

Model calculations of radiative capture of nucleons in MeV region

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We address calculations of the neutron and the proton radiative capture at incident energies 10 to 25 MeV on medium and heavy nuclei leading to both bound and unbound discrete states of essentially single-particle configurations. The main formalism used is the pre-equilibrium (exciton) model of γ emission using the single-particle radiative mechanism [1], extended to enable quantum numbers of separate states to be employed [2]. A link to the CDS (consistent direct-semi-direct model) [3] is studied as well. The resulting pre-equilibrium (plus equilibrium) calculations of the gamma spectra and of the radiative capture excitation functions are compared to available experimental data (e.g. [4]) and also some cross section trends important for possible production of therapeutic radioisotopes are extracted.

References

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