



E65 A Novel Method for Ninhydrin Development of Fingerprints on Absorbent Surfaces

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The goal of this presentation is to familiarize attendees with a new method of developing fingerprints on absorbent surfaces such as paper. The method is rapid, solvent free, does not run ball point ink, and is easily portable. Fingerprints on paper are particularly useful since they can be recovered weeks or months after being deposited.

This presentation will impact the forensic science community by showing how the contact ninhydrin method makes recovery of fingerprints from paper available to those without laboratory facilities.

This presentation will cover work completed on the development of a novel ninhydrin method for developing fingerprints on absorbent surfaces such as paper. When developing prints without running ink is desired, a dry ninhydrin method has been known for a long time. It was not used regularly since it is such a slow reaction; the recommended development period is 48 hours or more. The primary objectives in this study were to develop a contact ninhydrin fingerprint visualization method free of organic solvents, highly portable, rapid, does not run ink, and which produces high-quality fingerprints on paper and other absorbent surfaces. This is accomplished using three basic components: a ninhydrin development sheet, a “dry” portable moisture source, and the use of microwave energy to speed the usually slow ninhydrin/amino acid reaction. This reaction produces the deeply colored Ruhemann’s purple that makes the fingerprint visible.

The first component is treated paper (card stock) containing ninhydrin and additives to enhance contact with the substrate. The second component is the “dry” portable moisture source which can be a diaper pad or a paper package containing a deliquescent solid. The third major component is the use of a sandwich of microwaveable boards to hold the other components together under pressure to facilitate the good contact needed for the solid phase reaction.

This study tested this method with synthetic fingerprint material applied to a substrate with a rubber stamp and fingerprint samples obtained anonymously from students and others. The synthetic fingerprint material, obtained commercially and applied, as reproducibly as possible, to the paper substrate allows one to compare ninhydrin sheets of varying composition and evaluate method variations for their efficiency.

The procedure developed involves placing the substrate, ninhydrin sheet, and moisture source in intimate contact between two rigid materials that readily pass microwaves. The sandwich is held in close contact with heavy rubber bands. This sandwich is placed in a microwave oven set on defrost or low power and microwaved for a short time (two to six minutes). The sandwich is allowed to cool for about five minutes, opened, and the substrate examined. This procedure has been run on a great many samples and has been shown to develop visible prints with samples even when only trace amounts of amino acid containing residue have been deposited.

Some of the advantages of this method are: (1) the proposed “contact” ninhydrin method greatly speeds the color development versus the classic “dry” ninhydrin method; (2) the method does not cause colorization of the substrate background which makes for better contrast; (3) ninhydrin sheets are easily prepared, quite stable, and readily portable; (4) the development process is free of any organic solvents; (5) the ninhydrin sheets can be used multiple times; (6) the proposed method does not cause the running of most ballpoint pen inks; and, (7) all the necessary materials, except the microwave oven, can be transported elegantly in an American Academy of Forensic Sciences (AAFS) meeting bag.

The contact ninhydrin procedure should make recovery of fingerprints from absorbent surfaces available to individuals involved in investigation but with limited access to laboratory facilities. Absorbent surfaces have the advantage of providing a source of usable fingerprint evidence months, or even years, after they were deposited.

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