^{111}Cd(pol d,t),^{111}Cd(d,t) 1992Bl02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	G. Gürdal and F. G. Kondev	NDS 113, 1315 (2012)	1-Aug-2011

1992Bl02: Reaction: ^{111}Cd(POL d,t), E(d)=22 MeV. 173 μg/cm^2 thick, 96.3% enriched ^{111}Cd target was deposited on a 10 μg/cm^2 thick carbon backing. Outgoing particles were identified and detected by means of the Q3D magnetic spectrography and of a detection system consisting of two subsequent single-wire proportional counters and a plastic scintillator. Angular distributions were measured from θ=5° to 45°. The solid angle was 11 msr, except for θ=10°, where it was reduced to 6 msr. The overall FWHM was ≈ 9 keV. In order to find evidence for possible doublets, a ≈ 40 μg/cm^2 thick ^{111}Cd target was used to record a spectrum at θ=15°. Within this target FWHM was ≈ 5 keV. Measured: $\sigma(\theta)$, A(θ). Deduced: Energy levels of ^{110}Cd, J^π.

Others: 1960Co10: Reaction: ^{111}Cd(d,t), E(d)=14.9 MeV. The beam was provided by the University of Pittsburgh cyclotron. The reaction products were passed through a wedge magnet spectrograph and detected by the tracks they produced in a photographic emulsion located at the focus. Measured: Energy levels of ^{110}Cd.

1964Co11: Reaction: ^{111}Cd(d,t), E(d)=15 MeV. Measured: Neutron binding energies.

J^π(^{111}Cd)=1/2$^+$.

^{110}Cd Levels

E(level)†	J$^\pi$&	L#	S@	Comments
0.0	0$^+$	0	0.930	S: C^{2}S for s1/2 orbital.
658 *1*	2$^+$	2		C^{2}S(d3/2)=0.110, C^{2}S(d5/2)=0.201.
1474‡ *2*	0$^+$,2$^+$	2+0		C^{2}S(s1/2)=0.024, C^{2}S(d5/2)=0.142.
1542 *2*	4$^+$	4	0.187	S: C^{2}S for g7/2 orbital.
2081 *2*	0$^+$		0.019	S: C^{2}S for s1/2 orbital.
2163 *2*	2$^+$,3$^+$		0.035	S: C^{2}S for d5/2 orbital.
2198 *2*	2$^+$,3$^+$		0.002	S: C^{2}S for d5/2 orbital.
2220 *2*	4$^+$		0.298	S: C^{2}S for g7/2 orbital.
2288 *2*	2$^+$			C^{2}S(d3/2)=0.002, C^{2}S(d5/2)=0.002.
2333 *2*	0$^+$	0	0.056	S: C^{2}S for s1/2 orbital.
2357 *2*	2$^+$			C^{2}S(d3/2)=0.009, C^{2}S(d5/2)=0.002.
2365 *2*	2$^+$			C^{2}S(d3/2)=0.004, C^{2}S(d5/2)=0.001.
2381 *2*				C^{2}S(d3/2)=0.003, C^{2}S(d5/2)=0.009.
2433 *2*	2$^+$	2		C^{2}S(d3/2)=0.073, C^{2}S(d5/2)=0.230.
2477 *3*	2$^+$			C^{2}S(d3/2)=0.046, C^{2}S(d5/2)=0.147.
2563 *3*	2$^+$,3$^+$,4$^+$			C^{2}S(d3/2)=0.010, C^{2}S(g7/2)=0.588.
2633 *3*	2$^+$			C^{2}S(d3/2)=0.038, C^{2}S(d5/2)=0.120.
2662 *3*	3$^+$	2+4		C^{2}S(d5/2)=0.052, C^{2}S(g7/2)=0.631.
2707 *3*	4$^+$		0.058	S: For g7/2 orbital.
2759 *3*	1$^+$,2$^+$		0.010	S: For d3/2 orbital.
2786 *3*	1$^+$,2$^+$	2	0.041	S: For d3/2 orbital.
2813 *3*				
2834 *3*	3$^+$,4$^+$		0.077	S: For g7/2 orbital.
2867 *3*	2$^+$			C^{2}S(d3/2)=0.013, C^{2}S(d5/2)=0.015.
2915 *3*	2$^+$,3$^+$,4$^+$			C^{2}S(d5/2)=0.032, C^{2}S(g7/2)=0.144.
2938 *3*	2$^+$			C^{2}S(d3/2)=0.001, C^{2}S(d5/2)=0.003.
2972 *3*	2$^+$			C^{2}S(d3/2)=0.002, C^{2}S(d5/2)=0.006.
2983 *3*	5$^-$,6$^-$	5	0.101	S: For h11/2 orbital.
2993‡ *3*				C^{2}S(s1/2)=0.001 for J^π=0$^+$ component, C^{2}S(d5/2)=0.053 for J^π=3$^+$,4$^+$ component.
3040‡ *3*				C^{2}S(s1/2)=0.005 for J^π=0$^+$ component, C^{2}S(d3/2)=0.009 for J^π=2$^+$,3$^+$ component.
3052 *3*	2$^+$			C^{2}S(s1/2)=0.021 C^{2}S(d3/2)=0.038.
3073‡ *3*				C^{2}S(s1/2)=0.004 for J^π=1$^+$,2$^+$ component, C^{2}S(h11/2)=0.079 for J^π=5$^-$,6$^-$ component.
3098 *3*	2$^+$			C^{2}S(s1/2)=0.016, C^{2}S(d3/2)=0.002.
3106 *3*	3$^+$,4$^+$		0.269	S: C^{2}S for d5/2 orbital.
3125 *3*	1$^+$,2$^+$,3$^+$			C^{2}S(d3/2)=0.011, C^{2}S(d5/2)=0.004.
3141 *3*	2$^+$,3$^+$,4$^+$			C^{2}S(d5/2)=0.002, C^{2}S(g7/2)=0.139.

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^{111}Cd(pol d,t),^{111}Cd(d,t) 1992Bl02 (continued)

^{110}Cd Levels (continued)

E(level)[†]	Jπ[&]	S[@]	Comments
3148 *3*	0^+	0.003	S: C^2S for s1/2 orbital.
3168 *3*	$2^+,3^+,4^+$		C^2S(d5/2)=0.004, C^2S(g7/2)=0.012.
3179[‡] *3*			C^2S(d5/2)=0.004 for $J^\pi=2^+,3^+$ component, C^2S(h11/2)=0.112 for $J^\pi=5^-,6^-$ component.
3190 *3*	$1^+,2^+,3^+$		C^2S(d3/2)=0.005, C^2S(d5/2)=0.001.
3203[‡] *3*			C^2S(s1/2)=0.010 for $J^\pi=0^+$, C^2S(d5/2)=0.014 for $J^\pi=2^+,3^+$.
3253 *3*	$1^+,2^+,3^+$		C^2S(d3/2)=0.029, C^2S(d5/2)=0.006.
3262 *3*	$1^+,2^+,3^+$		C^2S(d3/2)=0.057, C^2S(d5/2)=0.110.
3279[‡] *3*	$1^+,2^+,3^+,4^+$		C^2S(d3/2)=0.006, C^2S(g7/2)=0.122.
3309 *3*	$1^+,2^+,3^+$		C^2S(d3/2)=0.007, C^2S(d5/2)=0.005.
3353 *3*	$2^+,3^+$	0.002	S: C^2S for d5/2 orbital.
3362[‡] *3*	$1^+,2^+,3^+,4^+$		C^2S(d3/2)=0.005, C^2S(d5/2)=0.004, C^2S(g7/2)=0.036.
3373 *3*	$3^+,4^+$	0.046	S: C^2S for g7/2 orbital.
3397 *3*	$1^+,2^+,3^+$		C^2S(d3/2)=0.004, C^2S(d5/2)=0.002.
3412 *3*	$3^+,4^+$	0.034	S: C^2S for g7/2 orbital.
3427 *3*	0^+	0.002	S: C^2S for s1/2 orbital.
3442 *3*	$1^+,2^+$		C^2S(d3/2)=0.025, C^2S(d5/2)=0.029.
3460 *4*	$1^+,2^+$		C^2S(d3/2)=0.004, C^2S(d5/2)=0.008.
3471[‡] *4*	$1^+,2^+,3^+,4^+$		C^2S(d3/2)=0.007, C^2S(g7/2)=0.024.
3487[‡] *4*			C^2S(s1/2)=0.004 for $J^\pi=0^+$ component, C^2S(h11/2)=0.047 for $J^\pi=5^-,6^-$ component.
3499 *4*	$1^+,2^+$	0.007	S: C^2S for d3/2 orbital.
3510 *4*	$1^+,2^+$	0.046	S: C^2S for d3/2 orbital.
3536 *4*	$1^+,2^+,3^+$		C^2S(d3/2)=0.047, C^2S(d5/2)=0.016.
3581 *4*			
3603 *4*	$1^+,2^+,3^+$		C^2S(d3/2)=0.007, C^2S(d5/2)=0.005.
3614 *4*	$1^+,2^+,3^+$		C^2S(d3/2)=0.003, C^2S(d5/2)=0.005.
3630[‡] *4*			C^2S(d3/2)=0.027 for $J^\pi=1^+,2^+,3^+$ component, C^2S(d5/2)=0.021 for for $J^\pi=1^+,2^+,3^+$ component, C^2S(h11/2)=0.094 for $J^\pi=5^-,6^-$ component.
3657 *4*	$1^+,2^+,3^+$		C^2S(d3/2)=0.014, C^2S(d5/2)=0.025.
3668 *4*	$1^+,2^+,3^+$		C^2S(d3/2)=0.014, C^2S(d5/2)=0.0016.
3686[‡] *4*			C^2S(d5/2)=0.005 for $J^\pi=2^+,3^+$ component, C^2S(h11/2)=0.014 for $J^\pi=5^-,6^-$ component.
3696			C^2S(d5/2)=0.051 for $J^\pi=2^+,3^+$ component, C^2S(h11/2)=0.014 for $J^\pi=5^-,6^-$ component.
3713[‡]			C^2S(s1/2)=0.002, C^2S(d3/2)=0.003, C^2S(g7/2)=0.014.
3738 *4*	$1^+,2^+,3^+$		C^2S(d3/2)=0.019, C^2S(d5/2)=0.015.
3760 *4*	$1^+,2^+,3^+$		C^2S(d3/2)=0.005, C^2S(d5/2)=0.002.
3773 *4*	$1^+,2^+,3^+$		C^2S(d3/2)=0.004, C^2S(d5/2)=0.003.
3808 *4*	$2^+,3^+$	0.007	S: C^2S for d5/2 orbital.
3830 *4*	$1^+,2^+,3^+$		C^2S(d3/2)=0.008, C^2S(d5/2)=0.003.
3850[‡] *4*	$0^+,1^+,2^+$		C^2S(s1/2)=0.005. C^2S(d3/2)=0.010.
3866 *4*	$1^+,2^+,3^+$		C^2S(d3/2)=0.010, C^2S(d5/2)=0.005.
3888 *4*	$2^+,3^+$	0.005	S: C^2S for d5/2 orbital.
3924 *4*	$1^+,2^+,3^+$		C^2S(d3/2)=0.026, C^2S(d5/2)=0.021.
3968 *4*	$1^+,2^+,3^+$		C^2S(d3/2)=0.005, C^2S(d5/2)=0.004.
3988 *4*	$1^+,2^+,3^+$		C^2S(d3/2)=0.005, C^2S(d5/2)=0.001.
4005 *4*	$1^+,2^+$	0.005	S: C^2S for d3/2 orbital.
4024 *4*	0^+	0.005	S: C^2S for s1/2 orbital.
4042 *4*	$1^+,2^+,3^+$		C^2S(d3/2)=0.013, C^2S(d5/2)=0.003.
4078 *4*	$1^+,2^+,3^+$		C^2S(d3/2)=0.002, C^2S(d5/2)=0.002.
4104 *4*	$1^+,2^+,3^+$		C^2S(d3/2)=0.002, C^2S(d5/2)=0.007.
4128 *4*	0^+	0.002	S: C^2S for s1/2 orbital.
4154 *4*	$1^+,2^+,3^+$		C^2S(d3/2)=0.003, C^2S(d5/2)=0.003.
4171 *4*	$1^+,2^+,3^+$		C^2S(d3/2)=0.005, C^2S(d5/2)=0.004.
4181[‡] *4*			C^2S(d5/2)=0.007 for $J^\pi=2^+,3^+$ component, C^2S(h11/2)=0.032 for $J^\pi=5^-,6^-$ component.

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^{111}Cd(pol d,t),^{111}Cd(d,t) 1992Bl02 (continued)

^{110}Cd Levels (continued)

† From 1992Bl02. ΔE estimated as ≈0.1% by the authors.
‡ Unresolved doublet.
# From 1992Bl02, as presented at Figure 2.
@ C^2S given in 1992Bl02.
& From comparison of experimental angular distributions with DWBA calculations using DWUCK4 code in 1992Bl02.