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Study of the Production of Mo and Tc Medical Radioisotopes Via Proton Induced Nuclear Reaction on natMo.

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^{99m}Tc radioisotope is a very important medical radioisotope for diagnostic tests. In this work an alternative route of producing this isotope, either directly or through the generator ^{99}Mo (^{99m}Tc), namely using cyclotrons, is introduced and discussed. The excitation functions for the different proton-induced nuclear reactions on natMo target are measured and compared with some previously measured data. This study aims to release some contradictions between the existing data, and to give a reliable data set for the production of ^{99m}Tc and some other isotopes of importance in nuclear medicine beside some impurities. Some monitoring reactions on Al and Cu targets are also measured and compared with the recommended IAEA data sets, in order to give a high degree of consistency to our results. The present excitation functions confirm some previously measured sets, while contradicting others. Therefore, further experimental studies are needed to obtain recommended cross-section values for the production of ^{99}Mo , ^{94g}Tc , ^{95g}Tc and ^{99m}Tc via proton induced reactions. Theoretical code calculations using TALYS code are performed and show a good consistency with the measured cross-section values. The code calculations can be used for cross-section estimations, when not enough experimental data are existing. Furthermore, the integral or thick target yields are estimated based on the measured excitation functions for all the investigated reactions.

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