



### **B89 The NITE-CRIME Network: Development of International Protocols for the Use of Natural Isotopes and Trace Elements in Criminalistics and Environmental Forensics**

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Attendees of this presentation will learn about the NITE-CRIME Thematic Network and results of its efforts to develop protocols for the use of natural isotopes and trace elements in the fight against international terrorism, fraud and environmental crime.

This presentation will impact the forensic community by demonstrating international protocols for elemental analysis of forensic evidence; lessons learned from and results of interlaboratory validation studies; validation studies that will help support legal admissibility of elemental analysis methods

Characterization of evidentiary materials by their trace element and isotopic compositions can provide valuable sourcing information, which can be used in the fight against international terrorism, fraud, and environmental crime. To support this effort, in 2000, eight organizations representing European countries joined with three international partners to form a Network for the development of analytical protocols for the use of natural isotopes and trace elements in criminalistics and environmental forensics (NITE-CRIME). The principal goal of the NITECRIME Network is to be a global forum for the development of analytical protocols involving trace element and isotopic analysis of materials of forensic significance. Most of the analytical protocols being developed involve the use of laser ablation inductively coupled plasmamass spectrometry (LA-ICP-MS), but additional studies utilizing methods such as x-ray fluorescence spectrometry (XRF) and inductively coupled optical emission spectroscopy (ICP-OES) are also being conducted. In addition to protocol development, the NITE-CRIME Network also has the objectives of guiding the development and production of standard reference materials, providing guidelines for establishment of international databases of compositions of various materials, and fostering exchange of information and training of forensic scientists through publications, technical presentations, a NITE-CRIME website, and training workshops. Specific materials of interest include glass, bullet lead, human hair and nails, steel, tape, marble, sugar, bovine serum, and selected drugs of abuse. Some of the lessons learned in organizing the Network, protocol development, and the conduct of interlaboratory validation studies will be discussed. Examples from the instrument cross-validation study and glass and bullet lead protocols will be used to illustrate considerations concerning sample preparation procedures, the use of mass spectrometers of differing designs, and the selection of appropriate elements and isotopes for source discrimination purposes.

#### **Trace Elemental Analysis, Criminalistics, Interlaboratory Validation**