

Development of rotating beryllium disk stripper

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High-intensity uranium (U) ion beams are successfully provided at the RIKEN RI Beam Factory (RIBF). A pair of charge-stripping devices to strip U-ion beams are installed during the multi-stage acceleration at RIBF. Carbon Nano Tube-sputter deposited carbon (CNT-SDC) foil^[1], which was utilized as the first charge stripping device, was replaced by the He gas stripping system^[2] in 2012 because the lifetime was shortened by increasing U beam intensity. A static type carbon foil (C-foil) with a thickness of 0.085 mm^t (17 mg/cm²) was used as the second charge-stripping device. However, similarly in the case of the first charge stripper, the C-foil lifetimes became shorter and it had to be replaced by a long-lived alternative in 2011. We tried to extend C-foil lifetimes by increasing irradiated area using a rotating large Carbon disk (C-disk) stripper device in 2006^[3]. However, no commercially available C-disk with 0.085 mm^t met our requirements for practical use in terms of high density and tolerable thickness deviation. In 2012, we tested a beryllium (Be) disk (0.1 mm^t, diameter=120mm) as the second charge-stripping device instead of C-disk. Since fairly good results were obtained, the Be disk was used for the beam-time operation. In 2013, we found that a specially polished Be disk with 0.085 mm^{t[4]} was best for energy matching of subsequent cyclotron and almost no fluctuation of the beam intensity attributed to thickness deviation was observed. This presentation reports a series of developments of the Be disk.

References

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