Abstract Submitted
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Development of thin film UO_2 targets using spin coating and combustion synthesis methods.[1] ASHABARI MAJUMDAR, KHACHATUR MANUKYAN, STEFANIA DEDE, JORDAN ROACH, DANIEL ROBERTSON, PETER BURNS, ANI APRAHAMIAN, University of Notre Dame — Stable, uniform and cost-effective targets are essential in measuring the nuclear properties of actinides for nuclear astrophysics experiments. Existing methods of target production fall short in providing reliable and cost-efficient targets. The present work shows a novel technique for the production of actinide targets through a combination of solution combustion synthesis and spin coating methods. Depleted UO_2 targets were produced with control of film thicknesses ranging from 30 – 260 nm. Uniformity of the targets were measured using X-ray fluorescence (XRF) with variations found to be less than 5%. Alpha spectroscopy confirmed a linear increase in uranium content with increases in film thickness. Target stability was tested using ion beam bombardment with Ar^{2+} ions at 1.7 MeV. XRF and alpha spectroscopy of irradiated samples showed no sign of sputtering degradation up to a fluence of 10^{17} ions/cm^2. Phase transitions (amorphization and recrystallization) occurred in the targets after irradiation but the chemical composition remained unchanged. This talk will discuss the details of the production method and the properties of the newly developed UO_2 targets.

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