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	<i>Document Manager: Cheryl Lozen</i>	<i>Approved By: Jeffrey Nye</i>

12.1 Leucocrystal Violet

12.1.1 Introduction

Aqueous Leucocrystal Violet (LCV) can be used to enhance and develop latent footwear impressions stained with blood on porous and nonporous surfaces. It can also be used to stain blood marks such as transfers, swipes, wipes and other contact to track where a suspect or victim walked, was dragged, or somehow came in contact with the surface. This solution is an indicator for blood; however, it may react with other substances not specific to blood.

12.1.2 Safety Considerations

As with all chemicals, always read the MSDS (material safety data sheet) to learn about the safe handling and health hazards of each chemical. Nitrile or chemical gloves and protective clothing, such as disposable, Tyvek ® lab coats or coveralls, should be worn when using aqueous Leucocrystal Violet at the crime scene. It should be used with a mist respirator if the product is being sprayed at the scene. In the laboratory, this solution should be used in a fume hood. Some of the solvents used to mix it are hazardous and/or corrosive. Use the proper safety precautions in handling and disposal. Because this solution is used on surfaces contaminated with blood, the proper safety precautions for disposal of biohazards must be considered.

12.1.3 Working Solutions

Various recipes are available for use. The one below is one example. See reference materials for other options.

Some kits have been pre-prepared at some laboratories: There are three bottles in the kit containing pre-measured chemicals. The large bottle, A, contains the Fix Reagent, a liquid. Bottle B contains the dry Leucocrystal Violet and Bottle C contains the dry Sodium Acetate. Start by adding about 30 ml (1 ounce) of the liquid Fix Reagent (Bottle A) to the bottle of Leucocrystal Violet (Bottle B). Put the cap on the bottle and shake vigorously for about 2 to 3 minutes. Pour the contents of this bottle (Bottle B) into the large bottle (Bottle A) and shake it. Now, pour about 30 ml (1 ounce) of the liquid in the large bottle (Bottle A) into Bottle C containing the dry Sodium Acetate. Put the cap on Bottle C and shake vigorously for about 2 to 3 minutes. Pour the contents back into the large bottle (Bottle A). Put the cap back on Bottle A and shake thoroughly.

- 500ml 3% Hydrogen peroxide

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- 10 grams 5-Sulfosalicylic acid
- 4.4 grams Sodium acetate
- 1.1 grams Leucocrystal violet

12.1.4 Processing Method

Prior to applying aqueous Leucocrystal Violet, it is recommended to do a presumptive test for blood and to collect a sample of the suspected blood, if visible, for DNA or other blood-type testing.

Aqueous Leucocrystal Violet can be applied to porous or nonporous surfaces, such as paper, metal, plastics or glass. LCV can be applied by submersion, by washing the solution over the surface in question or by spraying. The development of a dark blue reaction color will begin to occur within 30 seconds. Begin by spraying lightly with a fine mist to avoid overdevelopment. If desired, the processed area can be rinsed or carefully blotted with tissue or similar, to remove excess LCV.

12.1.4.1 Processing Instructions — Vertical Surfaces

Spray LCV on the area of interest.

12.1.4.2 Processing Instructions — Horizontal Surfaces

Aqueous Leucocrystal Violet solution can be washed or sprayed directly on the floor or other horizontal surface. If desired, after about 30 to 60 seconds, rinse or blot with tissues or paper towel material.

12.1.5 Photography

Photography of LCV enhanced impressions should be performed as soon as possible, especially if the area of interest is not rinsed after chemical reaction takes place. LCV is light sensitive and all areas that retain the chemicals will eventually turn dark blue if exposed to light. Keep items in a dark packaging if photography cannot be performed immediately.

Photography of impressions developed with LCV should not pose any problems if the surface background is a light color. If the surface is a dark color but will fluoresce, it may be beneficial to use fluorescence examination to enhance the photographic contrast. One recommended method is to use a Forensic Light Source set between 550 and 600 nm, view with red goggles and photograph with a dark red filter, such as a Tiffin or Wratten 25 or 29.

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12.1.6 Storage & Shelf-Life

The unmixed Leucocrystal Violet Kit of three bottles has a shelf-life of at least one year. Once it is mixed, the shelf-life is approximately 3 months if stored within an office environment and kept in a dark place. If the mixed solution is stored in a vehicle in hot temperatures, the shelf-life will be considerably less.

12.1.7 Disposal & Cleanup

Since any crime scene or piece of evidence is suspected to have blood on it when used with this solution, the greater hazard of the blood dictates its disposal and cleanup. Clean any surfaces and blotting tissues in accordance with the regulations for cleaning the biohazard of blood. Bleach may clean some of the staining from Aqueous Leucocrystal Violet.

12.1.8 Minimum Quality Standards and Controls

Before every use, test the LCV solution on known blood to verify that it is working.

12.1.9 References

Criminalistics: An Introduction to Forensic Science by Richard Saferstein ©1998, sixth edition, pages 492-499, 623

Chemical Formulas and Processing Guide for Developing Latent Prints by US Department of Justice, Federal Bureau of Investigation, revised 1994, pages 47-48

Footwear Impression Evidence: Detection, Recovery and Examination by William J. Bodziak ©2000, second edition, pages 160-163

<http://www.cbdiai.org/Reagents/lcv.html>