Forensics Source
13386 International Parkway
Jacksonville, Florida 32218
Tel. 800-347-1200
Fax: 800-366-1669
www.forensicssource.com

Rhodamine 6G

TECHNICAL NOTES

Background

Rhodamine 6G is an excellent laser or Forensic Light Source dye. It can be dissolved in water or solvents to be used as a liquid dye in solution staining, or it can be introduced into magnetic powder to form a fluorescent magnetic powder. It is the dye of choice of many latent print examiners.

Safety

As with all chemicals, always read the MSDS (material safety data sheet) to learn about the safe handling and health hazards of each chemical. With Rhodamine 6G, it is recommended that rubber gloves and safety glasses be worn. When combined with any of the solvents listed below, the solution should be mixed and used in a fume hood. When examining the evidence with a light source, wear protective goggles. Be familiar with the light source and know which goggles to wear under all circumstances.

Mixing Variations

While there is more than one formulation for mixing Rhodamine 6G, the simplest formula uses about 0.1 gram per 2-3 liters of carrier. The carrier can be either distilled water or a solvent such as methanol. With larger, powerful lasers, a more dilute solution may be more effective or with a small, portable unit, a less dilute solution could be better. There is room for experimentation for each type of laser or Forensic Light Source used. Because each piece of evidence is different, a test should be done using the aqueous (water) solution and the methanol solution. On some types of materials, the methanol solution will absorb into the item and the whole surface will then fluoresce. On other items, the aqueous solution will absorb, causing unacceptable results.

Glue Fuming

Before using Rhodamine 6G, it is necessary to process the evidence with cyanoacrylate esters (super glue) prior to the staining process. It is recommended that the CA process results in under fuming rather than over fuming. If heavy white residue is present on the background surface or heavy white latent prints are developed, the Rhodamine 6G solution may stain the entire surface and the latent prints will appear as bright glowing globs with no

ridge detail when illuminated with a light source. The use of fast-acting, chemical catalysts or accelerator pads is not recommended, as the process can develop heavy, white residue.

The evidence can be processed in a specially designed CA fuming chamber, a closed tank or a Coleman Vacu-Print™ vacuum chamber. With a dedicated fuming commercial fuming chamber, the fuming process is generally controlled by a microprocessor.

If using a closed container, place a few drops of liquid glue in a aluminum cup or attach a Hard Evidence™ Pouch to the side of the closed container with the evidence and a cup of warm water. Allow the evidence to remain about ten minutes before checking. To check the progress of the fuming without opening the lid of the fish tank, place a black latent print backing card in the tank with test prints on it. When these test prints are just becoming visible, remove the evidence from the tank to stop the process.

Fuming under vacuum with a Coleman Vacu-Print™ will help to eliminate the problems associated with over fuming. Vacuum technology for glue fuming is relatively new. This method will develop latent prints without excessive residue coating the surface of the evidence, and it will be easier to handle the evidence. Because there is no residue buildup on the evidence, dye-staining for fluorescent examination is more effective. When there is excessive buildup of the glue residue, the dye stains all of it, causing the entire surface to fluoresce, perhaps obscuring ridge detail. With a vacuum process, items of evidence, such as garbage bags do not have to be opened up. The fumes will coat all of the surfaces. Also, items such as soda cans, screwdrivers and handguns can be placed inside the chamber with the items touching each other. It is not necessary to leave space between each item.

After the completion of the CA processing phase, the item should be visually examined for any latent print development. Any ridge detail should be photographed prior to subsequent processing procedures.

Method

Rhodamine 6G processing is intended for non-porous items of evidence. The preferred method of application is to dip the item into the solution or stream the solution over the evidence. In some instances Rhodamine can be spray or squirted onto the surface, but care must be taken when utilizing these methods as this will create minute droplets that can be inhaled or deposited on the skin.

Experimentation will help determine if the item of evidence should be rinsed prior to ALS examination. Generally a methanol rinse will clear the excess stain from the non-print surface allowing for a more clear mark. The rinse can be applied either by dipping or streaming over the surface.

Examination

In a darkened room and with proper eye protection, shine the light from the forensic light source or laser over the surface of the item. Make note of any fluorescence or ridge detail that become visible when the light is passed over it. Photograph the visualized latent prints. Best results are found with examination in the 495nm to 525nm range with the optimal results generally around 525nm. The use of orange or red barrier goggles is recommended for viewing and photography.

Photography

To photograph the fluorescent-developed latent prints, duplicate the arrangement by which the best contrast was viewed with the eye. Include a fluorescent scale in the photograph next to the evidence. Use the wavelength, the color of viewing goggles and the angle of the light source to obtain the best photograph. A camera setting utilizing a medium *ƒ*-stop (*ƒ*/8 or *ƒ*/11) will give a photograph showing highly defined ridge details.

Additional Reading

Advances in Fingerprint Technology edited by Dr. Henry Lee and Dr. R. E. Gaensslen
Manual of Fingerprint Development Techniques by the British Home Office, second edition
Fingerprint Detection by Fluorescence Examination by the British Home Office

Ordering Information

Catalog No. 1-0040 ..... Rhodamine 6G, 25 grams
Catalog No. 1-4700 ..... Coleman Vacu-Print™ Table-Top Chamber
Catalog No. 1-4702 ..... Vacuum Pump/Motor
Catalog No. 1-4501 ..... Loctite® Liquid Glue, 1 oz.
Catalog No. 1-4510 ..... Hot Plate for fuming
Catalog No. 1-4620 ..... Hard Evidence™ Pouch, 20 pack
Catalog No. 1-4661 ..... Hard Evidence™ Solvent, 2 oz.
Catalog No. 1-2101 ..... Booklet of 50 Black Reversible Backing Cards, 2 1⁄4" x 4 1⁄4"
Catalog No. 6-3847 ..... Adhesive Fluorescent Scales, 2 in—50 mm, pack of 50
Catalog No. 6-3816 ..... 6 inch Fluorescent Scales, cardstock, pack of 10
Catalog No. 6-3885 ..... INCH “L” Shaped Scale, Fluorescent, cardstock, pack of 5
Catalog No. 8-5015 ..... HOME OFFICE/*Manual of Fingerprint Development Techniques,* 2nd edition
Catalog No. 8-5039 ..... HOME OFFICE/*F/P Detection by Fluorescence Examination*
Catalog No. 8-5041 ..... LEE/*Advances in Fingerprint Technology*