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Accelerator-Pathway for ^{99}Mo Production without Highly Enriched Uranium

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ABSTRACT

Argonne National Laboratory (Argonne) is supporting NorthStar Medical Radioisotopes LLC and SHINE Medical Technologies in their efforts to become domestic ^{99}Mo producers. NorthStar Medical Radioisotopes, LLC is utilizing the photonuclear reaction in an enriched ^{100}Mo target for the production of ^{99}Mo . In this approach, a high-power electron accelerator is used to produce the required flux of high-energy photons through the bremsstrahlung process. SHINE Medical Technologies is developing a system for producing fission-product ^{99}Mo using a D/T-accelerator to produce fission in a non-critical target solution of aqueous uranyl sulfate. Argonne is assisting both companies in development and optimization of ^{99}Mo production technologies. Production experiments are conducted using a high power/medium energy electron LINAC at Argonne. In this presentation, we will review accelerator related aspects of both projects.