**STUDY OF THE 16O(α, α)16O(3–) AND 15N(α, *t*)16O(3–)**

**REACTIONS MECHANISM AT *E*α = 30.3 MeV**

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| *Cross sections of* (α, α′) *(a)* *and* (α, *t*) *(b) reactions: thin solid line – CC (stripping), dotted – exchange of 12С , dot-dash – CN, fat solid − sum, black dots* *– experiment* |

The study of the differential cross sections angular dependence of the reactions 16O(α, α′)16О(3–) [1] and 15N(α, *t*)16O(3–) [2] at *E*α = 30.3 MeV was carried out. Both magnitude and shape of the measured cross sections and large value of *E*3 transition between the ground and 3− level of 16O nucleus justify the use of CCBA formalism, when both couple channels method (CC) and DWBA are combined (FRESCO [3]) as well as the compound nucleus (CN) mechanism (TALYS [4]) in the theoretical analysis. The strength of coupling factors were introduced from the experimental reduced transition probability *B*(*E*3). The exchange of 12С cluster with summation over all states allowed by the selection rules for transfer mechanism at both reactions and proton stripping for the (α, *t*)-reaction were taking into account. The spectroscopic amplitudes are obtained in the shell model. The calculated angular distributions, together with the experimental ones, are shown in figs. It can be seen that in (α, α′)-scattering, the cross section is determined by collective excitation in the front hemisphere and by 12С exchange at large angles. The СN contribution is not noticeable. In the reaction (α, *t*), the main contribution is made by the CN mechanism, else the contribution of the proton stripping is noticeable at forward hemisphere. The 12C exchange mechanism is important at θ*t* > 90°. The performed analysis showed that the calculated cross sections of both reactions agree with the experimental one without introducing normalization factors only when all considered mechanisms are taken into account.

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