

## REGISTRATION OF g-QUANTA FOR DETECTING $^{12}\text{B}$ AND $^{12}\text{N}$ - ACTIVITIES PRODUCED AT THE PULSED ELECTRON ACCELERATOR IN THE REACTIONS $^{13}\text{C}(\text{g}, \text{p})$ ; $^{14}\text{N}(\text{g}, 2\text{p})$ ; $^{14}\text{N}(\text{g}, 2\text{n})$

*Saturday, 25 September 2021 16:45 (25 minutes)*

Studies of the cross-sections and yields of photonuclear reactions with production of  $^{12}\text{B}$  ( $T_{1/2} = 20.2$  ms) and  $^{12}\text{N}$  ( $T_{1/2} = 11.0$  ms) are interesting both for development of ideas about nuclear reactions with nuclei-products near the boundaries of stability to nucleon-emission, and for detection of hidden explosives and drugs (see, e.g., [1]) with registration of  $^{12}\text{B}$ - and  $^{12}\text{N}$ - activities.

In [2, 3] there were considered features of emission of g- quanta, electrons and positrons from targets at decays of produced in them  $^{12}\text{B}$ - and  $^{12}\text{N}$ - nuclei.

In [4] for the reactions  $^{13}\text{C}(\text{g}, \text{p})$ ,  $^{14}\text{N}(\text{g}, 2\text{p})$ ,  $^{14}\text{N}(\text{g}, 2\text{n})$ , there was given analysis of known experimental and model-calculated data (including our own calculated by the widely used models of nuclear reactions). It was shown that new yield measurements are necessary for these reactions because estimated discrepancies of data are on the level of at least one order of magnitude. In [5] there were considered two variants of such experiments with measuring activities of  $^{12}\text{B}$  and  $^{12}\text{N}$  with registration of emitted b- particles or g- quanta.

In the present work we considered measuring of  $^{12}\text{B}$ - and  $^{12}\text{N}$ - activities at the pulsed electron accelerator based on registration of emitted from the target g- quanta by two NaI-spectrometers (length 100 mm, diameter 150 mm) with usage of the controlled dividers of power supply for the photomultiplier tubes of both scintillation spectrometers [6].

1. L.Z. Dzhilavyan. Phys. Part. Nucl. No 5, 556 (2019).
2. S.S. Belyshev, L.Z. Dzhilavyan, et al., Bull. Russ. Acad. Sci.: Phys. 80, 566 (2016).
3. S.S. Belyshev, et al., Bull. Russ. Acad. Sci.: Phys. 83, 449 (2019).
4. O.I. Achakovskiy, et al., Bull. Russ. Acad. Sci.: Phys. 80, 572 (2016).
5. L.Z. Dzhilavyan. About yield measuring for the reactions  $^{14}\text{N}(\text{g}, 2\text{n})$   $^{12}\text{N}$  and  $^{14}\text{N}(\text{g}, 2\text{p})$   $^{12}\text{B}$ . Poster Reports of
6. L.Z. Dzhilavyan, et al., Bull. Russ. Acad. Sci. Phys. 83, 474 (2019).

**Primary author:** DZHILAVYAN L.Z. 1 (Institute for Nuclear Research of the Russian Academy of Sciences, Moscow, Russia)

**Co-author:** BELYSHEV S.S. 2

**Presenter:** DZHILAVYAN L.Z. 1 (Institute for Nuclear Research of the Russian Academy of Sciences, Moscow, Russia)

**Session Classification:** Section 2. Experimental and theoretical studies of nuclear reactions

**Track Classification:** Section 2. Experimental and theoretical studies of nuclear reactions.