



B167 Cyanoacrylate Fuming of Latent Fingerprints - Chemical Studies and Their Forensic Implications

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After attending this presentation, attendees will understand how components of fingerprint residues interact with cyanoacrylate molecules to lead to fingerprint visualization.

While fuming of fingerprints with superglue is well known, this presentation will impact the forensic community and/or humanity by proposing and defining the processes by which polymer formation occurs preferentially on a fingerprint in contrast to the surfaces around it.

The use of alkyl cyanoacrylates (commonly called superglue) for the fuming/detection of latent fingerprints is one of most well-known methods of forensic analysis. While the approach has been well defined, and on non-absorbent surfaces it works well, questions remain on how the selective formation of polymer on a fingerprint actually occurs. Fingerprints are very complex chemical mixtures. A number of components (amino acids, fatty acids, hydrocarbons, proteins) have been cited as the key component in this method, while few studies definitively make this identification. The behavior of several components of fingerprints, to determine if they alone will lead to a fuming response similar to an actual fingerprint, were investigated, with a focus on the behavior of hydrocarbons. Thin films of hydrocarbons will fume in a humid cyanoacrylate atmosphere, responding similarly to actual fingerprints. Some hydrocarbons respond more than others, with a dependence on not only the size of the alkane molecules, but extent of branching. The thickness of the 'film' is also an important variable. These observations suggest that a good model for fuming of fingerprints may be gas chromatography - in which an analyte partitions between a gaseous mobile phase and a liquid stationary phase. This model will be addressed. Also, studies of fuming simulated hydrocarbon fingerprints suggest that one may consider superglue fuming experiments as a time dependent study, where the rate at which prints appear could provide additional information on when they were created.

Fingerprint, Fuming, Detection