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#04-158 Fragment production in 200MeV proton reaction on ^{232}Th , experimental and simulated data.

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This paper shows the results from the experiment at Joint Institute for Nuclear Research in Dubna and was carried out in 2014. The sample, using a special device, were placed in the accelerator chamber at a radius corresponding to the energy of protons 200 MeV at the current of 0.3 A. The position of the 200 MeV beam was determined by placing an aluminium foil inside the accelerator and perpendicular to the proton beam and evaluating the activity of the foil. For the target, foils of Th^{232} were used with a thickness of 100 microns and a weight of 149.5 mg placed between two Al foils with thickness of 50 μm . The foil area was 1.5 cm^2 . After target irradiation, foils were removed from the device and moved to YSNAPP-2 complex where was separately measured the spectra of radiation from the Th and Al foils by HPGe detectors of the CANBERRA company with efficiency 18% and resolution of 1.9 keV in the line 1332 keV. The processing of the gamma spectra was carried out using the DEIMOS32 program to find positions of peaks, their areas and other parameters. The identification of the nuclei formed in Th^{232} samples as a result of nuclear reactions with protons and their reaction rates was carried out using a set of scripts based on the Ruby programming language. For modelling of the experiment MCNP 6.1 was used. The main purpose was to simulate creation of parent residual nuclei during proton irradiation, their distribution and escaping from the Th foil and calculate the cross-section of the residual nuclei. The experimental data on the fragmentation of the Th^{232} nucleus under the influence of protons in the energy of 200 MeV have been processed. As a result we compared the calculated and simulated results, found residual nuclei and their cross-sections.

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