

Abstract Submitted
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Study of the $^{10}\text{B}(\text{p},\alpha)$ and $^{10}\text{B}(\text{p},\gamma)$ reactions A. KAFKARKOU, Duke University, TUNL, M.W. AHMED, Duke University, TUNL, North Carolina Central University, R.H. FRANCE III, Georgia College and State University, H.J. KARWOWSKI, TUNL, University of North Carolina - Chapel Hill, D.P. KENDELLEN, Duke University, TUNL, I. MAZUMDAR, Tata Institute of Fundamental Research, J.M. MUELLER, L.S. MYERS, Duke University, TUNL, R.M. PRIOR, University of North Georgia, M.H. SIKORA, TUNL, George Washington University, M.C. SPRAKER, University of North Georgia, H.R. WELLER, Duke University, TUNL, W.R. ZIMMERMAN, TUNL, University of Connecticut — The cross sections of the $^{10}\text{B}(\text{p},\alpha)^7\text{Be}$ and $^{10}\text{B}(\text{p},\gamma)^{11}\text{C}$ reactions have been measured for bombarding proton energies between 2.0 and 6.0 MeV. The experiments were performed at Triangle Universities Nuclear Laboratory using a 10 MV FN Tandem accelerator. These reactions are relevant to potential next-generation nuclear reactors which propose to use boron as a fuel. For the $^{10}\text{B}(\text{p},\alpha)^7\text{Be}$ reaction, the differential cross section was measured at seven laboratory angles with 100 keV steps. A Legendre polynomial analysis was performed to extract the total cross sections and astrophysical S-factors. Final results will be presented. The $^{10}\text{B}(\text{p},\gamma)^{11}\text{C}$ reaction has never been studied for energies above 2 MeV. For this reaction, a ^{10}B target was irradiated with protons with 500 keV steps for one hour (~ 3 ^{11}C half-lives) at each energy. After the irradiation, the 511 keV γ -rays from the β^+ decay of ^{11}C were detected in coincidence using two LaBr_3 detectors for another one hour. From these data the total cross section can be determined and preliminary results will be presented.

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