Abstract Submitted
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Lithium Ion Batteries Used for Nuclear Forensics[1] ERIK B. JOHNSON, CHRISTOPHER J. STAPELS, X. JIE CHEN, CHAD WHITNEY, Radiation Monitoring Devices, KEITH E. HOLBERT, Arizona State University, JAMES F. CHRISTIAN, Radiation Monitoring Devices — Nuclear forensics includes the study of materials used for the attribution a nuclear event. Analysis of the nuclear reaction products resulting both from the weapon and the material in the vicinity of the event provides data needed to identify the source of the nuclear material and the weapon design. The spectral information of the neutrons produced by the event provides information on the weapon configuration. The lithium battery provides a unique platform for nuclear forensics, as the Li-6 content is highly sensitive to neutrons, while the battery construction consists of various layers of materials. Each of these materials represents an element for a threshold detector scheme, where isotopes are produced in the battery components through various nuclear reactions that require a neutron energy above a fundamental threshold energy. This study looks into means for extracting neutron spectral information by understanding the isotopic concentration prior to and after exposure. The radioisotopes decay through gamma and beta emission, and radiation spectrometers have been used to measure the radiation spectra from the neutron exposed batteries. The batteries were exposed to various known neutron fields, and analysis was conducted to reconstruct the incident neutron spectra.

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