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Optimization of the Extraction Efficiency of a Gas Stopper using a Th-228 Source MICHAEL DEVANZO, Department of Physics, Astronomy, and Geosciences at Towson University, MARISA C. ALFONSO, Cyclotron Insitute and Department of Chemistry at Texas A&M University, CHARLES M. FOLDEN III, Cyclotron Institute at Texas A&M University — A gas stopper, or Recoil Transfer Chamber (RTC), for heavy element research has been fabricated at the Cyclotron Institute at Texas A&M University and characterized offline using a Th-228 source. The RTC features a laminar He gas flow and a series of ring and spherical electrodes to efficiently transport heavy ions through an extraction nozzle to an appropriate chemistry set up. Applying a decreasing potential difference across the ring and spherical electrodes creates potential gradients which act as a means of guiding and focusing heavy ions, respectively. By systematically altering potential gradients in the RTC, a determination can be made of the most efficient RTC configuration by using the radioactive recoils from a Th-228 source as a measure of extraction efficiency. An efficiency of up to 70 percent was obtained with the most effective electrode configuration, based on recent offline measurements. This poster will elaborate on RTC experimentation and propose electrode settings for which maximal extraction efficiency may be achieved.

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