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Production of ^{45}Ti by Proton Irradiation of ^{45}Sc

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Objectives: ^{45}Ti with a half-life of 3.08 h is a positron emitter radioisotope with a positron branching of 85% and also decays 15% by electron capture with $E(\beta^+_{\text{max}})$, 1.04MeV. The high β^+ yield, short half-life and a stable daughter make ^{45}Ti a suitable candidate for positron emission tomography (PET) imaging. This properties makes this radionuclide useful in the diagnosis of tumors.

Methods: In this study after considering the excitation functions for $^{45}\text{Sc}(p,n)^{45}\text{Ti}$ reaction using TALYS and ALICE/ASH codes and comparison with other experimental data's, ^{45}Ti was produced by dint of pressing method with newly designed and manufactured shuttle and capsule. Essential target thickness and physical yield were calculated.

Results: new method for production and purification of ^{45}Ti was evaluated. The scandium oxide target was irradiated at 20 μA current and 21 MeV proton beam energy for 1h. experimental yield of 403.3 MBq/ μAh was reported

Key words: ^{45}Ti , Radiochemical Separation, Pressing Method.

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