

ABSTRACT

DEVELOPMENT OF A METHOD TO DETECT WATER-SOLUBLE ACCELERANTS IN ARSON DEBRIS FOR FORENSIC LABORATORIES

Gas Chromatography-Mass Spectrometry was used to develop a method to detect water-soluble accelerants in arson debris for forensic laboratories. A current method exists to analyze non-polar arson samples but it does not detect polar accelerants. An optimized GC-MS method to separate methanol, ethanol, acetone and iso-propanol was developed. Then, an activated carbon strip was analyzed for its adsorption abilities and used to extract the compounds by heated headspace analysis. The optimized method did not show interference from pyrolytic products formed by charred wood, rug and dry wall. However, there was interference with the analysis when moisture, in the form of water, was added to the samples. In order to mimic real-world samples, fires were set on wood, rug and dry wall using a mixture of all four accelerants. All of the accelerants were detected in the debris collected from these controlled fires.

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