Production of medium-mass neutron-rich nuclei from fragmentation of Sn isotopes*

D. Pérez-Loureiro[1], H. Álvarez Pol[1], J. Benlliure[1], B. Blank[2], E. Casarejos[1], D. Dragosavac[1,3],† V. Föhr[4], M. Gascón[1], W. Gawlikowicz[5], A. Heinz[6], K. Hellariutta[7], A. Kelic[4], S. Lukic[4], F. Montes[4], L. Pienkowski[5], K-H. Schmidt[4], M. Staniou[4], K. Subotic[3], K. Süemerer[4], J. Taieb[8], and A. Trzcinska[5]

[1] *University of Santiago de Compostela, Spain*
[2] *Centre d'Etudes Nucleaires, Bordeaux-Gradignan, France*
[3] *VINCA-Institute, Belgrade, Serbia*
[4] *Gesellschaft für Schwerionenforschung, Darmstadt, Germany*
[5] *Warsaw University, Poland*
[6] *Yale University, New Haven, CT, USA*
[7] *University of Helsinki, Finland and*
[8] *CEA, Saclay, France*

Medium-mass neutron-rich nuclei are important for nuclear structure investigations (e. g. shell evolution with neutron excess) and nuclear astrophysics(e. g. r-process in nucleosynthesis). However, these investigations are limited because of the dificulties in producing medium-mass nuclei with a large neutron excess. A new idea is to use a two step reaction scheme [1], instead of the traditional method of fission of actinides [2].

Medium-mass neutron-rich isotopes are produced with hig h intensities as fission fragments. Then, they are used as projectiles in a second step to produce even more neutron-rich nuclei by cold fragmentation. In fact, this two step reaction might be a tool for prod ucing beams of extremely neutron rich isotopes of refractory elements and short lived nuclei in ISOL fac ilities [3].

The production cross sections of residual nuclei, were investigated in an experiment performed at the Fragment Separator (GSI). A 950 MeV/u, and 10^9 particles per spill, ^{238}U beam impinged onto a 650 mg/cm^2 Pb target at the entrance of the separator for producing fission fragments. Forward emitted fragments were isotopically identified in the first part of the FRS. These fully identified fission residues impinged onto a 2.6 g/cm^2 beryllium target located at the intermediate focal plane. The fragmentation products were also identified in the second section of the separator. In this contribution we will present the measured production cross sections of this fragmentation residues that will be compared with different model calculations.

[1] K. Hellariutta et al., Eur. Phys. J. A, 17 (2003) 17
[2] M. Bernas et al., Phys Lett. B, 415 (1997) 111
[3] EURISOL WEB page: `http://www.ganil.fr/eurisol`

* This work was supported by EU, EURONS contract No. 506065.
†Present address:Univ. of Santiago de Compostela, Spain