^{122}In β^- decay (10.3 s) 1979Ch10,1979Fo10,1988Ra09

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	T. Tamura	NDS 108, 455 (2007)	30-Sep-2006

Parent: ^{122}In: E=40 *60*; J$^\pi$=5$^+$; $T_{1/2}$=10.3 s *6*; Q(β^-)=6370 *50*; %β^- decay=100.0

1979Ch10: used cross-bombarding technique in source preparation for the identification of low- and high-spin isomers; ^{238}U(p,f), E(p) was not given (also see 1977ChZO), on-line mass separation; ^{124}Sn(d,α), enriched target; semi γ, $\gamma\gamma$-coin, $\gamma\gamma$-delayed coin.

1979Fo10: ^{235}U(n,f) E=th, on-line mass separation; on-line chem; semi γ, ce, $\gamma\gamma$-coin, $\beta\gamma$- and $\gamma\gamma$-delayed coin; proposed decay scheme.

Other: 1977ChZO (^{238}U(p,f) E(p)=100 MeV).

The decay scheme is that proposed by 1988Ra09 on the basis of energy sums and of $\gamma\gamma$-coin in 1979Fo10 and 1979Ch10.

^{122}Sn Levels

E(level)	J$^\pi$†	E(level)	J$^\pi$†	E(level)	J$^\pi$†	E(level)	J$^\pi$†
0.0	0$^+$	2415.64 *5*	2$^+$	3206.1? *3*	(0)$^+$	3840.75 *9*	(4$^+$)
1140.55 *3*	2$^+$	2492.73 *5*	3$^-$	3233.79 *4*	4$^+$	3876.53 *16*	5$^-$,6$^+$
2142.12 *4*	4$^+$	2555.57 *6*	6$^+$	3305.75 *4*	4$^+$	3882.15 *6*	4$^+$
2153.89 *4*	2$^+$	2734.55 *13*	2$^+$	3371.46 *25*	(2$^+$)	3899.6? *3*	0$^+$,1$^+$,2$^+$
2245.86 *4*	5$^-$	2775.52 *8*	2$^+$	3627.09 *15*	4$^+$	3948.6 *5*	5$^-$,6$^+$
2331.15 *4*	4$^+$	2973.46 *4*	4$^+$	3670.36 *7*	4$^+$		
2409.30 *20*	7$^-$	3082.18 *6*	4$^+$	3782.88 *18*	(4$^+$)		

† From Adopted Levels.

β^- radiations

E(decay)†	E(level)	Iβ^-‡	Log *ft*	Comments
(2.46×10^3 *8*)	3948.6	0.30 *10*	6.52 *16*	av Eβ=995 *36*
(2.53×10^3 *8*)	3882.15	3.77 *18*	5.47 *7*	av Eβ=1026 *37*
(2.53×10^3 *8*)	3876.53	1.27 *22*	5.95 *10*	av Eβ=1028 *37*
(2.57×10^3 *8*)	3840.75	1.94 *15*	5.79 *7*	av Eβ=1045 *37*
(2.63×10^3 *8*)	3782.88	0.42 *8*	6.49 *11*	av Eβ=1072 *37*
(2.74×10^3 *8*)	3670.36	2.59 *18*	5.78 *7*	av Eβ=1124 *37*
(2.78×10^3 *8*)	3627.09	1.40 *21*	6.08 *9*	av Eβ=1144 *37*
(3.04×10^3# *8*)	3371.46	0.30 *6*	6.90 *11*	av Eβ=1263 *37*
(3.10×10^3 *8*)	3305.75	35.1 *9*	4.88 *6*	av Eβ=1294 *37*
(3.18×10^3 *8*)	3233.79	16.9 *4*	5.24 *6*	av Eβ=1328 *37*
(3.33×10^3 *8*)	3082.18	3.0 *3*	6.07 *7*	av Eβ=1399 *37*
(3.44×10^3 *8*)	2973.46	11.9 *4*	5.53 *6*	av Eβ=1450 *37*
(3.63×10^3# *8*)	2775.52	0.25 *20*	7.3 *4*	av Eβ=1543 *37*
(3.68×10^3# *8*)	2734.55	0.75 *11*	6.86 *8*	av Eβ=1562 *37*
(3.85×10^3 *8*)	2555.57	1.47 *22*	6.66 *8*	av Eβ=1647 *37*
(3.92×10^3 *8*)	2492.73	0.7 *3*	8.61^{1u} *20*	av Eβ=1661 *37*
(3.99×10^3# *8*)	2415.64	1.61 *18*	6.68 *7*	av Eβ=1713 *37*
(4.08×10^3 *8*)	2331.15	1.5 *9*	6.8 *3*	av Eβ=1753 *37*
(4.27×10^3 *8*)	2142.12	11.6 *20*	5.95 *9*	av Eβ=1842 *37*

† log *ft* ≈ 6.5 for some 2$^+$ levels are too low for the J^π change from parent state 5$^+$. The situation may be caused from 2 reasons: 1) lack of exact knowledge of dividing relevant γ's among 10.3-s and 10.8-s isomers in the analysis of mixed source; 2) these 2$^+$ levels possibly be fed by either undetected or unassigned γ's from unobserved high-lying levels because Qβ^-=6370 keV.

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^{122}In β^- decay (10.3 s) 1979Ch10,1979Fo10,1988Ra09 (continued)

β^- radiations (continued)

‡ Absolute intensity per 100 decays.
# Existence of this branch is questionable.

$\gamma(^{122}Sn)$

Iγ normalization: Assumed no it decay and no β^- branching to g.s.

E_γ †‡	I_γ #a	E_i(level)	J_i^π	E_f	J_f^π	Mult.&	δ&	α b	Comments
103.74 *1*	6.1@ *5*	2245.86	5⁻	2142.12	4⁺	E1		0.1639	α(K)= 0.1418; α(L)=0.01792; α(M)=0.00345; α(N+..)=0.00075 Mult.: from α(K)exp=0.13 *3* (1979Fo10).
x138.35 *11*									
163.48 *20*	0.20@ *10*	2409.30	7⁻	2245.86	5⁻	E2		0.283	α(K)=0.2259; α(L)=0.0457; α(M)=0.00912; α(N+..)=0.00194 Mult.: from α(K)exp=0.23 *5* (1979Fo10).
x212.64 *25*									
246.4c *8*	0.5 *2*	2492.73	3⁻	2245.86	5⁻				E_γ: Not observed in (n,n′γ) from the same excited state.
261.79 *9*	0.85 *10*	2415.64	2⁺	2153.89	2⁺				
309.70 *4*	2.28 *14*	2555.57	6⁺	2245.86	5⁻	E1(+M2)	+0.01 *2*		
332.27 *5*	1.78 *12*	3305.75	4⁺	2973.46	4⁺				
360.5c *3*	0.18 *8*	2775.52	2⁺	2415.64	2⁺				E_γ: Not observed in (n,n′γ) from the same excited state.
x381.9 *4*									
x405.3 *4*									
457.81 *19*	0.37 *10*	3233.79	4⁺	2775.52	2⁺				
530.10 *17*	0.53 *10*	3305.75	4⁺	2775.52	2⁺				
544.8 *4*	0.26 *12*	3627.09	4⁺	3082.18	4⁺				
596.5 *10*	0.09 *3*	3371.46	(2⁺)	2775.52	2⁺				
642.59 *21*	0.49 *16*	2973.46	4⁺	2331.15	4⁺				
678.10 *25*	0.39 *14*	3233.79	4⁺	2555.57	6⁺				
750.76 *13*	0.85 *14*	3082.18	4⁺	2331.15	4⁺				
x791.10 *25*									
794.46 *22*	0.69 *18*	3876.53	5⁻,6⁺	3082.18	4⁺				
812.99 *10*	1.38 *16*	3305.75	4⁺	2492.73	3⁻				
819.54 *3*	7.8 *3*	2973.46	4⁺	2153.89	2⁺	E2			
831.35 *3*	5.6 *2*	2973.46	4⁺	2142.12	4⁺	M1+E2	−0.61 *10*		
902.62 *4*	3.59 *20*	3233.79	4⁺	2331.15	4⁺	M1(+E2)			
974.61 *3*	13.2 *5*	3305.75	4⁺	2331.15	4⁺	M1+E2			
987.60 *16*	0.83 *17*	3233.79	4⁺	2245.86	5⁻				
1001.58 *3*	51.7@ *18*	2142.12	4⁺	1140.55	2⁺				
1013.34 *3*	10.7 *15*	2153.89	2⁺	1140.55	2⁺	M1+E2	+3.8 *4*		
x1044.42 *20*									
1059.92 *4*	2.77 *14*	3305.75	4⁺	2245.86	5⁻				
x1066.0 *3*									
1071.4 *3*	0.28 *8*	3627.09	4⁺	2555.57	6⁺				
1080.00 *9*	0.85 *8*	3233.79	4⁺	2153.89	2⁺				
1091.67 *3*	7.9 *2*	3233.79	4⁺	2142.12	4⁺	M1(+E2)			
1105.66 *25*	0.07@ *3*	2245.86	5⁻	1140.55	2⁺				

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^{122}In β^- decay (10.3 s) 1979Ch10,1979Fo10,1988Ra09 (continued)

γ(^{122}Sn) (continued)

E_γ[†‡]	I_γ[#a]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	δ[&]
1140.55 *3*	100[@] *3*	1140.55	2⁺	0.0	0⁺	E2	
1163.61 *3*	15.7 *6*	3305.75	4⁺	2142.12	4⁺	M1+E2	
1190.58 *3*	20.9 *7*	2331.15	4⁺	1140.55	2⁺		
[x]1197.69 *18*							
[x]1242.2 *6*							
[x]1250.8 *5*							
1254.80 *11*	0.57 *6*	3670.36	4⁺	2415.64	2⁺		
[x]1268.9 *4*							
1275.06 *14*	0.49 *7*	2415.64	2⁺	1140.55	2⁺	M1+E2	−0.34 *4*
1296.4 *3*	0.41 *10*	3627.09	4⁺	2331.15	4⁺		
1340.0 *5*	0.26 *10*	3670.36	4⁺	2331.15	4⁺		
1352.15 *4*	2.08 *10*	2492.73	3⁻	1140.55	2⁺	E1(+M2)	−0.03 *2*
[x]1363.4 *3*							
1367.9 *10*	0.06 *2*	3782.88	(4⁺)	2415.64	2⁺		
[x]1385.8 *5*							
1389.22 *18*	0.45 *11*	3882.15	4⁺	2492.73	3⁻		
1393.1 *6*	0.11 *6*	3948.6	5⁻,6⁺	2555.57	6⁺		
[x]1432.6 *5*							
1467.7 *7*	0.13 *6*	3876.53	5⁻,6⁺	2409.30	7⁻		
1485.0 *3*	0.23 *9*	3627.09	4⁺	2142.12	4⁺		
1516.49 *8*	1.06 *8*	3670.36	4⁺	2153.89	2⁺		
1527.84 *22*	0.30 *8*	3670.36	4⁺	2142.12	4⁺		
1539.4 *10*	0.11 *6*	3948.6	5⁻,6⁺	2409.30	7⁻		
1546.2 *8*	0.10 *5*	3876.53	5⁻,6⁺	2331.15	4⁺		
1550.82 *17*	0.47 *8*	3882.15	4⁺	2331.15	4⁺		
1594.01 *18*	0.41 *9*	2734.55	2⁺	1140.55	2⁺		
1630.44 *22*	0.38 *10*	3876.53	5⁻,6⁺	2245.86	5⁻		
1634.73 *11*	0.82 *10*	2775.52	2⁺	1140.55	2⁺	M1+E2	+0.14 *2*
1698.54 *9*	1.58 *13*	3840.75	(4⁺)	2142.12	4⁺		
1740.17 *7*	1.41 *8*	3882.15	4⁺	2142.12	4⁺		
1806.3 *7*	0.09 *5*	3948.6	5⁻,6⁺	2142.12	4⁺		
[x]1905.2 *5*							
1941.66 *5*	3.17 *14*	3082.18	4⁺	1140.55	2⁺		
[x]1957.6 *3*							
[x]1960.4 *6*							
2065.6[c] *2*	<0.10	3206.1?	(0)⁺	1140.55	2⁺		
2093.23 *3*	3.27 *14*	3233.79	4⁺	1140.55	2⁺		
2153.65 *19*	0.30 *7*	2153.89	2⁺	0.0	0⁺	E2	
2165.05 *15*	0.44 *7*	3305.75	4⁺	1140.55	2⁺		
2230.85 *25*	0.22 *5*	3371.46	(2⁺)	1140.55	2⁺	Q	
2415.62 *7*	1.11 *8*	2415.64	2⁺	0.0	0⁺	E2	
2486.2 *3*	0.25 *8*	3627.09	4⁺	1140.55	2⁺		
2529.63 *15*	0.45 *7*	3670.36	4⁺	1140.55	2⁺		
2642.28 *18*	0.37 *7*	3782.88	(4⁺)	1140.55	2⁺	Q	
[x]2669.25 *14*							
2700.42 *16*	0.40 *7*	3840.75	(4⁺)	1140.55	2⁺		
2734.50 *18*	0.36 *6*	2734.55	2⁺	0.0	0⁺		
2741.50 *6*	1.52 *8*	3882.15	4⁺	1140.55	2⁺		
2759.1[c]	<0.2	3899.6?	0⁺,1⁺,2⁺	1140.55	2⁺		
2775.55 *21*	0.25 *6*	2775.52	2⁺	0.0	0⁺	E2	
[x]2957.76 *16*							

[†] From 1988Ra09, unless noted otherwise; 1988Ra09 reported the upper limits for the strong γ's observed from 1.5-s isomer:

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^{122}In β^- decay (10.3 s) 1979Ch10,1979Fo10,1988Ra09 (continued)

γ(^{122}Sn) (continued)

Eγ=2065.6 (<0.10) from 3206 level and Eγ=2759.1 (<0.20) from 3899.6 level.

‡ Unplaced γ′s are observed as either 10.3-s or 10.8-s parent state (1988Ra09).

From 1988Ra09, unless noted otherwise; the ΔIγ′s are calculated from table of 1988Ra09 by multiplying a factor 1.15 to the ΔIγ for the mixed source data (10.3-s (83%) and 10.8-s (17%)), unless otherwise noted; see 1988Ra09 for the information on Iγ and ΔIγ for unplaced γ′s.

@ ΔIγ is subject to dividing error for 10.3-s and 10.8-s isomers.

& From adopted gammas, unless noted otherwise.

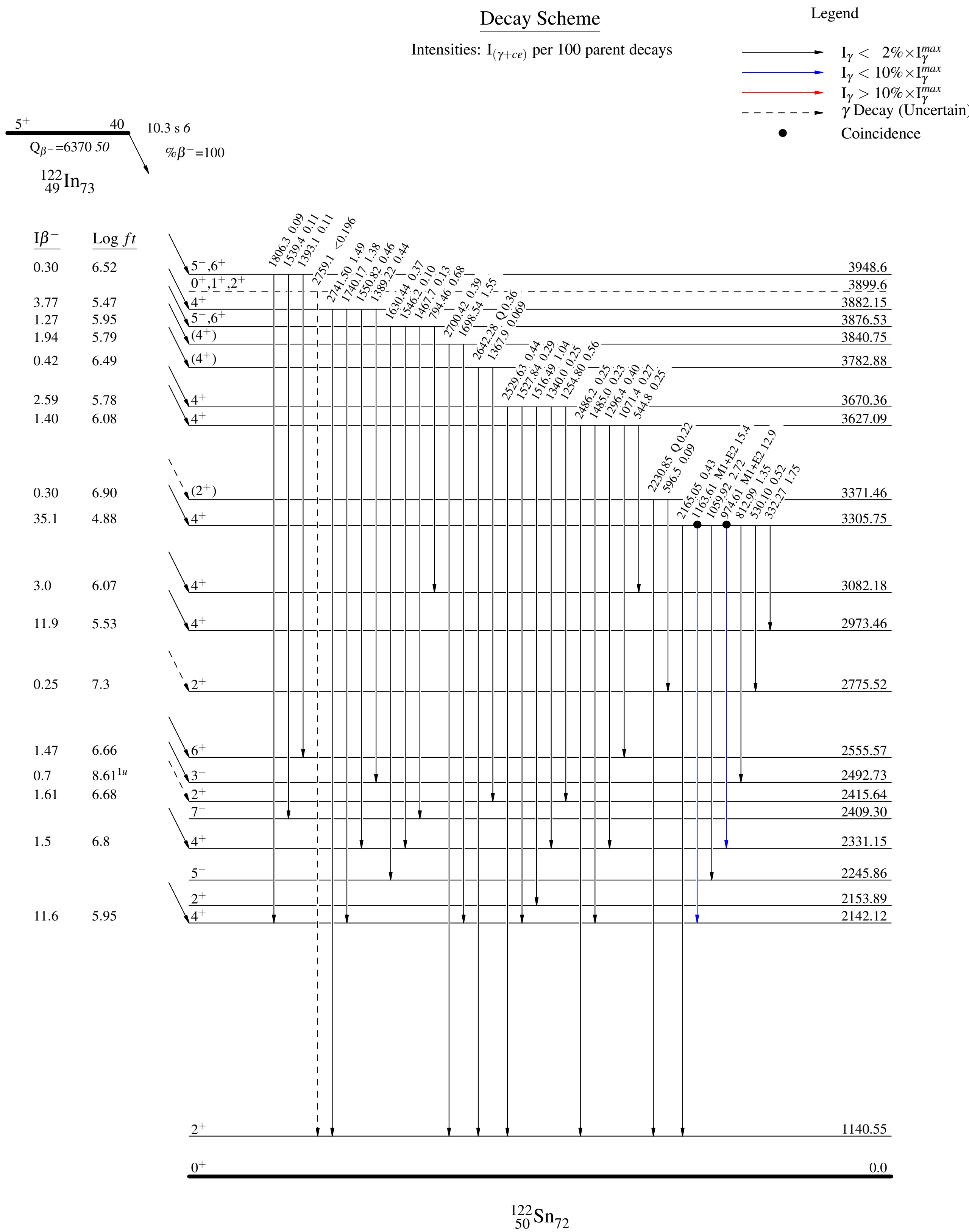
[a] For absolute intensity per 100 decays, multiply by 0.9804 *30*.

[b] 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.

[c] Placement of transition in the level scheme is uncertain.

[x] γ ray not placed in level scheme.

^{122}In β^- decay (10.3 s) 1979Ch10,1979Fo10,1988Ra09



^{122}In β^- decay (10.3 s) 1979Ch10,1979Fo10,1988Ra09