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Relative yields of tin and antimony isotopes in neutron induced fission of ^{nat}U

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Improved independent fission yields will enhance our understandig of the fission process. The mass and charge distribution contain valuable information on the scission configuration and the nuclear potential-energy landscape.

To this end, a Be(p,xn)-neutron converter target and a dedicated ion guide for neutron induced fission reactions has been developed for the IGISOL-4 facility at the University of Jyväskylä, Finland. We present the design, characterisation and performance of the converter together with the first results from a systematic study of neutron induced fission yields using the IGISOL technique.

The reaction products from high-energy neutron-induced fission of ^{nat}U were stopped in a gas cell filled with helium buffer gas, and online-separated using a dipole magnet. The isobars, with mass numbers in the range 128 to 133, were transported to a tape-implantation station and identified through γ-spectroscopy. From this the relative cumulative isotopic yields of tin (Z = 50) and the relative independent isotopic yields of antimony (Z = 51) were deduced. The yields of tin show a staggered behaviour around A = 131, not observed in the ENDF/B-VII.1 evaluation. The yields of antimony also contradict the trend from the evaluation, but are in agreement with a calculation performed using the GEF model that shows the yield increasing with mass in the range A = 128 to A = 133.

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