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MOLYBDENUM-99 PRODUCTION TECHNOLOGY DEVELOPMENT**

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**Fabrication of Molybdenum Target Materials Employing
“Recycled” Powders**

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ABSTRACT

Molybdenum powder for the fabrication of target disks and assemblies employing traditional press-and-sinter and laser melt additive consolidation approaches is being produced directly from ammonium heptamolybdate tetrahydrate. The heptamolybdate is being examined for the recovery and recycle of isotopically-enriched molybdenum from spent radiopharmaceutical solutions. The molybdenum-containing compound is processed to produce particles of a select size range and morphology, reduced using the same two-stage process developed for molybdenum trioxide, and then sintered to produce a “flowable” powder with characteristics similar to spray-dried and/or spheroidized material. Compaction and sintering parameters are being optimized to fabricate target disks with properties that meet specifications for use in neutron capture and accelerator processes. Fully-dense powders are being evaluated as feedstock for the laser melt additive manufacture of accelerator targets and assemblies. This approach eliminates numerous processing steps saving time and minimizing waste or the loss of valuable material(s).