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MOLYBDENUM-99 TECHNOLOGICAL DEVELOPMENT**

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**Optimization of the Dissolution of Mo Disks**

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**ABSTRACT**

NorthStar Medical Technologies, LLC (NorthStar) is planning on producing  $^{99}\text{Mo}$ , via the  $^{98}\text{Mo}(n, \gamma)^{99}\text{Mo}$ , reaction at the University of Missouri Research Reactor (MURR) as a short term solution to meet demands. NorthStar's longer-term solution, will be, in addition, to produce  $^{99}\text{Mo}$  via the photoneuclear reaction  $^{100}\text{Mo}(\gamma, n)^{99}\text{Mo}$  from the electron linear accelerator driven irradiation of  $^{100}\text{Mo}$ -enriched targets. Processing of irradiated targets from either production route requires dissolution in hydrogen peroxide. Subsequent processing steps include partial evaporation of the solution, removal of impurities via precipitation, and conversion of the final solution to a 5 M hydroxide solution. Argonne National Laboratory has optimized this process by reducing processing time from >8 hrs to <3 hrs per 300 g batch of Mo. Recently, Argonne has demonstrated the enhanced dissolution process on a larger scale (600 g batches) on disks of varying size. Modifications to the dissolution equipment are underway to adapt the process from benchtop to hot cell.