

THE FIRST EXPERIMENTS AT $E = 180$ MEV ON THE ELECTRON BEAM OF THE LINAC-200 ACCELERATOR TO DETERMINE ISOMERS OF BISMUTH AND LEAD

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In the framework of the "Energy + Transmutation"[1] project, the experiments have been carried out at the LINAC-200 accelerator of JINR. The ^{209}Bi samples were irradiated in the field of bremsstrahlung radiation by the 180 MeV electrons. The bismuth was used as a converter to obtain the bremsstrahlung radiation, Figure 1. The gamma spectra of the ^{209}Bi activated samples were studied using HPGe detectors in a range from 40 to 3000 keV on the spectrometric complex at YASNAPP-LNP and LHEP JINR. The identification of the nuclei and their yields obtained in the ^{209}Bi sample as a result of the irradiation and were carried out under the periods of the half-life time and the ratio of the intensities of the gamma rays in the spectra as well as compared the results with literary data on the study of $^{209}\text{Bi}(\gamma, xn)$ reactions [2].

The yields of the bismuth nuclei obtained in (γ, xn) reactions at the electron energies $E = 60$ and 180 MeV are shown in Figure 1.

The yield of the isotopes with $A = 202$ for $E = 180$ MeV is up to more than ten times compared with the yield at $E = 60$ MeV, which makes it possible to effectively study the isomers and structure of the bismuth nuclei and lead with masses of A from 199 to 203.

Fig. 1. The relative yields of the (γ, xn) reactions in ^{209}Bi .

1. S.I. Tyutyunnikov, V.I. Stegailov et al., // "NUCLEUS-2020". St-Petersburg, 117-118 (2020).
2. S.S. Belyshev et al., // Eur. Phys. J. A 51, 67 (2015).

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