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DATA ANALYSIS FROM CATCHER FOIL EXPERIMENT FOR CROSS SECTIONS MESUREMENT OF 40Ar + 144Sm REACTION

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Cross sections from the complete fusion reaction of 40Ar + 144Sm were measured by the catcher foil method [1] (on the U400M cyclotron at the Flerov Laboratory of Nuclear Reactions). The catchers were made out of five aluminum foils (0.8 μm thick) stacked downstream from the target. The experiment was carried out in repetitive short cycles (10 s). The foils were periodically moved from the beam position to the detector position. Data from the detector were analyzed to obtain α-spectra of implanted isotopes. A new method of data analysis was proposed in the work taking into account TRIM [2],[3] and Geant4 [4]Monte-Carlo simulations for alpha spectra, PACE4 [5]fusion-evaporation code for residual nuclei energy distribution, Couple channel method calculation [6] for theoretical cross sections and SRIM [3] evaluation of produced isotopes stopping ranges. Using this method the 1pxn, 2pxn and 1αxn complete-fusion excitation functions are presented.

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