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CROSS SECTION AND NEUTRON-YIELD FOR CHARGED PARTICLES INTERACTION WITH ^{66}ZN, ^{67}ZN, ^{103}RH AND ^{100}RU

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ABSTRACT

In this study reacting charged particles with intermediate nucleus as a target (^{67}Zn , ^{103}Rh, ^{66}Zn *and* ^{100}Ru) in $^{67}_{31}Zn(p,n)^{67}_{32}Ga$, $^{103}_{45}Rh(p,n)^{103}_{46}Pd$, $^{66}_{30}Zn(d,n)^{67}_{31}Ga$, $^{100}_{44}Ru(\alpha,n)^{103}_{46}Pd$ reactions as well as proton with range energy (4-29.5MeV) for $^{67}_{31}Zn(p,n)^{67}_{32}Ga$ reaction, proton with range energy (2.305-39.055MeV) for $^{103}_{45}Rh(p,n)^{103}_{46}Pd$, deuteron with range energy (1.8-15.4MeV) for $^{66}_{30}Zn(d,n)^{67}_{31}Ga$ and alpha particle with range energy (10.0-25.0 MeV) for $^{100}_{44}Ru(\alpha,n)^{103}_{46}Pd$ are used according to the available experimental data of cross sections in Exfor library.

We've calculated the cross section of above mentioned data and results have been obtained by using (Matlab-8.34014a) program.

The stopping powers have been calculated from Zeigler formula by using SRIM-2013 with the results of cross sections to calculate the neutron-yield for reactions depending on ^{67}Zn, ^{66}Zn, ^{103}Rh and ^{100}Ru isotopes as targets for reactions, and also comparing between cross section of those reactions to choose the best reactions to produce ^{67}Ga *and* ^{103}Pd isotope as shown in figure (5) and (7). We also found that comparing between neutron yields of mentioned reactions to choose the best reaction which has high neutron yield as shown in figure (6) and (8).

KEYWORDS: Cross Section (Excitation Function), Stopping Power, Neutron Yield, Data Evaluation, Gallium-67, Palladium-103