THE PARTICIPATION OF f-PROTONS IN THE COMPOUND MODEL OF THE REACTION $^{7}Li(p,\alpha)^{4}He$ AT LOW ENERGIES

D. M. Ćirić
Faculty of Tecnical Sciences, University of Novi Sad
R. V. Popić
Faculty of Natural Sciences, University of Beograd
M. R. Aleksić, B. Z. Stepančić and R. B. Žakula
Boris Kidrič Institute of Nuclear Sciences of Beograd

The processing of experimental data of angular distributions is made by the method of least squares. The expression for the angular distribution is given as

$$\sigma(E) = C(E)\left[1 + A(E)\cos^2\theta + B(E)\cos^4\theta\right] \qquad (1)$$

where the contribution of the p-protons is represented by the coefficient A, and f-protons by B. This is in agreement with the theory of Inglis and other authors [1,2].

In this experiment the distribution of α-particles is analysed with an incident beam of low-energy protons of 150, 300 and 600 keV. The experimental data used in order to determine the coefficients A, B and C of expression (1) are given in the table 1.

TABLE 1.

E_p[keV]	150	300	600
A^{exp}	0.969	0.639	1.660
A^{theor}	0.178	0.756	1.796
B^{exp}	-0.225	-0.185	0.045
B^{theor}	-0.044	-0.116	-0.326
C^{exp}	0.432 $\left(\frac{mb}{sr}\right)$	2.64 $\left(\frac{mb}{sr}\right)$	13.45 $\left(\frac{mb}{sr}\right)$

The coefficients A^{theor} and B^{theor} are calculated from the expression given in ref. [1].

Comparing the experimental and theoretical coefficients in the table it is obvious that a general agreement with the conclusions given in the ref. [1] takes place, being almost perfect at 300 keV. Nevertheless it has to be mentioned that the

experimental results slightly enhance the contribution of f-protons which has no counterpart in the theory. The experimental data in the table show a lack of monotony of the dependence of B with energy and does not allow an unambiguous conclusion concerning the proportionality of the cross section with the energy which could have been expected on the basis of ref.[1].

REFERNCES

1) D. R. Inglis, *Phys. Rev.* 74 (1948) 21.

2) Ch. L. Critchfield and E. Teller, *Phys. Rev.* 60 (1941) 10.