J9 Analysis of Writing Ink by Gas Chromatography-Mass Spectrometry: Batch Variations

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After attending this presentation, attendees will understand the differentiation capability of GC/MS in the examination of handwritten entries and its pitfalls.

This presentation will impact the forensic community and/or humanity by providing a further refinement of methodology for the differentiation of writing ink samples, including limitations and pitfalls.

Attendees will assess the ability to differentiate batch variations among handwritten writing ink entries using GC/MS, as compared with other analytical methodologies.

Since writing ink is a manufactured product, it is susceptible to quality control issues. Numerous writings have been published using both physical and chemical methodologies to differentiate both ink formulations and different batches of the same formulation. Gas Chromatography-Mass Spectrometry is recognized as a technique with a high discriminating power and thus should be appropriate for this purpose.

Several different ink formulations were identified and chosen for analysis based upon their apparent similarity of components. These samples were both blue and black ball pen and contained numerous samples of different manufacturing batches. All of the samples examined were prepared at least 2 years before the date of examination. Each sample was examined by infrared reflectance and luninesence, thin layer chromatography, TLC densitometry and GC/MS. Triplicate analysis of each writing sample was performed and statistical analysis of the data was conducted.

The applicability of GC/MS to the examination of writing inks is evident, due to its ability to detect components that are not normally detectable by the other reported methodologies. However, depending upon the particular ink formulation examined, results obtained from samples of different batches of the same formulation were of a magnitude consistent with variations normally found between different ink formulations.

Ink Analysis, Questioned Documents, Batch Variation

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