^{108}Cd(^{3}He,d)   1983Ta06

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	S. Kumar(a), J. Chen(b) and F. G. Kondev	NDS 137, 1 (2016)	31-May-2016

Target ^{108}Cd $J^\pi=0^+$.

1983Ta06: E(^{3}He)=19.5 and 21 MeV, Tandem Accelerator, University of Sao Paulo. Target: 40-50 μg/cm^2 thick with carbon backing, 82.4 % enriched. Detectors: Engel split-pole magnetic spectrometer (FWHM=16 keV), Nuclear emulsion plates with Al absorbers, Measured: σ(^{3}He,d) (12 angles ranging from 6° to 56° at 19.5 MeV, and 4 angles ranging from 10° to 40° at 21 MeV), angular distributions, DWBA analysis. Deduced: L, J, π, spectroscopic factor. Absolute cross-sections were obtained by normalising the results with elastic ^{3}He cross-section measured at 38.6° 4, which lead to 12% systematic uncertainty.

^{109}In Levels

E(level)[†]	J^π[†]	L[‡]	C^{2}S[‡]	Comments
0.0	9/2$^+$	4	0.17	C^{2}S: 0.17 at E(^{3}He)=21 MeV.
647 4	1/2$^-$	1	0.071	C^{2}S: 0.067 at E(^{3}He)=21 MeV.
981 4	3/2$^-$	1	0.040	C^{2}S: 0.043 at E(^{3}He)=21 MeV.
1098 4	5/2$^+$	2	0.50	C^{2}S: 0.48 at E(^{3}He)=21 MeV.
1171 4	1/2$^+$	0	0.34	C^{2}S: 0.33 at E(^{3}He)=21 MeV.
1321 7				
1484 5	3/2$^+$,5/2$^+$	2	0.27,0.14	C^{2}S: 0.26, 0.14 at E(^{3}He)=21 MeV.
1723 5	7/2$^+$,9/2$^+$	4	0.47,0.21	C^{2}S: 0.37, 0.16 at E(^{3}He)=21 MeV.
1957 7	(3/2$^+$,5/2$^+$)	(2)	0.049,0.026	C^{2}S: 0.040, 0.021 at E(^{3}He)=21 MeV.
2030 6	(1/2$^+$,3/2$^+$,5/2$^+$)	(0,2)		C^{2}S: 0.066, 0.098, 0.051 at E(^{3}He)=19.5 MeV, 0.056, 0.088, 0.046 at 21 MeV.
2076 5	(1/2$^+$,3/2$^+$,5/2$^+$)	(0,2)		C^{2}S: 0.063, 0.088, 0.046 at E(^{3}He)=19.5 MeV, 0.043, 0.061, 0.032 at 21 MeV.
2140 5	(3/2$^+$,5/2$^+$)	(2)	0.070,0.036	C^{2}S: 0.046, 0.024 at E(^{3}He)=21 MeV.
2210 5	(1/2$^-$,3/2,5/2$^+$)	(1,2)		C^{2}S: 0.048, 0.021, 0.028, 0.015 at E(^{3}He)=19.5 MeV, 0.042, 0.018, 0.026, 0.014 at 21 MeV.
2266 5	(3/2$^+$,5/2$^+$)	(2)	0.059,0.031	C^{2}S: 0.057,0.030 at 21 MeV.
2307 5	(1/2$^+$,3/2$^+$,5/2)	(0,2,3)		C^{2}S: 0.022, 0.031, 0.016, 0.10 at E(^{3}He)=19.5 MeV, 0.023, 0.030, 0.015, 0.12 at 21 MeV.
2332 5	(1/2$^+$,3/2$^+$,5/2$^+$)	(0,2)		C^{2}S: 0.020, 0.030, 0.016 at E(^{3}He)=19.5 MeV, 0.017, 0.028, 0.014 at 21 MeV.
2360 6				
2474 7				
2564 6	(1/2$^+$,3/2$^+$,5/2$^+$)	(0,2)		C^{2}S: 0.053, 0.078, 0.041 at E(^{3}He)=19.5 MeV, 0.050, 0.079, 0.041 at 21 MeV.
2585 6	(7/2$^+$,9/2$^+$)	(4)	0.54,0.24	C^{2}S: 0.41, 0.18 at E(^{3}He)=21 MeV.
2674 6	(1/2$^+$,3/2$^+$,5/2$^+$)	(0,2)		C^{2}S: 0.060, 0.090, 0.048 at E(^{3}He)=19.5 MeV, 0.046, 0.064, 0.033 at 21 MeV.
2709 6				
2812 7	(1/2$^+$)	(0)	0.046	C^{2}S: 0.045 at 21 MeV.
2839 6				
2888 7	(1/2$^+$,3/2$^+$,5/2)	(0,2,3)		C^{2}S: 0.047, 0.067, 0.035, 0.21 at E(^{3}He)=19.5 MeV, 0.052, 0.076, 0.038, 0.25 at 21 MeV.
2993 6	(3/2$^+$,5/2$^+$)	(2)	0.12,0.066	C^{2}S: 0.14, 0.071 at E(^{3}He)=21 MeV.

[†] From 1983Ta06.

[‡] From 1983Ta06, by comparing the experimental differential cross-sections with results from DWBA calculations. The latter used finite range and non-locality corrections (DWUCK II code), proton parameters radius=1.25 fm, diffuseness=0.65 fm, and spin-orbit-coupling strength=25 for 19.5 MeV. Spectroscopic factors are normalized by $\Sigma(2J+1)C^2S=2$ and the first three levels (1983Ta06). Values quoted are for E(^{3}He)=19.5 MeV and values for E(^{3}He)=21 MeV are given in comments.