

PW7 Differentiation of inks using Laser Desorption Ionisation Time of Flight Mass Spectrometry (LDI-ToFMS): A single fibre technique and case study

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An 'almost' non-destructive technique has been developed for ink discrimination by LDI-ToFMS.

Mass spectrometry is a valuable technique for the specific identification of organic molecules and is widely used in forensic science for this purpose. LDI is a soft ionisation technique that emphasises the molecular ion in the spectrum. ToFMS provides high resolution and accurate mass measurement. A great advantage of LDI/ToFMS in forensic science is the capability to present small, untreated samples in the solid state for analysis.

This poster describes a new technique for dye identification using LDI/ToFMS [1]. A sample, as small as a single paper fibre, can be prised from the surface of the document under a stereo microscope. The sample is then transferred to a carbon adhesive tape disc mounted on a modified MALDI metal plate. This sampling process causes imperceptible damage to the surface of the document. The sample is then presented to the instrument for analysis. As there is little fragmentation and the paper does not produce a complex background clear mass spectrometric identification of the components in the different ink dyes are obtained. A case study is reported where conventional techniques had failed to discriminate changes 'allegedly' made to a receipt. Ink discrimination by single fibre LDI/ToFMS showed clearly where alterations had been made and 'cracked' the case without 'cracking' the evidence.

[1] B Matthews, New applications for Laser Desorption/Ionisation (LDI) of Ballpoint Pen Inks in Forensic Document Examination, Honour Thesis 40 pp, Flinders University, 2008