

Technical Progress and Preliminary Cost Analysis for the Direct Production of ^{99m}Tc

F. Bénard, K. Buckley, A. Celler, S. Foster, M. Kovacs, F.S. Prato, T.J. Ruth,
J.F. Valliant and P. Schaffer

The ITAP Consortium

TRIUMF, 4004 Wesbrook Mall, Vancouver, BC V6T 2A3 – Canada

ABSTRACT

A consortium of Canadian institutions continue to implement the direct production of ^{99m}Tc via the $^{100}\text{Mo}(p,2n)$ transformation from enriched ^{100}Mo target using small (16 to 19 MeV) medical cyclotrons. Production levels demonstrated to date range from 4.7 Ci using 130 μA at 16 MeV to 9.4 Ci using 200 μA at 18 MeV on targets irradiated for up to 7 hours. Our process includes novel high-power targets, mechanical target transfer systems and automated dissolution, purification and formulation systems to produce sodium pertechnetate $\text{Na}[^{99m}\text{TcO}_4]$. The work underway also includes steps associated with scale-up, regulatory affairs, radiopharmaceutical kit formulation and clinical validation with a goal of having a cost-effective process in place when the Chalk River reactor ceases ^{99}Mo production in 2016. This presentation will provide a technical update as well as a discussion on the economic feasibility of routinely producing Ci quantities of ^{99m}Tc in existing cyclotron centers.