Structure of neutron-rich Zr and Mo isotopes

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Neutron-rich isotopes in the vicinity of ^{110}Zr have attracted much attention, because a shape transition to oblate or triaxial and a tetrahedral-shape isomer may be observed.[1)] The decay spectroscopy of the Zr and Mo isotopes was performed at RIBF at RIKEN Nishina Center to extend the previous experiment[1)] to more neutron-rich region. The neutron-rich nuclei were produced by the in-flight-fission reaction of ^{238}U beam at 345 MeV/u in a 3-mm-thick Be target, and implanted into the double-sided silicon-strip detectors (WAS3ABi), which were placed at the center of the high-purity-germanium detector array (EURICA).[2)] A fast-timing $LaBr_3$(Ce) array was combined with EURICA for a half-life measurement of excited states.

Figure 1 shows the particle-identification (PID) plot of the radioactive-isotope (RI) beam separated by the BigRIPS separator. The β-γ spectroscopy of ^{102,104}Y, and ^{106}Nb was performed individually by using a high-purity-beam setting. Figure 2 shows the PID spectrum of ^{102}Y setting. The purity of ^{102}Y was 46%. A preliminary result of the half-life measurement for ^{102,104}Zr using the fast timing array is given in another report.[3)] The beam setting shown in Fig. 3 is used to search for an isomeric state in ^{110}Mo using a passive Cu stopper. Further analysis is in progress.

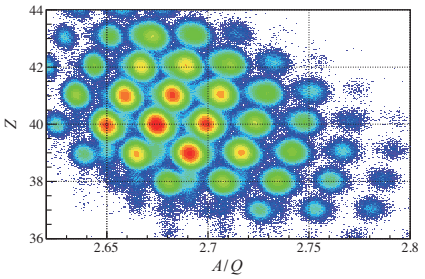

Fig. 1. PID plot of the atomic number Z and the mass to charge ratio A/Q. A wider and more-neutron-rich region than Figs. 2 and 3 was selected by the BigRIPS separator.

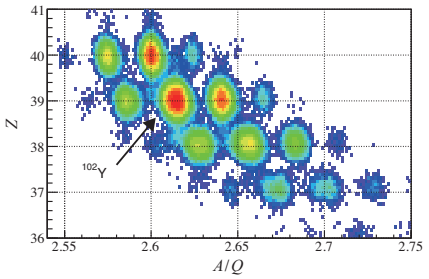

Fig. 2. PID plot of a high-purity-beam setting for the spectroscopic study of β decay from ^{102}Y.

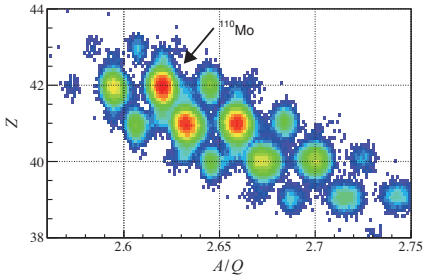

Fig. 3. PID plot of a high-purity-beam setting to search for an isomeric state in ^{110}Mo.

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