Theoretical Analysis of Neutron Double-Differential Cross Section of n+^{19}F at 14.2 MeV

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Abstract: A new light nuclear reaction model has been developed and the double-differential measurements of 1p shell nuclei have been analyzed successfully. Now, the application of this model is expanded to ^{19}F of the 2s-1d shell nucleus. The double-differential cross section of total outgoing neutron for n+^{19}F reactions at E_n=14.2 MeV has been calculated and analyzed, which agrees fairly well with the experimental measurements. In this paper, the contributions from different reaction channels to the double-differential cross sections have been analyzed in detail. The calculations indicate that this light nuclear reaction model is also able to be used for the 2s-1d shell nucleus so long as the related level scheme could be provided sufficiently.

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