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Analysis and classification of smokeless powders by GC-MS and DART-TOFMS

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Highlights

- Smokeless powders analyzed via GC-MS and DART-TOFMS to compare instrumental methods
- Compounds observed were comparable between instrumental methods
- Robust classification models were produced from both instruments
- Indicates each instrument has a high probability of classifying new samples
- DART-TOFMS is a suitable screening method for organic components in powders

1 Abstract

Partially burned smokeless powder particles may be present as a form of evidence following a shooting or explosive event, such as the explosion of a pipe bomb. The characterization and classification of residual smokeless powers may allow for a known sample, i.e. sample collected from a suspect, to be connected to an unknown sample, i.e. sample obtained from a crime scene. In this study, thirty-four (34) smokeless powders were analyzed using GC-MS and DART-TOFMS to determine how comparable the discriminatory power of each instrument was based on the smokeless powder constituents identified within each