Abstract

Rare Isotope Science Project of Institute for Basic Science

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A big picture was drawn for promoting basic science in Korea with name of International Science Business Belt (ISBB) by Korean Government in 2009. Thereafter a new world-class research organization in the ISBB, Institute for Basic Science (IBS) was created to provide a creative research environment for basic science in Korea. Rare Isotope Science Project (RISP) was launched at the end of 2011 with the budget of about 0.4 B$ for the construction of a heavy ion accelerator complex as a key research facility of IBS. At that time, the budget was only for constructing accelerators and experimental devices, but in the middle of 2014, the budget of about 1.44 B$ in total was finalized for the full construction of the facility, including civil engineering and conventional facilities as well as accelerators and experimental apparatus.

The goal of the accelerator complex is to produce variety of stable and rare isotope beams to be used for researches in basic science and various applications. The complex, named RAON meaning joyful and happy in Korean, consists of a heavy ion superconducting linear accelerator as the driver for In-flight (IF) fragmentation system, a proton cyclotron as the driver for the Isotope Separator On Line (ISOL) system and post-accelerator for the ISOL system. The ISOL and the IF system can be operated separately and independently. In addition, the rare isotopes produced in ISOL can be injected into the driver linac for accelerating the RI beam even higher energies or for use in IF system to produce even more exotic rare isotopes. RAON has a unique feature of having both ISOL and IF system for the production of isotope beams. High intensity rare isotope beams provide opportunities for a wide range of basic science researches and applications.

Prototyping of major accelerator components has been almost finished and their test is going on. Prototyping of experimental systems are mainly performed for light components like detectors. The present status and prospect of RISP will be introduced.