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Production of Ac-225 at CERN-ISOLDE and prospects for CERN-MEDICIS

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Over the last few years, several studies have proven the effect of targeted alpha therapy using Ac-225 and Bi-213 [1, 2, 3]. One of the crucial bottlenecks in upscaling these studies and moving to clinical trials is the availability of these isotopes. The current production methods cannot provide sufficient quantities of Ac-225 or its daughter Bi-213. Furthermore, some of these production techniques result in batches of Ac-225 with a lot of impurities which require advanced radiochemical separation techniques to be purified, and with limited specific activity (e.g. contamination from Ac-227). Therefore, the ISOL-technique is under investigation as a new production route for these isotopes, as it could provide both chemical and isotopic separation, to reach high purity and high specific activity. Recently, the first online radioactive Ac+ beams at CERN-ISOLDE have been produced with the Resonant Ionization Laser Ion Source (RILIS) [4]. Full characterization of the Ac+ beam has been performed.
Recent results on the beam production of Ac isotopes will be presented, focusing on Ac-225 and Bi-213 as medical radioisotopes. These measurements can be extrapolated to the CERN-MEDICIS facility as an indication of the batches that can be collected for medical research in the near future.

References

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