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Study of isomer ratio in (n,2n) and (γ ,n) reactions on the ^{198}Hg nucleus

The measurement and interpretation of isomeric ratios have provided information about the energy levels structure of nuclear systems and the angular momentum and reaction mechanism effects involved in the production of isomeric states in nuclei.

In the present work results of the investigation of the isomeric yield ratios Y_m/Y_g of the reaction $^{198}\text{Hg}(\gamma, n)^{197m,g}\text{Hg}$ and $^{198}\text{Hg}(n, 2n)^{197m,g}\text{Hg}$ are presented.

Samples of natural have been irradiated in the bremsstrahlung beam of the betatron SB-50 of the Institute of Applied Physics of the National University of Uzbekistan in the energy range of $12 \div 35 \text{ MeV}$ with an energy step of 1 MeV . For 14 MeV neutron irradiation we used the NG-150 neutron generator of the Institute of Nuclear Physics.

The gamma spectra reactions products were measured with a spectroscopic system consisting of HPGe detector CANBERRA with an energy resolution of 1.8 keV at 1332 keV gamma-ray of ^{60}Co , amplifier 2022, and multichannel analyzer 8192 connected to the computer for data processing.

The results are compared with the calculations made in the statistical Fermi-gas theory. The experimental results are in agreement with the calculated ratios for values of the spin cut-off parameter σ between 2 and 3.

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