2015 European Nuclear Physics Conference
European Physical Society — university of groningen — kvi - center for advanced radiation technology
Groningen — 31 August - 4 September 2015 — www.EuNCP2015.org

Contribution ID: **202** Type: **Poster**

Investigations of alternative, non-reactor based routes for production of Tc-99m

Thursday, 3 September 2015 16:30 (1h 30m)

Alternative methods for producing the medical imaging isotope 99mTc are actively being developed around the world in anticipation of the imminent shutdown of the NRU reactor in Canada and the Petten reactor in Holland that together currently produce up to 80% of the world's supply through fission. The most promising alternative methods involve accelerators that focus Bremsstrahlung radiation or protons on metallic targets comprised of 100Mo. 100Mo(p,2n)99mTc provides a direct route to produce 99mTc, while 100Mo(γ,n)99Mo has to be followed by radiochemical processing. Production of 99Mo by bremsstrahlung radiation is achieved with limited specific activity that becomes even more difficult to use with current technology used generators. Using γ beams with high flux density, 99Mo can be produced with much higher specific activity, consistent with current technology. Such beams can be used to pump a good fraction of the nuclear ground state population via excited levels into an isomeric state. Using the new beam facilities compact targets could be exposed to the gamma radiation and undergo photonuclear reactions to form radioisotopes that can be incorporated into routine production in regional centres. All of alternative routes has to reconsider the radiochemical processing employing gel-generator technology or thermal separation. Preliminary results on (p,2n) reaction and post-processing and simulations on (γ,n) route will are presented.

Primary author: LEONTE, Radu (Horia Hulubei National Institute for Physics and Nuclear Engineering, Magurele, Romania)

Co-authors: NICULAE, Dana (Horia Hulubei National Institute for Physics and Nuclear Engineering, Magurele, Romania); Prof. BALABANSKI, Dimiter (Horia Hulubei National Institute for Physics and Nuclear Engineering, ELI/NP, Magurele, Romania); Dr MATEI, Lidia (Best Theratronics, Ottawa, ON, CANADA); Prof. JOHNSON, Richard (Best Cyclotron Systems, Vancouver, BC, CANADA); Dr LUO, Wen (Horia Hulubei National Institute for Physics and Nuclear Engineering, ELI/NP, Magurele, Romania)

Presenters: NICULAE, Dana (Horia Hulubei National Institute for Physics and Nuclear Engineering, Magurele, Romania); LEONTE, Radu (Horia Hulubei National Institute for Physics and Nuclear Engineering, Magurele, Romania)

Session Classification: Poster