

## Determination of the gamma-ray yields generated during the interaction of 14.1 MeV neutrons with Na, K and Cl nuclei by the tagged neutron method.

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In the frame of TANGRA-project at JINR-FLNP (Dubna) we measured the gamma-rays resulting from the inelastic scattering of 14.1 MeV neutrons on sodium (Na), potassium (K), and chlorine (Cl). As a source of 14.1-MeV “tagged” neutrons we used ING-27 portable neutron generator of VNIIA (Moscow) where the neutrons are produced in a d-t fusion nuclear reaction,  ${}^3\text{H}(\text{d},\text{n}){}^4\text{He}$ . The alpha-particles were registered by a 64-pixel Si charge particle detector embedded in ING-27 vacuum chamber.

The aim of this work is to estimate the gamma yields and to determine the neutron induced reaction cross-section for Na, Cl and K nuclei. The experimental data obtained by means of a HPGe detector were processed and analysed with CERN-ROOT modular scientific software toolkit. In this work, we set and performed such tasks as: determining the detector efficiency using calibration gamma-ray sources ( ${}^{137}\text{Cs}$ ,  ${}^{152}\text{Eu}$ ,  ${}^{60}\text{Co}$ ,  ${}^{228}\text{Th}$ ), using a coincidence window for the collected statistics, finding the full-energy absorption peaks, fitting a Gauss function to them, and determining the gamma-ray quantum outputs. The data obtained can be used for scientific, applied and methodological purposes.

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