West Virginia University

C. Eugene Bennett Department of Chemistry

Elemental Analysis in Forensic and Intelligence Investigations

Prof. Tatiana Trejos
West Virginia University
Department of Forensic and Investigative Sciences

Laser Ablation spectrochemical methods (LIBS and LA-ICP-MS) are emerging technologies for direct *in-situ* micro-sampling of materials. The intrinsic advantages of these methods are desirable for forensic tests, especially for its micro-destructive nature, the elimination of the need for chemical procedures for dissolution, ultrafast analysis, and informative potential.

Laser Ablation ICP-MS and Laser Induced Breakdown Spectroscopy (LIBS) are used for the chemical characterization of natural and man-made materials that become physical evidence. This presentation describes the development and application of these laser ablation spectrochemical methods for the elemental profiling of a variety of matrices. Casework examples include the examination of glass for criminal investigations, characterization of tapes and documents for homeland security threats, identification of gunshot residues in firearm-related crimes, and the detection of chemical taggants as theft-deterrent products.

A critical evaluation of the parameters of forensic interest is discussed in detail, including optimization and validation of the analytical methods, discrimination potential (when comparing samples), homogeneity of the samples at the micro-scale, sampling strategies, calibration strategies, error rates, interlaboratory studies and standardization process, database development, and interpretation of the weight of the evidence

Date: Wed, Feb 14, 2018
Time: 4:30-5:30 pm
Location: 208 Clark Hall