^{14}C(d,^{3}He) 2016Be08

History

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

1975Ma41: ^{14}C(d,^{3}He) E=52 MeV from Karlshuhe Cyclotron; measured σ(E(^{3}He),θ) for θ=10° to 40° using four ΔE-E telescopes. Deduced levels at ^{13}B(0, 3.71 MeV) with C^{2}S=3.75 and 0.29, respectively. DWBA analysis. Self supporting 40% enriched ^{14}C 30 μg/cm^2 target. See reanalysis of these data and discussion on the ANC for ^{14}C→^{13}B+p in (2022Ke03).

2016Be08: XUNDL dataset compiled by TUNL (2016).

The authors analyzed the angular distributions of ^{3}He particles from the ^{14}C(d,^{3}He)^{13}B proton-removal reaction, in inverse kinematics, to study the J^{π} values of ^{13}B states involved in the reaction.

A beam of 17.1 MeV/nucleon ^{14}C ions with the intensity of ≈0.1 pnA, produced in the sputter source at the ANL/ATLAS facility, impinged on 140 μg/cm^2(Cd$_2$)$_n$ polyethylene foils located at the HELIcal Orbit Spectrometer (HELIOS) target position. The kinematics of ^{3}He particles from (d,^{3}He) reactions were determined from analysis of the HELIOS array data, while recoiling boron isotopes were detected in set of silicon detector ΔE-E telescopes that covered θ_{lab}=1°−5°. The resolution for excitation energies was found as FWHM≈180 keV. Angular distributions were analyzed via DWBA to obtain L, J^{π} and C^{2}S values.

The ^{3}He particle reaction data were analyzed in coincidence with any boron isotope to give access to population of unbound states.

^{13}B Levels

E(level)†	J$^{\pi}$†	L†	C^{2}S†	Comments
0	3/2$^-$	1	2.80 *30*	C^{2}S: See also C^{2}S=3.75 (1975Ma41).
3.8×10^3	(1/2$^-$)	1	0.70 *8*	C^{2}S: See also C^{2}S=0.29 (1975Ma41).
4.8×10^3 *2*	(1/2$^+$)	0	0.13 *2*	
5.3×10^3 *3*	(1/2,3/2)$^-$	1	0.35 *6*	
6.3×10^3 *4*	$^+$	(0)		E(level): This peak likely contains more than one unresolved state (2016Be08).

† From DWBA analysis of spectroscopic factors in (2016Be08).