

# MEASUREMENTS OF HIGH-ENERGY PART (7–20 MeV) OF BREMSSTRAHLUNG SPECTRA USING PHOTONUCLEAR REACTIONS

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The presented method is based on using threshold photonuclear ( $\gamma, n$ ) reactions [1]. Thin foils made of K, Sc, Ni, Cu, Ga, Ge, Br, Zr, Nb, Cr, Ta are used as irradiated materials [2].

Selection of employed materials was made by the next parameters: half-life period, threshold and cross-section of ( $\gamma, n$ ) reaction, decay probability of secondary isotope accompanied by  $\gamma$ -quantum emission, energy of decay  $\gamma$ -photons, and isotopic abundance of parent isotope.

Bremsstrahlung spectra measurements are conducted as follow. Thin foil assembly made of selected materials is installed in the bremsstrahlung beam. After irradiation ( $\gamma, n$ ) photonuclear reactions occur in the assembly leading to radioactive isotopes formation. This assembly is then installed in HPGe detector, which measures the  $\gamma$ -decays of radioactive isotopes. The magnitude of measured detector signal characterizes the amount of these isotopes formed in the irradiated assembly. Knowing the cross-sections of ( $\gamma, n$ ) reactions and assuming the shape of spectra we can restore the original spectra of bremsstrahlung bunch in energy region of ( $\gamma, n$ ) reactions from 7 to 20 MeV [3].

## References

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