

عنوان مقاله:

Using the Coupled-Channeled Optical Model Code to Investigate the Nuclear Property of Protactinium- ^{233}Pa for Reactor Fuel Application

محل انتشار:

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خلاصه مقاله:

This work uses the coupled-channelled optical model code to investigate the nuclear property of protactinium- ^{233}Pa for reactor fuel application. The high demand for nuclear reactor fuels has necessitated this research. As one of the major naturally occurring radionuclides with lots of fuel prospect, Protactinium- ^{233}Pa with half-life of ۲۶.۹۷۵ days occur in trace. By neutron induction, protactinium- ^{233}Pa can produce fissile materials to be used as reactor fuel. Computations were done for both the Potential Expanded by Derivatives (PED) which account for the Rigid-Rotor Model (RRM) that treat nuclei as rigid vibrating sphere and account for nuclear volume conservation and Rotational Model Potentials (RMP) which account for the Soft-Rotator Model (SRM) that treat nuclei as soft rotating spherical deformed shapes. Each of the calculated data was compared with the retrieved data from Evaluated Nuclear Data File (ENDF) which was found to be in good agreement. The threshold energies in all cases were found to be ≤ 4 MeV for both PED (Potential Expanded by Derivatives) and RMP (Rotational Model Potentials). It is observed that results from RMP much better agreed with the retrieved data than one obtained from PED.

کلمات کلیدی:

Reactor, Breeder Fuel, OPTMAN Code, Coupled-Channeled Model, Soft-Rotor, Rigid-Rotor

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