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The synchrotron, as a source of neutrons, has a number of advantages, in particular, the presence of a starting time mark. The high energy spectrum, up to energies of 1 GeV may be an advantage for measuring the cross-section of reactions with neutrons. The application of the PNPI synchrotron in the splice mode is described in detail in the article [1]. In this work, the experiment was conducted simultaneously with the experiment on GNEIS.
To estimate the neutron spectrum, several identical containers with a moderator and thin stainless foils were used as monitors. Three tanks measuring 200x300x400 mm with a volume of 24 liters were placed under the synchrotron chamber against the proton motion (to reduce the influence of the scattered proton beam on the experimental results) starting from the plumbum target. Else two containers were placed in the transverse direction. In the lower part of the containers, foils were fixed. After the irradiation, the activity was determined from the gamma spectra of the samples and the fluence was found by the formula:

\begin{equation}Fluence=\(\frac{IM_{N}eˆ{\frac{\ln 2}{T_{\frac{1}{2}}}t_{lag}}}{\text{mkσ}N_{A}(1 - eˆ{\frac{\ln 2}{T_{\frac{1}{2}}}t_{exp}})}\\en

I is the partial activity of the isotope in the monitor, M_N is the mass of the nucleus of the parent isotope in atomic mass units, $T_{1/2}$ –the half-life of the daughter isotope, t_{lag} –the measurement delay time after the synchrotron stops, t_{exp} –the time of irradiation of the sample in the neutron flux, m—the mass of the sample, k –the product of the content of the corresponding element and the percentage of the parent isotope in it, σ –the cross section of the reaction of the parent nucleus + neutron, NA –the number of Avogadro-neutron fields. The results of the experiment were compared with the numerical experiment. The coincidence of the real experiment and the numerical one can be considered satisfactory. The flux for the sample that registered the most "soft" spectrum was about 10^8 neutrons per second per cm^2.

1. Shcherbakov, O.A., Vorobyev, A.S. & Ivanov, E.M. Spallation neutron source GNEIS. Phys. Part. Nuclei 49, 81–83 (2018). https://doi.org/10.1134/S1063779618010355

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