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# Towards building a Radionuclide Bank from proton irradiated Hg and Pb-Bi targets

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The proposed EURISOL facility is expected to be the world's largest ISOL facility to produce a large variety of high intensity radioactive ion beam in near future. Unlike the existing ISOL facilities, mercury or lead-bismuth target will be exploited simultaneously as neutron converter and coolant in the EURISOL facility. A large number of radionuclides will be produced as a result of a few GeV proton induced spallation reactions on these targets. Long term proton irradiation will introduce enough activity in the mercury assembly, which needs to be separated time to time in order to recycle the mercury. Though the size of separable activity is small compared to the total volume of mercury, but it will be enough for building "radionuclide bank"for several applications, like, industry, medicine, basic science, etc.

This "radionuclide bank"will be of use only if each constituent is separated with high radiochemical and radioisotopical purity. At the same time, the quantification of each of the radionuclide is also important. With this aim, we would like to develop different radiochemical methodologies for separation of different radionuclides from the irradiated mercury and lead-bismuth target. The off line experiments will be carried out at the radiochemistry laboratory of Saha Institute of Nuclear Physics (SINP), Kolkata, India. SINP radiochemistry laboratory is equipped with various α and γ detectors including Compton shielding.

Apart from clinically or industrially important short-lived radionuclides, emphasis will be given to search exotic long-lived radionuclides of astrophysical importance which may be formed in the minuscule amount in the mercury/lead-bismuth target as result of very high intensity proton beam. The ICPOES and ICPMS (both available in SINP-radiochemistry laboratory) will be useful to search these lomg-lived radionuclides rather than radiation detectors.

## Summary

Proposal for development of radiochemical methods for separation of different radionuclides from Hg/Pb-Bi target

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