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EXCITATION OF ISOMERIC STATES IN REACTIONS (γ,n) AND (n,2n) ON 81Br AND 86Sr

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Nuclear reactions with various bombarding particles serve as an important source of information both on the mechanisms of nuclear reactions and on the properties of the excited states of atomic nuclei.
This work presents work results of investigation of the isomeric yield ratios $Y_{\mathrm{m}}/Y_{\mathrm{g}}$ of the $^{86}\mathrm{S}(\gamma,\mathrm{n})^{85\mathrm{m,g}}\mathrm{Sr}$, $^{86}\mathrm{Sr}(\mathrm{n},2\mathrm{n})^{85\mathrm{m,g}}\mathrm{Sr}$, $^{81}\mathrm{Br}(\gamma,\mathrm{n})^{80\mathrm{m,g}}\mathrm{Br}$ and $^{81}\mathrm{Br}(\mathrm{n},2\mathrm{n})^{80\mathrm{m,g}}\mathrm{Br}$ reactions. The isomeric yield ratios were measured by the induced radioactivity method. Samples of natural Sr and Br have been irradiated in the bremsstrahlung beam of the betatron SB-50 in the energy range of $10 \div 35\mathrm{MeV}$ with energy step of 1 MeV. For 14 MeV neutron irradiation, we used the NG-150 neutron generator.
The gamma spectra reactions products were measured with a spectroscopic system consisting of HPGe detector CANBERRA with energy resolution of 1.8 keV at 1332 keV gamma ray of $^{60}\mathrm{Co}$, amplifier 2022 and multichannel analyzer 8192 connected to computer for data processing. The filling of the isomeric and ground levels was identified according to their γ lines. Values $Y_{\mathrm{m}}/Y_{\mathrm{g}}$ at $E_{\gamma,\mathrm{max}} = 30\mathrm{MeV}$ for the reaction (γ, n) on nuclei $^{81}\mathrm{Br}$ and $^{86}\mathrm{Sr}$ are respectively: 0.46 ± 0.02 and $0,56 \pm 0.04$. In the range $26 \div 35$ MeV the isomeric yield ratios Y_m/Y_g of the reaction (γ, n) on $^{81}\mathrm{Br}$ and $^{86}\mathrm{Sr}$, are obtained at first. Using the isomer yield ratio and the total cross section of the (γ, n) reaction on $^{81}\mathrm{Br}$ and $^{86}\mathrm{Sr}$ [1] received the cross sections of $(\gamma, n)^m$ and $(\gamma, n)^g$ reactions. The cross section isomeric ratios at $E_\gamma = E_{\mathrm{m}}$ are estimated.
The experimental results have been discussed, compared with those of other authors as well as considered by the statistical model [2]. Theoretical values of the isomeric yield ratios have been calculated by using code TALYS-1.6.

1. A.V. Varlamov et al. Atlas of GDR. INDS(NDS)-394.// Vienna: IAEA, 1999.
2. www.talys.ed

Authors: Prof. SAIMBAY, Palvanov; Mrs EGAMOVA, Feruza; Dr KAJUMOV, Maqsud; Mrs PALVANOVA, Gulnaza

Presenter: Prof. SAIMBAY, Palvanov

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