

Probing proton emitters using the MARA separator

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Using the fusion-evaporation reaction $^{96}\text{Ru}(^{58}\text{Ni}, p4n)^{149}\text{Lu}$ and the MARA vacuum-mode recoil separator we have identified a new proton-emitting isotope ^{149}Lu . The measured decay Q-value of 1920(20) keV is the highest measured for a ground-state proton decay, and it naturally leads to the shortest *directly* measured half-life of 450^{+170}_{-100} ns for a ground-state proton emitter. The decay rate is consistent with $l_p = 5$ emission, suggesting a dominant $\pi h_{11/2}$ component for the wave function of the proton-emitting state. Through non-adiabatic quasiparticle calculations we were able to conclude that ^{149}Lu is the most oblate deformed proton emitter observed to date. In this talk I will discuss the experimental details and the already published results [1]. Additionally, we collected a good number of recoil-decay tagged γ rays feeding the proton decaying ^{147}Tm and ^{147m}Tm . The preliminary level schemes extracted from these data are also presented and discussed.

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