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Measurement of thulium-167 radioisotope from alpha-particle induced reaction on holmium for medical application

In the present work, the cross sections of 167Tm radioisotope were measured from α-particles induced reactions on 165Ho. The reaction cross sections were measured in the energy range of 49.6 MeV down to the threshold of production of the thullium-167. The stacked-foil activation technique was used for the irradiation of target whereas the gamma-ray spectrometry was perfumed using a Ge detector. The measured excitation function for the radioisotope was compared with previous measurements as well as the TENDL-2017 library. We also calculated the thick target yield for the radioisotope. The present results could be useful for medical applications, astrophysical studies, and for the improvements of the nuclear reaction models codes. Specifically, the 67Tm was proposed as an important radioisotope for studying bone and tumor and as skeletal imaging agent [1, 2]. Furthermore, the emission of Auger electrons, low energy γ- and X-rays by the 167Tm and its moderate long half-life (9.25 days) are fitting characteristics for radiotherapy [3,4], making it suitable for the treatment of small tumors weighing 1 mg or less [5].

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