THE REACTIONS (t, α) ON ^{10}B AND ^{11}B NUCLEI

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On the 1.5 MeV accelerator of "B. Kidrič" Institute at Vinča, the reaction (t, α) were studied experimentally for the ^{10}B and ^{11}B nuclei. The investigations were related to the outgoing channel of $^{9}Be + \alpha$ reaction on ^{10}B and to the energy interval of the incident beam was 0.5 ÷ 1.25 MeV and this corresponds to the excitation energy of the compound nucleus ^{13}C for the interval 24.2 - 24.8 MeV and to the excitation energy of ^{14}C for the interval 21.0 - 21.7 MeV, respectively.

The groups α_0, α_1, α_2 and α_3 from the $^{10}B(t, \alpha)^{9}Be$ reaction as well as the group α_1 from the $^{11}B(t, \alpha)^{10}Be$ reaction were detected. The effective cross section values were determined relatively with respect to the $^{10}B(d, \alpha)^{8}Be$ reaction[1]). We note here that the corresponding values of cross section for the same reaction which are given in [2, 3, 4] and that these values are less than the values given in reference[1]).

The excitation functions were measured at the 110° angle and they are given in Fig.1. The excitation function for α_1 group from $^{10}B(t, \alpha)^{9}Be$ reaction suggests the existence of 24,73 MeV isolated level in the compound nucleus ^{13}C. The same effect was not observed in the excitation function measurement for α_1, α_2 and α_3. The excitation functions, for $^{11}B(t, \alpha_1)^{10}B$, which are shown in Fig. 2 are pointing out the absence of any isolated level in the compound nucleus ^{14}C for the energy range investigated.

The angular distributions were measured for the energies at 900 KeV and 1100 keV. Fig. 3. shows the distributions in C.M. system for α_0 from $^{10}B + t$ reaction and for α_1 from $^{11}B + t$ reaction at the 900 keV. The full-line curve represents the result of the elaborating of the experimental points. This elaboration: was carried out under the assumption that the compound theory is valid in the given range of energies. The method of least squares was used, and expansion over the Legendre polynomials was taken up to fourth order terms.

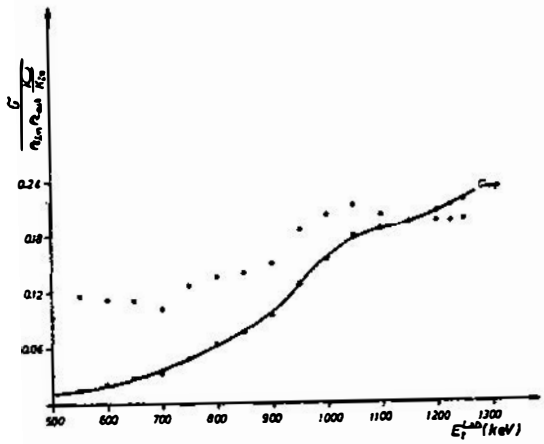


FIG. 1

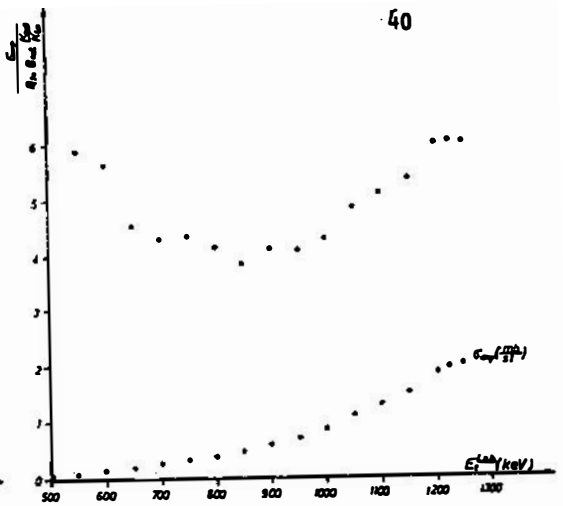
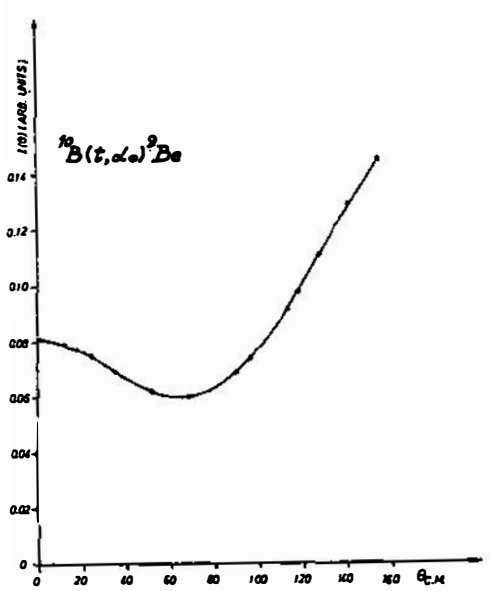


FIG. 2



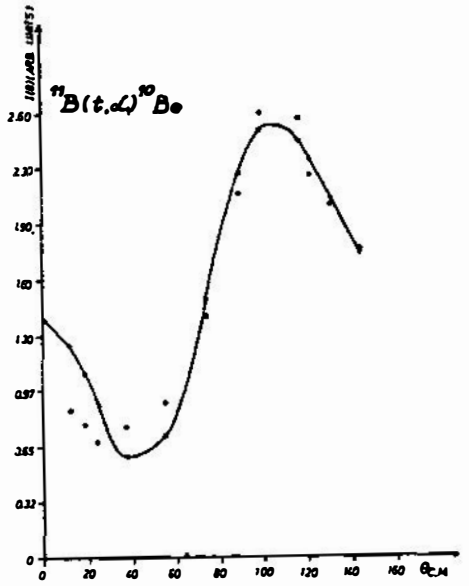


FIG. 3

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