

Removal of Tc from Neutron-Capture ^{99}Mo using Eichrom's ABEC Resin

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ABSTRACT

NorthStar Medical Radioisotopes is pursuing a neutron capture [$^{98}\text{Mo}(n,\gamma)^{99}\text{Mo}$] route for ^{99}Mo production at the University of Missouri Research Reactor (MURR). Argonne is assisting NorthStar in the development of some aspects of the operation. Once the molybdenum targets are removed from the reactor, they will undergo dissolution. The output of the dissolution results in ~1500 mL of a 5 M KOH solution containing ~400 Ci of ^{99}Mo , as well as a few byproducts (compared to fission) including Tc. This solution is pumped from a shielded cask through a chromatography column containing ABEC to remove Tc present from the target irradiation. This polishing step will allow radiopharmacies to use the first aliquot of Tc they elute from their generators. Currently, radiopharmacies discard the first aliquot from the generator, as it contains unacceptable levels of ^{99g}Tc . Various ABEC cartridge sizes and flow rates through these cartridges have been investigated, and a method for processing the 1500 mL of 5 M KOH solution has been established.