

Abstract Submitted
for the DNP15 Meeting of
The American Physical Society

Deuterated Polyethylene Target Production for Inverse Kinematic Transfer Reactions S.C. SHADRICK, R.L. KOZUB, Tennessee Technological University, D. WALTER, Rutgers University, M. FEBBRARO, S.D. PAIN, ORNL — Inverse kinematic transfer reactions play an important role in the study of nuclear structure far from stability, where the radioactive heavy reactant cannot be used as a target. These reactions can give insights into the production of proton-rich species in nova explosions (rp process) and of heavier, neutron-rich isotopes produced in the r-process, where such unstable isotopes could form and quickly react with neutrons to make even heavier species. In general, deuteron stripping reactions [(d,p), (d,n)] serve to provide the single particle structure needed to understand these nucleosynthesis processes. Such experiments require a target containing deuterium, such as a pure gas jet or a solid compound. In preparation for upcoming experiments using the GODDESS array,¹ deuterated polyethylene films, $(C_2D_4)_n$, of thicknesses ranging from .04 - 5 mg/cm² were created. The method used, while similar to previous approaches, involved a number of extra procedures to make the technique more reliable; these procedures will be presented. This research is supported by the Office of Nuclear Physics in the U.S. Department of Energy.

¹A. Ratkiewicz et al., AIP Conf. Proc. 1525, 487-491 (2013).

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Date submitted: 31 Jul 2015

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