CRIME SCENE CHEMISTRY: FINGERPRINT DETECTION

Crime scene fingerprints sometimes require chemical techniques to make them visible. Here, we take a look at four key techniques used.

TYPES OF FINGERPRINT

PATENT PRINT

The name given to finger prints on hard surfaces which are visible. These can be photographed without the aid of chemicals to improve visibility.

LATENT PRINT

Fingerprints made by the body's oils and sweat remaining on hard surfaces after contact. Not visible, so various techniques are used to make them visible.

PLASTIC PRINT

Three-dimensional fingerprints left on soft surfaces such as wax or wet paint. Already visible, so can be photographed without the use of additional techniques.

LATENT FINGERPRINT POWDERS

PIGMENTS C Al Zn Cu

Includes aluminium, zinc, and copper powders, and colloidal carbon

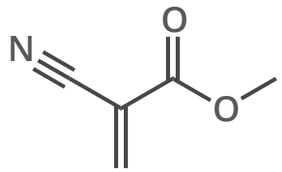
BINDERS

Wide variety used

ROSIN · GUM ARABIC · IRON POWDER · LYCOPODIUM

A range of powders of varying compositions, but commonly consisting of a pigment and a binder. When brushed on a surface, the powder clings to the moist and oily residue left by fingerprints, visualising them.

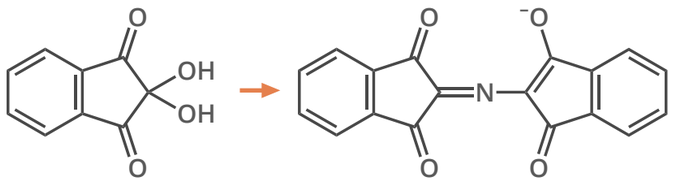
CYANOACRYLATE FUMING



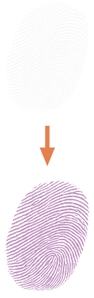
METHYL CYANOACRYLATE

Surfaces where latent fingerprints may be found can be exposed to cyanoacrylate fumes to make them visible. Cyanoacrylates are used in superglue, and polymerise on contact with fingerprint residue, making a white 3D matrix.

CHEMICAL DEVELOPERS



NINHYDRIN **RUHEMANN'S PURPLE**

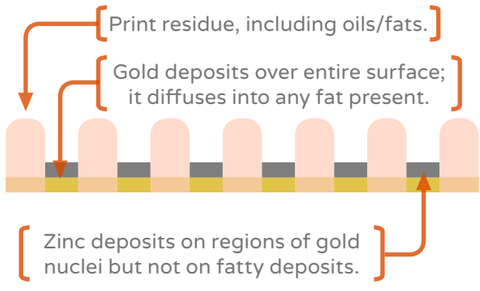


Ninhydrin is a commonly used chemical developer. It reacts with amino acids in sweat, producing a purple compound. Other developers, such as 1,2-diazafluoren-9-one (DFO), make fingerprints glow in certain colours of light.

VACUUM METAL DEPOSITION (VMD)

Au

Zn



This process involves layers of metal atoms being left on a surface under vacuum conditions to visualise latent prints. The usual combination is gold followed by zinc. It works because the zinc doesn't deposit on fatty regions.