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Production and Separation of Exotic Beams via Fragmentation Reactions Using MARS[1] KENNETH WHITMORE, William Jewell College, R.E. TRIBBLE, B.T. ROEDER, L. TRACHE, Texas A&M University — Radioactive nuclei away from the valley of stability are important in the study of nuclear astrophysical reactions. Because such nuclei cannot be found in nature, they must be produced in the lab in order to be studied. The Momentum Achromat Recoil Spectrometer (MARS) at Texas A&M University is able to produce beams of radioactive nuclei and separate them from other products based on their charge, mass, and energy. Fragmentation reactions can produce a wider range of exotic beams at higher energies than other reaction mechanisms at lower energies. Reaction products from three different fragmentation reactions are studied, and production rates for various nuclei are determined and compared to predictions made by the simulation program LISE++. Production rate is related to the cross section, the kinematics and other particulars of a given reaction, and it is important to know how well the simulation can predict these rates. Work presented includes data from reactions with ^{36}Ar at 45 MeV/u, ^{40}Ar at 40 MeV/u, and ^{24}Mg at 48 MeV/u, all on a ^{9}Be target. These are the first fragmentation reactions to be studied with MARS.

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