Electrodeposited Ni/phosphors Composite Coating for Latent Fingerprints Visualization

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Fingerprint is a crucial means of physical evidence in forensic science owing to its uniqueness. It is important for identification to make those invisible latent fingerprints visible. Instead of methods based on making fingerprint secretions themselves visible, a novel approach involving electrochemically driven processes is proposed, through which fluorescent particles are innovatively introduced. The fingerprint secretions act as insulating masks, and then Ni/phosphors composite electrodeposition process only spatially selective occurs on bare metal surface between fingerprint ridges to generate a negative image of the fingerprint. In order to optimize the composite electrodeposition process, surfactant and concentration of phosphors in the electroplating solution are investigated. In addition, the fingerprint fluorescent visualization effects based on concentration of phosphors as well as electrochemical processing time are compared. The method presents the great advantage of being efficient, facile, and innoxious, particularly when the latent fingerprint is on a multicolored or dark background.

Keywords: latent fingerprint; forensic science; electrodeposition; phosphor; coating

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