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On-Line production of SnS radioactive ion beams with the ISOL technique

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Selectivity is a major parameter of the ISOL process. In order to avoid overloading downstream processes, purity control should be implemented as early as possible in the process chain from target material to the beam user delivery point [1]. In this work we present a novel approach for the development and production of SnS radioactive ion beams using the photofission production mode. The successful developments of the sulfur delivery system at ISOLDE and SPES, in the frame work of the BEAMLAB task of the ENSAR2 program, have triggered the beam time request for molecular tin (SnS) beams at the ALTO facility.
The On-line radioactive SnS Beam has already taken place and SnS molecules are well formed and released from the UCx target volume. The major observation is the purification of the tin beams by sulfurization. We note the antimony, main isobaric contaminant of tin isotopes, was fully suppressed and we got very pure SnS beams. Radioactive exotic isotopes 133Sn and 134Sn have well identified and released. Technical developments of the target-ion source production setup and selected results of these on-line measurements will be presented. The overall molecular production efficiency which was 75% will be discussed.

[1] U. Köster, ISOLDE target and ion source chemistry, Radiochimica Acta 89 (2001)

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