

Structural Evolution in the Neutron Rich-Nucleus $^{14}\text{B}^\dagger$

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We have studied ^{14}B employing two complementary reactions: $^{13}\text{B}(d,p)^{14}\text{B}$ and $^{15}\text{C}(d,^3\text{He})^{14}\text{B}$. Both measurements were conducted in inverse kinematics using HELIOS at the ATLAS facility at ANL. The radioactive ^{13}B and ^{15}C beams were produced using the In-Flight method. The light particles (p and ^3He) were analyzed with HELIOS. The beam-like $^{13,14}\text{B}$ ions were identified in a set of silicon ΔE - E telescope, distinguishing bound and unbound states in ^{14}B . From the $^{13}\text{B}(d, p)^{14}\text{B}$ measurement the excitation energies and spectroscopic factors for the low-lying $(2_1, 1_1, 3_1, 4_1)^-$ states were extracted. The proton removal measurement explores only the states with $1s_{1/2}$ strength in ^{14}B ; the results provide a determination of 2_2^- energy level. The data from both measurements lead to a determination of the $1s_{1/2}$ and $0d_{5/2}$ effective single-particle energies in ^{14}B .

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