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Energy Distributions and Absolute Yields Measurements of the Long-Range Alpha Particles and the Tritons in Thermal Neutron-Induced Ternary Fission of 235U Using a Twin-Gridded Ionization Chamber

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The energy distributions and absolute yields of the long-range alpha particles and the tritons in thermal neutron induced ternary fission of 235U were measured using a twin-gridded ionization chamber. The experimental result shows that the long-range alpha particles and the tritons can be separated obviously in the cathode amplitude vs anode amplitude two-dimensional spectrum, and the absolute yield of the long-range alpha particles can be obtained accurately by selecting the event region, and the yield is (1.84 ± 0.10) × 10-3. For the tritons, the tritons can be distinguished from the long-range alpha particles in the anode amplitude vs anode rime time two-dimensional spectrum, but the yield of the tritons needs to be corrected after considering the influence of the long-range alpha particles. The absolute yield of the tritons is (1.13 ± 0.06) × 10-4. The energy distributions of the long-range alpha particles and the tritons were determined by adjusting the mean energy and the FWHM of these particles to make sure that the simulated energy distributions are in good agreement with the experimental result. These results are discussed and compared with previous data.

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