Contribution ID: **381** Type: **Oral report**

REGISTRATION OF DELAYED NEUTRONS FROM 238U PHOTOFISSION AT E max 10 MeV IN INTERVALS OF ~ (1 5) ms AFTER BEAM PULSES OF THE ELECTRON ACCELERATOR

Wednesday 14 October 2020 17:00 (25 minutes)

Studies of production and properties of nuclei near the stability boundary with respect to neutron emission are an important part of modern nuclear spectroscopy (see, e.g., [1]). In fission of actinide nuclei, neutron-rich nuclei are produced (especially in short-lived light fragments formed in asymmetric fission at low energies of bombarding particles). In small part of beta-decays of these fragments-precursors (with values of their half-lives T1/2) highly excited states of daughter-nuclei are populated, for which in some cases it may be possible to emit delayed neutrons. Usually, for convenience of description, several groups of nuclei-precursors are introduced according to their T1/2 values of which until now have been not less than 0.2 s [2, 3]. But for an adequate description of critical systems (e.g., their reactivity) it is very important to look for precursors with T1/2 down to ~1 ms [3].
In our previous work [4] the measurement was performed from 4.5 ms after the beam pulse. And it seemed that for photofission of 238U at Eg max about 10 MeV there is indication for existence of short-lived nuclei-precursors with T1/2 ~ 1 ms. In the present work we continued studies in this direction.
Measurements were made at the pulsed linear electron accelerator LUE-8-5 of the INR RAS [5] at the energy of incident electrons Ee about 10 MeV and beam repetition rate 100 Hz. The scintillation fast neutron spectrometer with pulse shape discrimination of background g-quanta (see [6] and references therein) was used. The controlled divider of photomultiplier tube of the scintillation detector [7] had to be used to decrease negative influence of big light output near the beam pulse time. Delayed neutrons and g-quanta were registered in interval from 1.5 ms after beam pulse to 9 ms with average beam currents about 16 nA.
The statistical uncertainties of the data, obtained so far in this way, do not allow us to distinguish existence of nuclei-precursors of delayed neutrons with T1/2 ~ 1 ms.

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

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