SURROGATE POST-DETONATION URBAN DEBRIS (SPUD) STANDARD REFERENCE MATERIAL

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The discipline of nuclear forensics was developed in response to an increasing concern that nuclear and/or radiological material will be used in a terrorist attack. Conclusions drawn from nuclear forensics analyses, coupled with law enforcement and intelligence information, may support attribution – the identification of those individuals responsible for planning and carrying out these attacks. Currently, well documented, measurement-traceable, post-nuclear detonation reference materials (RMs) do not exist to support post-detonation nuclear forensics sample analysis. Post-detonation RMs would allow for analytical method development, measurement performance assessment, and serve as quality control materials to achieve metrological traceability and measurement accuracy. Furthermore, these RMs ensure confidence in data quality that provide legal defensibility for forensic results.

In response to the nuclear forensic community's need for a complex material that contains the potential to produce fission as well as activation products, NIST, in concert with partner labs (FBI (DOJ), AFIT (DoD), and NPL) and support from the FBI, have developed a Surrogate Post-Detonation Urban Debris (SPUD) Standard Reference Material (SRM). This SRM has been developed to mimic the "rubble" of a city after an improvised nuclear device detonation, and it is capable of producing fresh fission as well as activation products upon irradiation. This collaboration is in the process of assessing the homogeneity of the minor and trace elements in the material by energy dispersive X-ray fluorescence spectrometry and neutron activation analysis, respectively. The next stages will be certifying these elements, as well as the U isotope composition. We will present an update on the homogeneity and characterization analyses.