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Chemical analysis of fingerprints for development purposes

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The determination of the efficacy of finger mark development techniques has always been a rather difficult matter. One of the reasons is the variation in the composition of finger marks and the great difficulty to mimic this matrix of constituents for establishing the optimum conditions for certain reagents.

There have been several reports on the standardization of experiments for the development of novel reagents and their formulations. Approaches for the standardization of fingerprint deposits have been suggested, in order to establish the reactivity of the constituents under controlled conditions.

The measurement of the chemical makeup of a fingerprint, using GCMS and FTIR, has been reported on several occasions. These reports have resulted in the application of these analytical techniques used for the purpose of the quantification of the changes in fingerprints over time. We propose the use of GCMS and LCMS for the determination of the abundance of amino acids in fingerprints and the effects of several conditions on the constituents of fingerprints.

The effects of the age of a standard deposit of a representative group of amino acids on a porous material and the duration of the treatment, amongst other conditions, were measured. This resulted in a better understanding of the reaction of these amino acids with DFO and ninhydrin.

As only a few amino acids were measured with satisfying results using GCMS, we turned to LCMS, which resulted in the measurement of 19 amino acids with good results. With the developed method we performed measurements on the efficacy of 1, 2-indanedion. As 1, 2-indanedion is a relatively novel reagent for the visualization of finger marks, we propose these analytical results will substantiate the earlier published results on this reagent.

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