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BBD

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Name of Procedure:

BBD (7-Benzyl amino-4-Nitrobenz-2-oxa-1,3-diazole)

Suggested Uses:

One of the most effective ways to recover latent prints from items of evidence is to use a laser dye followed by a laser or alternate light source examination. BBD has been found to be an effective alternative to other laser dyes in recovering latent prints on porous surfaces. BBD developed impressions will generally result in a more intense latent fluorescence than other dyes. The use of BBD has also been successful in the development of bloody impressions on various painted surfaces when the proper laser or alternate light sources are applied.

Equipment Needed to Perform Procedures:

A - Laser (Argon-Ion, YAG, Copper Vapor) or alternate light sources
(Omniprint1000, Spectrum 9000, etc.)

B - Laser Goggles

C - Filter (Laser)

D - Camera (35mm, 2 1/4, MP-4, CU5)

E - Fume hood

F - Rubber gloves and apron

G - Face shield visor and/or safety goggles

H - Large beaker

I - Plastic applicators with spouts or glass tray for submerging items

J - Magnetic stirrer, magnetic follower and magnetic retriever

K - Processing tray

Chemicals Needed For Preparation of Chemical Solution(s):

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Three (3) formulations are being provided and the chemicals needed will depend on the formulation utilized to conduct this procedure.

A - .03 gram of BBD

B - Forty (40) ml to one (1) liter of Methanol

C - Fifteen (15) ml of Acetone

D - Fifteen (15) ml of 2-Propanol

E - Nine-hundred thirty (930) ml of Pentane or 1,1,2 Trichlorotrifluoroethane or Petroleum Ether

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

Formulation # 1 - Methanol Formula:

1. Place .03 gram of BBD in one (1) liter of methanol.
2. Thoroughly dissolve the BBD in the methanol and the solution is ready to use.

Formulation #2 - Quick Dry Formula:

1. Place .03 gram of BBD in a large beaker.
2. Add fifteen (15) ml of Acetone and forty (40)ml of Methanol with a magnetic stirrer and stir.
3. Add fifteen (15) ml of 2-Propanol and nine-hundred thirty (930) ml of Pentane (Petroleum Ether may be substituted for Pentane) to the solution with continual stirring.
4. Once the BBD has completely dissolved, place the solution in a clearly marked spray bottle or dark shatterproof container until needed.

Formulation #3 - Nonflammable Formula:

1. Place .03 gram of BBD in a large beaker.
2. Add fifteen (15) ml of Acetone and forty (40)ml of Methanol with a magnetic

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stirrer and stir.

3. Add fifteen (15) ml of 2-Propanol and nine-hundred thirty (930) ml of 1,2,2 Trichlorotrifluoroethane to the solution with continual stirring.
4. Once the BBD has completely dissolved, place the solution in a clearly marked spray bottle or dark shatterproof container until needed.

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

The first (critical) step is to super glue the item of evidence (SEE - Cyanoacrylate ester process). This process will not only locate many latent prints, but more importantly (for the laser process) will adhere to the most minute of fingerprint residue not visible to the naked eye. The process will virtually “set” the latent print in place. Once this procedure is completed, the BBD solution can be applied. **Avoid over fuming the item of evidence as this may cause excessive luminesce of the background which will reduce the contrast between the impression and the background.**

1. Utilizing a fume hood and rubber gloves, spray, completely submerge or brush the item of evidence with the solution of BBD and allow to completely air-dry.
2. When completely dry, view the item using either the argon-ion laser or an alternate light source while wearing laser safety goggles.

Note: This dye will preferentially adhere to the super glued print, but a certain amount will adhere to the item itself. If the background does fluoresce brightly, simply rinse the item with plain methanol . The excess dye will wash away and in most cases the dye adhering to the latent print will remain.

BBD developed impressions often will fade within a short period of time if subjected to excessive heat, prior powdering techniques and/or prolonged light during the photographic process. Developed impressions should be photographed as soon as possible; however, most impressions which have started to fade may be restored with a second application of the BBD solution.

There are no set rules on the proper wavelengths needed to visualize latent impressions

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with this procedure; however, fluorescence will generally occur within the 450 to 500 nm range.

Bloody Impressions:

1. BBD has been successful in developing bloody impressions on some oil and most latex painted surfaces and the above procedures should be followed; however, there is no need to super glue the surface prior to treatment. The blood should be completely dry or cured before applying the BBD solution. The use of BBD on bloody impressions will not affect subsequent treatment of other blood impression processes.
2. The bloody impressions will appear black in color when a laser or alternate light source is applied within the 400 to 500 nm range. The impression will appear in the correct position and no reversal is necessary if photographed correctly. The makeup of the impression(s) may vary and fluorescence may be achieved at other wavelengths also.

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). The utilization of a 35 mm, 2 1/4, MP-4, or CU5 camera will suffice for BBD developed impressions because the fluorescence is so intense. However, all laser prints must be photographed using a laser filter; otherwise, they will not be recorded on the film. Some impressions developed with BBD may be lifted in the same manner as powdered impressions.

Safety Concerns:

Presently the safety concerns have not been thoroughly investigated in respect to the use of this chemical and there are varied opinions on the associated health effects. This chemical solution should be applied and treated with extreme care until the full health effects are known. As with any chemical it may cause some irritation when in contact with the eyes or skin and may be harmful if inhaled or ingested. The methanol, acetone and 2-Propanol used in this solution are corrosive and flammable and should be handled with extreme care.

Storage and Location of Chemical and Solutions:

BBD reagents should be stored in a sealed ziplock plastic bag in a refrigerator until needed.

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The various working solutions should be stored in dark shatterproof containers until needed.

Daily use of solutions may be stored in a clear spray bottles.

Shelf Life:

BBD reagent - Indefinite if stored properly

Working solutions - In excess of thirty (30) days if stored properly

Other Information:

BBD may be used in conjunction with other fluorescent dyes which may be available. Other dye stains such as Rhodamine, Basic Yellow, etc. should be used after BBD.

All serological examinations or samples should be done prior to use of these solutions.

This procedure is not recommended at this time for use on items which may be transferred to other laboratory sections until the health effects are thoroughly investigated.

The use of Methanol Formula will produce a more intense fluorescence than the Quick-dry or Nonflammable formulas and care should be taken as the Methanol formula will also destroy certain painted and lacquer finished surfaces and handwritten markings. BBD applications in some cases has yielded additional latent impressions after the use of Physical Developer and Multimetel Deposition.