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# Vacuum Vaporization Technique for Latent Fingerprints Development on Thermal Papers using Lawsone Natural Products

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The vacuum vaporization is a technique of thin-film deposition. This process is widely used in the semiconductor, microelectronic and optical industries which involved the deposition thin film of metals onto surfaces. The metals used was generated into their gas phases and deposited to substrate for a thin film. Currently, this technique is used to develop of visualized latent fingerprints on banknotes for forensics investigation using vacuum metal deposition of copper and gold. However, in this study, we reported the first utilization of lawsone instead of metals in the vacuum vaporization technique. The lawsone was sublimation in vacuum and showed the detected latent fingerprints on thermal papers.

The method involves hanging the thermal paper samples 5, 10, 15 cm above a heating source with dispersed lawsone solids in a vacuum chamber. The optimized condition for lawsone sublimation are 50, 100, 150 mg with low-vacuum (0.1 mbar) and vaporizing temperature at 40-60℃. The sample fingerprints was left for 1, 3 and 7 days before examination comparison between lawsone and fingerprint ink pad using an Automated Fingerprint Identification (AFIS).

The resulted showed that using 50 mg lawsone sublimation on thermal paper at the range of 10 cm evidenced the clear, detectable minutiae which can be used for visualization and identification of latent prints without the background black staining known. Thus, This study might be interested application for developing latent fingerprints as a solvent free technique and non-hazardous materials.

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