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ELECTRON-CAPTURE-DELAYED FISSION IN ^{232}AM

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Actinide nuclei near the proton dripline have large electron capture Q-values (Q_{EC}) that can populate states in the daughter nucleus up to Q_{EC}. Delayed fission can occur in the daughter nucleus and may be important in the astrophysical r-process. Thus electron-capture-delayed fission (ECDF) allows us to study fission in neutron-deficient nuclei at excitation energies comparable to the fission barrier height. The ECDF branch of ^{232}Am is $(6.9 \pm 1.0) \times 10^{-4}$.

During an 80-hour experiment ^{232}Am was produced at the Lawrence Berkeley National Laboratory 88-Inch Cyclotron in the ^{237}Np(^{3}He, 8n) reaction using a stack of 10 thin (124-197 μg/cm^2 each) targets at a beam energy of 75 MeV incident on the first target. Recoiling activities were collected and transported to a "Sample Changer" that moved samples into Gammasphere for analysis. The latest results on ECDF in this nuclide and rotational structure in the electron capture daughter ^{232}Pu will be discussed. These experiments show the promise of using Gammasphere to study nuclei that would otherwise be inaccessible due to the need for radioactive targets or pre-separation in the Berkeley Gas-Filled Separator.

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