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### **B70 Method Validation Parameters for Drugs and Explosives in Ion Mobility Spectrometry (IMS)**

*A. Bakarr Kanu, PhD\*, Winston-Salem University, Rm 311, Dept of Chem, WB Atkinson, 601 S Martin Luther King Jr Way, Winston-Salem, NC 27110*

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After attending this presentation, attendees will develop an understanding of practical analytical figures of merit that could be used to distinguish a false positive response from an actual drug of abuse or explosive using IMS. A false positive response is when an interfering compound produces a response identical to that of a target compound.

This presentation will impact the forensic science community by providing data that will be very useful in solving problems with false positive response when IMS is used in the field. This presentation will add to research already performed in forensic instrumental analysis by broadening understanding of analytical figures of merit that could help unravel how well a target compound can be discriminated or separated from a false positive response.

A major problem with field measurements is the possibility of false positives. False positive responses result in loss of time, and further testing may be required to insure that target explosives or drugs of forensic interest may be absent or present in a given circumstance.<sup>1</sup> In the complex forensic world, it is becoming increasingly important to develop accurate parameters to reliably identify forensic samples. Method validation is the process of proving that an analytical method is acceptable for its intended purpose. Developing method validation parameters for a specific forensic compound may be the answer to developing an accurate identification marker for substances like drugs and explosives of forensic interest.

Certified reference materials of drugs and explosives samples were prepared at different concentrations and analyzed with an Electrospray Ionization-High-Performance Ion Mobility Spectrometry (ESI-HPIMS) to determine method validation parameters for drugs and explosives. The preliminary results have determined the following method validation parameters for drugs of abuse and explosives: conditional reduced mobility, limit of detection, limit of quantification, control chart, linearity, sensitivity, accuracy precision, range, resolving power, and reporting limit.<sup>2-6</sup>

In conclusion, the preliminary data suggests that method validation parameters, when correctly implemented, could be used as a unique identifier for forensic samples. The result holds great promise for detecting and identifying forensic samples and reducing false positive rates.

#### **Reference(s):**

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#### **Method Validation, Identity Confirmation, ESI-HPIMS**