

Wake County Bureau of Forensic Services
Crime Scene Science Division Technical Manual

Effective Date: 9/15/2025

Chapter 38: Leuco-crystal Violet

Issued By: Director

Chapter 38: Leuco-crystal Violet (LCV)

1. Purpose

1.1 To establish a procedure to search for blood or to develop/enhance impression evidence in suspected blood. This can be applied to porous and non-porous surfaces.

1.2 Leuco-crystal violet is a presumptive test for blood which reacts with hemoglobin.

2. Materials

- Personal Protective Equipment
- Leuco-crystal Violet crystals
- 5-Sulfosalicylic Acid
- Sodium Acetate
- Hydrogen Peroxide
- Spray bottles
- Funnel
- Coffee filter
- Mixing bottle
- Known positive control
- Sterile collection swabs

3. Procedure

3.1 Wear suitable protective clothing, gloves, and goggles.

3.2 All visible prints or impressions of potential value in blood should be photographed.

3.3 Prior to application of any reagents, test the area with Phenolphthalein.

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3.4 Prior to application, it will be verified that the suspected blood is completely dry or fixed on the item to be processed.

3.5 The formula for LCV is a mixture of:

- 10g 5-Sulfosalicylic Acid (A)
- 3.7g Sodium Acetate (B), and
- 1g Leuco-Crystal Violet (C)
- 500ml Hydrogen Peroxide (H₂O₂)

3.6 Mix (A) in H₂O₂ and shake vigorously for approximately one minute. Then add (B) and shake vigorously followed by (C) and shaking vigorously.

3.7 Strain the mixed solution with a coffee filter and funnel it into the sprayer.

3.8 Spraying is the most effective method of application. When spraying, use the finest mist possible because an excess application may cause overdevelopment or running of the blood print. Spray the target area. The development will occur within 30 seconds. Do not spray directly at potential prints.

3.9 After spraying, blot the area with a tissue or paper towel. After the area is dry, the preceding steps can be repeated to possibly improve the contrast.

3.10 All prints or impressions of potential value should be collected and/or should be photographed.

4. Safety Considerations

4.1 Refer to Safety Data Sheets for specified chemicals.

4.2 Follow proper safety precautions. Use proper ventilation.

4.3 Wear suitable protective clothing, gloves, and goggles.

4.4 Avoid contact with skin and eyes.

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5. Limitations

- 5.1** LCV is limited to the development or enhancement of suspected blood. When using the LCV process, any prints that are developed should be photographed as soon as possible.
- 5.2** LCV has a limited shelf life of approximately one month and should be made immediately prior to use.
- 5.3** Cyanoacrylate fuming may be detrimental to this process.
- 5.4** Various protein stains, such as Amido Black, etc., can be used after the LCV process.

6. Quality Control

- 6.1** A quality control test of Leuco-Crystal Violet is performed when a working solution is mixed and prior to each use if the use is on a subsequent day from when the working solution is created.
- 6.2** If a bulk stock working solution is mixed and/or created by a Technical Leader a quality control test shall be performed and the results will be documented on the Chemical Reagent Log.
- 6.3** Control tests are performed by the application of the reagent on a known smear of blood.
- 6.4** Development of a purplish blue color on the known smear of blood shall denote a positive control. The area surrounding the blood smear should result in minimum to no development and will serve as the negative control.
- 6.5** Processing of evidence shall not be conducted until a control test bearing a positive control and a negative control has been carried out and documented in the notes along with the lot number of both the control and the Leuco-Crystal Violet.

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7. References

- 7.1 Latent Fingerprint Processing Techniques - Selection and Sequencing Guide.
Leucocrystal Violet (2010). *Chesapeake Bay Division International Association for Identification*.

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Document Revision History		
Revision Date	Prepared By	Revision
4/25/2024	B. Fail	Removed goals, objectives and list of services provided. Moved to Technical Manual and Header information updated. Corrected numbering of Section 3. Removed Quality Control Section. Added Reference. Numbered chapters of Crime Scene Science Technical Manual, Header and Revision History updated to new format.
10/31/2024	A. Abernethy	Document revised to reflect the agency name change from Raleigh/Wake City-County Bureau of Identification to Wake County Bureau of Forensic Services, effective December 1, 2024. No change to procedure content.
9/15/2025	B. Fail	Add quality control procedure. Updated purpose, procedure and references.