Nuclear decay studies of neutron-rich nuclei becomes difficult at conventional ISOL facilities when going far from beta-stability due to high background generated by the nuclei within the same isobaric chain. Therefore, when studying the properties of the most exotic nuclei, the background level can be significantly reduced by using the Penning trap as a high-resolution mass filter to separate the nuclei of interest from the isobaric contaminants.

The unique possibilities of the IGISOL mass separator [1] coupled to the JYFLTRAP triple trap setup [2] have been used for nuclear spectroscopic studies at the University of Jyväskylä. The fission products have been isobarically purified by the purification Penning trap of JYFLTRAP and sent forward to subsequent beta and gamma spectroscopy studies. In addition, the Penning traps have also been used for the high-precision $Q_\beta$-value measurements.

The studied exotic, neutron-rich nuclei around mass $A = 110$ are located in the region of rapid nuclear shape changes and close to the path of the astrophysical r-process. The results of the latest trap-assisted spectroscopy experiments of fission products will be presented in this contribution.