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The new Batch Mode Ion Source (BMIS) for stand-alone operation of the ReA reaccelerator at the Facility for Rare Isotope Beams (FRIB)

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The reaccelerator ReA at FRIB has been used for a successful science program with rare isotopes produced by projectile fragmentation. In the transition of the FRIB laboratory from providing rare isotopes from the National Superconducting Cyclotron Laboratory's Coupled Cyclotron Facility to full FRIB operation with its high-power superconducting linear accelerator and new rare isotope production facilities, a stand-alone capability for long-lived and stable isotopes has been added to ReA operation. A Batch Mode Ion Source (BMIS) has been built largely following the designs and concepts developed and employed at ISOLDE/CERN. BMIS consists of an oven, where rare isotopes with relatively long lifetimes are placed, coupled to an oven ion-source (OIS) system mounted to a front-end with optics elements for beam transport. ISOLDE target modules with a VADIS ion source are being used for the OIS. With the OIS biased at the maximum of 60 kV, ion beams are extracted and delivered to the stopped-beam area and the Electron Ion Beam Trap (EBIT) of the ReA facility. At present BMIS has been used to successfully produce and deliver stable and rare isotopic beams of 10Be, 7Be, 32Si, 26Al, 58Fe, 86Kr, 120Sn, and 50Cr for experiments. This contribution describes BMIS, how the desired rare isotopes were produced, and how the delivered beam was purified and identified with techniques involving the ReA linac.

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