

## **Technical Procedure for Coomassie Blue**

**1.0 Purpose** - This procedure describes how to make Coomassie Blue solution and apply it to items of evidence.

**2.0 Scope** – This procedure applies to porous and non-porous items of evidence that may contain bloody impressions that require developing/enhancing. This procedure may also be used in processing adhesive sides of tapes.

**3.0 Definitions** – N/A

### **4.0 Equipment, Materials and Reagents**

#### **4.1 Equipment and Materials**

- Protective gloves and apron/coat
- Face shield visor and/or safety goggles
- Magnetic stirrer, magnetic follower and magnetic retriever
- Two (2) glass beakers
- Application equipment: two (2) spray bottles and two (2) glass trays
- Camera/scanner
- Fume hood

#### **4.2 Reagents**

- Coomassie Brilliant Blue (0.44 gram)
- Glacial acetic acid (40 mL)
- Methanol (200 mL)
- Distilled water (200 mL)

### **5.0 Procedure**

#### **5.1 Mixing Procedure**

##### **5.1.1 Staining Solution (Developer)**

- 5.1.1.1** Place 0.44 g of Coomassie Brilliant Blue and two-hundred (200) mL of methanol in a large glass beaker with magnetic stirrer and stir.
- 5.1.1.2** Add forty (40) ml of glacial acetic acid and two-hundred (200) mL of distilled water to the solution with continuous stirring to ensure the solution is thoroughly mixed.
- 5.1.1.3** Place the solution in a clearly marked spray bottle for immediate use or a dark container for long term use as needed.

##### **5.1.2 Destaining Solution (Rinse Solution)**

- 5.1.2.1** Place forty (40) mL of glacial acetic acid and two-hundred (200) mL of methanol in a large beaker with a magnetic stirrer and stir.

- 5.1.2.2 Add two-hundred (200) mL of distilled water to the solution with continuous stirring to ensure the solution is thoroughly mixed.
- 5.1.2.3 Place the solution in a clearly marked spray bottle for immediate use or a dark jug for long term use as needed.
- 5.1.2.4 Larger amounts of Coomassie Blue may be mixed for large items or for use at crime scenes.

**5.2 Application Procedure** Forensic Scientists shall produce a self-made test print to be processed concurrently with items of evidence. (See Section Technical Procedure for Ensuring Quality Control.)

#### **5.2.1 Spray Method**

- 5.2.1.1 Completely cover the area of interest with the staining solution.
- 5.2.1.2 Spray the item with the destaining solution to clear the background. The destaining solution shall be used generously to remove the excess staining solution.
- 5.2.1.3 Allow the item to dry completely prior to proceeding.

#### **5.2.2 Immersion Method**

- 5.2.2.1 Completely immerse the item in a tray of staining solution. Immerse the item for approximately thirty (30) to ninety (90) seconds.
- 5.2.2.2 Remove the item from the staining solution and place in a separate tray of destaining solution for approximately one minute and agitate to clear the background. This procedure may be repeated with a fresh destaining solution if the background is not completely clear.
- 5.2.2.3 Remove the item from the solution and allow the item to dry completely prior to proceeding.
- 5.2.2.4 Preserve the developed impressions through photography, according to the techniques in Photographic Equipment/Procedures and/or by electronically recording the impressions (See Image Processing). The impression may be lifted directly from the item only after the item is completely dry.

**5.3 Standards and Controls** – N/A

**5.4 Calibration** - N/A

**5.5 Sampling** –N/A

**5.6 Calculations** – N/A

**5.7 Uncertainty of Measurement** – N/A

**6.0 Limitations** - Coomassie Blue powder and solution have an indefinite shelf life.

**6.1** The Coomassie Blue reagent shall be stored in the original shipping container until needed.

**6.2** The staining and destaining solutions may be stored in clear spray bottles or dark containers until needed.

**7.0 Safety** – Glacial acetic acid and methanol can be harmful if inhaled or ingested and shall be used in a fume hood when mixing and/or processing evidence. Protective gloves, eye goggles and aprons shall be worn as the staining solution will stain clothing and skin. This technique may be used at crime scenes; however, use only in a well vented area or use a fan to remove the fumes produced.

## **8.0 References**

Hunter, J.L. "Fingerprint Evidence with Coomassie Blue—After 25 years." *Journal of Forensic Identification*. Vol. 44, 6: 619-622 (1994).

Kent, T. ed. *Manual of Fingerprint Development Techniques: A Guide to the Selection and Use of Processing for the Development of Latent Fingerprints*. Police Scientific Development Branch, London (July 1992).

Lee, H.C. "Methods of Latent Print Development." *Proceedings of the International Forensic Symposium on Latent Prints*. (July 1987): 15 – 24.

Lennard, C.J. and P.A. Margot. "Sequencing of Reagents for the Improved Visualization of Latent Fingerprints." *Proceedings of the International Forensic Symposium on Latent Prints*. (July 1987): 141-142.

*Manual of Fingerprint Development Techniques*. (January 1986): 2-8.

*Manual of Fingerprint Development Techniques: A Guide to the Selection and Use of Processes for the Development of Latent Fingerprints*. Scientific Research and Development Branch, London (1986).

Norkus, P. M. and K. Noppinger. "Enhanced Latent Prints in Blood with a New Staining Technique." *Proceedings of the International Forensic Symposium on Latent Prints*. (1987): 147.

Trozzi, T. A., R.L. Schwartz and M.L. Hollars. *Processing Guide for Developing Latent Prints*. (2000): 1-64.

US Department of Justice. *Chemical Formulas and Processing Guide for Developing Latent Prints*. FBI Laboratory Division, Latent Fingerprint Section (1994).

**9.0 Records** – N/A

**10.0 Attachment** – N/A

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