

Elastic and inelastic scattering of ^4He on ^9Be : excited states and nucleon transfers

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Angular distributions of the $^4\text{He}+\text{Be}$ elastic and inelastic scattering were measured at the energy $E_{\text{lab}}=63\text{MeV}$, delivering by the K130 Cyclotron of the Jyväskylä University.

Angular dependences of the differential cross sections for the $^4\text{He}(^9\text{Be}, ^9\text{Be}^*)^4\text{He}$, $^4\text{He}(^9\text{Be}, ^{10}\text{Be})^3\text{He}$ and $^4\text{He}(^9\text{Be}, ^{10}\text{B})^3\text{H}$ have been measured to get potential parameters.

Adding of second valence neutron or proton to the ^9Be nucleus leads to the production of nuclei ^{10}Be and ^{10}B . As an example, differential cross sections versus angle for the ground states for ^{10}Be and ^{10}B are given in Figure. Results of the present experiment are shown by solid symbols and data from [1] are presented by the open symbols.

Fig. Differential cross sections of the ground states of ^{10}Be and ^{10}B .

These reactions were used as an effective method to study the both internal cluster structures and isobar analog states for ^{10}Be and ^{10}B , as members of $J^\pi=0^+$, $T=1$ multiplet. Experimental angular distributions for ground and for a few first excited states were analyzed with the frame of the optical model and distorted-wave theory DWUCK5 [2].

An attempt to extract spectroscopic factors was performed.

1. M.N. Harakeh et al. Nucl. Phys. A344 (1980), p.14-40.
2. <http://nr.vj.inr.ru/>

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