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3.24 Titanium Dioxide

3.24.1 Introduction

Titanium Dioxide (TiO₂) is a common paint pigment that is used in a sticky-side powder suspension for processing items for latent prints on dark colored surfaces. This suspension works on both sides of black electrical tape as well as other dark colored, non-porous surfaces. The methanol based Titanium Dioxide formula is also an effective solution that is used to process latent prints deposited in blood on dark colored, non-porous surfaces. The solution is sensitive enough that it may develop very faint or invisible ridge detail.

Latent prints developed with Titanium Dioxide result in white ridges that can be seen under normal room lighting conditions. Greater contrast may be visualized by viewing under a UV light. The solution may develop very faint ridges. The contrast may be improved after a second application of the solution. Background staining will occur quickly with this solution making it important to rinse the Titanium Dioxide suspension with the rinse solution very soon after application.



3.24.2 Safety Considerations

- Titanium Dioxide
- Methanol

This procedure involves hazardous materials. This procedure does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this procedure to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. Proper caution should be exercised and the use of personal protective equipment should be considered to avoid exposure to dangerous chemicals. Consult the appropriate MSDS for each chemical prior to use.

3.24.3 Preparations

3.24.3.1 Titanium Dioxide Methanol Solution

1g Titanium Dioxide
10 ml Anhydrous Methanol

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Mix the two together in a bottle. The result is a suspension which must be frequently agitated.

3.24.3.2 Titanium Dioxide Methanol Solution Rinse

Anhydrous Methanol

3.24.4 Instrumentation

See General Instrumentation

3.24.5 Minimum Standards and Controls

The Standards and Controls for Titanium Dioxide consists of testing a small deposit of known blood on a similar surface.

3.24.6 Procedure or Analysis

All applications should be done in a fume hood.

3.24.6.1

Because the chemical solution uses Methanol as a carrier, pre-fixing the blood proteins is not necessary.

3.24.6.2

The working solution should be agitated before evidence application as well as during the immersion process.

3.24.6.3

Titanium Dioxide working solution is applied to the item by using a pump spray bottle, immersing the item in the working solution in a large tray (ensuring complete coverage of the area to be examined) or by applying with a brush.

The item is then rinsed with the rinse solution after approximately 30 seconds.

The prints may be re-treated to increase contrast.

3.1.6.4

The developed impressions are then photographed.

3.24.7 Interpretation of results

The blood impressions will be intensified and contrast increased on dark colored surfaces. Additional detail not previously visible may be revealed. The processed latent prints are stable; however, developed impressions should be photographically preserved. Dried impressions which lose contrast may be re-immersed in the second rinse solution and photographed.

3.24.8 Minimum Quality Standards and Controls

See Standards

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3.24.9 Other Related Procedures

Acid Yellow
Hungarian Red
Sticky-Side Powder

3.24.10 Impact on other disciplines

No Biology or DNA analysis can be conducted after this staining procedure. Prior to processing for latent prints, discussion with other disciplines is essential ensure the best protection for all forensic analysis.

3.24.11 References

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