The Beijing Radioactive ion beam facility Isotope Separator On-Line (BRISOL) is a radioactive ion beam facility based on a 100MeV cyclotron providing 100pA proton beam bombarding the thick target to producing radioactive nuclei, which is transferred into ion source to producing singly ion beam. The CaO and MgO target were tested on line. The first radioactive ion beam of $^{38}\text{K}^+$ was produced by bombarding CaO target by 100MeV proton beam. The first experiment with RIB ($^{20}\text{Na}^+$) is carrying out. The test and the current status of the BRISOL will be presented in this paper.

1 Introduction

The Beijing Radioactive Ion-Beam Facility (BRIF) has been constructed at China Institute of Atomic Energy (CIAE). This project consists of a 100 MeV high intensity cyclotron, an ISOL system (BRISOL), and a superconducting booster.

2 The target station

The target station adopts modularization design to overcome the maintenance of the high activation target. The modules can be taken out of the vacuum chamber and delivered to hot cell for maintenance by a overhead crane and vice versa. The vacuum, gas and electronic can be disconnected automatically when the module is pulled out from vacuum chamber remotely.

3 The separator of BRISOL

BRISOL separator consists two stages of separator. The first stage of separator consists two 90° dipole magnets on 300kV high voltage platform, and the second stage separator consists two large dipole magnets ($\rho=2.5\text{m, }\beta=100$) on ground potential. Surface coils ($\beta, \gamma$) were set on the magnets. The measured mass resolution is 24,460.

4 The first radioactive ion beam of BRISOL

The first radioactive beams ($^{38}\text{K}, ^{42}\text{K}$, etc.) were produced by bombarding CaO target with 100MeV proton beam from cyclotron. The production of $^{38}\text{K}^+$ is $1E+6$ pps with surface ion source.

5 The first experiment with radioactive ion beam of BRISOL

The first physical experiment with RIB ($^{20}\text{Na}^+, 125\text{keV}$) is carrying out at the RIB experimental hall. A new forced electron beam induced discharge (FEBIAD) type ion source was developed to produce more radioactive beam other than alkaline ions, and the beam of $^{20}\text{Na}^+, ^{21}\text{Na}^+, ^{23}\text{Ne}^+$ etc.) were generated by bombarding MgO target with 100MeV proton beam. The production of $^{20}\text{Na}^+$ beam is 1700ppps (not optimized), and the production of $^{21}\text{Na}^+$ beam is $2.5E+4$pps when the primary beam($\text{H}^+$) is $3\mu\text{A}$.

6 Future developments

Due to the first radioactive beams ($^{38}\text{K}, ^{20}\text{Na}^+, ^{21}\text{Na}^+, ^{23}\text{Ne}^+$ etc.) were produced, the commissioning of BRISOL is successful. Future tests will be carried out to optimize the charge exchange efficiency and R&D programme on the ion source will be under way to enhance the production yields. The production of $1E+8$pps for $^{38}\text{K}^+$ beam is promising by the increasing of primary beam up to 50\muA. And also other target, such as SiC, UCx, will be under development to produce more radioactive beam.