Stir the final solution to ensure it is mixed thoroughly. It is best to store this working bleach solution in \ the dark. Potassium Ferricyanide solutions are somewhat light sensitive. Should the stock solution turn blue, the bleach has been ruined and must be discarded.

STOCK SOLUTION B (The redevelopment solution)

This solution must be mixed in a well ventilated area. Small amounts of hydrogen sulfide will be given off during mixing. This compound is a poisonous and powerful

photographic fogging agent. Since sulfide solution is quite caustic, you should wear rubber gloves while mixing and transferring this solution.

Chemical Amount Units

Water (120°F/48°C) 750 ml

Sodium Sulfide 45 g*

Cold water to make 1000 ml

*90g per Dignan's Cookbook

Place 300 ml of water in the mixing container and add the Sodium Sulfide. Stir the solution until the solid completely dissolves. Add cold water to bring the volume up to 500 ml and stir to ensure the solution is mixed thoroughly. After mixing, clean all the utensils thoroughly with water followed by soap and water. Should any of this solution be spilled on your skin, wash immediately with cold water followed by soap and water.

USING THE TONER

Correctly exposed and fully developed prints work best. This toner **MUST** be used in a well ventilated area.

BLEACHING THE PRINT

Undiluted Stock Solution A is used at room temperature as the bleach. The print to be bleached must be thoroughly washed and wet before it is immersed in the bleach solution. If residual hypo is left on the print, the hypo combined with the ferricyanide in the bleach will cause permanent loss of the image. Pour just enough Stock Solution A to cover a print into a plastic or glass tray. Immerse the print in the bleach solution and gently rock the tray. The black image will be converted to a light brown or straw colored image, or may disappear altogether depending on your paper, within one minute. Wash the bleached print in running water (68°F/20°C) for 10-15 minutes. During the wash, the yellow ferricyanide color on the print will be lost. The bleach solution can be reused.

REDEVELOPMENT

A redevelopment working solution is prepared by diluting part of Stock Solution B with 8 parts of water. This working solution is to be discarded after a working session (see the Safety Discussion on the disposal of sulfide solutions)

USAGE

Place the working solution in a plastic or glass tray and immerse the well-washed, bleached print. Redevelopment of the image to a rich sepia tone will occur in about 1 minute.

IMPORTANT: Use clean trays, free from exposed iron spots especially with bleaching bath. Otherwise blue spots may form on prints. After redevelopment, wash the print in running water for about 30 minutes.

AFTER TREATMENT

The sulfide bath will soften the emulsion of the print. Therefore, it is

advisable to harden the print before it is dried. You may fix the toned print in a fixer with hardener (Cat. No. 03-0146) for 30 minutes, with a 10 minute wash to follow.

NOTE

The Bleach solution is the same as that used with the Thiourea Toner.

REFERENCE

Photo-Lab-Index, Section 15, Supplement 172, p. 64.

Sepia Sulfide Toner 221, Photographers' Formulary (800-922-5255).

The Darkroom Cookbook, p.160.

Toner Descriptions.

Borrowed from Jack's Photographic and Chemistry Collection

Red Toner (GT-15)

This toner works well with bromide and chloride papers to produce red tones.

SOLUTION A

Chemical Amount Units

Potassium Citrate 100 g

Water to make 500 ml

SOLUTION B

Chemical Amount Units

Copper Sulfate 7.5 g

Water to make 250 ml

SOLUTION C

Chemical Amount Units

Potassium Ferricyanide 6.5 g

Water to make 250 ml

USAGE

Mix solution B into solution A, then slowly add solution C, stirring well. Remove prints from toning bath when desired tone is obtained and wash thoroughly.

NOTE

Before using toning baths it is essential that the prints be well washed. It will be found that a given formula will not produce an identical tone on all papers; as a rule the commercial type bromide and chloride papers respond better to toning than do the more specialized emulsions. The majority of toning formulas exert a bleaching action in addition to creating the change of color, and for that reason prints to be toned should be made considerably deeper than normal.

REFERENCE

Photo-Lab-Index, Section 15, Supplement 173, p. 66.

The Darkroom Cookbook, p.167.
Red Toner (GT-15).

Blue Toner (GT-14)

This formula produces blue tones on print papers.

SOLUTION A

Chemical Amount Units
Ferric Ammonium Citrate 5.6 g
Water to make 56.7 ml

SOLUTION B

Chemical Amount Units
Potassium Ferricyanide 5.6 g
Water to make 56.7 ml

SOLUTION C

Chemical Amount Units
Acetic Acid (28%) 227.3 ml
Water to make 341.0 ml

USAGE

Mix the three solutions together. Soak prints until the image becomes bright blue. After toning, wash in clear water until the highlights are clear.

NOTE

Before using toning baths it is essential that the prints be well washed. It will be found that a given formula will not produce an identical tone on all papers; as a rule the commercial type bromide and chloride papers respond better to toning than do the more specialized emulsions. The majority of toning formulas exert a bleaching action in addition to creating the change of color, and for that reason prints to be toned should be made considerably deeper than normal.

Copper Print Toner

Copper Toner is a general purpose toner that acts by deposition of copper metal. It is capable of producing a variety of colors ranging from warm brown to chalk red. The exact tone that is obtained depends upon the length of time the paper is immersed in the toning bath, and the type of paper used. Almost all papers can be used with this toning bath, although fiber based papers are best, resin coated papers work nicely also.

CHEMICAL SAFETY

POTASSIUM Ferricyanide: In spite of the fact that this compound contains cyanide,

it is not particularly toxic. The reason is that the cyanide groups are bound to the iron atom and are not free to act as a poison. The cyanide groups can be released as hydrogen cyanide gas if the potassium Ferricyanide is placed in a strong acid solution: however the copper toning process does not call for acid. To dispose of excess potassium Ferricyanide (solid or in solution) wash the material down the drain with excessive amounts of water.

MIXING THE STOCK SOLUTIONS

You will need Two storage containers each with a capacity of one liter. CAUTION: NEVER USE ANY METAL UTENSILS OR CONTAINERS IN MIXING, STORING OR USAGE OF ANY TONER.

Stock Solution A

Chemical Amount Units

Water (68°F/20°C) 600 ml

Copper Sulfate 4 g

Potassium Citrate 16 g

Water to make 1000 ml

Place the water in the storage container or a mixing container and add the Copper Sulfate. Stir until the solid completely dissolves. Next add the Potassium Citrate and stir until the solid dissolves. Add water to bring the volume of the solution up to 1000 ml. Be sure to stir the final solution to ensure it is mixed thoroughly.

Stock Solution B

Chemical Amount Units

Water (68°F/20°C) 600 ml

Potassium Ferricyanide 3.3 g

Potassium Citrate 16 g

Water to make 1000 ml

Mix the chemicals in the order given, in the same manner as directed for Stock Solution A. MIXING THE WORKING SOLUTION Mix the working solution just prior to toning. To prepare the working solution, mix equal volumes of Stock Solutions A and B. Do not dilute the working solution. Discard the working solution after a working session.

TONING THE PRINT

All toners work best if the print is fixed with a non hardening fixer. A hardening fixer decreases the permeability of the gelatin of the print thus decreasing the ability of the toning chemicals to reach the silver metal in the print. To tone the print, immerse the fixed and washed print in the undiluted toning solution in a plastic tray. If you start with a dry print, be sure to presoak it in water. The longer the print is immersed in the toning solution, the more the tone will appear as a red hue. If the print is allowed to remain too long in the bath the whites will turn pink. When first using this toning solution, it is wise to determine the toning time with test strips. Rinse the toned print in running water for 20 minutes.

REFERENCE

Classic Toning Methods, Peter Reichelt, Mastering Black-and- White Photography, p.49.

Formulary Copper Toner Kit No. 06-0010, Photographers' Formulary (800-922-5255).

Borrowed from Jack's Photographic and Chemistry Collection

Hypo-Alum Sepia Toner

Hypo-Alum Sepia Toner produces brown to reddish-brown tones on almost any print. The actual hue that you will obtain depends upon the toning time, upon the paper, and upon the speed of the paper. Silver nitrate and potassium iodide are both included in this kit although their use is optional, the silver nitrate can be used to decrease the ripening time and the potassium iodide gives a toning solution that yields warmer tones. There are a number of different formulations in the photographic literature that are called "Hypo-Alum Toners". All of these toners act by the deposition of silver sulfide on the print. They differ from one another principally in the amounts of the ingredients used in their preparation.

CHEMICAL SAFETY

Silver nitrate is both an oxidizer (can supply oxygen to a fire) and a caustic (can cause skin burns). Clean up any spilled solid silver nitrate with water and dispose of any excess down the drain. Never dispose of solid silver nitrate in a wastepaper basket. If solid silver nitrate comes into contact with the skin, a chemical burn may result. Wash the area with cold water followed by soap and water. Treat any wound in the same manner you would treat a heat burn. When dilute solutions of silver nitrate are spilled on the skin a brown to brown-black stain results. The color is due to silver metal bound to the protein of the skin and cannot be washed off. While there are chemical methods to remove these brown stains, the best procedure is to just let them wear off.

MIXING THE TONER

You will need a 1 liter (or larger) mixing bowl and a 1 liter storage container. The toning solution is mixed in four separate steps. The first and second steps prepares the toner itself. The third and fourth steps are optional and are explained below.

Step 1

WORKING SOLUTION

Chemical Amount Units

Water (125°F/52°C) 750 ml

Sodium Thiosulfate (penta) 300 g

Water to make 1000 ml

Place the hot water in a mixing bowl and add the thiosulfate. Stir the solution until the solid goes into solution.

Step 2

Chemical Amount Units

Solution from step 1 1000 ml

Potassium Alum 25 g

Add the alum to the solution obtained from Step 1 and stir the solution until the solid goes into solution. This solution can be used as such as a Hypo-Alum Toner. If you wish to do so, transfer the solution to the storage container. Skip to the instructions labeled "Final Dilution". If you choose this alternative, be sure to read the comments at the start of Step 3 and the section on "Ripening the Toner."

(Optional)

A solution containing only thiosulfate and alum will act as a reducer and bleach a print by removal of the silver. When the silver concentration in the bath is high enough, the solution will act as a toner. In order to convert a fresh thiosulfate-alum solution to a toning bath, silver must be added. This is carried out in two stages, silver nitrate is added to the bath and scrap prints are toned in the bath until a satisfactory toning solution is obtained.

Chemical Amount Units

Silver nitrate 0.12 g

Water to make 1000 ml

Add the water to the vial containing the silver nitrate.

Add the silver nitrate solution to the solution obtained from Step 2. If a precipitate should form, ignore it. Stir the solution to ensure it is homogeneous.

Step 3 (optional)

The toning solution as described above tends to give cold tones. If you wish to obtain warmer tones, then potassium iodide must be added.

Chemical Amount Units

Water (68°F/20°C) 50 ml

Potassium Iodide 1 ml

Place the water in a clean mixing bowl (such as a water glass) and add the potassium iodide. Stir the solution to dissolve the solid. Pour the iodide solution into the bath obtained from Step 2 (or Step 3). A precipitate usually forms, especially if silver nitrate has been added to the bath. The precipitate is normal, therefore just ignore it.

FINAL DILUTION

Transfer the toning solution to its storage container and add sufficient water to bring the final volume in the container up to 1000 ml. Cap and shake the container to ensure it is homogeneous.

RIPENING THE TONING SOLUTION

Without sufficient silver in the toning bath, prints will be bleached rather than toned. Some of the required silver can be added to the bath (Step 3) but the final amount must be added by allowing the bath and the silver on a print to attain an equilibrium. To obtain the proper silver concentration, "tone" scrap prints. The first five or so of these prints will be ruined. (The actual number ruined will depend upon print size, density, etc.). The tone of the scrap prints will improve as the bath approaches the proper ratio of ingredients.

CAPACITY OF THE TONING BATH

The ripened bath has a very high capacity and can be used for years. It is reported to improve with use. Add a little water (or better, fresh unripened toner solution) from time to time to maintain its volume.

USING THE TONER

The print to be toned should be developed more than usual to obtain the best result. All types of papers can be used but the exact tone will depend upon the paper used. RC papers will tend to gray from loss of their optical brightener in this bath. The toning bath should be used undiluted and at 120°F/50°C to minimize the toning time. Place the toning solution in a plastic tray. Try to avoid transferring any precipitate to the toning tray however, if some should be transferred, don't worry about it. Float the toning tray in a larger tray containing hot water. Add hot water to the larger tray from time to time to maintain its temperature. Immerse a wet well washed print in the hot toning solution. Rock the toning tray to wash the print with fresh solution and to keep any precipitate off its surface. Tone to the desired hue about 10 minutes will be required. After toning, wash the print in running water for 10-20 minutes. Use a wet cotton swab to clean any scum off the print's surface.

NOTES

Higher temperatures give colder tones. Warmer tones can be obtained by adding 1 gram of potassium iodide to each liter of toner. Toning may be speeded up by placing the prints in a 10% sulfuric acid solution for 1 minute and then transferring directly to the toning bath.

REFERENCE

Hypo-Alum Sepia Toner Kit No. 06-0100, Photographers' Formulary (800-922-5255).

Photo-Lab-Index, Section 15, Supplement 172, p. 62, 63, 65

The Darkroom Cookbook, p.161.

Toner Descriptions.

Borrowed from Jack's Photographic and Chemistry Collection