



Engineering Sciences Section – 2010

C10 Tools of the Environmental Forensic Microscopist

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After attending this presentation, attendees will have a basic understanding of how Polarized Light Microscopy (PLM), Scanning Electron Microscopy-energy Dispersive X-ray Spectrometry (SEM- EDS), Fourier Transform Infrared Microspectroscopy (FTIR)) and transmission electron microscopy-energy dispersive x-ray spectrometry with selected Area Electron Diffraction (AEM) can be applied to the characterization of nuisance dusts, airborne and waterborne particulate, and other materials that contain fine particulate.

This presentation will impact the forensic science community by reinforcing the procedures used to characterize and study some of the most challenging samples in a logical and systematic manner.

Dust and debris samples can be intimidating to the inexperienced analyst as can the instrumentation used by the microscopist! Knowing the capabilities and limitations of the various microscopes used in the environmental forensic laboratory is essential to guide the analysis and collect the data needed to characterize the most complicated samples in a timely manner.

Basic concepts of sample preparation, sample study and advanced techniques for preparation of some of the more challenging samples will be presented through case studies. The types of materials and particles present in an "unknown" sample dictate how the analysis progresses. Having a basic procedure to record observations, collect information and use the information collected allows the microscopist to guide his analysis procedure and proceed in a logical, reproducible and confident manner. The initial examination of the sample using gross visual examination and low power stereomicroscopy coupled with the microscopist's experience and knowledge of microscopy allows the characterization of a complex particulate sample to progress in a logical and flexible manner. The process of studying a sample using the tools available to the microscopist cannot be overemphasized especially when results are needed yesterday. The time spent in guiding an ongoing investigation through the careful study of a microscopic sample can result in a huge savings in time, labor and costs.

Microscopy, Environmental, Dust