

Purpose: To detect and enhance latent or patent imprint/impressions using various chemical processes.

Responsibility: Imprint Examiners

Safety: All proper personal protection equipment will be used as appropriate.

Procedure:

Special Note:

All chemical enhancement processing will be coordinated and conducted with the assistance of the Latent Print and/or other Section(s) of the Laboratory.

Procedure:

1. Review information provided by submitting agency and conduct preliminary examination of items to determine if chemical enhancement processing is necessary.
2. Photograph all items prior to processing.
3. All chemicals and reagents will be stored and kept in appropriate containers. Containers will be properly labeled as to the contents, date of preparation, and expiration date, as applicable. Chemicals and reagents that have expired or have passed their shelf-life will be discarded.
4. The selection of the chemical or reagent is at the discretion of the examiner and may be based on several factors, including the material from which the imprint is made, the color of the substrate, the background reactivity of the substrate and the amount of blood, dirt or other material in the imprint.
5. Before a chemical/reagent can be used on any item of evidence, it shall be tested to assure that its shelf-life has not passed and that expected results will be achieved. The substrate shall also be tested for possible background interference. The results of the test(s) shall be recorded in the examiner's notes and in any log book as applicable. Any chemical/reagent that does not produce a positive result of an acceptable strength shall be discarded. A new supply source shall be tested and utilized only if positive results are obtained.
6. The following reagents and powders are approved for use by the Imprint section. Whenever possible premixed solutions or premixed kits will be purchased.

a. **Amido Black**

Aqueous Amido Black solution can be used to enhance or develop blood-contaminated imprints. Since this solution is aqueous mixed with water, it is safer to use and does not require pre-soaking the various objects in methanol like a standard Amido Black solution requires. Do not refrigerate. (Premixed rinse/destains may also be used)

Procedure of Application

1. Be certain that the blood is “dried” prior to application.
2. Squirt, spray bottle or tray application – apply Amido Black solution for 30 to 90 seconds.
3. For Methanolic based formula only: apply rinse solution for approximately 1 minute.
4. Apply a final distilled water rinse.
5. Allow the item to air dry.
6. Forced air or blot dry.

Rinse Solution Formula for Methanolic Solution

1. Combine the following:

100 mL Glacial Acetic Acid
900 mL Methanol

2. Final rinse of distilled water.

b. Ammonium/Potassium Thiocyanate

Iron will react with thiocyanate ions in an acid solution. If iron is present in the residue of an imprint, a positive reaction will produce a reddish-brown color. Iron is found in some soils. The procedure works well for wet residue and muddy impressions.

Prepare the Ammonium Thiocyanate reagent as follows:

2 g ammonium thiocyanate
90 mL acetone
10 mL nitric acid

Dissolve 2 g ammonium thiocyanate in 90 mL acetone then add 10 mL nitric acid.

or

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Prepare the Potassium Thiocyanate reagent as follows:

15 g potassium thiocyanate
120 mL acetone
15 mL distilled water
8.5 mL sulfuric acid (dilute)

To 120 mL of acetone and 15 mL of water add 15 g of potassium thiocyanate. Then add 8.5 mL of dilute sulfuric acid. Make sure that you add the sulfuric acid to the acetone/water mixture. A milky mixture will result, which, on standing, will separate into two layers. When the layers have separated, remove the top layer, which is clear. This is the solution to be sprayed on the impressions. The reagent can be stored for three months.

Procedure of Application

1. Spray the impression with the ammonium thiocyanate reagent using a fine spray in light successive coatings until satisfactory development is obtained. Be careful to not over spray, as running of the reagent can occur.

c. Crystal/Gentian Violet

Crystal Violet is a staining process using a water-based working solution. Used for non-porous evidence and the adhesive side of tape/lifters. The evidence is repeatedly stained and rinsed until optimum development occurs. This reagent may be applied to surfaces that are contaminated with oils and grease. The working solution may be re-used. The working solution may also be applied by brushing. Enhanced detail may be observed under a forensic light source at 505 nm to 570 nm using red viewing goggles.

Crystal Violet (Gentian Violet) Formula (A):

Stock Solution

1.5 g Crystal Violet
100 mL Ethyl Alcohol

Working Solution

2 mL Stock Solution

100 mL Distilled Water

Crystal Violet (Gentian Violet) Formula (B):

Stock Solution

5 g Crystal Violet
10 g Phenol (caution hazardous)
50 mL Ethyl Alcohol

Working Solution

1 mL Stock Solution

Add the distilled water constantly swirling the mixture until the gold film on the surface disappears.

Procedure of Application

1. Pass the item through a tray containing the reagent solution for 1 to 2 minutes.
2. Cold tap water rinse – 30 seconds.

d. **LCV (Leuco-Crystal Violet)**

LCV is used to enhance blood through the catalytic oxidation of the dye, while simultaneously fixing and enhancing the blood impression. Other blood enhancement techniques such as Amido Black may be applied after this technique.

Procedure of Application

1. Spray the blood impression or suspected using a fine-mist sprayer. Development should occur in 30 sections.

e. **Wetwop**

Wetwop is a pre-mixed liquid that is applied to the adhesive side of tape/lifters. Wetwop has an indefinite shelf-life.

Procedure of Application

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1. Apply Wetwop to the adhesive side of the item being processed with a camel hair style brush.
2. Rinse under mild stream of tepid tap water.
3. Allow item to dry (adhesive side up).

Photograph and/or record results.

Results:

Dependent on results of chemical enhancement processing.

Sources of Error: N/A

Quality Assurance: N/A

References: See bibliography.

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