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Cyclotron production and radiochemical isolation of 117mSn

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In the recent years there has been significant interest in the production of certain isomers, especially the ones with potential applications in the field of nuclear medicine. 117mSn has been considered as an emerging radio therapeutic isotope, which is particularly promising due to its favorable nuclear decay proprieties: T1/2 = 13.60d, 100% IT decay mode and main gamma emission of 159 keV (86%).

There are number of potentially available ways for the production of 117mSn. In the current study the cyclotron method for 117mSn production by α -particles induced reaction on 116Cd has been investigated. The target consisting of enriched 116Cd (98%) in oxide form was irradiated at U-200 under the following conditions: beam current 5,5 μ A and energy of the accelerated α -particles 35 MeV. The cross section of reaction 116Cd(4He,3n) has been taken in consideration in order to optimize the irradiation conditions. For 117mSn separation from the target material La(OH)3 and LaF3 precipitations were used. In order to achieve deep purification and concentration, ion exchange chromatography was applied using a micro column loaded with Dowex 1x8 resin in F- form. The radiochemical recovery of 117mSn through the separation procedure was above 90%, with high specific activity of the final product.

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