^{114}Cd(α,2nγ) 1980Va13,1979Br07

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 111, 717 (2010)	1-Dec-2009

E(α)=17-33 MeV. Others: 1969Ya05, 1969Ch15, 1973IsZQ.
E(Li)=30 MeV, (6.4 μs) pulsed beam measured decay of ^{116}Sn 10$^+$ (1987Lu06).
Measured: γ, $\gamma\gamma$(t), σ(Eγ,θ), ce, semi, linear polarization.
1990Ch42 (α,4n) excitation function at E(α)=40,45,50 MeV, agree with previous results concerning levels energies and J$^\pi$.

^{116}Sn Levels

E(level)	J$^\pi$[†]	T$_{1/2}$	Comments
0.0	0$^+$		
1293.52	2$^+$		
1756.82[‡]	0$^+$		
2112.3[‡]	2$^+$		
2266.1	3$^-$		
2365.9	5$^-$	335 ns *50*	g=−0.0749 *6* (1973IsZQ) T$_{1/2}$: from 1980Va13. Other: 370 ns (1973IsZQ). g: value not corrected for Knight shift or diamagnetism.
2391.2	4$^+$		
2529.4[‡]	4$^+$		
2773.1	6$^-$		
2802.1	4$^+$		
2908.8	7$^-$	0.5 ns *3*	T$_{1/2}$: from 1980Va13.
3033.2[‡]	6$^+$		
3105.6	(7$^-$)		J$^\pi$: J$^\pi$=5$^-$ in Adopted Levels. No evidence is given by authors.
3209.9	7$^-$		
3227.9	8$^-$		
3276.7	(6$^+$)		
3492.9	8$^+$		
3522.5	9$^-$		
3547.0	10$^+$	833 ns *30*	g=−0.2312 *15* (1973IsZQ) T$_{1/2}$: from 1980Va13. Others: 904 ns (1973IsZQ), 750 ns *100* (1969Ch15), 900 ns *100* (1987Lu06). g: value not corrected for Knight shift or diamagnetism.
3713.9	8$^+$		
4495.8	(10$^-$)		
4507.7[‡]	10$^+$		
4879.3	11$^-$		
5391.9[‡]	12$^+$		

[†] Based on γ multipolarities.
[‡] Band(A): positive parity band on 0$^+$. 1979Br07 suggest that bandheads Originate from proton 2p-2h excitations in the Z=50 shell.

γ(^{116}Sn)

E$_\gamma$	I$_\gamma$[†]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[‡]	α[@]	Comments
54.0 *5*	0.36 *25*	3547.0	10$^+$	3492.9	8$^+$	E2	14.4 *6*	α(K)=7.35 *21*; α(L)=5.7 *3*; α(M)=1.18 *6*; α(N+..)=0.211 *10* α(N)=0.205 *10*; α(O)=0.0061 *3* Mult.: based on α deduced from an intensity balance in a delayed spectrum (1973IsZQ).

Continued on next page (footnotes at end of table)

^{114}Cd(α,2nγ) 1980Va13,1979Br07 (continued)

$\gamma(^{116}Sn)$ (continued)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[#]	α[@]	Comments
99.82 *6*	16.1 *8*	2365.9	5^-	2266.1	3^-	E2		1.606	α(K)=1.164 *17*; α(L)=0.356 *5*; α(M)=0.0726 *11*; α(N+..)=0.01340 *19* α(N)=0.01284 *19*; α(O)=0.000558 *8* α(K)exp=0.69 *40* (1980Va13) α: 1980Va13 report α=1.8 *4* based on an intensity balance.
135.8 *2*	12.9 *6*	2908.8	7^-	2773.1	6^-	M1+E2	−0.09 *12*		α(K)exp=0.41 *20* (1978VaZK); α(K)exp=0.24 *5* (1969Ch15)
138.3 *6*	1.0 *1*	2529.4	4^+	2391.2	4^+				
214.0		3492.9	8^+	3276.7	(6^+)				
264.0		3492.9	8^+	3227.9	8^-				
294.6 *2*	6.0 *2*	3522.5	9^-	3227.9	8^-	M1+E2	+0.13 *2*		α(K)exp=0.024 *6* (1980Va13)
319.1[&]	17.4[&]	3227.9	8^-	2908.8	7^-	M1+E2	+0.11 *1*		I_γ: from Iγ(M1+E2)/Iγ(M2)=4.0 (1978VaZK) and doublet Iγ=21.7 *9*.
319.1[&] *1*	4.3[&] *9*	3547.0	10^+	3227.9	8^-	M2			α(K)exp=0.038 *9* (1980Va13)
332.5 *3*	0.5 *1*	3105.6	(7^-)	2773.1	6^-				
355.2	0.3 *2*	2112.3	2^+	1756.82	0^+				I_γ: from 1979Br07.
407.18 *10*	24.7 *8*	2773.1	6^-	2365.9	5^-	M1+E2	+0.02 *2*		α(K)exp=0.011 *2* (1980Va13)
416.86 *10*	8.3 *2*	2529.4	4^+	2112.3	2^+	E2			α(K)exp=0.011 *2* (1979Br07)
436.6 *3*	1.2 *1*	3209.9	7^-	2773.1	6^-				α(K)exp=0.012 *2* (1980Va13)
463.3 *3*	1.2 *1*	1756.82	0^+	1293.52	2^+				
505.3 *8*	4.4 *2*	3033.2	6^+	2529.4	4^+	E2			α(K)exp=0.0052 *12* (1978VaZK)
542.73 *13*	25.2 *14*	2908.8	7^-	2365.9	5^-	E2			α(K)exp=0.0053 *10* (1980Va13)
584.16 *12*	12.9 *10*	3492.9	8^+	2908.8	7^-	E1			α(K)exp=0.0021 *8* (1980Va13)
641.0 *2*	7.9 *2*	3033.2	6^+	2391.2	4^+	E2			α(K)exp=0.0032 *6* (1979Br07)
679.7 *8*	7.0 *2*	3713.9	8^+	3033.2	6^+	E2			α(K)exp=0.0024 *4* (1978VaZK)
747.8 *2*	1.5 *1*	3276.7	(6^+)	2529.4	4^+				
793.8 *2*	3.7 *1*	4507.7	10^+	3713.9	8^+	E2			α(K)exp=0.0020 *4* (1978VaZK)
818.9 *1*	4.5 *2*	2112.3	2^+	1293.52	2^+	M1+E2	−1.5 *4*		α(K)exp=0.0023 *6* δ: others: −1.8 *2* (1974Ga05), −1.52 *+26−22* (1975Ya08).
844.2 *3*	6.4 *5*	3209.9	7^-	2365.9	5^-	E2			
884.2 *3*	1.1 *1*	5391.9	12^+	4507.7	10^+	E2			α(K)exp=0.0013 *4*(1978VaZK)
972.62 *6*	49. *2*	2266.1	3^-	1293.52	2^+	E1			α(K)exp=0.00055 *8*
1072.26 *17*	16.1 *12*	2365.9	5^-	1293.52	2^+	E3			α(K)exp=0.0018 *4* (1980Va13)
1098.7 *2*	16.6 *4*	2391.2	4^+	1293.52	2^+	E2			α(K)exp=0.00077 *15* (1969Ch15); α(K)exp=0.0008 *2* (1979Br07)
1267.9 *5*	2.3 *8*	4495.8	(10^-)	3227.9	8^-				
1293.52 *6*	100	1293.52	2^+	0.0	0^+	E2			
1356.8 *5*	1.7 *5*	4879.3	11^-	3522.5	9^-				α(K)exp=0.0009 *4* (1980Va13)
1508.6 *5*	2.5 *3*	2802.1	4^+	1293.52	2^+	E2			
2113.4 *7*	5.9 *4*	2112.3	2^+	0.0	0^+	E2			

[†] Relative photon intensity at E=24 MeV (1979Br07,1980Va13).
[‡] From α(K)exp of 1979Br07 and 1980Va13, except where noted otherwise, normalized so α(K)exp(1293)=0.000647 (E2 theory). Values of 1969Ch15 are normalized to α(K)exp=1.00 and 0.0054 for the 99 and 543 γ's, respectively.
[#] From 1980Va13 using $\gamma(\theta)$, except 135γ which is from 1978VaZK.
[@] Data are from 1980Va13, 1978VaZK, 1979Br07. They normalized to α(K)(1293). 1969Ch15 normalize to α(K)exp=1.00 and 0.0054 for the 99γ and 543γ.
[&] Multiply placed with intensity suitably divided.

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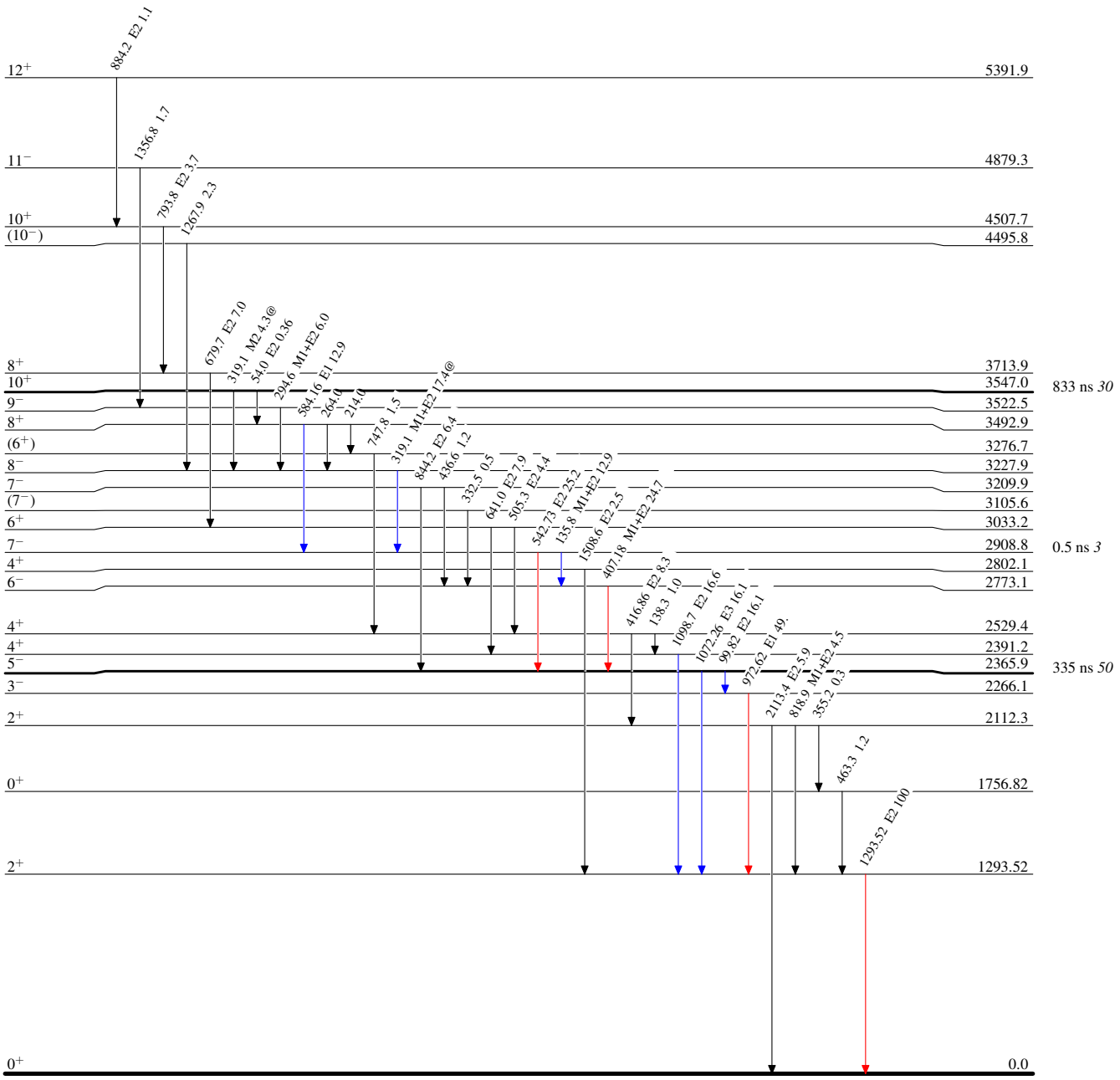
Level Scheme

Intensities: Relative I_γ
@ Multiply placed: intensity suitably divided

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$



$^{116}_{50}Sn_{66}$

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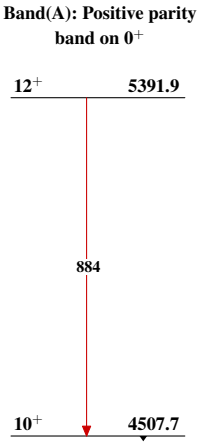

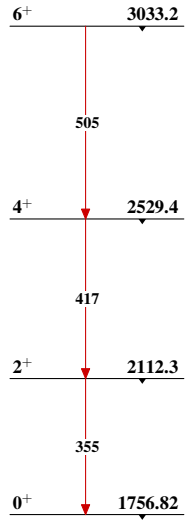

$^{116}_{50}Sn_{66}$