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Experimental design for an isomer depletion experiment on ^{108m}Ag via fast neutron reactions BRIAN GODDARD, Drexel University, JAMES CARROLL, US Army Research Laboratory, NOEL GUARDALA, Naval Surface Warfare Center, Carderock Division, MARC LITZ, US Army Research Laboratory, SARKIS KARAMYAN, Joint Institute for Nuclear Research — The nuclide ^{108}Ag is unstable with a ground-state half-life of 2.38 min, and primarily β^- decays to ^{108}Cd. Interestingly, the isomer ^{108m}Ag has a substantially longer half-life of 438 years due to its high spin (J = 6) at modest energy (110 keV). This nuclide, with such a long isomeric lifetime and relatively short ground-state lifetime, is an excellent candidate for study as a potential medium for long-term energy storage. The key to extracting this energy is the ability to deplete part of the population held in the isomer state by exciting it to a higher-lying intermediate state that has a greater probability of transitioning toward the ground state. Isomer depletion for ^{108m}Ag has been successfully demonstrated at ARL using bremsstrahlung to excite intermediate states (AIP Conf. Prod. 1525, 586, 2013). The present experiment will investigate depletion of ^{108m}Ag via irradiation by fast neutrons at the NSWCCD accelerator facility – the initial phase will use neutrons near 500 keV from the ^{7}Li(p, n) reaction, so that only (n, n') reactions are expected. This poster will discuss the background, theory, and experimental design for this experiment, including the construction of a customized sample transport system and automated control utilizing LabVIEW.

Brian Goddard
Drexel University

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