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Title
Electron-Capture-Delayed Fission in 232Am

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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 $\mu$g/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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