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WITHDRAWN - Optimal Model Description of Proton Induced Reactions on ^{232}Th for the Production of ^{225}Ra and ^{225}Ac up to 200 MeV.

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Using the EMPIRE 3.2 code, an optimal model has been adapted to describe the proton interaction on ^{232}Th for accelerator-based production of ^{225}Ra and ^{225}Ac which are important alpha emitting medical radioisotopes with viable production in accelerators. A hybrid nuclear level density which combines the nuclear level densities in Empire for the production of ^{225}Ra , and ^{225}Ac has been determined. The optimal model shows the important roles of the nuclear level densities and pre-equilibrium contribution to the good description of these interactions from 0 – 200 MeV. The reaction descriptions are found to be sensitive to the Nuclear Level Density description at different energies. It is noted that while no single description of the Nuclear Level Density provides an overall generally good description of the reaction throughout the energy range from threshold to 200 MeV, the energy and spin dependent level density parameter affects the Nuclear Level Density contribution significantly. The excitation functions obtained from this optimal description have been shown to have good agreement up to about 12% standard deviation with available measurements in EXFOR. The result of this work gives an insight into the necessary parameters for the production of ^{223}Ra and ^{225}Ac through ^{232}Th .

Keywords: ^{225}Ra , ^{225}Ac , Alpha emitter, Proton interaction, Radioisotopes.

Keyword-1

Alpha emitter

Keyword-2

Proton interaction

Keyword-3

Radioisotopes

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