^{1}H(^{11}C,P):res 2006Pe21

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. H. Kelley, J. E. Purcell and C. G. Sheu	NP A968, 71 (2017)	1-Jan-2017

2003Ku36,2003Te01,2003Te09,2003Te12: A beam of 3.5 MeV/nucleon ^{11}C from the RIKEN/CRIB facility impinged on a thick CH_2 target. Scattered protons recoiled out of the target and were detected along θ=0°. The data were analyzed using standard Thick Target Inverse Kinematics (TTIK) scattering techniques.

2006Pe21: XUNDL dataset compiled by McMaster, 2006.

Beam=$^{11}CO_2$, hydrogen targets=$(CH_2)_n$ (polyethylene) and CH_4 (gas).

Two different experiments on ^{11}C+p resonance scattering were carried out:

1. The Berkeley/Bears facility produced a molecular $^{11}CO_2$ beam, via the ^{14}N(p,α) reaction, which was injected into the Berkeley 88-inch cyclotron. ^{11}C beams with 90 MeV and 125 MeV were separately extracted. The 90 MeV beam was degraded to 73.8 MeV and scattered on a CH_2 target to populate ^{12}N resonant states with $E_x \approx 2.2$-6.6 MeV; the 125 MeV beam was used to populate resonant states with $E_x \approx 6.5$-11 MeV. A ΔE-E silicon detector detect scattered protons at $\theta_{lab} \approx 0°$, 5° and 10°. The excitation function was obtained via standard Thick Target Inverse Kinematics (TTIK) techniques.
2. A 99.8 MeV ^{11}C beam was produced via ^{1}H(^{11}B,^{11}C) reactions at the Texas A&M/MARS facility. The beam impinged on a (CH_4) gas filled chamber. Four detector telescopes at θ=0°, 12.5°, 11.5° and 16.5° detected scattered protons. The detector resolution was about 50 keV, the absolute calibrations were better than 25 keV. The excitation function was deduced, via TTIK, for $E_x \approx 2.0$-8.6 MeV.

R-matrix analyses of the excitation functions were carried out using parameters from known ^{12}B level structures, along with shell-model calculations.

^{12}N Levels

E(level)[@]	Jπ	Γ[@]	E(level)[@]	Jπ	Γ[@]	E(level)[@]	Jπ	Γ[@]
0[†]	1^+		3433	1^-	0.052 MeV	5331?[#]	3^-	0.480 MeV
960[†]	2^+		3480?[‡#]	2^+	0.211 MeV	5410?[#]	1^+	0.207 MeV
1195[‡]	2^-	0.109 MeV	3983?[#]	2^-	1.056 MeV	5500?[#]	1^-	1.696 MeV
1796[‡]	1^-	0.581 MeV	4340?[#]	4^-	0.572 MeV	7831	$(1^-,2^+)$	0.078 MeV
2428[‡]	0^+	0.079 MeV	5015?[#]	1^+	0.445 MeV	8200	$(1^-,2^-,3^-)$	1.270 MeV
3127?[‡#]	3^-	0.227 MeV	5275?[#]	3^+	0.490 MeV	10026	(3^-)	0.605 MeV

[†] Sub-threshold levels from literature included in R-matrix analysis.
[‡] Also observed in (2003Ku36,2003Te01,2003Te09,2003Te12).
[#] Levels related to known ^{12}N or ^{12}B states that are included in the R-matrix fit.
[@] From R-matrix analysis (2006Pe21).