



A117 Direct Analysis of Trace Analytes and GSR From Fibers Utilizing Nanomanipulation- Coupled Mass Spectrometry

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After attending this presentation, attendees will learn about a new instrumental technique for trace analysis.

This presentation will impact the forensic science community by allowing analysis of analytes below ppb levels.

A novel instrumentation of nanomanipulation coupled to nanospray mass spectrometry in order to probe trace analytes and gunshot residue from fibers will be presented. Nanomanipulation is ideal for these applications due to its translational resolution of 10-100nm, in lieu of the optical limit, making it ideal to couple to nanospray mass spectrometry, which only requires a minimum of 300nL and 300attograms of analyte. This technique increases analyte detection sensitivity, and decreases the amount of sample required with minimal damage to the evidence. With this instrument we are able to directly probe and manipulate from a fiber using the nanospray tip, and then transfer the analyte to the mass spectrometer reducing the analyte preparation. This technique is demonstrated by probing histidine and caffeine from a single rayon fiber then analyzing the trace particles. Also demonstrated is the extraction of GSR from dyed fabric. The instrument is multifunctional with applications to the forensic sciences including analysis of trace elements, gunshot residue, and document ink.

Trace Analysis, Mass Spectroscopy, Nanomanipulation