Processing Evidence Using Leucocrystal Violet (LCV)

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1 INTRODUCTION

This procedure is intended to be utilized by trained personnel to ensure consistency and transparency of methods employed during the enhancement of patterned impressions observed in blood located on evidence received in the Questioned Documents Unit (QDU).

2 SCOPE

These procedures apply to examiners and analysts in the QDU enhancing patterned impressions in blood utilizing Leucocrystal Violet (LCV).

3 EQUIPMENT

- Balance
- Weighing pans
- Spatulas
- Beakers (10 mL – 2000 mL)
- Magnetic stirrer
- Magnetic stirring bars
- Squirt bottles or spray bottles
- Fume hood (optional)
- Appropriate Personal Protective Equipment (e.g., gloves, lab coat, eyewear, mask)
- 5-Sulfosalicylic acid
- 3% Hydrogen peroxide
- Sodium acetate
- Leucocrystal Violet
- Tap water

4 STANDARDS AND CONTROLS

4.1 Leucocrystal Violet Solution

A. Using a 1-liter beaker on a magnetic stirring device, dissolve 10 grams of 5-Sulfosalicylic acid in 500 mL of 3% hydrogen peroxide.
B. Add 3.7 grams of sodium acetate and 1 gram of Leucocrystal Violet.
    - If the LCV crystals are yellow instead of white, do not use the crystals. This is an indication that the reagent is old, and the resulting solution will not be effective.
C. The LCV solution will be tested on a positive control blood stain prior to use.
    - A positive reaction will produce a violet color.
D. Record the results of the control test in the Chemical Enhancement and Control Logbook located in the Footwear/Tire Laboratory space.
E. The LCV solution can be stored in dark bottles for up to 30 days.

5 PROCEDURE

A. The LCV solution may be applied by spraying the item to be enhanced with an aerosol sprayer or cascading the liquid with a squeeze bottle. The color of the reaction should occur within 30 seconds.
B. The enhanced impression should be rinsed with tap water after enhancement and allowed to dry.
C. At the completion of chemical enhancement, refer to IMPRS-300 Footwear and Tire Evidence Examinations.

6 LIMITATIONS

The color of the background substrate must be tested prior to use of this solution. LCV and hydrogen peroxide will react with blood to produce a violet color. If the background substrate is similar in color to violet, then it will obscure the chemically enhanced impression. If the enhancement occurs outdoors or in intense light, then the impression should be photographed as soon as possible since photo ionization of the dye may occur, creating a violet background. If the background also stains a violet color, then it will obscure the chemically enhanced impression.

7 SAFETY

Standard precautions should be followed for the handling of chemical and biological materials. Chemical and biological materials that are hazardous or potentially hazardous will be maintained and examined in specifically designated areas within QDU space. QDU personnel may refer to the FBI Laboratory Safety Manual for additional guidance.

When processing evidence in the laboratory, a fume hood will be used when the solution is sprayed with an aerosol sprayer. When the solution is being used as a search or enhancement reagent at a crime scene, a dust/mist mask should be worn.

All chemicals will be disposed of according to the Chemical Disposal Guidelines on file in the Footwear and Tire Laboratory space.

Safety information concerning each of the chemicals used in these procedures are available from the Material Safety Data Sheets (MSDS) on file in the Footwear and Tire Laboratory space.

8 REVISION HISTORY

Revision	Issued	Changes
02	01/14/2022	Document revised to address new technical procedure requirements.