

Section D

Naptha-Ninhydrin

Subsection 4

Name of Procedure:

Naphtha-Ninhydrin

Suggested Uses:

To develop latent impressions on porous items which will be examined by the Documents Section or documents which must be returned in the same relative condition. Examples of these types of papers include deeds, wills and other important papers which contain original signatures or writings which must be returned and used for official purposes.

Equipment Needed to Perform Procedures:

A - Magnetic stirrer, magnetic follower and magnetic retriever

B - Dark shatter proof storage container (four liter)

C - Separatory funnel

D - Glass long neck flask (125 ml)

E - Beaker (500 ml)

F - Glass graduated cylinder with single metric scale

G - Forceps (type which will not leave impression)

H- Fume Hood

I - Rubber gloves and aprons

Chemicals Needed For Preparation of Chemical Solution(s):

A - Twenty (20) grams of ninhydrin crystals.

B - Forty (40) ml of methanol.

C - One (1) liter of hexane.

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Formula/Directions for Preparation of Chemical Solution(s):

1. Place twenty (20) grams of ninhydrin crystals and forty (40) ml of methanol into the 125 ml glass long neck flask.
2. Place the long neck flask on the electric stirrer and the magnetic follower in the flask.
3. Turn on the electric stirrer and stir the solution until all the ninhydrin crystals have dissolved (Do not use heat).
4. Pour the dissolved ninhydrin/methanol solution into the Separatory funnel.
5. Add five-hundred (500) ml of hexane to the Separatory funnel.
6. Shake the Separatory funnel by hand (Venting Frequently). **Failure to vent will cause the Separatory funnel to explode.**
7. Drain methanol back to the long neck flask.
8. Drain the finished product into a dark brown plastic container.
9. Pour five-hundred (500) ml of additional hexane into the Separatory funnel.
10. Pour the previously drained methanol back into the Separatory funnel.
11. Shake the Separatory funnel (**Remember to vent frequently**).
12. Drain the methanol and discard.
13. Drain the finished product into the appropriate container.
14. Clean all equipment ensuring that grease is applied to the plug and control of Separatory funnel.

Processing Procedures for Application to Item(s) of Evidence:

1. Pour a sufficient amount of the naphtha-ninhydrin solution into a glass tray.

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2. Submerge or dip the item of evidence into the solution for approximately two (2) seconds.
3. Allow the item to completely air-dry prior to proceeding.
4. Latent impressions will develop over a period of time at room temperature. One recommended method for developing latent impressions is to place the items in a plastic bag for a period of time until impressions develop.
5. To expedite the process, a number of methods may be used:
 - a. Steam iron - the iron is heated with the steam to provide a moist heat. The iron is then held just above the item taking care not to touch the item. Great care must be taken as this method may scorch the item if the iron comes in contact with surface.
 - b. Microwave - the microwave should be heated with a tray of water in the bottom to produce steam for approximately five minutes. The item is the placed in the microwave on a rack to avoid contact with the water and heated for approximately five minutes. Once the heating time is complete, it is recommended that the item be left in the microwave for approximately five minutes to absorb additional moisture.
 - c. Humidity Chamber - Large bulky items or a large number of papers may be placed in a humidity chamber for approximately four to five hours to develop latent impressions.

Steps to Preserve Developed Impressions:

The most appropriate methods to preserve developed impressions is through photography, using the proper techniques (See Photographic Equipment/Procedures) and/or electronically recording the impressions (See Image Processing).

Safety Concerns:

A fume hood should always be utilized as the fumes from the solution may cause chemically induced pneumonia or other bodily injury. The solutions may be toxic and the methanol and hexane used is highly flammable. Improper use may cause some irritation when in contact with the eyes or skin. Protective goggles, gloves and aprons should be worn at all times during

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processing as the solution will also stain skin and clothing.

Storage and Location of Chemicals and Solutions:

The ninhydrin crystals may be stored in their original container until needed.

Naphtha-ninhydrin solutions should be stored in non-breakable dark containers at all times to avoid direct exposure to sunlight.

Shelf Life:

Ninhydrin Crystal - Indefinite

Naphtha-ninhydrin solution - Thirty (30) days (Ensure that there are no deposits of crystals in the container prior to use).

Other Information:

Naphtha-ninhydrin may be used in conjunction with a number of processes in the normal sequence of processing techniques.

Naphtha-ninhydrin will react with the amino acids present in fingerprint residue.

Naphtha-ninhydrin will not dissolve the inks present on paper items.

Various improved formulations are presently pending research to improve the quality and application process of ninhydrin solutions.