

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

Wednesday 23 May 2018 10:00 (20 minutes)

Improved independent fission yields will enhance our understanding 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  $^{nat}\text{U}$  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  $\gamma$ -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  $A = 133$ .

**Primary author:** SOLDERS, Andreas (Uppsala University)

**Co-authors:** GORELOV, Dmitry (University of Jyväskylä); ERONEN, Tommi (University of Jyväskylä); CANETE, Laetitia (University of Jyväskylä); AL-ADILI, Ali (Uppsala University); Dr MATTERA, Andea (Uppsala University); Mr ÄYSTÖ, Juha (University of Jyväskylä); Mr VILEN, Markus (University of Jyväskylä); RINTA-ANTILA, Sami (University of Jyväskylä); Mr RAKOPOULOS, Vasileios (Uppsala University); POMP, Stephan (Uppsala University); POHJALAINEN, Ilkka (University of Jyväskylä); Dr PENTTILÄ, Heikki (University of Jyväskylä); Dr NESTERENKO, Dmitrii (University of Jyväskylä); MOORE, Iain (University of Jyväskylä); LANTZ, Mattias (Uppsala University); KANKAINEN, Anu (University of Jyväskylä)

**Presenter:** SOLDERS, Andreas (Uppsala University)

**Session Classification:** Session 5