



TENNESSEE BUREAU OF INVESTIGATION

Forensic Services Division

Latent Print Standard Operating Procedures

3.10 1,2 - Indanedione

3.10.1 Scope

This procedure describes the use of 1,2-Indanedione to enhance latent prints on porous evidence. The chemical is applied to the object and visually examined with an alternate light source (ALS). Under the ALS, a range of wavelengths and filter goggles can be utilized to obtain optimal contrast.

3.10.2 Evidence

Any porous item such as paper, cardboard or unfinished wood.

3.10.3 Safety Precautions

Mix all reagents inside a fume hood. Take all laboratory precautions during reagent preparations, including wearing gloves (Nitrile preferred), laboratory coats, and safety glasses, to keep chemicals from coming into contact with skin or eyes. Avoid inhalation of fumes and keep all chemicals away from open flames, sparks, or heat sources.

All reagents shall be applied within a fume hood.

3.10.4 Chemicals/Reagents

1,2-Indanedione solid
Ethyl acetate
Petroleum Ether

3.10.5 Instruments/Equipment

Beakers
Graduated Cylinders
Magnetic Stirrers
Magnetic Stir Bars
Balance
Aspirating flask, glass bowl or tray, or brush (camel hair or stiff bristle)
Compressed air
Steam Iron
Humidity Chamber
Yellow, orange, and red goggles
Fume Hood
Dark Storage Bottles
Polilight PL500

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SPEX Crimescope (ALS)
Full Spectrum Imaging System (FSIS)
FSIS flashlights
Yellow, orange, and red filters for camera
Fluorescent ruler
Camera

3.10.6 Preparation:

In a 1L beaker, combine 2g of 1,2-Indanedione solid and 70 ml of ethyl acetate in a beaker and stir for 20 minutes or until dissolved. Add 930ml of Petroleum Ether.

3.10.7 Storage:

1,2-Indanedione solid kept in a dark place
Solution kept in a dark bottle

3.10.8 Shelf Life:

1,2-Indanedione shall have a control performed prior to any evidence being tested. The working solution shall be mixed with a stir bar and magnetic stirrer prior to each use. The mixture shall be tested regularly for effectiveness. It shall be discarded when no latent prints are detected on a control.

3.10.9 Controls:

1,2-Indanedione shall be applied to a comparable non-evidence medium containing latent prints.

After applying 1,2-Indanedione, expose the item to heat and humidity. The levels should be approximately 100°C and 60% relative humidity. The item may be placed in the humidity chamber or passed over with an iron.

A positive result is the presence of fluorescing ridge detail under a wavelength appropriate for that medium.

A negative result is the lack of fluorescing ridge detail under a wavelength appropriate for that medium.



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A control must be performed each time 1,2-Indanedione is prepared and recorded in the Reagent Log Book.

A control must be successfully performed before 1,2-Indanedione is applied to evidence and recorded in the examiner's notes.

If at any time a control test indicates that a reagent is not working properly, the examiner or technician performing the control will properly dispose of that reagent, make a new reagent, and test a new control. Once the control tests appropriately, the reagent may be used.

In some circumstances of a failed control test it may be necessary to review each component of the reagent/solution to ensure no deficiencies exist in that lot number. If a deficiency is discovered, the preparer will properly dispose of that lot number and document the deficiency and disposal in the Chemical Log. A different lot shall then be used to make the reagent.

3.10.10 Procedure:

1. Document the appearance of the item (photograph and/or photocopy)
2. Thoroughly stir the solution immediately prior to each use.
3. 1,2-Indanedione shall be applied in the fume hood.
4. 1,2-Indanedione may be applied to evidence either by spray, dip, or brush
5. Evidence will then be dried and either placed in a humidity chamber at 100°C and 60% relative humidity or passed over with an iron for approximately one to three minutes.
6. Observe for fluorescence of ridges under the alternate light source (ALS) according to the following:

<u>Wavelength</u>	<u>Filter (Goggles)</u>
≤ 455nm	yellow
≤ 515nm	orange
≤ 555 nm	red

Refer to 1.1 in the Latent Print Unit Standard Operating Procedure Manual for further instruction.

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3.10.11 Deviation from Protocol

Any major variation in the above procedure may be performed with supervisor approval.

3.10.12 Interpretation of Results

Latent prints of comparable value shall be marked and photographed with a ruler included using the appropriate filter. Refer to 2.5.2 and 2.5.5 of the Forensic Services Division Quality Assurance Manual for further instruction.

Re-examine evidence after 24 hours. Mark and photograph any additional areas developed. A second, qualified Latent Print Examiner should also review the evidence after this time period.

3.10.13 References:

Federal Bureau of Investigation. 2002. Validating IND (1,2 Indanedione). Federal Bureau of Investigation, Washington D.C.