

ABSTRACT

A DATA TRANSFORMATION TO CORRECT FOR EVAPORATIVE WEATHERING IN FORENSIC FIRE DEBRIS ANALYSIS

Automated identification of ignitable liquids by comparison of GC-MS data could provide a significant benefit to forensic laboratories. Many chromatographic pattern comparison techniques fail to correctly identify these liquids because of chromatographic profile distortion caused by evaporative weathering. A method was developed that uses a set of linear transformations of the original GC-MS data to reduce the sensitivity of these techniques to evaporative weathering. The key transformation is normalization within a narrow retention time region. This method was tested by evaluating evaporated gasoline samples against a library of five neat gasoline samples and two neat medium petroleum distillates. All evaporated gasoline samples were correctly identified up to at least 75% evaporated by mass, while some were correctly identified up to 95% evaporated by mass.

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