^{108}Cd(α,2nγ) 1980Va13

History

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

Beam: Eα=32 MeV. Target: 5 mg/cm^2 (for γ-ray measurements) and 0.5 mg/cm^2 (for conversion electron measurements) thick, isotropically enriched self-supporting foils. The α beam was provided by the AVF cyclotron of the Vrije Universiteit in Amsterdam. γ-rays were detected using two large volume Ge(Li) detectors. Conversion electrons were detected using a mini-orange spectrometer. Measured: Eγ, Iγ, $\gamma\gamma$(t), $\gamma(\theta)$, E(ce), Ice.

Other: 1969Ya05, 1980Va13.

^{110}Sn Levels

E(level)†	J$^{\pi}$‡	T$_{1/2}$	Comments
0.0	0$^+$	4.154 h *4*	T$_{1/2}$: From Adopted Levels.
1212.02 *9*	2$^+$		
2197.05 *10*	4$^+$		
2455.9 *4*	(4$^+$)		
2480.0 *8*	6$^+$	8.2 ns *2*	Q=0.34 *4* μ=0.072 *18* T$_{1/2}$: Weighted average of 8.0 ns *2* (1212γ(t)) and 8.4 ns *2* (985γ(t)) in 1980Va13. Other: 8.5 ns *4* (282.9γ(t)) in 1980Va13, but the transition is contaminated with similar one in ^{110}In. Q: from $\gamma(\theta$,H,t) (1989Vo17). μ: From $\gamma(\theta$,H,t) (g=0.012 3) (1989Vo17). configuration: Possible admixture of $\nu(g_{7/2})^2$ and $\nu(g_{7/2},d_{5/2})$ configurations.
2756.0 *8*	6$^+$		
2804.6 *9*			
2967.1 *9*	(7)		
3689.3 *8*	7$^-$		
3767.5 *9*	8$^-$		μ=−2.4 *12* μ: From IPAD (g=−0.30 15) (1989Vo17). configuration: possible $\nu(h_{11/2},d_{5/2})$ configuration.
3814.8 *9*	(8$^+$)		
3935.3 *9*	9$^-$		
4319.0 *9*	10$^{(-)}$		
4897.2 *9*	10$^{(-)}$		
5111.0 *9*	11$^-$		
5332.4 *10*	11$^-$		

† From least-squares fit to Eγ's.
‡ From 1980Va13, based on the deduced γ-ray transition multipolarities.

γ(^{110}Sn)

E$_\gamma$‡	I$_\gamma$‡	E$_i$(level)	J$^{\pi}_i$	E$_f$	J$^{\pi}_f$	Mult.#	δ@	α†	Comments
78.2 *1*	13 *1*	3767.5	8$^-$	3689.3	7$^-$	M1+E2	0.05 *3*	1.140 *20*	α(K)=0.983 *16*; α(L)=0.128 *4*; α(M)=0.0251 *9*; α(N+..)=0.00511 *15* α(N)=0.00471 *15*; α(O)=0.000402 *7* Mult.: 0.07≤α≤1.5 deduced from intensity balance by the authors, α=1.5 *2* by the evaluators; A$_2$=−0.147 *12*, A$_4$=0.01 *2*.
167.84 *6*	19.3 *9*	3935.3	9$^-$	3767.5	8$^-$	M1+E2	0.08 *3*	0.1341 *20*	α(K)=0.1159 *17*; α(L)=0.0147 *3*; α(M)=0.00289 *5*; α(N+..)=0.000589 *10* α(N)=0.000542 *10*; α(O)=4.68×10^{-5} *7* Mult.: α(K)exp=0.15 *3*; A$_2$=−0.090 *10*, A$_4$=−0.01 *2*.

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^{108}Cd(α,2nγ) 1980Va13 (continued)

γ(^{110}Sn) (continued)

E_γ ‡	I_γ ‡	E_i(level)	J_i^π	E_f	J_f^π	Mult. #	δ @	α †	Comments
276.06 *8*	20 *1*	2756.0	6^+	2480.0	6^+	M1(+E2)	0.0 *2*	0.0354 *7*	α(K)=0.0307 *6*; α(L)=0.00382 *11*; α(M)=0.000747 *22*; α(N+..)=0.000153 *4* α(N)=0.000141 *4*; α(O)=1.227×10^{-5} *22* Mult.: α(K)exp=0.038 *8*; A_2=0.382 *11*, A_4=0.01 *2*.
282.9 *8*	70 *6*	2480.0	6^+	2197.05	4^+	(E2)		0.0430 *8*	α(K)=0.0360 *6*; α(L)=0.00564 *10*; α(M)=0.001121 *20*; α(N+..)=0.000220 *4* α(N)=0.000205 *4*; α(O)=1.427×10^{-5} *24* E_γ: Doublet with 283 keV transition in ^{110}In. Mult.: α(K)exp=0.030 *12*; A_2=0.32 *3*, A_4=−0.07 *10*.
324.6 *2*	2.6 *2*	2804.6		2480.0	6^+				Mult.: A_2=0.11 *3*, A_4=0.06 *6*.
383.7 *3*	4.9 *3*	4319.0	$10^{(-)}$	3935.3	9^-	M1(+E2)	0.0 *2*		Mult.: A_2=−0.16 *2*, A_4=−0.01 *3*.
487.1 *2*	3.1 *2*	2967.1	(7)	2480.0	6^+	M1+E2			Mult.: A_2=−0.59 *3*, A_4=−0.04 *4*.
985.03 *3*	84 *3*	2197.05	4^+	1212.02	2^+	E2		0.001330 *19*	α=0.001330 *19*; α(K)=0.001155 *17*; α(L)=0.0001421 *20*; α(M)=2.78×10^{-5} *4*; α(N+..)=5.65×10^{-6} α(N)=5.21×10^{-6} *8*; α(O)=4.43×10^{-7} *7* Mult.: α(K)exp=1.16×10^{-3}; A_2=0.314 *13*, A_4=−0.06 *2*.
1011.3 *2*	5.3 *3*	3767.5	8^-	2756.0	6^+	M2		0.00371 *6*	α=0.00371 *6*; α(K)=0.00321 *5*; α(L)=0.000399 *6*; α(M)=7.83×10^{-5} *11*; α(N+..)=1.605×10^{-5} *23* α(N)=1.476×10^{-5} *21*; α(O)=1.295×10^{-6} *19* Mult.: α(K)exp=3.8×10^{-3} *12*; A_2=0.30 *3*, A_4=−0.16 *4*.
1129.7 *4*	5.3 *3*	4897.2	$10^{(-)}$	3767.5	8^-	(E2)			Mult.: α(K)exp=0.57×10^{-3} *12*; A_2=0.42 *7*, A_4=−0.18 *8*.
1175.6 *3*	8.8 *4*	5111.0	11^-	3935.3	9^-	E2		0.000911 *13*	α=0.000911 *13*; α(K)=0.000789 *11*; α(L)=9.56×10^{-5} *14*; α(M)=1.87×10^{-5} *3*; α(N+..)=8.08×10^{-6} *12* α(N)=3.51×10^{-6} *5*; α(O)=3.02×10^{-7} *5*; α(IPF)=4.27×10^{-6} *7* Mult.: α(K)exp=0.75×10^{-3} *15*; A_2=0.36 *2*, A_4=−0.11 *5*.
1209.42 *9*	33 *2*	3689.3	7^-	2480.0	6^+			0.000424 *6*	α=0.000424 *6*; α(K)=0.000336 *5*; α(L)=3.93×10^{-5} *6*; α(M)=7.63×10^{-6} *11*; α(N+..)=4.07×10^{-5} *6* α(N)=1.437×10^{-6} *21*; α(O)=1.251×10^{-7} *18*; α(IPF)=3.92×10^{-5} *6* Mult.: α(K)exp=0.67×10^{-3} *8* for unresolved 1209.4-1212.0 doublet; A_2=0.30 *2*, A_4=−0.05 *2*.

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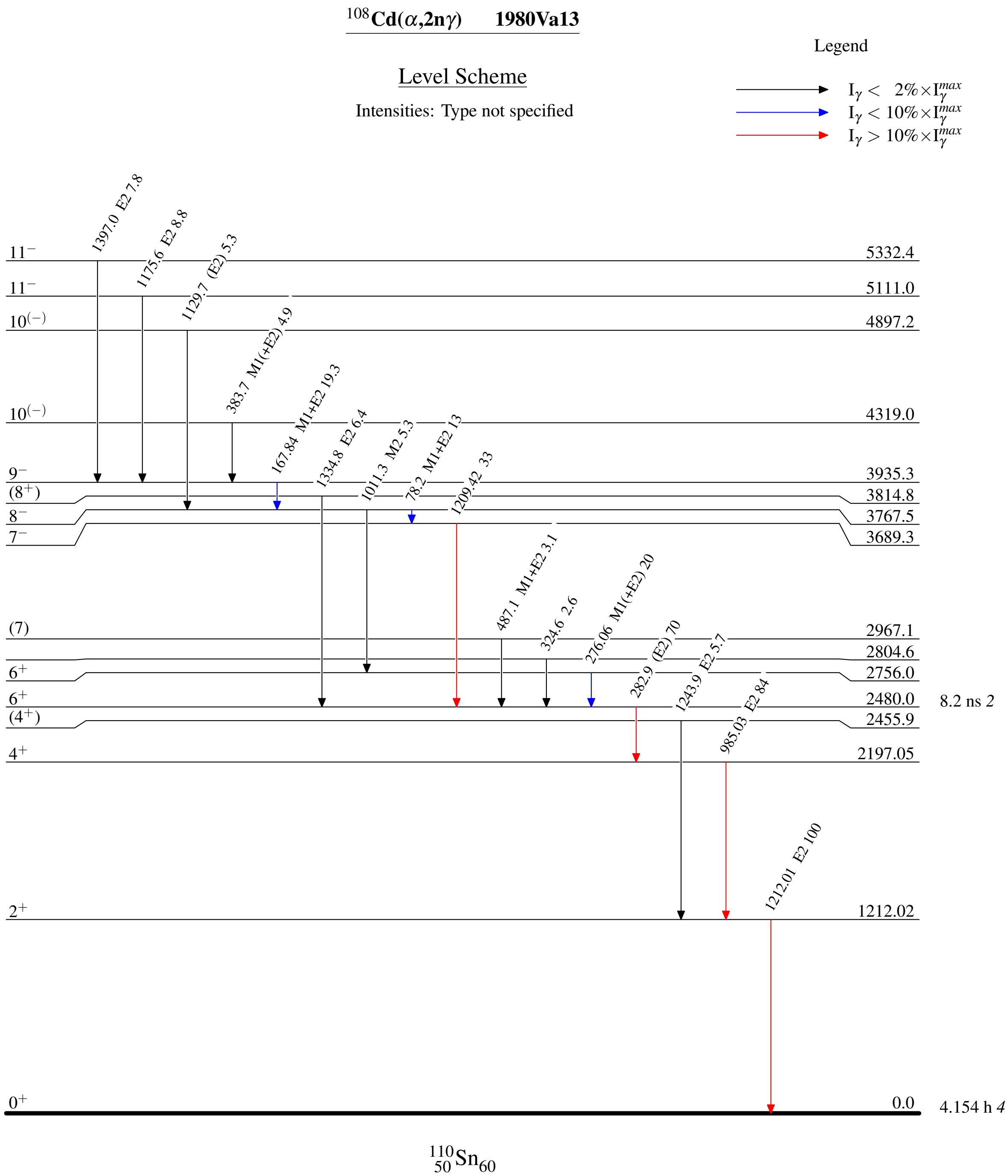
^{108}Cd(α,2nγ) 1980Va13 (continued)

γ(^{110}Sn) (continued)

E_γ‡	I_γ‡	E_i(level)	J^π_i	E_f	J^π_f	Mult.#	α†	Comments
1212.01 *9*	100	1212.02	2^+	0.0	0^+	E2	0.000859 *12*	α=0.000859 *12*; α(K)=0.000740 *11*; α(L)=8.95×10^{-5} *13*; α(M)=1.746×10^{-5} *25*; α(N+..)=1.203×10^{-5} α(N)=3.28×10^{-6} *5*; α(O)=2.83×10^{-7} *4*; α(IPF)=8.47×10^{-6} *12* Mult.: α(K)exp=0.67×10^{-3} *8* for unresolved 1209.4-1212.0 doublet; A_2= −0.27 *2*, A_4=0.02 *6*.
1243.9 *3*	5.7 *3*	2455.9	(4^+)	1212.02	2^+	E2	0.000819 *12*	α=0.000819 *12*; α(K)=0.000702 *10*; α(L)=8.47×10^{-5} *12*; α(M)=1.652×10^{-5} *24*; α(N+..)=1.653×10^{-5} α(N)=3.11×10^{-6} *5*; α(O)=2.68×10^{-7} *4*; α(IPF)=1.316×10^{-5} *19* Mult.: α(K)exp=0.67×10^{-3} *12*; A_2=0.31 *2*, A_4=−0.06 *4*.
1334.8 *2*	6.4 *4*	3814.8	(8^+)	2480.0	6^+	E2	0.000729 *11*	α=0.000729 *11*; α(K)=0.000608 *9*; α(L)=7.30×10^{-5} *11*; α(M)=1.423×10^{-5} *20*; α(N+..)=3.37×10^{-5} *5* α(N)=2.68×10^{-6} *4*; α(O)=2.32×10^{-7} *4*; α(IPF)=3.08×10^{-5} *5* Mult.: α(K)exp=0.59×10^{-3} *10*; A_2=0.35 *2*, A_4=−0.01 *5*.
1397.0 *5*	7.8 *4*	5332.4	11^-	3935.3	9^-	E2	0.000684 *10*	α=0.000684 *10*; α(K)=0.000555 *8*; α(L)=6.64×10^{-5} *10*; α(M)=1.295×10^{-5} *19*; α(N+..)=5.02×10^{-5} *8* α(N)=2.44×10^{-6} *4*; α(O)=2.11×10^{-7} *3*; α(IPF)=4.75×10^{-5} *7* Mult.: α(K)exp=0.56×10^{-3} *14*; A_2=0.38 *3*, A_4=−0.08 *4*.

† Additional information 1.
‡ From 1980Va13 (Iγ(1212.01)=100).
\# From $\gamma(\theta)$ and α(K)exp in 1980Va13.
@ From $\gamma(\theta)$ in 1980Va13.


^{108}Cd(α,2nγ) 1980Va13
Level Scheme
Intensities: Type not specified
Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
11− 5332.4
11− 5111.0
10(−) 4897.2
10(−) 4319.0
9− 3935.3
(8+) 3814.8
8− 3767.5
7− 3689.3
(7) 2967.1
2804.6
6+ 2756.0
6+ 2480.0 8.2 ns 2
(4+) 2455.9
4+ 2197.05
2+ 1212.02
0+ 0.0 4.154 h 4
1397.0 E2 7.8
1175.6 E2 8.8
1129.7 (E2) 5.3
383.7 M1(+E2) 4.9
167.84 M1+E2 19.3
1334.8 E2 6.4
1011.3 M2 5.3
78.2 M1+E2 13
1209.42 33
487.1 M1+E2 3.1
324.6 2.6
276.06 M1(+E2) 20
282.9 (E2) 70
1243.9 E2 5.7
985.03 E2 84
1212.01 E2 100
$^{110}_{50}Sn_{60}$