

- New medium energy ion scattering (MEIS) facility and applications. Ultra-high vacuum and superior energy resolution electrostatic toroidal analyzer is designed to be applied for characterization of composition and structure of several upper atomic layers of materials.



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## **ON-SITE AND OFF-SITE FORENSIC ANALYSIS CAPABILITIES FOR PROLIFERATION AND TERRORISM PREVENTION**

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We will present current on-site technologies that can be utilized for the screening of explosives, chemical agents, and environmental contaminants. These techniques must have the capability to detect various hazardous materials at very low levels, since they pose a major challenge for first responders. Specifically, the technology must detect concealed explosives or chemical agents on-site rapidly. Lawrence Livermore National Laboratory (LLNL) is currently developing several different high explosive screening and detection technologies for field use. Two technologies that have demonstrated an ability to screen for explosives at low levels are colorimetric spot tests and thin layer chromatography (TLC). Another technology that has demonstrated usefulness for the on-site analysis of unknowns is portable gas chromatography-mass spectrometry (GC-MS) with solid phase micro-extraction (SPME) sampling. Several examples utilizing these technologies and their usefulness will be presented.

In addition to developing on-site screening methods, LLNL is an Organization for the Prohibition of Chemical Weapons (OPCW) designated laboratory and is certified to accept CW suspect samples. Currently, LLNL is expanding its ISO-17025 certification to include nuclear forensics and explosives. These off-site forensic analysis capabilities and certified procedures will support the needs for homeland security. We will highlight some of the ISO-17025 requirements to accredit procedures, handle samples, and reports.

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