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In-beam γ-ray spectroscopy of a neutron-rich nucleus of ^{240}U T. ISHII, M. ASAI, M. MATSUDA, S. ICHIKAWA, Japan Atomic Energy Research Institute, S. SHIGEMATSU, J. KANEKO, T. KOHNO, M. OGAWA, Tokyo Institute of Technology, A. MAKISHIMA, National Defense Medical College, I. HOSSAIN, Seoul National University — We have measured deexcitation γ rays in a neutron-rich nucleus of ^{240}U for the first time. The ^{240}U nuclei were produced by the two-neutron-transfer reaction of a 200-MeV ^{18}O beam with a ^{238}U target at the JAERI tandem booster facility. Outgoing nuclei and γ rays were measured using 4 Si ΔE-E detectors and 7 Ge detectors, respectively, and ΔE-E-γ-(γ)-t coincidence data were recorded. The outgoing nuclei were clearly separated not only by the atomic number but by the mass number on the E-ΔE plots. The γ rays in ^{240}U were identified by taking coincidence with ^{16}O; the excitation energies of ^{240}U were selected below the neutron separation energy by the kinetic energies of ^{16}O. The multipolarities of γ-rays in ^{240}U were determined by the in-plane to out-of-plane anisotropies of γ rays. The ground-state band and the $K^\pi = 0^-$ octupole band of ^{240}U were established up to 12^+ and 9^-, respectively. The moment of inertia for the ground-state band of ^{240}U is consistent with the systematics of β_2 and β_4 deformations in actinide nuclei. The octupole-band head of ^{240}U is higher than those of ^{236,238}U by about a hundred keV, suggesting that a secondary maximum of octupole correlations exists at $N = 144 - 146$ in U isotopes.

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