^{112}Cd(α,nγ) 1975Ma38

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 113, 2391 (2012)	1-Sep-2012

E=14-18 MeV.
Others: ^{115}In(p,nγ) E=9 MeV (1975Ma38); also cross bombardment exp via ^{115}In(d,2nγ), ^{113}Cd(α,2nγ).
Measured γγ-, γce-coin, γγ(t), γ(θ), γ(t) pulsed beam.

^{115}Sn Levels

E(level)	J$^{\pi}$ †	$T_{1/2}$	Comments
0.0	1/2$^+$	stable	
497.3	3/2$^+$		
612.8	7/2$^+$	3.26 μs *8*	
713.4	11/2$^-$	159 μs *1*	
986.5	5/2$^+$		
1280.0	3/2$^+$		
1416.8	5/2$^+$		
1633.7	(3/2,5/2)$^+$		Iγ(1021γ)/Iγ(1136γ)/Iγ(1633γ)=11 *4*/18 *2*/100 (1975Ma38), 12 *2*/36 *2*/100 (1975WiZX, ^{115}Sb decay).
1643.7	(3/2,5/2,7/2)$^+$		
1733.9	(3/2,5/2)$^+$		Branching: Iγ(1236γ)/Iγ(1121γ)/Iγ(747γ)=100/52 *14*/49 *13* (1975Ma38) via (α,nγ), 100/80 *22*/44 *12* (1975Ma38) via (p,nγ), 100/27 *2*/34 *4* (1975WiZX, ^{115}Sb decay).
1785.6	(7/2)$^-$		
1824.5	(3/2),5/2$^+$		
1857.6	(3/2),5/2$^+$		
1973.8	(1/2,3/2,5/2$^+$)		
2060.0	(1/2,3/2,5/2$^+$)		
2084.2	(3/2,5/2)$^+$		
2155.8	(5/2,7/2)		
2164.3	(1/2,3/2,5/2)		
2192.7	(3/2,5/2)		
2207.5	(5/2,7/2$^+$)		
2231			
2365.3	(3/2,5/2$^+$)		Branching: Iγ(1379γ)/Iγ(1752γ)/Iγ(1867γ)=100/88 *37*/75 *32* (α,nγ), 100/83 *24*/<78 (p,nγ); Iγ-ratios via ^{115}Sb decay are different.
2553.3	(9/2,11/2,13/2)		E(level): may correspond with L=(2) 2553-keV (d,t) excitation.

† From 1975Ma38 based on γ multipolarities.

γ(^{115}Sn)

α(K)exp normalized to α(K)(115γ)=0.72 (E2 theory) and α(K)(986γ)=0.00115 (E2 theory).

E_γ	I_γ[#]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[@]	δ[&]	α[a]	Comments
100.7 *3*	4.6 *2*	713.4	$11/2^-$	612.8	$7/2^+$	M2		5.7	α(K)exp=4.50 *32*; α(L)exp=0.867 *20* δ(E3/M2)=0.05 *5* (1975Ma38) admixture deduced from α(L)exp.
115.4 *2*	24.3 *15*	612.8	$7/2^+$	497.3	$3/2^+$	E2		0.96	Mult.: from α(K)exp=0.69 *7* (1964Iv01, ^{115}Sn IT decay).
373.6 *4*	0.51 *5*	986.5	$5/2^+$	612.8	$7/2^+$	M1+E2	−0.26 *6*	0.01644 *4*	α(K)exp=0.0188 *40*
^{x}401.2 *2*	0.26 *4*					M1,E2			α(K)exp=0.0132 *27*
^{x}454.1 *2*	0.11 *3*								
489.3 *3*	9.4 *9*	986.5	$5/2^+$	497.3	$3/2^+$	M1+E2	+0.040 *23*		α(K)exp=0.0075 *20*
497.3 *2*	100	497.3	$3/2^+$	0.0	$1/2^+$	M1+E2	+0.21 *2*	0.00805 *1*	α(K)exp=0.0070 *4*
^{x}551.0[‡] *3*	0.33 *3*					M1,E2			α(K)exp=0.0052 *6*
^{x}561.3[‡] *2*	0.55 *8*								α(K)exp=0.0092 *12*
657.1 *3*	0.71 *18*	1643.7	$(3/2,5/2,7/2)^+$	986.5	$5/2^+$				α(K)exp=0.0031 *8*
^{x}660.9 *10*	1.25 *31*					E2		0.0034	α(K)exp=0.0024 *8*
^{x}703.6 *6*	0.53 *13*					M1		0.0035	α(K)exp=0.0031 *9*
^{x}739.5 *3*	0.29 *3*					E2		0.0026	α(K)exp=0.0022 *4*
747.5 *4*	0.51 *5*	1733.9	$(3/2,5/2)^+$	986.5	$5/2^+$	E2			α(K)exp=0.0023 *4*
^{x}803.2 *2*	0.88 *9*								
^{x}817.4 *7*	0.27 *5*					M1		0.0025	α(K)exp=0.0020 *4*
919.5 *2*	1.07 *5*	1416.8	$5/2^+$	497.3	$3/2^+$	M1+E2	+0.17 *3*		α(K)exp=0.0017 *3*
^{x}929.8[†] *2*	4.26 *21*					E2		0.0015	α(K)exp=0.00132 *12*
^{x}939.6 *4*	0.42 *4*								
^{x}972.5 *2*	0.58 *6*					M1,E2			α(K)exp=0.0018 *2*
986.5 *2*	3.72 *19*	986.5	$5/2^+$	0.0	$1/2^+$	E2			Mult.: deduced from γ anisotropy and A_2=0.277 *13* via Coul. ex.
1020.7	0.31 *12*	1633.7	$(3/2,5/2)^+$	612.8	$7/2^+$				
^{x}1046.2 *4*	0.35 *10*								
1072.2[†] *2*	4.4 *2*	1785.6	$(7/2)^-$	713.4	$11/2^-$	E2			α(K)exp=0.00096 *14* Observed weak (1072γ)(ce(K) 101γ)-coin suggests π=− state at 1786 keV (1975Ma38).
1097.7 *2*	1.16 *10*	2084.2	$(3/2,5/2)^+$	986.5	$5/2^+$	E2			α(K)exp=0.00089 *13*
1121.2 *5*	0.55 *5*	1733.9	$(3/2,5/2)^+$	612.8	$7/2^+$				
1136.6 *2*	0.52 *5*	1633.7	$(3/2,5/2)^+$	497.3	$3/2^+$				
^{x}1192.5[†] *2*	3.06 *15*					E2		0.0009	α(K)exp=0.00074 *7*
1206.6	<0.4	2192.7	(3/2,5/2)	986.5	$5/2^+$				
1211 *1*	0.14 *7*	1824.5	$(3/2),5/2^+$	612.8	$7/2^+$				
1221.1 *2*	0.87 *6*	2207.5	$(5/2,7/2^+)$	986.5	$5/2^+$				
^{x}1232.1[‡] *2*	5.5 *11*					M1,E2		0.0009	α(K)exp=0.00094 *18*
1236.2 *4*	1.05 *26*	1733.9	$(3/2,5/2)^+$	497.3	$3/2^+$				

γ(^{115}Sn) (continued)

$E_γ$	$I_γ$[#]	E_i(level)	$J^π_i$	E_f	$J^π_f$	Mult.[@]	δ[&]	α[a]	Comments
1244.4 *4*	0.70 *10*	2231		986.5	$5/2^+$				
1280.0 *2*	3.83 *19*	1280.0	$3/2^+$	0.0	$1/2^+$	M1+E2	−2.2 *2*		A_2=−0.03 *10*.
[x]1311.3	2.8 *3*					E2		0.00073	A_2=0.21 *6* (1975Ma38), 0.217 *66* (1979Ha12) intraband $15/2^-$ to $11/2^-$ transition (1979Ha12).
1327.8 *8*	0.45 *5*	1824.5	$(3/2),5/2^+$	497.3	$3/2^+$				
1360.4 *2*	2.65 *13*	1857.6	$(3/2),5/2^+$	497.3	$3/2^+$	E2			α(K)exp=0.00057 *7*
1378.9 *5*	0.52 *16*	2365.3	$(3/2,5/2^+)$	986.5	$5/2^+$				
[x]1383.4[‡] *2*	2.9 *6*					E2		0.00065	α(K)exp=0.00052 *16*
1416.8 *3*	4.36 *22*	1416.8	$5/2^+$	0.0	$1/2^+$	E2			Mult.: deduced from γ anisotropy, A_2=0.257 (Coul. ex.); consistent with α(K)exp=0.00049 *10*.
[x]1454.0 *4*	2.11 *20*								A_2=0.62 *68*.
1471.7 *6*	0.77 *7*	2084.2	$(3/2,5/2)^+$	612.8	$7/2^+$				
1476.7 *5*	0.64 *9*	1973.8	$(1/2,3/2,5/2^+)$	497.3	$3/2^+$				
[x]1482.7[†] *5*	1.1 *2*								A_2=−0.34 *15*.
1543.0[b] *2*	0.69 *7*	2155.8	(5/2,7/2)	612.8	$7/2^+$				
1562.7 *4*	1.25 *10*	2060.0	$(1/2,3/2,5/2^+)$	497.3	$3/2^+$	(E2)			A_2=0.24 *19*.
1579.6 *6*	1.28 *19*	2192.7	(3/2,5/2)	612.8	$7/2^+$				A_2=0.08 *10*.
1594.5[b] *5*	0.46 *12*	2207.5	$(5/2,7/2^+)$	612.8	$7/2^+$	M1			α(K)exp=0.00056 *10*
1633.4 *4*	2.83 *14*	1633.7	$(3/2,5/2)^+$	0.0	$1/2^+$	(M1)			α(K)exp=0.00059 *5* Probable composite.
1658.5 *4*	0.81 *8*	2155.8	(5/2,7/2)	497.3	$3/2^+$				
1667.1 *4*	1.62 *8*	2164.3	(1/2,3/2,5/2)	497.3	$3/2^+$				A_2=0.14 *32*.
[x]1686.7 *3*	0.62 *12*								
1696.0 *10*	0.21 *6*	2192.7	(3/2,5/2)	497.3	$3/2^+$				$I_γ$: Iγ(1580γ)/Iγ(1696γ)=6 *2* (α,nγ), 2.7 *6* (p,nγ), 0.10 *4* (^{115}Sb decay).
1752.1 *11*	0.46 *14*	2365.3	$(3/2,5/2^+)$	612.8	$7/2^+$				
[x]1768.8 *3*	0.85 *8*								A_2=0.12 *5*.
[x]1786.7 *7*	0.42 *6*								
[x]1795.5 *12*	0.79 *8*								
1824[b] *1*	0.81 *16*	1824.5	$(3/2),5/2^+$	0.0	$1/2^+$				
[x]1832.9 *11*	0.88 *17*								
1857 *1*	0.40 *8*	1857.6	$(3/2),5/2^+$	0.0	$1/2^+$				
1868.1[b] *3*	0.39 *12*	2365.3	$(3/2,5/2^+)$	497.3	$3/2^+$				
[x]1877.4 *10*	0.52 *8*								
1940.5[‡] *7*	1.37 *10*	2553.3	(9/2,11/2,13/2)	612.8	$7/2^+$				
1973.8 *10*	0.84 *25*	1973.8	$(1/2,3/2,5/2^+)$	0.0	$1/2^+$				
[x]2054 *1*	0.50 *10*								
2060	<0.5	2060.0	$(1/2,3/2,5/2^+)$	0.0	$1/2^+$				
[x]2131.5	<1								
2231.1 *10*		2231		0.0	$1/2^+$				

γ(^{115}Sn) (continued)

† γ-ray excit suggest depopulation of J=5/2 or 7/2 states of undetermined energy.
‡ γ-ray excit suggest depopulation of high-spin states (J≥9/2).
# Measured at Eα=15 MeV. Other: ^{115}In(p,nγ) E=9 MeV (1975Ma38).
@ Deduced from α(K)exp and A_2 coef, except as noted.
& Deduced from γ-ray angular distributions via Coul. ex.
a Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
b Placement of transition in the level scheme is uncertain.
x γ ray not placed in level scheme.

$^{115}_{50}Sn_{65}$-4

^{112}Cd(α,nγ) 1975Ma38

Level Scheme

Intensities: Relative I_γ