

On-line yield measurements of actinide targets

H.K. Carter¹, E. H. Spejewski¹, A. Kronenberg¹, D. W. Stracener², W. Talbert³, H.-H. Hsu³, J. Nolen⁴,
J. Greene⁴, T. Burtseva⁴

¹*Center of Excellence for Radioactive Ion Beam Studies for Stewardship Science, Oak Ridge Associated Universities, PO Box 117, Oak Ridge, TN 37831 USA*

²*Physics Division, Oak Ridge National Laboratory, PO Box 2008, Oak Ridge, TN 37831 USA*

³*TechSource, Santa Fe, New Mexico USA*

⁴*Argonne National Laboratory, 9700 S. Cass Avenue, Argonne, IL 60439 USA*

Using the online isotope separator (UNISOR) at the Holifield Radioactive Ion Beam Facility, we are studying the release properties of various actinide targets for the production of neutron rich nuclei by proton induced fission. The goal is to increase the intensity and purity of beams which are of experimental interest to our Center. In addition, we are attempting to obtain fundamental parameters that can be used in simulations to predict yields from other target configurations such as would be used at TRIUMF/ISAC, HRIBF and others.

By measuring the decay gamma rays following online mass separation we are able to determine the yields for each isotope. Using these yields and proton-induced cross sections we are able to determine target/ ion source efficiencies for each isotope. By measuring efficiencies for a number of different half lives of each element we can deduce the holdup time for each element. We have also made direct measurements of the holdup time using the beam on/off technique. These experiments have been repeated for a number of different UC-type target materials supplied by ANL as well as for ThO₂.

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