

Abstract

The use of radionuclides has been well developed in medicine and today nuclear medicine is well established as a medical specialty. This work deals with "Evaluation of Nuclear Reaction Cross Sections of Positron Emitting ^{62}Zn , a Potential Candidate of PET ". ^{62}Zn radionuclide is particularly important for diagnostic purposes especially used in transport kinetics of zinc into pancreas and across blood-brain-barrier.

The objective of the present study is to know about importance of ^{62}Zn in the field of nuclear medicine. Basically, ^{62}Zn is a positron emitting radionuclide with $T_{1/2}$ of 9.26 hr and it can be produced by using particle accelerator.

There are many nuclear reactions for the production of ^{62}Zn and a number of authors have reported their experimental data for the production of ^{62}Zn . Almost all available data is given in EXFOR library but the reactions are selected on the basis of energy of incoming particles. All experimental cross sections are compared with theoretical model calculations using TENDL and ALICE-IPPE codes. On the basis of comparison between different regions of experimental and theoretical data, it can be concluded that $^{nat}\text{Cu}(p,x)^{62}\text{Zn}$ is the most suitable route of nuclear reaction for the production of ^{62}Zn . Energy ranges required for this reaction can easily be achieved in a low energy cyclotron. Maximum value of thick target yield recorded for $^{nat}\text{Cu}(p,x)^{62}\text{Zn}$ is 47.09 (MBQ/MUAHR) at 24.5 MeV energy.