DIFFERENTIAL CROSS SECTION OF REACTIONS $^{7}Li(\gamma,t)^{4}He$, $^{7}Li(\gamma,t)X$ AND $^{7}Li(\gamma,He)X$, INITIATED BY VIRTUAL PHOTONS WITH ENERGY $E_{\gamma}=40\pm2$ MeV

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Energy distributions $d\sigma_{e,a}(E_o,E_a,\Theta)/d\Omega dE_a$ of tritons and He nuclei (a) escaping at an angle of $\Theta=110°$ (in a lab system) in electronuclear reactions $^{7}Li(e,a)X$ have been measured. These measurements have been performed at electron energies E_0 equal to 42,40 and 26 MeV, the latter being the kinematic threshold of a multi-particle disintegration of the ^{7}Li nuclei.

By the difference of spectra measured at electron energies 42 and 40 MeV which was corrected by accounting the contribution of the two-body reaction $^{7}Li(e,t)^{4}He$ at virtual photon energies lower than 26 MeV, the energy distributions of particles t(He) have been obtained in the reactions caused by the virtual photon spectrum shown in the insertion of fig. 1.

The differential cross sections $d\sigma_{\gamma,a}(E_{\gamma}\approx40\text{ MeV}, E_a,\Theta)/d\Omega\, dE_a$ of the reactions $^{7}Li(\gamma,t)^{4}He$ and $^{7}Li(\gamma,t)X$ as well as $^{7}Li(\gamma,^{4}He)t$ and $^{7}Li(\gamma,He)X$ are accordingly shown in fig. 1 and fig. 2. The experimental data corresponding to the multi-particle reactions $^{7}Li(\gamma,a)X$ have been interpreted as a result of photodisintegration of the nucleon assosiations in ^{7}Li nuclei, such as $^{6}Li(^{6}He)$ and ^{4}He.

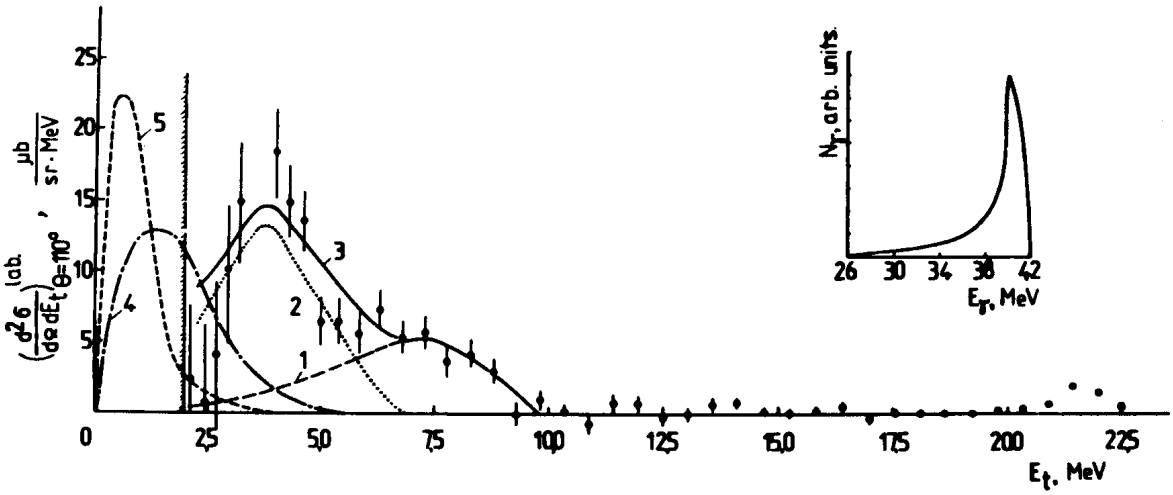

Fig. 1. Differential cross section of $^7Li(\gamma,t)^4He$ and $^7Li(\gamma,t)X$ reactions initiated by photons with energy $E_\gamma = 40 \pm 2$ MeV ($\Theta = 110°$). Calculated spectra of tritons in photodisintegration reactions are shown by curves: *1* — clusters of $^6Li(^6He)$ to $^3He+t(t+t)$; *2,4,5* — clusters of ^4He to $p+t$ with spectators correspondingly t, $(d+n)$, $(p+2n)$; *3* — sum of curves 1 and 2. Vertical line corresponds to threshold of triton registration

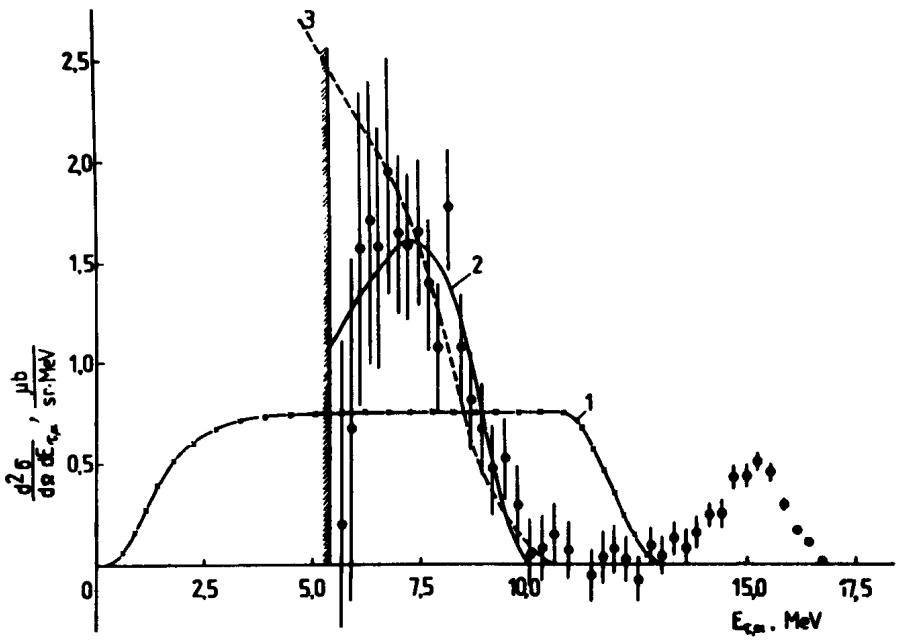

Fig. 2. Same as fig. 1, but for $^7Li(\gamma,He)X$ reactions. Curves — calculated spectra of He nuclei in cases: *1* — neutron knock-out from s-shell ^7Li nuclei with formation of quasistationary excited states of ^6Li nuclei decaying to ^4He+d; *2* — photodisintegration of clusters ^6Li to ^3He+t. Contribution of $^7Li(\gamma,^4He)t$ reaction is seen at end of experimental spectrum; *3* — $\gamma+^7Li \to p+^6He^* \to p+n+n+^4He$ reactions