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Photonuclear production of Mo-99/Tc-99m using molybdenum trioxide and activated carbon

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ABSTRACT

Electron linear accelerators inducing the Mo-100 photoneutron reaction are a promising alternative to the aging research reactors for Mo-99 mass production. For realizing this method, we conducted experiments on Mo-99 photonuclear production using an L-band electron linear accelerator, and developed activated carbon chromatography called Technetium Master Milker (TcMM). TcMM is an automated device which can extract Tc-99m from Mo-99 having low as well as high specific activities. Here we provide an overview of our Mo-99/Tc-99m photonuclear production approach; emphasis will be put on use of molybdenum trioxide pellets, Tc-99m-specific adsorption and purification using columns of activated carbon and alumina, and Mo-100 recovery from spent Mo-99 solutions.