

Towards the Identification of Neutron-rich Nuclei: Recent Progress in the Study of the Reaction ^{70}Zn (15 MeV/nucleon) + ^{64}Ni with the MAGNEX Spectrometer

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The present project is focused on our research group's recent efforts to study the production and identification of neutron-rich medium-mass rare isotopes from peripheral reactions at beam energies around and below the Fermi energy [1-3]. We obtained high-quality experimental data from a recent experiment with the MAGNEX spectrometer at the INFN-LNS in Catania, Italy [4]. The main aim of this experiment was to check the feasibility of ejectile identification in this energy regime with the use of a large acceptance magnetic spectrometer. Our developed technique is influenced from the standard approach of particle identification as presented in [5,6]. It depends mainly on a reconstruction of both the atomic number Z and the ionic charge Q of the ions, followed by the identification of the mass. Our method was successfully applied to identify neutron-rich ejectiles from multinucleon transfer generated from the reaction of ^{70}Zn (15 MeV/nucleon) + ^{64}Ni . We expect that with our PID procedure, a good identification of the neutron-rich ejectiles will be achieved [6]. Preliminary results indicate that the extracted experimental distributions, along with comparisons with the theoretical models may help us to shed light to the complex reaction mechanism of multinucleon transfer in this energy regime.

References

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