Software Tool for Classification and Identification of Ignitable Liquids in Fire Debris

Methods for incorporating Gas Chromatography coupled with Mass Spectrometry (GC-MS) summed ion spectra into a software tool for identifying the cause of a fire by comparing fire debris data to a universal database for quick matching with commercially available ignitable liquids.

Gas Chromatography coupled with Mass Spectrometry (GC-MS) is an extremely useful tool in forensics analysis. In the case of a fire, the scientist may need to determine if the fire was accidental or intentional. In the case of an explosion, the scientist needs to identify explosive materials that were the cause, in order to assist law enforcement in identifying the individual or group responsible. Tracing the identity of flammables, accelerants and explosives is often complicated by other burned contaminants such as carpeting, foam padding and building materials. Comparison of a total ion chromatogram of a sample to the suspected ignitable liquid can be undermined by the presence of residues from these contaminants.

Technical Details

Researchers in Forensics at UCF, in conjunction with the National Center for Forensic Science (NCFS) have developed a summed ion approach to analyzing GC-MS data of ignitable liquids, useful for forensic science, counter terrorism, medical diagnostics and manufacturing quality control. This method utilizes software that can rapidly search through a database/library of summed ion spectra for commercially available ignitable liquids and match it to the residue left behind in a suspected arson. The software also takes into account the presence of known or experimentally determined pyrolysis components (contaminants).

Benefits

- Rapid analysis and matching of fire debris data to commercially available ignitable liquids
- Works even in the presence of contaminants
- Use of software to establish a national database of ignitable liquid fingerprints
- Easily integrated into current Gas Chromatography coupled with Mass Spectrometry (GCMS) devices

Applications

- Software
- Law enforcement
- GC-MS instruments

Additional related technology: 33703

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