^{124}In β^- decay (3.7 s)   **1979Fo10**

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. Katakura, Z. D. Wu	NDS 109, 1655 (2008)	1-Apr-2008

Parent: ^{124}In: E<50; J$^\pi$=(8$^-$); T$_{1/2}$=3.7 s *2*; Q(β^-)=7360 *50*; %β^- decay=100.0

1979Fo10: ^{235}U(n,F) on-line ms; semi γ ce, $\gamma\gamma$ coin, $\beta\gamma$ delayed coin.
1987Sp09: ^{235}U(n,F) on-line ms; semi γ β, $\beta\gamma$ coin.
1978Al18: ^{235}U(n,F) on-line ms; semi γ β, $\beta\gamma$ coin.
The decay scheme is that proposed by 1979Fo10 on the basis of $\gamma\gamma$ coin and Eγ sums.

^{124}Sn Levels

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$[#]	E(level)[†]	J$^{\pi}$[‡]	E(level)[†]	J$^{\pi}$[‡]
0.0	0$^+$		2578.32 *11*	8$^{(+)}$	3684.77 *12*	(7$^-$)
1131.65 *7*	2$^+$		3011.0 *4*	(7,8,9)	3765.01 *14*	(7$^-$,8$^-$,9$^-$)
2101.59 *9*	4$^+$		3240.22 *23*	(7,8,9)	3809.57 *23*	(7,8,9)
2204.50 *9*	5$^-$	0.27 μs *6*	3362.2 *3*	(7,8,9)	3931.3 *4*	(7,8,9)
2324.87 *10*	(7$^-$)	3.1 μs *5*	3523.88 *12*	(7$^-$,8$^-$)		
2568.01 *10*	6$^-$		3643.2 *3*	(7,8,9)		

† From a least-squares fit to Eγ's.
‡ From Adopted Levels.
\# From $\beta\gamma$(t) plastic-Ge(Li) by 1979Fo10.

β^- radiations

E(decay)	E(level)	Iβ^-[†]	Log ft	Comments
(3.48×10^3 *5*)	3931.3	1.80 *25*	5.92 *8*	av Eβ=1458 *26*
(3.60×10^3 *5*)	3809.57	2.4 *4*	5.86 *9*	av Eβ=1515 *26*
(3.64×10^3 *5*)	3765.01	10.0 *12*	5.26 *7*	av Eβ=1536 *26*
(3.73×10^3 *5*)	3684.77	56 *6*	4.55 *6*	av Eβ=1574 *26*
				E(decay): 3660 *40* from av of 3590 *107* from (β)(1117γ) coin and 3668 *45* from (β)(1360γ) coin (1987Sp09). Other: 3680 *210* from av of values from $\beta\gamma$ coin (1978Al18).
(3.77×10^3 *5*)	3643.2	1.40 *23*	6.18 *8*	av Eβ=1594 *26*
(3.89×10^3 *5*)	3523.88	21.2 *22*	5.06 *6*	av Eβ=1650 *26*
(4.05×10^3 *5*)	3362.2	1.6 *4*	6.25 *12*	av Eβ=1726 *26*
(4.17×10^3 *5*)	3240.22	1.3 *4*	6.40 *14*	av Eβ=1784 *26*
(4.40×10^3 *5*)	3011.0	1.10 *22*	6.57 *10*	av Eβ=1892 *26*
(4.83×10^3 *5*)	2578.32	<0.8	>6.9	av Eβ=2097 *26*
(4.84×10^{3‡} *5*)	2568.01	<3.0	>6.3	av Eβ=2102 *26*

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

^{124}In β^- decay (3.7 s)　　　1979Fo10 (continued)

$\gamma(^{124}\text{Sn})$

Iγ normalization: Assumed no IT decay and no β^- branching to g.s.
α(K)exp from Ice(K)/Iγ by 1979Fo10.

E_γ[†]	I_γ[†&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	δ[@]	α[a]	Comments
102.91 5	45 3	2204.50	5^-	2101.59	4^+	E1		0.1672	B(E1)(W.u.)=4.2×10^{-7} 10 α(K)=0.1447 21; α(L)=0.0183 3; α(M)=0.00356 5; α(N+..)=0.000706 10 α(N)=0.000656 10; α(O)=4.96×10^{-5} 7
120.34 5	38 3	2324.87	(7^-)	2204.50	5^-	E2		0.827	B(E2)(W.u.)=0.107 18 α(K)=0.629 9; α(L)=0.1602 23; α(M)=0.0325 5; α(N+..)=0.00607 9 α(N)=0.00579 9; α(O)=0.000280 4
243.12 5	10.6 10	2568.01	6^-	2324.87	(7^-)	M1(+E2)	+0.01 3	0.0494	α(K)=0.0428 6; α(L)=0.00534 8; α(M)=0.001046 15; α(N+..)=0.000214 3 α(N)=0.000197 3; α(O)=1.716×10^{-5} 24
253.45 5	4.4 4	2578.32	$8^{(+)}$	2324.87	(7^-)	D+Q	+0.09 5		
^{x}339.9[‡] 3	0.7 1								
363.54 5	17.0 13	2568.01	6^-	2204.50	5^-	M1(+E2)	+0.01 2	0.01750	α(K)=0.01519 22; α(L)=0.00187 3; α(M)=0.000366 6; α(N+..)=7.49×10^{-5} 11 α(N)=6.89×10^{-5} 10; α(O)=6.03×10^{-6} 9
403.01 20	1.4 2	3643.2	(7,8,9)	3240.22	(7,8,9)				
^{x}409.60[‡] 20	1.8 2								
432.7 3	1.1 2	3011.0	(7,8,9)	2578.32	$8^{(+)}$				
^{x}449.33[‡] 20	1.9 2								
^{x}496.5[‡] 6	1.3 2								
^{x}549.0[‡] 3	1.2 2								
569.11 15	1.8 2	3931.3	(7,8,9)	3362.2	(7,8,9)				
^{x}574.1[‡] 3	0.9 2								
784.0 6	1.4 2	3362.2	(7,8,9)	2578.32	$8^{(+)}$				
^{x}820.3[‡] 4	0.9 2								
^{x}849.73[‡] 20	2.0 2								
915.35 20	2.7 3	3240.22	(7,8,9)	2324.87	(7^-)				
955.90 10	12.4 10	3523.88	$(7^-,8^-)$	2568.01	6^-				
969.94[#] 7	52 4	2101.59	4^+	1131.65	2^+	E2			
^{x}977.15[‡] 15	1.6 2								
1037.3 3	2.0 2	3362.2	(7,8,9)	2324.87	(7^-)				
1072.85 7	47 4	2204.50	5^-	1131.65	2^+				
1106.9 6	1.0 2	3684.77	(7^-)	2578.32	$8^{(+)}$				
1116.77 10	15.5 15	3684.77	(7^-)	2568.01	6^-				
1131.64[#] 7	100 8	1131.65	2^+	0.0	0^+	E2		9.85×10^{-4}	α(K)=0.000855 12; α(L)=0.0001039 15;

^{124}In β^- decay (3.7 s)   **1979Fo10** (continued)

$\gamma(^{124}$Sn) (continued)

E$_\gamma$[†]	I$_\gamma$[†&]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Comments
						α(M)=2.03×10^{-5} 3; α(N+..)=5.50×10^{-6} 8
						α(N)=3.81×10^{-6} 6; α(O)=3.27×10^{-7} 5; α(IPF)=1.366×10^{-6} 20
1186.6 4	0.8 2	3765.01	(7$^-$,8$^-$,9$^-$)	2578.32	8$^{(+)}$	
1198.97 10	8.8 8	3523.88	(7$^-$,8$^-$)	2324.87	(7$^-$)	
1359.86 10	39 3	3684.77	(7$^-$)	2324.87	(7$^-$)	
1440.13 10	9.2 8	3765.01	(7$^-$,8$^-$,9$^-$)	2324.87	(7$^-$)	
^{x}1452.6[‡] 4	1.6 2					
1484.69 20	2.4 3	3809.57	(7,8,9)	2324.87	(7$^-$)	
^{x}1672.3[‡] 6	0.6 2					
^{x}1762.7[‡] 9	0.5 2					
^{x}1856.0[‡] 4	1.4 2					
^{x}1907.2[‡] 6	1.1 2					
^{x}2699.6[‡] 4	3.1 3					
^{x}2781.3[‡] 5	1.0 2					

[†] From 1979Fo10.
[‡] Isomeric assignment uncertain (1979Fo10).
[#] Weighted av from ^{124}In β^- decay (3.7 s) and ^{124}In β^- decay (3.11 s).
[@] From adopted gammas.
[&] For absolute intensity per 100 decays, multiply by 1.00 8.
[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.
[x] γ ray not placed in level scheme.

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Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays

Legend

I$_\gamma$ < 2%×I$_\gamma^{max}$
I$_\gamma$ < 10%×I$_\gamma^{max}$
I$_\gamma$ > 10%×I$_\gamma^{max}$
● Coincidence

(8⁻)   <50   3.7 s 2
Q$_{\beta^-}$=7360 *50*   %β⁻=100

$^{124}_{49}$In$_{75}$

Iβ^-	Log ft			
1.80	5.92	(7,8,9)		3931.3
2.4	5.86	(7,8,9)		3809.57
10.0	5.26	(7⁻,8⁻,9⁻)		3765.01
56	4.55	(7⁻)		3684.77
1.40	6.18	(7,8,9)		3643.2
21.2	5.06	(7⁻,8⁻)		3523.88
1.6	6.25	(7,8,9)		3362.2
1.3	6.40	(7,8,9)		3240.22
1.10	6.57	(7,8,9)		3011.0
<0.8	>6.9	8$^{(+)}$		2578.32
<3.0	>6.3	6⁻		2568.01
		(7⁻)	3.1 μs 5	2324.87
		5⁻	0.27 μs 6	2204.50
		4⁺		2101.59
		2⁺		1131.65
		0⁺		0.0

Gamma transitions:
569.11 1.9
1484.69 2.4
1440.13 9.2
1186.6 0.90
1359.86 39
1116.77 15.5
1106.9 1.10
403.01 1.50
1198.97 8.8
955.90 12.4
1037.3 2.1
784.0 1.50
915.35 2.7
432.7 1.20
253.45 D+Q 4.4
363.54 M1(+E2) 17.3
243.12 M1(+E2) 11.1
120.34 E2 69
1072.85 47
102.91 E1 53
960.94 E2 52
1131.64 E2 100

$^{124}_{50}$Sn$_{74}$