



B23 An Appropriate and Practical Sample Preparation Procedure for Clean-Up and Analysis of Explosives Residues

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After attending this presentation, attendees will better understand an appropriate and practical Solid-Phase Extraction (SPE) procedure for the analysis of explosives residues.

This presentation will impact the forensic science community by establishing streamlined clean-up procedures for the recovery of explosives residues.

The detection of trace explosive residues from post-blast scenes has always been challenging in the forensic field, due to possible high matrix interference from the background of the scene, trace amounts of explosive residues left after the blast, and the wide range of possible compounds used by the perpetrator. Thus, there is a compelling need to develop an efficient extraction procedure for clean-up and analysis of samples.

An optimized single-step SPE procedure was reported by Nopporn Song-im et. al. involving four target organic explosives and two inorganic anions.¹ In this study, an SPE method will be utilized for sample clean-up and analysis of a wide range of analytes. A suitable solvent system and SPE adsorbent will be determined to effectively retain the target organic explosive analytes while allowing inorganic explosive analytes to be eluted. The target organic explosive analytes will then be eluted in subsequent steps. Other parameters of the SPE method will also be optimized. Liquid Chromatography coupled to high-resolution accurate mass Orbitrap mass spectrometer (LC-Orbitrap) and Gas Chromatography coupled to a Mass Spectrometer (GC/MS) will be used for the analysis of organic explosive analytes while Ion Chromatography (IC) will be used for the analysis of inorganic analytes. This SPE sample preparation method will provide efficient clean-up of the samples. The resultant effluents are compatible with multiple types of instrumental analysis for a wide range of explosive analytes.

Reference(s):

1. Nopporn Song-im et. al, Establishing a universal swabbing and clean-up protocol for the combined recovery of organic and inorganic explosive residues. *Forensic Science International*. 223 (2012) 136–147

Explosives, Extraction, SPE