



## Criminalistics Section – 2007

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### **B196 Applications of IMS to Clandestine Laboratory Evidence**

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After attending this presentation, attendees will understand potential applications of ion mobility spectrometry for field screening of clandestine laboratory evidence as well as the pros and cons of integrating this analytical tool into clan lab investigations and remediation.

This presentation will impact the forensic community and/or humanity by demonstrating the use of ion mobility spectrometry applied to clandestine laboratory investigation (lab and field) from discovery through remediation.

Currently there are two common methods of methamphetamine synthesis used in clandestine laboratories: the Nazi/Birch method and the red cook/phosphorus method. From set-up through abandonment, such laboratories present significant law enforcement, forensic, and environmental problems. When laboratories are found, the first issue is what items should be collected for analysis, a task that often demands screening of dozens of pieces of evidence. Alternatively, most or all items are submitted to the laboratory, which transfers the responsibility for sample screening and selection to the forensic analyst. Once sites are secured and evidence collected, tasks switch to disposal and clean-up. Clean-up operations are best monitored analytically, but this is often limited by time and financial resources.

Ion mobility spectrometry, which can be deployed in the field or as a laboratory instrument, offers promise for rapid sample screening for clandestine drug laboratory evidence and remediation. In the field, IMS can be used for sample selection and tentative identification ancillary materials such as precursors. In the laboratory, the instrument can be configured to rapidly screen samples including solids and multi-phase liquids. A typical IMS screening analysis requires a few seconds and is semi-quantitative and therefore allows for rapid and efficient screening of potential evidentiary materials. IMS can also be used to provide insight into the synthetic method used through identification of precursors, ingredients, and intermediates, providing significant investigative information. Finally, IMS can assist in clean-up and remediation activities by providing rapid presumptive testing on-site.

Field and laboratory ion mobility spectrometers were utilized to characterize typical ingredients for both synthetic methods, typical products, by-products, and wastes. The value of IMS as a field and laboratory screening device for clandestine laboratory evidence will be discussed in analytical as well as cost/benefit terms. Strengths and limitations of this approach will be presented.

**Ion Mobility Spectrometry, Clandestine Labs, Methamphetamine**