

$^2\text{H}(^{15}\text{C},\alpha)$ **2014Wu10**

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	J. H. Kelley, C. G. Sheu and J. E. Purcell		NDS 198,1 (2024)	1-Aug-2024

2014Wu10: XUNDL dataset compiled by TUNL, 2015.

The authors used the highly spin selective (d, α) deuteron transfer reaction to study states with “stretched” nuclear configurations. A beam of 15.7 MeV/nucleon ^{15}C ions was produced using the $^2\text{H}(^{14}\text{C},^{15}\text{C})$ reaction at the ANL/ATLAS In-Flight production facility. The beam impinged on $145\text{ }\mu\text{g}/\text{cm}^2$ $(\text{Cd}_2)_n$ polyethylene foils located at the HELical Orbit Spectrometer (HELIOS) target position. The kinematics of α particles from (d, α) reactions were determined from analysis of the HELIOS array data, while recoiling boron isotopes were detected in an array of position sensitive Si detectors that covered $\theta_{\text{lab}}=1.0^\circ\text{--}5.6^\circ$ for 92% of the azimuthal angle range. The resolution for excitation energy was found as $\approx 240\text{ keV}$ FWHM.

The reaction data were analyzed for α -particles in coincidence with any boron isotope; this gave access to population of bound states, as well as, 1-n and 2-n unbound states.

 ^{13}B Levels

E(level)	J^π	L	Comments
0	$3/2^-$		J^π : From Adopted Levels.
3.6×10^3			E(level): three states have previously been observed at $E_x=3.53, 3.68$ and 3.71 MeV .
10.0×10^3			
11.7×10^3	$(5/2, 7/2)^+{}^\dagger$	$(2)^\dagger$	
12.2×10^3	$(5/2, 7/2)^+{}^\dagger$	$(2)^\dagger$	

† For 11.7- and 12.2-MeV doublet. Comparison of the angular distribution of the $E_x\approx 12\text{ MeV}$ group with the $^2\text{H}(^{14}\text{C},\alpha)^{12}\text{B}^*(5.61, J^\pi=3^+)$ suggests this doublet results from the coupling of a $1s_{1/2}$ neutron to an aligned $[(0p_{3/2})^{-2}]_{3+}$ configuration in ^{12}B .