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ANGULAR DISTRIBUTION OF TRITONS FROM THE REACTION Li^7 *(α, t)* Be^8

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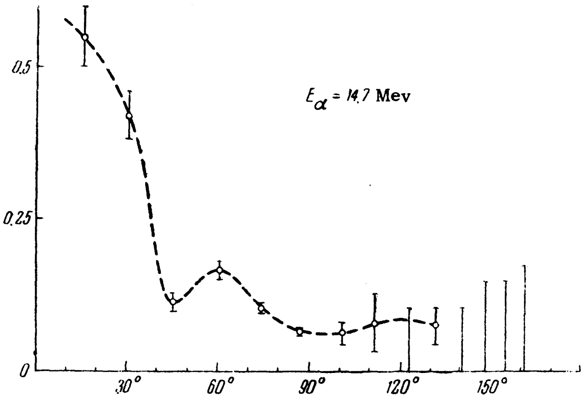
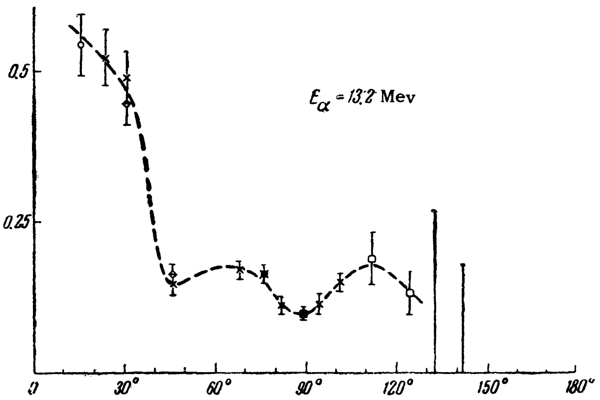
FOR the purpose of studying the reaction mechanism we used the nuclear emulsion method to investigate the angular distributions of tritons from the reaction $Li^7(\alpha, t)Be^8$ $(Q = -2.56$ Mev) with α particles accelerated in the cyclotron to energies of 8.34, 10.15, 11.5, 13.2, and 14.7 Mev. At all energies we obtained similar angular distributions. The curves in the figures show the dependence of the differential cross section (in relative units) on angle in the center of mass system with E_α = 13.2 and 14.7 Mev. The differently designated points were obtained in different experiments. At the larger angles we only evaluated the upper limit of the cross section.

The form of the angular distributions and its weak dependence on the energy of bombarding α particles show the important role of the direct interaction mechanism. Comparison with the Butler theory[1] showed that we can obtain satisfactory correspondence between theoretical and experimental curves with the angular momentum transferred to the nucleus at the time of collision $l = 1$ (the only possible value in line with the known values of nuclear spin[2] and the law of conservation of parity).

If, as is customary, we relate the isotropic part of the angular distributions, to compound nuclear processes, then we can see from the graph that the contribution of this process is large for $E_\alpha = 13.2$ Mev. We should note that in this case the full energy of motion in the c.m. system, if we include the energy spread of the α-particle beam and the energy loss in the target, corresponds to an energy ~ 16.9 Mev for the level of the compound nucleus B^{11}.





The absolute values of the differential cross section for a 16° angle (c.m.) are equal to $9.2^{+3.7}_{-1.85}$ mbn/sterad for E_α = 13.2 Mev and $9.4^{+4.0}_{-2.0}$ for E_α = 14.7 Mev.

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