

Abstract Submitted
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Charge States of ^{229m}Th : Path to Finding the Half-Life¹ MOLLY WAKELING, Washington State University, JASON BURKE, Lawrence Livermore National Laboratory, TIMOTHY CORDEIRO, United States Air Force Academy, GRANT SALK, Rochester Institute of Technology — ^{229}Th nuclei created from the alpha decay of ^{233}U were studied using the Time of Flight (TOF) technique by measuring the time difference between alpha particle detection by a silicon detector and ^{229}Th recoil nuclei detection by a multi-channel plate detector (MCP). The experiments proved that the recoiling ^{229}Th nuclei were produced in the 1+ and greater charge states. This implies that ^{229m}Th will decay by bound internal conversion, emitting photons that can be detected to measure the half-life of this isomeric state, which is currently unknown. The charge states were observed by measuring the TOF of nuclei coming from an electroplated ^{233}U (0.2 μCi , areal density 0.006 mg/cm^2) source in vacuum.

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