Contribution ID: **238** Type: **Invited Lecture**

INVITED LECTURE - Use of radioactive targets for production of therapy radionuclides at the Brookhaven Linac Isotope Producer

Wednesday 19 September 2012 12:40 (20 minutes)

Our program is presently investigating the production of 67Cu, 86Y and 225Ac. The half life and beta emission of 67Cu have long been recognized as attractive for radioimmunotherapy. The short lived positron emitter 86Y should be useful for patient dosimetry measurement prior to high dose 90Y immunotherapy. The alpha emitter 225Ac may be attractive for treatment of micrometastases, but supply from its 229Th parent is extremely limited. The reaction routes we have chosen for these products are 68Zn(p,2p)67Cu at proton energy above 100 MeV, 86Sr(p,n)86Y at proton energy of 15 MeV, and 232Th(p, spall)225Ac at proton energy above 130 MeV, respectively. The 68Zn and 86Sr targets are expensive enriched isotopes for which recovery and reuse are needed for economical production. After the first irradiation these materials will contain longer lived radioactive 65Zn and 85Sr. Similarly 232Th is slightly radioactive to start. Standard target claddings at BLIP are sealed by electron beam welding, but the use of this method for radioactive material is not feasible. Therefore a target cladding that can be sealed remotely in a hot cell was required. The final capsule design comprises two aluminum disks with thin machined windows that are held together with 8 screws, situated on the periphery of the target and sealed with a silver coated stainless steel "C"ring. Calculations of thermal and mechanical properties that guided the capsule design will be presented, as well as initial experimental results.

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