

Comparison of production yields of neutron-rich nuclei between Be and W targets by in-flight fission of ^{238}U beam

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We have measured production yields by the in-flight fission of a ^{238}U beam at 345 MeV/nucleon with a Be target and a W target, and investigated the suitability of the targets for the production of neutron-rich nuclei with atomic numbers Z ranging from 57 to 69. The isotopes were produced and identified using the BigRIPS separator. Particles were identified by the $B\rho$ -TOF- ΔE method to determine Z and the mass-to-charge ratio A/Q .

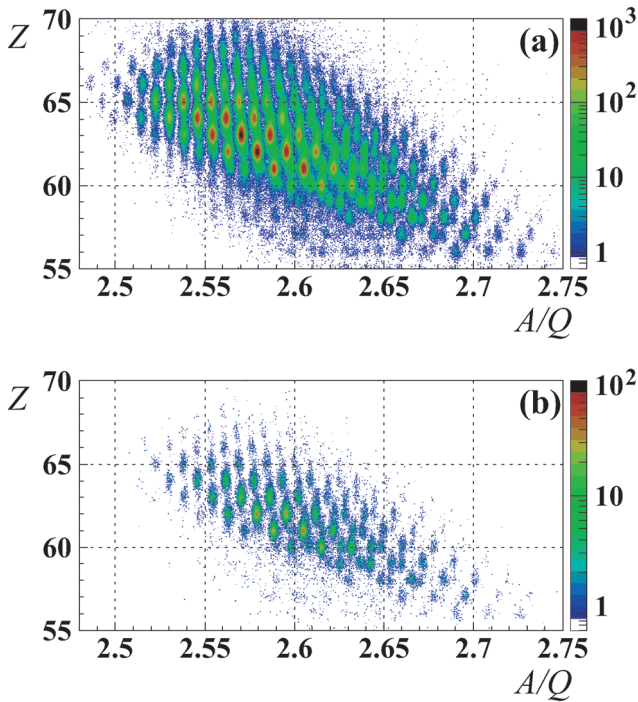


Fig. 1. Particle identification plot of Z versus A/Q obtained with (a) the Be target and (b) the W target.

The target thicknesses were 5 and 0.7 mm for the Be and W targets, respectively; these thickness were energy-loss equivalent. The BigRIPS setting was the same as the ^{168}Gd setting in the new-isotope-search experiment.¹⁾ The total rates were 79.9 counts/particle nA and 51.5 counts/particle nA for the Be and W targets, respectively. Figure 1 shows the Z versus A/Q plots for the Be and W targets. The resolutions of A/Q and Z are typically 0.045% and 0.45%, respectively. Figure 2 shows the production yield for each target. The squares and circles show the experimental data obtained with the Be and W targets, respectively. The result indicate that the production yield with the Be target is larger than that with the W target in the region where $Z > 62$.

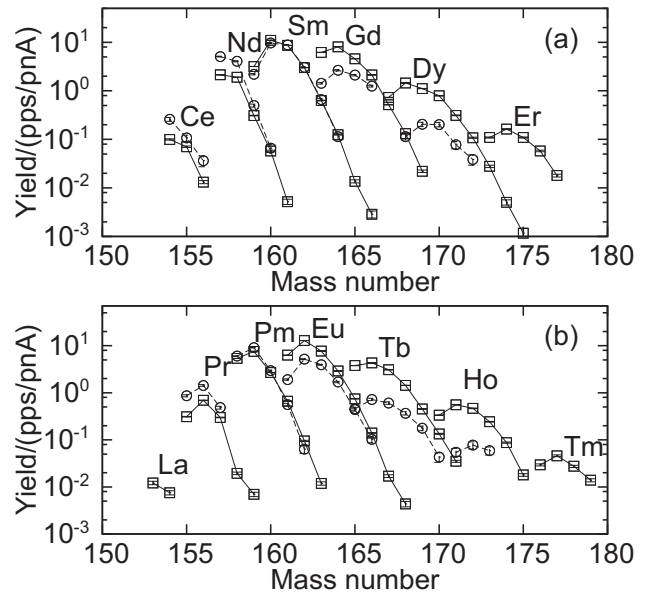


Fig. 2. Measured production yields with the Be (squares) and W (circles) targets. (a) Results for even- Z isotopes. (b) Results for odd- Z isotopes.

The transmission of the BigRIPS separator is not taken into consideration in these results. We are proceeding with the analysis to deduce the production cross sections.

References

- 1) D. Kameda et al.: RIKEN Accel. Prog. Rep. **45**, 117 (2012).

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