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Accelerator-Driven Production of Fission ⁹⁹Mo

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ABSTRACT

Results are reported for the production of ⁹⁹Mo from the accelerator-driven subcritical fission of a low enriched uranium (LEU) aqueous solution. Phase I of these experiments used a 5 L uranyl sulfate solution with a ⁹⁹Mo end-of-irradiation production limit of 2 Ci. The separation, recovery, and purification of ⁹⁹Mo were demonstrated using the recycled solution. Fission product partitioning trends will be shown for the recovery column, concentration column, and LEU Modified Cintichem process. The results from a 1.4 Ci ⁹⁹Mo production run, where the final product was sent to GE Healthcare for testing, will be highlighted. The information gained during Phase I has significantly impacted the design and implementation of Phase II. Phase II focuses on an end-of-irradiation production of 20 Ci of ⁹⁹Mo and a fission power density similar to the production facility in a 20 L LEU uranyl sulfate solution.