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The production of the first fission nuclear radioactive beam of BRISOL facility

The Beijing Radioactive ion beam facility Isotope Separator On-Line（BRISOL）is a radioactive ion beam facility based on a 100MeV cyclotron providing 200μA proton beam bombarding the thick target to produce radioactive nuclei, which are transferred into an ion source to produce singly charged ion beams. A surface ion source had been developed for BRISOL, and the first radioactive beams (37K+, 38K+, 42K+, etc.) were produced by bombarding a CaO target with a 100MeV proton beam from the cyclotron in 2015. A FEBIAD ion source with MgO target are successful used to the first physics experiments, including the decay study of 20Na with the energy of 110keV and the elastic scattering study of 21Na and 22Na beams, post-accelerated by a 13MV tandem. The refractory carbide targets such as SiC, LaC2 and UC2 are also developing for more radioactive beams. The first online test of SiC target has been completed recently, and radioactivity beams of 25Al, 26Al, and 28Al were produced. The radioactive nuclear beams of rubidium and cesium were generated using uranium carbide targets and used to study the decay characteristics of neutron rich beams. The details of the development of BRISOL facility and the online experimental results will be presented in this paper.

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