

Advancements in Cyanoacrylate Fuming for Latent Fingerprint Visualization

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Introduction

Identification of people, particularly victims and suspects, as well as the owners of various objects and the authors of pertinent papers, is one of the main objectives of criminal and civil inquiry progress. One of the most well-known and often used methods of personal identification is fingerprint matching. To maintain a better grip and to prevent slippage, the palmar surface of the hands is covered by a layer of corrugated skin. Friction ridges are these elevations on the palmar surfaces, while furrows or grooves are the troughs created between the ridges.

Dactyloscopy is the study of friction ridge structures, such as fingerprints, and ridgeology is the study of ridge analysis for the investigation of fingerprints. The friction ridges are dotted with pore openings that release sweat, which is mostly water with very trace amounts of salt chloride, organic acids urea, and albumin [1]. A fingerprint is an imprint that a human finger's friction ridges leave behind. If the two fingerprints are those of the person in issue, it is unquestionably possible to identify them. Fingerprint evidence is crucial for personal identification. A distinct pattern allows for fingerprint identification. However, only the patterns do not cause it [2].

Description

The traces of an impression from the friction ridges on any surface of a human or other primate hand are called fingerprints. Friction ridges may also be seen as a print from the foot's sole. Since criminals frequently touch or handle objects when they enter a crime scene, many of their fingerprints are sure to be left there unintentionally. "Chance prints" are the kind of fingerprints the offender left at the crime scene. A person may occasionally pick up a glass or plastic bottle with his hand and place it in a different location. The superglue method is a great way to create latent fingerprints. It is one of the greatest ways to gather one of the most significant kinds of physical evidence. It can be used as the main technique for creating latent fingerprints. A visible, sticky white substance that appears along the ridges of the fingerprint is created when superglue reacts with the latent fingerprint's protein, lipid acid, and amino acid traces as well as the moisture in the air. An image of the full latent fingerprint is the outcome [3].

Our initial experiments in this area were completed to document the impact of lowering the temperature of the superglue fuming process on the growth of poly(ethyl cyanoacrylate) from aged latent prints. These results show that lowering the temperature does improve the polymerization of ECA when applied to aged prints as it does to fresh prints. Notably the molecular weight

of the grown polymer approaches that which is found in un-aged fumed prints, indicating that the change in initiation and chain growth with temperature is similar for aged and un-aged print and is not affected by degradation or loss of mass of a print during aging. These results therefore suggest that lowering the temperature may improve the quality of the aged print [4].

In many forensic investigations, the recovery and identification of latent fingermarks are vital in recreating a crime scene. A standard, cost-effective, and straightforward method for developing these latent marks from a nonporous substrate is the cyanoacrylate fuming method. This method involves the exposure of a latent mark to the fumes of ethyl cyanoacrylate (ECA), more commonly known as superglue. The most effective procedure for fuming latent marks using ECA involves the rapid heating of the superglue, which causes the heated glue to turn into a white vapor. This vapor then reacts with the fingermark residue it contacts and begins growing polymer along the mark ridges. The result is a fixed and durable, visible coating of the fingermark friction ridges. Throughout this report, the term fingermark will primarily be used, but due to long-term habits, the term 'print' will occasionally be used, and should be viewed as equivalent to the term 'fingermark' [5].

Conclusion

It is becoming more and more frequent to have thyroid nodules. The most frequent use of FNAC or FNNAC is for thyroid nodules. Such testing is not only intrusive but also needs to be done repeatedly on numerous patients. An affordable, non-invasive, and readily available alternative to FNAC is ultrasound. However, thyroid nodules lacked uniformity and reproducibility prior to the introduction of TIRADS. TIRADS use is a useful technique for minimising unnecessary invasive procedures. TIRADS classification removes ambiguity in patient management and brings uniformity to reporting. Our research demonstrates a strong association between HPE diagnosis and TIRADS categorization. TIRADS are a useful tool for preventing pointless invasive operations.

Acknowledgement

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Conflict of Interest

None.

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