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Development of fast-release solid catchers for rare isotopes[1]
JERRY NOLEN, JOHN GREENE, Physics Div, Argonne Natl Lab, JEONG-SEOG SONG, RISP, Institute for Basic Science, Daejeon, S Korea, JEFFREY ELAM, ANIL MANE, Energy Systems Div, Argonne Natl Lab, UMA SAMPATHKUMARAN, RAYMOND WINTER, DAVID HESS, MOHAMMAD MUSHFIQ, Innosense, LLC, Torrance, CA, DANIEL STRACENER, Physics Div, Oak Ridge Natl Lab — Porous solid catchers of rare isotopes produced at high energies via in-flight reactions can play an important role in high power heavy ion accelerator facilities such as RIKEN, FRIB, and RISP. Such catchers can be complementary to helium gas catchers especially for parasitic harvesting of rare isotopes in the in-flight separators at such facilities. Materials for solid catchers are being developed by Innosense, LLC, under the DOE ONP SBIR program. The role of the catchers at high energy heavy ion facilities is to stop and quickly release rare isotopes for research with these isotopes either with stopped-beam instruments or as reaccelerated beams. Solid catchers can operate effectively with high intensity secondary beams, e.g. >>1E10 atoms/s with release times as short as 10-100 milliseconds. A new method for characterizing the release curves of such catchers is being developed at Argonne under this SBIR program. The method will utilize a very efficient and sensitive commercial residual gas analyzer for rapid measurements following implantation of stable isotopes delivered as energetic heavy ion beams.

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