Section H - Subsection 1 **Rhodamine 6G** **Page 1**

Name of Procedure:

Rhodamine 6G

Suggested Uses:

One of the most effective ways to recover latent prints from items of evidence is to use a laser dye followed by a laser or alternate light source examination. Rhodamine 6G has been found to be one of the most effective laser dyes in recovering latent prints on various surfaces. This dye is normally used on non-porous surfaces (metal, glass, plastic, etc.); however, under certain conditions can be used on porous or semi-porous surfaces. This dye is extremely efficient in that it is highly fluorescent and can be used with either an argon-ion laser, copper-vapor laser, YAG laser or various alternate light sources.

Equipment Needed to Perform Procedures:

A - Laser (Argon-Ion, YAG, Copper Vapor) or alternate light sources
(Omniprint1000, Spectrum 9000, etc.)

B - Laser Goggles

C - Filter (Laser)

D - Camera (35mm, 2 1/4, MP-4, CU5)

E - Fume hood

F - Rubber gloves and apron

G - Face shield visor and/or safety goggles

H - Plastic applicators with spouts or glass tray for submerging items

Chemicals Needed For Preparation of Chemical Solution(s):

A - .005 grams of Rhodamine 6G

B - Methanol or ethanol

Formula/Directions for Preparation of Chemical Solution(s):

1. Place .005 grams of Rhodamine in 500 ml of methanol. (To approximate this amount, moisten the end of a tooth pick and insert it in the chemical. What adheres to the toothpick can then be transferred to the solution. Properly dispose of the toothpick after use.)

2. Throughly dissolve the Rhodamine in the methanol and the solution is ready to use.

Processing Procedures for Application to Item(s) of Evidence:

The first (critical) step is to super glue the item of evidence (SEE - Cyanoacrylate ester process). This process will not only develop many latent prints, but more importantly (for the laser process) will adhere to the most minute of fingerprint residue not visible to the naked eye. The process will virtually "set" the latent print in place. Once this procedure is completed, the Rhodamine 6G solution can be applied.

Non-Porous Items:

1. Utilizing a fume hood and rubber gloves, spray or completely submerge the item of evidence with a methanol solution of Rhodamine 6G and allow to dry.

2. When completely dry, view the item using either the argon-ion laser or an alternate light source while wearing laser safety goggles.

Note: This dye will preferentially adhere to the super glued print, but a certain amount will adhere to the item itself. If too much dye is used, the entire surface will fluoresce and mask the latent print. In this case, simply rinse the item with plain methanol. The excess dye will wash away and in most cases the dye adhering to the latent print will remain.

If any latent prints are present, they will fluoresce bright yellow.

Porous Items:

Note: Porous items should be super glued prior to treatment, however, these items pose a problem when using Rhodamine 6G as a solution stain. The dye will immediately penetrate the pores of the item and cause an overall fluorescence. The latent print(s) will be masked and rinsing the excess dye from the item will be difficult. The best ways to solution stain these items is to use a **Water Based** solution.

1. Follow the above directions for non-porous items using distilled water instead of methanol or ethanol.

2. Once sprayed or immersed in the solution, the item should immediately be rinsed with clear water and scanned with the laser or an alternate light source. If a latent print is observed, the usual means of recording the image should be utilized.

Steps to Preserve Developed Impressions:

The most appropriate methods to preserve developed impressions is through photography, using the proper techniques (See Photographic Equipment/Procedures) and/or electronically recording the impressions (See Image Processing). The utilization of a 35 mm, 2 1/4, MP-4, or CU5 camera will suffice for Rhodamine 6G developed prints because the fluorescence is so intense. However, all laser prints must be photographed using a laser filter; otherwise, they will not be recorded on the film.

Safety Concerns:

Presently the safety concerns have not been thoroughly investigated in respect to the use of this chemical and there are varied opinions on the associated health effects. This chemical solution should be applied and treated with extreme care until the full health effects are known. As with any chemical it may cause some irritation when in contact with the eyes or skin and may be harmful if inhaled or ingested. The methanol used in this solution is corrosive and flammable and should be handled with extreme care.

Storage and Location of Chemicals and Solutions:

The Rhodamine 6G powder should be stored in the original shipping container until needed.

The methanol solution should be stored in the original shipping containers or in a flammable liquid storage area until needed.

Daily use of solutions can be stored in a clear spray bottles and larger solutions should be stored in dark bottles.

Shelf Life:

Rhodamine 6G powder - Indefinite

Rhodamine 6G solutions - Up to six (6) months.

Other Information:

Rhodamine 6G may be used in conjunction with other fluorescent dyes which may be available.

This procedure is not recommended at this time for use on items which may be transferred to other laboratory sections until the health effects are thoroughly investigated.

The use of Rhodamine B may also be utilized instead of Rhodamine 6G with the same procedures.

Various improved formulations are presently pending research to improve the quality and application process of Rhodamine solutions (Also see RAM /Optional Combination Enhancement Dyes).