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物理

中能中子与^{60}Ni反应的理论计算和分析

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摘要 在中子与^{60}Ni反应的总截面、去弹性散射截面和弹性散射角分布的实验数据基础上,获得了入射中子能量0.456~150 MeV范围内的一组普适的中子与^{60}Ni反应的光学模型势参数。利用光学模型、宽度涨落修正的Hauser-Feshbach理论、预平衡反应的激子模型和核内级联模型的中能核反应计算程序UNF和MEND，计算了中子与^{60}Ni反应的所有截面、角分布和能谱，并将理论计算结果与实验数据和评价数据进行了分析比较。

关键词 光学模型 中能核反应 UNF程序 MEND程序 ^{60}Ni

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Calculation and Analysis of Neutron-Induced Reactions on ^{60}Ni Below 150 MeV

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Abstract Based on the experimental data of the total, the nonelastic and the elastic cross sections and the elastic scattering angular distributions for n+^{60}Ni reactions, a set of parameters for neutron optical model potential was obtained in the incident neutron energy region of 0.456-150 MeV. Then reaction cross sections, angular distributions, energy spectra, gamma-ray production cross sections and gamma-ray production energy spectra were calculated in terms of the optical model, the distorted wave Born approximation theory, the Hauser-Feshbach theory, the exciton model and the cascade mechanism inside nuclear. The results were analyzed and compared with the existing experimental data and other evaluated data from ENBF/B-6. There are in agreement with each other within error.

Key words optical model _ intermediate energy nuclear reaction _ UNF code _ MEND code _ ^{60}Ni

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