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THE CORRELATION CHARACTERISTICS OF $^{14}C(3^-$;6.73 MeV) NUCLEUS IN THE $^{13}C(d,p\gamma)^{14}C$ REACTION

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In [1] we have investigated the cross sections of the $^{13}C(d,p\gamma)^{14}C(3^-$; 6.73 MeV) reaction at E_d = 15.3 MeV. In this article the double-differential cross sections of the same reaction were measured for six proton emission angles on the SINP MSU 120-cm cyclotron. The angular correlation functions $W(_\gamma, \varphi_\gamma; _p)$ were measured at four planes of gamma-rays registration. It allowed to restore sixteen even $A_{k\kappa}(_p)$ components of density matrix spin-tensor of the final nucleus $^{14}C(3^-)$. The obtained $A_{k\kappa}(_p)$ were used to determine other $^{14}C(3^-)$ orientation characteristics: the populations $P(_p)$ of sublevels with the M projection of the 3^- spin, orientation tensors $t_{k\kappa}(_p)$ and polarization tensors $T_{k\kappa}(2 \leq k \leq 6)$.
Experimental data were compared with theoretical ones, obtained within the neutron stripping mechanism by the coupled-channel method (code FRESCO [2], dotted curves in fig. 1*a*, *b*, *c*) and for the compound nucleus statistical mechanism (code CNCOR [3], dash-dot curves).
Our model analysis of $^{14}C(3^-)$ orientation characteristics has revealed that neutron stripping mechanism are dominant mechanisms of $^{13}C(d,p)^{14}C(3^-)$ reaction.

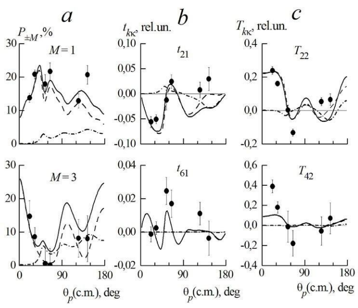

Figure 1: a –The populations P(θ_p) of sublevels 14C(3–) nucleus, b –orientation tensors t_kκ(θ_p), c - polarization tensor T_kκ(θ_p). Solid curve –the sum of the mechanisms examined

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2. http://www.fresko.org.uk/.
3. T.L.Belyaeva, N.S.Zelenskaya, et al. // Comp. Phys. Comm. 1992. V. 73. P. 161.

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