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Sulfide toning

This low-cost toning treatment (formula 10, see p. 242) markedly improves the stability of the silver image. It is less toxic than selenium toning, although the hydrogen sulfide gas (which has the odor of rotten eggs) that such baths can produce is harmful and can fog the photosensitive surfaces. It is advisable to work under a hood or in a well-ventilated area. The silver is converted into silver sulfide, which can tone the images a sepia color, depending on the concentration, and causes a slight loss of density and contrast (Fig. 139). It can be applied either directly after fixation in one single bath or in a two-step process that includes a preliminary bleaching. In the latter case, the silver sulfide particles are larger than the original silver particles.

Since the high pH of some of these baths has a tendency to swell and excessively soften the gelatin, the images should be handled with care to avoid mechanical damage.

The Image Permanence Institute introduced the Silverlock toning bath (formula 11, see p. 243) in the United States to treat silver microforms intended for backup archiving. It is applied directly after the fixing bath and may be mixed with a washing aid. The film should then be washed.

Kodak Toner T-8 (one bath)

water	750 ml
potassium polysulfide	7.5 g
sodium carbonate monohydrate	2.5 g
water to make	1,000 ml
or	
water	750 ml
potassium polysulfide	7.5 g
borax	2.5 g
water to make	1,000 ml

Potassium polysulfide, formerly known as liver of sulfur, is composed of a mixture of several sulfides in proportions that vary depending on the quality of the product. This product, which is very sensitive to oxidation, must be stored in tightly closed containers.

Dissolve the products in the order indicated. The photograph should be washed thoroughly, immersed for 15 to 20 minutes in the bath, and then rinsed under running water, immersed for 1 minute in a 3% sodium bisulfite solution, hardened in a hardening bath (e.g., Kodak F-5a), and then meticulously washed and dried.

Formula 11

Silverlock

potassium polysulfide	495 g
water to make	1,000 ml
borax	20 g

Dissolve the potassium polysulfide in the water. Then add the borax. Cover and allow to rest overnight. After decanting, dilute for use. For microfilm, use a 1:25 dilution at 27°C for a few dozen seconds.

KODAK PROFESSIONAL Brown Toner

Note: Wear rubber gloves when you mix or use Brown Toner.

1. Dilute 30 millilitres (1 fluidounce) of Brown Toner in 946 millilitres (1 quart) of water and mix thoroughly.
2. Immerse a thoroughly washed print in the toner solution, and agitate. Tone prints for 15 to 20 minutes at 20°C (68°F) *or* for 3 to 4 minutes at 38°C (100°F) with continuous agitation.
3. When toning is complete, remove the print from the toning bath and rinse it with water for 2 minutes.
4. Treat fiber-base prints in Hypo Clearing Agent for 1 minute, and then treat them in a bath made from 1 part KODAK Liquid Hardener* and 13 parts water for 2 to 5 minutes.

   Note: If hardening is required for resin-coated prints, you can treat them in the same way.

Wash fiber-base prints in running water at 18 to 20°C (65 to 75°F) for 30 minutes; wash resin-coated prints for 4 minutes.

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KODAK Fixing Bath F-24

This bath can be used for films, plates, or papers when no hardening is desired. For satisfactory use, the temperature of the developer, rinse bath, and wash water should not be higher than 20° C (68° F).

Water, about 50° C (125° F)	500 milliliters
KODAK Sodium Thiosulfate (Pentahydrated)	240.0 grams
KODAK Sodium Sulfite (Anhydrous)	10.0 grams
KODAK Sodium Bisulfite (Anhydrous)	25.0 grams
Cold water to make	1.0 liter

KODAK Hardener F-5a

Water, about 50° C (125° F)	600 milliliters
KODAK Sodium Sulfite (Anhydrous)	75.0 grams
*KODAK 28% Acetic Acid	235.0 milliliters
**KODAK Boric Acid, Crystals	37.5 grams
KODAK Potassium Alum, Fine Granular (Dodecahydrated)	75.0 grams
Cold water to make	1.0 liter

*To make approximately 28% acetic acid from glacial acetic acid, add 3 parts of glacial acetic acid to 8 parts of water.

**Crystalline boric acid should be used as specified. Powdered boric acid dissolves only with great difficulty, and its use should be avoided.

Slowly add 1 part of the cool stock hardener solution to 4 parts of cool 30% hypo solution (300 grams of sodium thiosulfate per liter of water), while stirring the hypo rapidly.

KODAK Polysulfide Toner T-8

Water	750 milliliters
Sulfurated Potassium (liver of sulfur)	7.5 grams
KODAK Sodium Carbonate (Monohydrated)	2.5 grams
Water to make	1.0 liter

This single-solution toning bath produces slightly darker sepia tones than the redevelopment-sulfide toner, KODAK Toner T-7a. It has the advantage, compared with hypo-alum toners, that it does not require heating, although raising the temperature to 38° C (100° F) reduces the time of toning to about one-fifth that necessary at 20° C (68° F).

To Use: Treat the well-washed black-and-white print for 15 to 20 minutes, with agitation, in the KODAK T-8 Toner bath at 20° C (68° F) or for 3 or 4 minutes at 38° C (100° F).

After toning, rinse the print for a few seconds in running water and place it for about 1 minute in a KODAK Hypo Clearing Agent bath, freshly mixed and kept for this purpose only, or in a solution containing 30 grams of sodium bisulfite per liter (1 ounce per quart) of water. Then treat the print for about 2 to 5 minutes in a hardening bath prepared by adding 1 part of KODAK Liquid Hardener to 13 parts of water, or 2 parts of KODAK Hardener F-5a stock solution to 16 parts of water. If any sediment appears on the print, wipe the surface with a soft sponge. Wash the print for at least 30 minutes at 18.5 to 21° C (65 to 70° F) before drying.

For a packaged toner with similar characteristics, obtain KODAK Brown Toner.