

Technical Procedure for Nile Red

1.0 Purpose – This procedure is a non-porous development procedure.

2.0 Scope – This procedure is a step in the processing of non-porous evidence that may contain impressions that require development/enhancing.

2.1 One of the most effective ways to recover latent prints from items of evidence is to use a fluorescent dye followed by a laser or alternate light source examination. Nile Red is one of the most effective laser dyes in recovering latent prints on various non-porous surfaces. This dye is normally used on non-porous surfaces, but may also be used on porous or semi-porous surfaces. Nile Red is extremely efficient as it is highly fluorescent and can be used with various alternate light sources.

3.0 Definitions

- **Alternate light source:** Any of the multiple forensic light sources readily available in the Latent Evidence Section including, but not limited to, the CrimeScope, Mini-CrimeScope, TracER Laser, and Ultra-Lite ALS.
- **CE:** Cyanoacrylate ester, also known as super glue.

4.0 Equipment, Materials and Reagents

4.1 Equipment and Materials

- Orange filter (goggles and/or camera lens filter)
- Alternate light source
- Fume hood
- Gloves
- Face shield and/or safety goggles
- Plastic applicator bottles or tray for submersion

4.2 Reagents

- Nile Red (powder)
- Methanol

5.0 Procedure

5.1 Mixing Procedure

5.1.1 Place 0.005 gram of Nile Red (powder) in 500 mL of methanol. (Dampen the tip of an unfolded paperclip with methanol and insert it into the chemical bottle. The powder that adheres to the paperclip can then be transferred into the methanol.)

5.1.2 Thoroughly dissolve the Nile Red powder in the methanol. Solution is ready for use.

5.2 Application Procedure

5.2.1 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).

5.2.2 First, apply cyanoacrylate ester to the item of evidence. Nile Red adheres to the chlorosis that occurs after processing with CE.

5.2.3 Non-porous items: Using the fume hood and gloves, spray or completely submerge the item of evidence in the Methanol/Nile Red solution. Allow to dry.

5.2.4 When completely dry, view the item using the CrimeScope, Mini-CrimeScope or TracER Laser. Use goggles to view any fluorescence. Latent prints will fluoresce bright yellow.

Note: Nile Red will preferentially adhere to super glued prints, but a certain amount may adhere to the item surface. If too much dye is used, the entire surface will fluoresce and mask the latent print. In this case, rinsing the item with methanol will cause the excess dye to wash away and, in most cases, the dye adhering to the latent print will remain.

5.2.5 Porous/semi-porous items: Follow the directions for Nile Red preparation in 5.1, substituting distilled water for methanol.

5.2.6 Once the item has been sprayed or submerged, it should IMMEDIATELY be rinsed with clear water and scanned with an ALS or laser.

Note: Porous/semi-porous items shall be super glued prior to treatment; however, these items pose a problem when using Nile Red as a solution stain. The dye penetrates the pores of the item causing overall fluorescence. The latent prints will be masked in this instance and rinsing the excess dye is difficult. The best way to solution stain porous/semi-porous items is to use the water based Nile Red solution.

5.2.7 Any latent prints shall be preserved using photography (see photographic equipment procedures). Camera shall be equipped with an orange filter for print visualization.

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 – Nile Red is generally designed to be used for the processing of non-porous evidence. Some porous/semi-porous items may be processed using this technique.

6.1 The cyanoacrylate fuming process is vital to the success of Nile Red processing.

6.2 Nile Red powder has an indefinite shelf life; however, once prepared it has a shelf life of six (6) months.

6.3 All prepared solution shall be stored in dark, shatter-proof bottles. Working solution may be stored in clear spray bottles.

6.4 Nile Red powder shall be stored in its original shipping container.

6.5 Nile Red may be used in conjunction with other fluorescent dyes.

6.6 It is recommended that items processed with Nile Red not be transferred to additional sections for analysis until the full health effects are thoroughly investigated.

6.7 Nile Red will severely stain the hydrophobic compounds (such as lipids) in cyanoacrylate developed impressions.

7.0 Safety –The safety concerns regarding Nile Red have not been thoroughly investigated and there are varied opinions on the associated health effects of this chemical. The chemical solution shall be applied and treated with extreme care until the full effects are known. It may cause irritation when in contact with the eyes or skin and may be harmful if inhaled or ingested. The methanol used in this solution is flammable and shall be handled with extreme care.

8.0 References

Day, K.J., and W. Bowker. “Enhancement of Cyanoacrylate Developed Latent Prints Using Nile Red.” *Journal of Forensic Identification*. Vol. 46, 2: 183-187 (1996).

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.

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).

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).

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 Attachments – N/A

Revision History		
Effective Date	Version Number	Reason
09/17/2012	1	Original Document