

ELASTIC SCATTERING CROSS SECTION MEASUREMENT OF ^{13}C NUCLEI ON ^{12}C AT ENERGY 22.75 MeV

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Elastic scattering cross section of the ^{13}C at nuclei ^{12}C have been measured (heavy ion accelerator DC-60, Astana, Kazakhstan) at 22.75 MeV energies, in the laboratory system.

Experimental data shows that for the $^{13}\text{C}+^{12}\text{C}$ reaction is observed the rise of elastic differential cross sections at large angles. Previously anomalous scattering of the system $^{12}\text{C} + ^{16}\text{O}$ at energies near the Coulomb barrier has been systematically investigated [1]. A significant rise of the elastic scattering cross sections for backward angles was shown. It is completely determined by the alpha cluster transfer mechanism between the interacting nuclei. The experimental data in the framework of the phenomenological and semi-microscopic (potential convolution) optical model were analyzed. Optimal parameters of the interaction potential for the system $^{12}\text{C} + ^{13}\text{C}$ were found. Experimental data reproduce by the parameters for the forward hemisphere. Anomalous behavior of ion scattering of ^{13}C on ^{12}C can be described by nucleon exchange mechanism [2] between the interacting nuclei calculated by DWBA. Figure 1 shows the experimental data of the elastic scattering cross section of the accelerated ions ^{13}C to ^{12}C at 22.75 MeV and result of the analysis. Differential cross sections can be describes by Rutherford scattering only for the front angles.

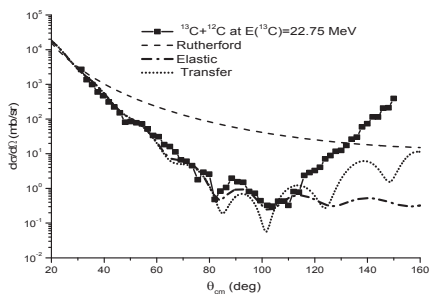


Fig. 1. The differential cross section of elastic scattering ^{13}C to ^{12}C nuclei at energy of 22.75 MeV.

1. Sh.Hamada, N.Burtebayev, N.Amangeldi, *et al.* // Journal of Physics: Conference Series. 2012. V.381. 012130.
2. A.Barbadoro *et al.* // Il Nuovo Cimento. A. 1986. V.95. N.3. P.197.