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CROSS-SECTIONS FOR THE 27Al(γ,2pn)24Na MULTIPARTICLE REACTION AT Eγmax = 31.5-100 MeV

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The possibility of using the photonuclear multiparticle reaction 27Al(γ,2pn)24Na (Eth = 31.4 MeV) as a monitor of the flux of γ-quanta with the bremsstrahlung end-point energies Eγmax up to 140 MeV was studied. The aluminum targets were activated by the bremsstrahlung beam at Eγmax = 30-100 MeV using the LUE-40 RDC "Accelerator"NSC KIPT. The γ-radiation spectra of the irradiated 27Al targets were registered using a semiconductor HPGe-detector with the 20% absolute efficiency and with the 1.8 keV energy resolution at the 1332.5keV γ-line of 60Co. The γ-line with Eγ = 1368.6 keV was used to obtain cross-sections <σ(E)> of the 27Al(γ,2pn)24Na reaction.
The experimental <σ(E)> results from [1-3] and the cross sections <σ(E)> estimated using the "photon difference"method showed a significant scatter of data near 0.2 mb. The experimental value of <σ(E)> found in the present work at the maximum of cross section of the reaction under study is near 0.2 mb and is consistent with the data [2,3]. The theoretical <σ(E)> value obtained with the TALYS 1.9 program code is 0.12 mb.

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Authors: Dr VODIN, A.N.; Dr OLEJNIK, S.N.; Dr DEIEV, O.S.; Dr TIMCHENKO, I.S.; Dr KACHAN, A.S.; Dr KORDA, L.P.; Dr KUPLENNIKOV, E.L.; Dr KUSHNIR, V.A.; Dr MITROCHENKO, V.V.; Dr PEREZHOGIN, S.A.; Dr PILIPENKO, N.N.

Presenter: Dr DEIEV, O.S.

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