Adopted Levels, Gammas

History

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

Q(β^-)=−613.2 *22*; S(n)=8489.2 *24*; S(p)=12093 *20*; Q(α)=−6702 *4* 2012Wa38
Note: Current evaluation has used the following Q record.
Q(β^-)=−616.5 *21*; S(n)=8487.6 *26*; S(p)=12100 *24*; Q(α)=−6688 *19* 2003Au03

^{124}Sn Levels

Cross Reference (XREF) Flags

A	^{124}In β^- decay (3.7 s)	F	^{124}Sn(e,e′)	K	^{124}Sn(^{3}He,^{3}He′)
B	^{124}In β^- decay (3.12 s)	G	^{124}Sn(n,n′γ)	L	^{124}Sn(α,α′)
C	^{124}Sn IT decay	H	^{124}Sn(p,p′)	M	Coulomb excitation
D	^{122}Sn(t,p)	I	^{124}Sn(p,p′γ)	N	^{128}Te(d,^{6}Li)
E	^{124}Sn(γ,γ′),(pol γ,γ′)	J	^{124}Sn(d,d′)		

$T_{1/2}(2\beta^-(0\nu+2\nu)(0^+$ to $2_1+)$:
> 9.1×10^{20} y (2008BaZZ)
> 3.1×10^{18} y (2008Da02)
> 2.3×10^{18} y (2007Ki13)

$T_{1/2}(2\beta^-(0\nu+2\nu)(0^+$ to $0_1+)$:
> 1.1×10^{21} y (2008BaZZ)
> 7.7×10^{18} y (2008Da02)
> 6.7×10^{18} y (2007Ki13)

$T_{1/2}(2\beta^-(0\nu+2\nu)(0^+$ to $2_2+)$:
> 9.4×10^{20} y (2008BaZZ)
> 4.4×10^{18} y (2008Da02)
> 7.9×10^{18} y (2007Ki13)

$T_{1/2}(2\beta^-(0\nu+2\nu)(0^+$ to $0_2+)$:
> 1.2×10^{21} y (2008BaZZ)
> 7.9×10^{18} y (2008Da02)

$T_{1/2}(2\beta^-(0\nu+2\nu)(0^+$ to $0_3+)$:
> 1.2×10^{21} y (2008BaZZ)

$T_{1/2}(2\beta^-(0\nu+2\nu)(0^+$ to $0_4+)$:
> 8.2×10^{20} y (2008BaZZ)
> 4.4×10^{18} y (2008Da02)

$T_{1/2}(2\beta^-(0\nu+2\nu)(0^+$ to $2_3+)$:
> 8.6×10^{20} y (2008BaZZ)
> 4.4×10^{18} y (2008Da02)

$T_{1/2}(2\beta^-(0\nu+2\nu)(0^+$ to $2_4+)$:
> 9.6×10^{20} y (2008BaZZ)
> 3.1×10^{18} y (2008Da02)

$T_{1/2}(2\beta^-(0\nu+2\nu)(0^+$ to $0_5+)$:
> 9.5×10^{20} y (2008BaZZ)

E(level)†	J^π	$T_{1/2}$&	XREF	Comments
0.0	0^+	stable	ABCDEFGHIJKLMN	<r^2>$^{1/2}$=4.6759 fm *12* (2004An14, evaluation). Mass excess=−88228 *20* with Penning trap mass spectrometer ISOLTRAP (2005Si34).
1131.739 *17*	2^+	0.92 ps *3*	ABCDEFGHIJKLMN	μ=−0.30 *20*; Q=−0.01 *17* J^π: E2 transition to 0^+. μ: From transient field integral PAC (1980Ha19,1989Ra17). See also 2005St24 compilation. Q: From Coul. ex. reorientation (1975Gr30,1989Ra17). See also 2005St24

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Adopted Levels, Gammas (continued)

^{124}Sn Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[&]	XREF	Comments
				compilation.
				$T_{1/2}$: from B(E2) in Coul. ex. Others: 0.93 ps *13* from (γ,γ'); > 1.2 ps from (n,n′γ). 2001Ra27 evaluation gives 0.917 ps *22*.
2101.711 *23*	4^+	3.7 ps *4*	AB D FGH MN	XREF: F(2180).
				Jπ: L=4 in (p,p′); L=5 in (t,p) but its assignment is questionable.
				$T_{1/2}$: from B(E2) in Coul. ex. Other: >0.8 ps from DSA in (n,n′γ).
				B(E4)(e,e′)=0.014 *3*.
2129.596 *25*	2^+	0.8 ps *+5–2*	B GHIJ MN	Jπ: $\gamma(\theta)$ in (n,n′γ), log *ft*=5.63 from $(1)^+$.
				$T_{1/2}$: other: ≥1.8 fs in Coul. ex.
2192.17 *3*	0^+	>0.55 ps	B GH	Jπ: $J^\pi=0^+$ from $\gamma(\theta)$, γ-pol and excitation function in (n,n′γ).
2204.620 *23*	(5^-)	0.27 μs *6*	A CD GH J N	XREF: D(2213).
				Jπ: E2 γ from (7^-), L=5(+4) in (p,p′).
				$T_{1/2}$: from $\beta\gamma$(t) ^{124}In β^- decay (3.7 s) (1979Fo10).
2221.75 *5*	$4^{+\#}$	0.9 ps *+9–3*	B G	
2325.01 *4*	(7^-)	3.1 μs *5*	A CD GH N	Jπ: L=7 in (p,p′) and (t,p).
				$T_{1/2}$: from $\beta\gamma$(t) ^{124}In β^- decay (3.7 s) (1979Fo10).
2366.5 *5*			B	
2426.316 *21*	2^+	0.35 ps *+20–10*	B DE GH J MN	Jπ: E2 γ to 0^+.
				$T_{1/2}$: other: >0.08 ps in Coul. ex., 0.72 ps *18* in (γ,γ').
2448[‡] *10*	(8^+)		H n	Jπ: L=(8) in (p,p′).
2454.34 *3*	$6^{+\#}$		G n	
2568.15 *4*	$6^{-\#}$		A G	
2578.44 *5*	$8^{(+)}$		A C G	Jπ: $\gamma(\theta)$ and γ-pol in (n,n′γ), low level population in (n,n′γ), E2 γ from (10^+).
2602.495 *25*	3^-	0.068 ps *6*	B D FGH J LMn	XREF: D(2612)L(2610).
				Jπ: L=3 in (α,α').
				B(E3)(e,e′)=0.076 *11*; 2002Ki06 evaluation gives 0.073 *10*.
2614.45 *3*	$4^{-\#}$		G n	
2656.6 *5*	(10^+)	45 μs *5*	C	%IT=100
				Jπ: systematics of 10^+ state in ^{116}Sn-^{130}Sn isotopes.
				$T_{1/2}$: from measurements with pulsed beam in ^{124}Sn IT decay (1992Br06).
2688.50 *5*	0^+	>0.28 ps	GHI MN	Jπ: p(θ) from (p,p′) IAR and excitation function in (n,n′γ).
				$T_{1/2}$: other: >0.2 ps in Coul. ex.
2701.78 *3*	$5^{-\#}$		G n	
2703.187 *25*	$2^{+\#}$	0.4 ps *+4–1*	B G n	
2706[‡] *10*	(4^+)		H n	Jπ: L=(4) in (p,p′).
2753.05 *3*	$4^{-\#}$		G	
2819.3 *5*	(6^+)	>0.4 ps	G	Jπ: from $\gamma(\theta)$ and excitation function in (n,n′γ).
2836.58 *4*	$3^{+\#}$	>0.28 ps	B G J	
2855.13 *5*	$6^{-\#}$		G	
2875.37 *5*	$2^{+\#}$	0.13 ps *+7–3*	B Gh n	XREF: h(2880).
2878.65 *5*	$2^{+\#}$	0.067 ps *+18–14*	B Gh n	
2958.11 *6*	4^+	>0.9 ps	GH	Jπ: $\gamma(\theta)$ and (M1+E2) γ to 4^+ in (n,n′γ).
2988.03 *3*	$3^{-\#}$	>0.55 ps	GH J	XREF: H(3002).
3011.1 *3*	(7,8,9)		A	Jπ: log *ft*=6.57 from (8^-).
3109.5 *5*	$1,2^+$		B	Jπ: γ to 0^+.
3130[‡] *20*	$(3^-,5^-)$		H J	Jπ: p(θ) in (p,p′) through $f_{7/2}$ analog resonance.
3143.86 *6*	4^+	0.11 ps *+9–4*	GH	Jπ: L=4 in (p,p′).
3214.36 *10*	2^+	0.025 ps *6*	B E GH J	XREF: J(3190).

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Adopted Levels, Gammas (continued)

^{124}Sn Levels (continued)

E(level)†	Jπ	$T_{1/2}$&	XREF	Comments
				Jπ: L=2 in (p,p′).
				$T_{1/2}$: other: 0.044 ps *6* in (γ,γ′).
3227.95 *11*		0.07 ps *+23−3*	G	
3240.36 *21*	(7,8,9)		A	Jπ: log *ft*=6.40 from (8−).
3264.49 *11*	2+	0.19 ps *+22−8*	B Gh	XREF: h(3275).
				Jπ: γ(θ) and γ-pol in (n,n′γ).
3267.13 *9*	1,2,3	>0.14 ps	Gh	Jπ: γ(θ) in (n,n′γ).
3293.42 *9*	2,3		B G	Jπ: γ(θ) in (n,n′γ).
3312.99? *7*	2,3,4		G	Jπ: γ(θ) in (n,n′γ).
3330.41 *10*	2,3	0.07 ps *+9−3*	GH	Jπ: γ(θ) in (n,n′γ).
3333.54 *9*	2(+)		B G	Jπ: γ(θ) and (M1+E2) γ to 2+ in (n,n′γ).
3346.46 *7*	(3,4)		G j	Jπ: γ(θ) in (n,n′γ).
3360 *5*	4+		D H	Jπ: L=4 in (p,p′).
3362.3 *3*	(7,8,9)		A j	Jπ: log *ft*=6.25 from (8−).
3363.59 *8*	3(+)		G	Jπ: γ(θ) and (M1+E2) γ to 4+ in (n,n′γ).
3396.5 *8*	1,2+		B	Jπ: γ to 0+.
3410.14 *13*	1		G	Jπ: γ(θ) in (n,n′γ).
3414 *5*	4+		D H L	Jπ: L=4 in (α,α′).
3490.18 *14*	1−@	0.0051 ps *5*	E G	$T_{1/2}$: from (γ,γ′), other: 0.006 ps *+4−3* in (n,n′γ).
				B(E1)(γ,γ′)=6.1×10−05 *7*.
3498.58 *15*	1,2,3		G	Jπ: γ(θ) in (n,n′γ).
3509.15 *9*	3(+)		D GH	Jπ: γ(θ) and (M1+E2) γ to 2+ in (n,n′γ).
3524.02 *8*	(7−,8−)		A	Jπ: γ to 6−, log *ft*=5.06 from (8−).
3551.53 *12*	(3−)		B GH	XREF: H(3560).
				Jπ: p(θ) in (p,p′) through $f_{7/2}$ analog resonance allows (3−,5−). log *ft*=6.26 from (1)+ rules out 5−.
3583.66 *13*	2+		GH	XREF: H(3570).
				Jπ: L=2 in (p,p′).
3603.86 *17*	2,3		GH	Jπ: γ(θ) in (n,n′γ).
3643.4 *3*	(7,8,9)		A H	Jπ: log *ft*=6.18 from (8−).
3655.20 *15*	2,3		B G	Jπ: γ(θ) in (n,n′γ).
3684.91 *8*	(7−)		A H	Jπ: log *ft*=4.55 from (8−), L=(6,7) in (p,p′).
3697.3 *4*	1@	0.029 ps *+13−10*	E G	$T_{1/2}$: other: 0.034 ps *6* in (γ,γ′).
3710.39 *19*	2+	0.030 ps *+28−15*	B E G	Jπ: E2 γ to 0+.
				$T_{1/2}$: other: 0.054 ps *9* in (γ,γ′).
3724.7 *3*	1,2+		B G	Jπ: γ to 0+.
3741.62 *10*	(2)+		B Gh	XREF: h(3752).
				Jπ: log *ft*=5.77 from (1)+, γ′s to 2+, 3− and 4+.
3760.27 *20*	(0+,1,2)		B h	Jπ: log *ft*=6.46 from (1)+, γ to 2+.
3761.83 *21*	2+	0.05 ps *+7−3*	B Gh	Jπ: E2 γ to 0+.
3765.14 *11*	(7−,8−,9−)		A	Jπ: log *ft*=5.26 from (8−).
3787 *10*			H	
3802.54 *17*	2,3		G	Jπ: γ(θ) in (n,n′γ).
3809.71 *21*	(7,8,9)		A	Jπ: log *ft*=5.86 from (8−).
3820 *10*	(3−,5−)		H	Jπ: p(θ) in (p,p′) through $f_{7/2}$ analog resonance.
3831.4 *3*	2,3,4		G	Jπ: γ(θ) in (n,n′γ).
3834.3 *7*	1,2+		B	Jπ: γ to 0+.
3864.26 *13*	1,2+		B G	Jπ: γ to 0+.
3872 *10*	(6+)		H	Jπ: L=(6) in (p,p′).
3888.0 *8*	1,2+		B l	XREF: l(3900).
				Jπ: γ to 0+.
3910.7 *9*	2+		B H l	Jπ: L=2 in (p,p′).
3917.27 *5*	2+		B h	XREF: h(3930).
				Jπ: γ′s to 0+ and 4+.
3923 *5*	4+		D h	XREF: h(3930).

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Adopted Levels, Gammas (continued)

^{124}Sn Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[&]	XREF	Comments
				Jπ: L=4 in (t,p).
3931.5 *3*	(7,8,9)		A h	XREF: h(3930).
				Jπ: log *ft*=5.92 from (8⁻).
3963.6 *3*	1,2		GH	Jπ: γ(θ) in (n,n′γ).
4043.8 *5*	1,2⁺		B H	Jπ: γ to 0⁺.
4074.4 *4*	2		G	Jπ: γ(θ) in (n,n′γ).
4094.2 *3*	2,3		G	Jπ: γ(θ) in (n,n′γ).
4120 *20*			H	
4156.1 *3*	2⁺		B GH	Jπ: L=2 in (p,p′).
4208.1 *3*	2,3		G	Jπ: γ(θ) in (n,n′γ).
4219.2 *6*	1[@]	13.1[a] fs *14*	E	
4227.57 *16*	1,2⁺		B G	Jπ: γ to 0⁺.
4263.5 *6*	1	23[a] fs *4*	E	
4264.1 *3*	1,2⁺		B H	Jπ: γ to 0⁺.
4269.82 *22*	(4)		G	Jπ: γ(θ) in (n,n′γ).
4331.4 *4*	1,2⁺		B H	XREF: H(4343).
				Jπ: γ to 0⁺.
4359.58 *20*	0⁺ to 4⁺		G	Jπ: γ to 2⁺.
4400 *20*			H	
4470.3 *4*	1,2⁺		B H	Jπ: γ to 0⁺.
4528.8 *4*	1,2⁺		B D H	Jπ: γ to 0⁺.
4560 *20*			H	
4570 *20*			H	
4604.6 *7*	1,2⁺		B	Jπ: γ to 0⁺.
4605.8 *6*		10.1[a] fs *25*	E	
4620 *5*	(4⁺)		D	Jπ: L=4 in (t,p).
4620 *20*	(3⁻,4⁻,5⁻)		H	Jπ: p(θ) in (p,p′) through $f_{7/2}$ analog resonance.
4672 *5*	3⁻		D H	Jπ: L=3 in (t,p).
4707 *5*	3⁻		D H l	XREF: l(4800).
				Jπ: L=3 in (t,p).
4770[‡] *20*	(3⁻,4⁻)		H l	Jπ: p(θ) in (p,p′) through $f_{7/2}$ analog resonance.
4818 *5*	(5⁻)		D	Jπ: L=5 in (t,p).
4880 *10*	3⁻		D H l	Jπ: L=3 in (t,p).
4916 *10*	3⁻		D	Jπ: L=3 in (t,p).
4948 *5*	(5⁻)		D h	XREF: h(4960).
				Jπ: L=5 in (t,p).
4953.8 *7*	1[@]	14[a] fs *3*	E	
4970 *5*	(2⁺,3⁻)		D h	Jπ: L=(2,3) in (t,p).
5014 *5*	3⁻		D H	Jπ: L=3 in (t,p).
5050 *20*			H	
5064.8 *7*		7.0[a] fs *15*	E	
5100 *20*			H	
5131 *5*	(4⁺)		D	Jπ: L=(4) in (t,p).
5166 *5*	3⁻		D l	XREF: l(5200).
				Jπ: L=3 in (t,p).
5196 *5*	3⁻		D H l	Jπ: L=3 in (t,p).
5267 *5*	(7⁻)		D H	Jπ: L=7 in (t,p).
5290 *20*			H	
5313 *5*	(5⁻)		D H	Jπ: L=5 in (t,p).
5345 *5*	(5⁻)		D	Jπ: L=5 in (t,p).
5379 *5*	(5⁻)		D H	Jπ: L=5 in (t,p).
5430 *5*	(5⁻)		D H	Jπ: L=5 in (t,p).
5459 *10*	(5⁻)		D H	Jπ: L=5 in (t,p).
5520 *20*			H	
5552 *10*			D	

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Adopted Levels, Gammas (continued)

^{124}Sn Levels (continued)

E(level)†	Jπ	$T_{1/2}$&	XREF	Comments
5614 *10*			D H	
5640 *20*			H	
5710 *20*			H	
5760 *20*			H	
5800 *20*			H	
5842.6 *7*	1$^-$@	1.02[a] fs *8*	E	B(E1)(γ,γ′)=6.4×10^{-5} *5*.
5866 *10*			D h	
5869.8 *8*	(1)@	5.1[a] fs *10*	E h	
5902.7 *7*	1@	5.4[a] fs *20*	E	
5951.9 *7*	1@	1.38[a] fs *19*	E	
5968.6 *7*	1@	2.2[a] fs *4*	E	
6002.2 *7*	1@	1.7[a] fs *3*	E	
6129.2 *7*	1@	0.82[a] fs *9*	E	
6171.0 *12*	1@	1.04[a] fs *10*	E	
6184.2 *6*	1$^-$@	0.94[a] fs *11*	E	B(E1)(γ,γ′)=5.9×10^{-5} *7*.
6236.7 *7*	1@	0.64[a] fs *6*	E	
6287.3 *7*	1@	1.52[a] fs *24*	E	
6321.8 *7*	1$^-$@	0.70[a] fs *6*	E	B(E1)(γ,γ′)=7.4×10^{-5} *7*.
6369.3 *7*	1$^-$@	0.277[a] fs *16*	E	B(E1)(γ,γ′)=18.2×10^{-5} *11*.
6453.3 *7*	1@	1.30[a] fs *16*	E	
6467.7 *6*	1@	0.95[a] fs *9*	E	
6503.4 *6*	1@	1.26[a] fs *20*	E	
6524.2 *5*	1$^-$@	0.56[a] fs *6*	E	B(E1)(γ,γ′)=8.3×10^{-5} *9*.
6548.7 *5*	1@	0.65[a] fs *7*	E	
6561.0 *7*	1$^-$@	0.35[a] fs *3*	E	B(E1)(γ,γ′)=13.1×10^{-5} *12*.
6566.0 *8*	1@	0.85[a] fs *11*	E	
6584.3 *6*	1$^-$@	0.75[a] fs *8*	E	B(E1)(γ,γ′)=6.0×10^{-5} *6*.
6600.0 *7*	1@	1.4[a] fs *3*	E	
6635.8 *6*	1$^-$@	0.39[a] fs *3*	E	B(E1)(γ,γ′)=11.4×10^{-5} *9*.
6678.1 *7*	1$^-$@	0.42[a] fs *3*	E	B(E1)(γ,γ′)=10.4×10^{-5} *9*.
6683.5 *8*	1$^-$@	0.71[a] fs *9*	E	B(E1)(γ,γ′)=6.1×10^{-5} *8*.
6705.6 *8*	1$^-$@	0.97[a] fs *14*	E	B(E1)(γ,γ′)=4.5×10^{-5} *6*.
6713.8 *7*	1$^-$@	0.52[a] fs *5*	E	B(E1)(γ,γ′)=8.3×10^{-5} *8*.
6722.5 *6*	1@	0.66[a] fs *7*	E	
6764.4 *8*	1$^-$@	0.58[a] fs *7*	E	B(E1)(γ,γ′)=7.2×10^{-5} *9*.
6775.8 *8*	1@	0.84[a] fs *15*	E	
6790.8 *8*	1$^-$@	0.71[a] fs *8*	E	B(E1)(γ,γ′)=5.8×10^{-5} *7*.
6808.2 *6*	1$^{(+)}$@	1.08[a] fs *14*	E	B(M1)(γ,γ′)=0.35 *5*.
6847.3 *8*	1$^-$@	0.90[a] fs *10*	E	B(E1)(γ,γ′)=4.5×10^{-5} *5*.
6902.3 *8*	1$^-$@	1.13[a] fs *14*	E	B(E1)(γ,γ′)=3.5×10^{-5} *4*.
6928.4 *8*	(1)@	1.4[a] fs *4*	E	
6939.1 *8*	1@	1.6[a] fs *3*	E	
6947.7 *8*	1@	1.6[a] fs *3*	E	
7018.2 *8*	1@	1.07[a] fs *13*	E	
7032.7 *7*	1$^-$@	0.97[a] fs *11*	E	B(E1)(γ,γ′)=3.9×10^{-5} *4*.
7062.4 *9*	1@	2.6[a] fs *6*	E	

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Adopted Levels, Gammas (continued)

^{124}Sn Levels (continued)

E(level)†	Jπ	$T_{1/2}$&	XREF	Comments
7071.3 *8*	1@	1.31[a] fs *18*	E	
7086.7 *7*	1@	1.46[a] fs *25*	E	
7125.9 *7*	1@	1.22[a] fs *17*	E	
7234.0 *8*	1@	1.8[a] fs *5*	E	
7258.8 *10*	1@	1.7[a] fs *5*	E	
7295.7 *7*	1−@	0.63[a] fs *5*	E	B(E1)(γ,γ′)=5.3×10^{-5} *4*.
7308.7 *9*	1@	1.7[a] fs *4*	E	
7326.4 *7*	1@	1.7[a] fs *4*	E	
7337.7 *7*	1−@	0.76[a] fs *11*	E	B(E1)(γ,γ′)=4.3×10^{-5} *6*.
7344.6 *7*	1@	1.06[a] fs *21*	E	
7394.7 *4*	1−@	0.93[a] fs *15*	E	B(E1)(γ,γ′)=3.5×10^{-5} *6*.
7487.8 *7*	1−@	0.72[a] fs *9*	E	B(E1)(γ,γ′)=4.3×10^{-5} *6*.
7536.7 *7*	1−@	0.70[a] fs *11*	E	B(E1)(γ,γ′)=4.4×10^{-5} *7*.
7551.1 *6*	1−@	0.83[a] fs *12*	E	B(E1)(γ,γ′)=3.6×10^{-5} *5*.
7567.1 *10*	1@	1.33[a] fs *18*	E	
7576.1 *7*	1−@	0.96[a] fs *12*	E	B(E1)(γ,γ′)=3.1×10^{-5} *4*.
7596.6 *10*	1−@	0.64[a] fs *6*	E	B(E1)(γ,γ′)=4.7×10^{-5} *4*.
7604.0 *8*	1−@	0.59[a] fs *8*	E	B(E1)(γ,γ′)=5.0×10^{-5} *7*.
7642.9 *8*	1−@	1.22[a] fs *24*	E	B(E1)(γ,γ′)=2.4×10^{-5} *5*.
7666.3 *7*	1@	1.9[a] fs *3*	E	
7679.1 *14*	1@	1.7[a] fs *4*	E	
7684.2 *11*	1−@	0.92[a] fs *17*	E	B(E1)(γ,γ′)=3.1×10^{-5} *6*.
7691.5 *7*	1@	1.08[a] fs *18*	E	
7702.9 *9*	1@	2.2[a] fs *5*	E	
7747.7 *7*	1−@	0.76[a] fs *8*	E	B(E1)(γ,γ′)=3.7×10^{-5} *4*.
7759.4 *4*	1−@	0.62[a] fs *6*	E	B(E1)(γ,γ′)=4.5×10^{-5} *4*.
7770.9 *6*	1@	1.09[a] fs *20*	E	
7778.4 *9*	1@	1.6[a] fs *3*	E	
7788.6 *5*	1@	0.78[a] fs *9*	E	
7815.6 *5*	1−@	0.345[a] fs *25*	E	B(E1)(γ,γ′)=7.9×10^{-5} *6*.
7863.7 *8*	1−@	0.90[a] fs *11*	E	B(E1)(γ,γ′)=3.0×10^{-5} *4*.
7872.4 *6*	1@	0.78[a] fs *12*	E	
7880.5 *5*	1−@	0.39[a] fs *3*	E	B(E1)(γ,γ′)=6.9×10^{-5} *5*.
7905.4 *12*	1@	1.6[a] fs *3*	E	
7913.4 *8*	1@	1.03[a] fs *21*	E	
7939.3 *12*	1@	1.6[a] fs *3*	E	
7957.4 *9*	1@	0.53[a] fs *3*	E	
7999.2 *9*	1−@	0.90[a] fs *12*	E	B(E1)(γ,γ′)=2.8×10^{-5} *4*.
8112.1 *16*	1@	1.22[a] fs *18*	E	
8119.1 *8*	1@	0.55[a] fs *4*	E	
8132.0 *15*	1@	0.64[a] fs *6*	E	
8162.5 *8*	1@	1.17[a] fs *16*	E	
8214.6 *12*	1@	1.6[a] fs *3*	E	
8229.2 *6*	1@	0.72[a] fs *8*	E	
8257.2 *9*	1@	1.43[a] fs *18*	E	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{124}Sn Levels (continued)

E(level)[†]	J^{π}	$T_{1/2}$[&]	XREF	Comments
8270.1 *7*	$1^{(+)}$[@]	0.81[a] fs *6*	E	B(M1)(γ,γ')=0.26 *2*.
8350.4 *13*	1[@]	1.44[a] fs *19*	E	
8376.5 *11*	1^-[@]	0.78[a] fs *7*	E	B(E1)(γ,γ')=2.9×10^{-5} *2*.
8423.1 *7*	1[@]	0.92[a] fs *9*	E	
8433.5 *10*	1[@]	1.08[a] fs *13*	E	

[†] For γ-connecting levels from a least-squares fit to the adopted Eγ's. Others from (t,p), unless otherwise noted.
[‡] From (p,p′).
[#] From $\gamma(\theta)$ and γ-pol in (n,n′γ).
[@] From $\gamma'(90°)/\gamma'(127°)$ and asymmetry in (pol γ,γ').
[&] From DSA of γ's in (n,n′γ), unless otherwise noted.
[a] From $\Gamma^2_{\gamma 0}/\Gamma_\gamma$ and branching ratios in (γ,γ').

Adopted Levels, Gammas (continued)

$\gamma(^{124}Sn)$

E_i(level)	J_i^π	E_γ[†]	I_γ[b]	E_f	J_f^π	Mult.[b]	δ[b]	α[d]	Comments
1131.739	2^+	1131.69 *2*	100	0.0	0^+	E2		9.85×10^{-4}	B(E2)(W.u.)=9.0 *3* α(K)=0.000855 *12*; α(L)=0.0001039 *15*; α(M)=2.03×10^{-5} *3*; α(N+..)=5.51×10^{-6} *8* α(N)=3.81×10^{-6} *6*; α(O)=3.27×10^{-7} *5*; α(IPF)=1.368×10^{-6} *20* Mult.: from α(K)exp=0.0009 *2* in ^{124}In β^- decay (3.7 s).
2101.711	4^+	969.97 *2*	100	1131.739	2^+	E2		1.38×10^{-3}	B(E2)(W.u.)=4.8 *6* α(K)=0.001195 *17*; α(L)=0.0001473 *21*; α(M)=2.88×10^{-5} *4*; α(N+..)=5.86×10^{-6} *9* α(N)=5.40×10^{-6} *8*; α(O)=4.59×10^{-7} *7*
2129.596	2^+	997.85 *2*	100.00 *10*	1131.739	2^+	M1+E2	+3.2 *+7−5*	1.31×10^{-3} *2*	B(M1)(W.u.)=0.0021 *5*; B(E2)(W.u.)=17.4 *4* α(K)=0.001142 *17*; α(L)=0.0001399 *21*; α(M)=2.73×10^{-5} *4*; α(N+..)=5.57×10^{-6} *8* α(N)=5.13×10^{-6} *8*; α(O)=4.39×10^{-7} *7*
		2129.6 *3*	1.73 *10*	0.0	0^+	E2		6.48×10^{-4}	B(E2)(W.u.)=0.012 *+4−8* α(K)=0.000250 *4*; α(L)=2.93×10^{-5} *5*; α(M)=5.70×10^{-6} *8*; α(N+..)=0.000363 *5* α(N)=1.075×10^{-6} *15*; α(O)=9.44×10^{-8} *14*; α(IPF)=0.000362 *5* Mult.: from (n,n′γ) and RUL of relevant levels.
2192.17	0^+	1060.42 *2*	100	1131.739	2^+	E2		1.13×10^{-3}	α(K)=0.000983 *14*; α(L)=0.0001201 *17*; α(M)=2.35×10^{-5} *4*; α(N+..)=4.78×10^{-6} *7* α(N)=4.40×10^{-6} *7*; α(O)=3.77×10^{-7} *6* Mult.: $\gamma(\theta)$ in (n,n′γ) and RUL.
2204.620	(5^-)	102.91[‡] *2*	100 *5*	2101.711	4^+	E1		0.1672	B(E1)(W.u.)=4.4×10^{-7} *11* 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* Mult.: from α(K)exp=0.15 *3* in ^{124}In β^- decay (3.7 s).
		1072.88[‡] *2*	92 *10*	1131.739	2^+	[E3]		0.00226	B(E3)(W.u.)=1.3 *4* α(K)=0.00194 *3*; α(L)=0.000255 *4*; α(M)=5.02×10^{-5} *7*; α(N+..)=1.017×10^{-5} *15* α(N)=9.39×10^{-6} *14*; α(O)=7.83×10^{-7} *11* I_γ: weighted av of 84 *7* from (n,n′) and 104 *9* from ^{124}In β^- decay (3.7 s).
2221.75	4^+	1089.97 *5*	100	1131.739	2^+	E2		1.07×10^{-3}	B(E2)(W.u.)=11 *+4−11* α(K)=0.000926 *13*; α(L)=0.0001129 *16*; α(M)=2.20×10^{-5} *3*; α(N+..)=4.50×10^{-6} *7* α(N)=4.14×10^{-6} *6*; α(O)=3.55×10^{-7} *5*
2325.01	(7^-)	120.38[‡] *3*	100	2204.620	(5^-)	E2		0.826	B(E2)(W.u.)=0.107 *18*

$^{124}_{50}Sn_{74}$-8

Adopted Levels, Gammas (continued)

γ(^{124}Sn) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[b]	E_f	J_f^π	Mult.[b]	δ[b]	α[d]	Comments
									α(K)=0.628 *9*; α(L)=0.1600 *23*; α(M)=0.0324 *5*; α(N+..)=0.00606 *9* α(N)=0.00578 *9*; α(O)=0.000280 *4* Mult.: from α(K)exp=0.64 *13* in ^{124}In β^- decay (3.7 s).
2366.5		1234.8[#] *5*	100	1131.739	2$^+$				
2426.316	2$^+$	1294.54 *2*	53 *6*	1131.739	2$^+$	M1+E2	−0.21 *2*	8.97×10^{-4}	B(M1)(W.u.)=0.00962 *8*; B(E2)(W.u.)=0.18 *4* α(K)=0.000766 *11*; α(L)=9.08×10^{-5} *13*; α(M)=1.770×10^{-5} *25*; α(N+..)=2.34×10^{-5} *4* α(N)=3.34×10^{-6} *5*; α(O)=2.95×10^{-7} *5*; α(IPF)=1.97×10^{-5} *3*
		2426.36 *3*	100 *8*	0.0	0$^+$	E2		7.32×10^{-4}	B(E2)(W.u.)=0.34 *+11−20* α(K)=0.000198 *3*; α(L)=2.31×10^{-5} *4*; α(M)=4.50×10^{-6} *7*; α(N+..)=0.000507 *7* α(N)=8.48×10^{-7} *12*; α(O)=7.46×10^{-8} *11*; α(IPF)=0.000506 *7*
2454.34	6$^+$	129.3[&] *3*	8.2 *12*	2325.01	(7$^-$)				
		249.72[&] *2*	100 *5*	2204.620	(5$^-$)	E1(+M2)	+0.05 *3*	0.0145 *9*	α(K)=0.0126 *8*; α(L)=0.00155 *11*; α(M)=0.000302 *22*; α(N+..)=6.1×10^{-5} *5* α(N)=5.6×10^{-5} *4*; α(O)=4.6×10^{-6} *4*
2568.15	6$^-$	243.13[‡] *3*	50 *6*	2325.01	(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* I_γ: weighted av of 47 *3* from (n,n′γ) and 62 *6* from ^{124}In β^- decay (3.11 s). Mult.: from α(K)exp=0.042 *13* in ^{124}In β^- decay (3.7 s).
		363.53[‡] *3*	100 *7*	2204.620	(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* Mult.: from α(K)exp=0.030 *9* in ^{124}In β^- decay (3.7 s).
2578.44	8$^{(+)}$	253.43[‡] *3*	100	2325.01	(7$^-$)	D+Q	+0.09 *5*		
2602.495	3$^-$	1470.71 *2*	100	1131.739	2$^+$	E1+M2	+0.05 *2*	4.84×10^{-4} *8*	B(E1)(W.u.)=0.00125 *11*; B(M2)(W.u.)=7 *6* α(K)=0.000242 *5*; α(L)=2.81×10^{-5} *5*; α(M)=5.47×10^{-6} *10*; α(N+..)=0.000209 *3* α(N)=1.030×10^{-6} *19*; α(O)=9.00×10^{-8} *16*; α(IPF)=0.000208 *3*
2614.45	4$^-$	409.83[&] *2*	100	2204.620	(5$^-$)	M1(+E2)	+0.02 *2*	0.01295	α(K)=0.01125 *16*; α(L)=0.001379 *20*; α(M)=0.000270 *4*; α(N+..)=5.52×10^{-5} *8* α(N)=5.08×10^{-5} *8*; α(O)=4.45×10^{-6} *7*
2656.6	(10$^+$)	78.2 *5*	100	2578.44	8$^{(+)}$	E2		3.83 *11*	B(E2)(W.u.)=0.024 *3* α(K)=2.53 *7*; α(L)=1.04 *4*; α(M)=0.214 *7*;

$^{124}_{50}Sn_{74}$-9

Adopted Levels, Gammas (continued)

γ(^{124}Sn) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[b]	E_f	J_f^π	Mult.[b]	δ[b]	α[d]	Comments
									α(N+..)=0.0390 *13* α(N)=0.0376 *13*; α(O)=0.00140 *4* E_γ,Mult.: from ^{124}Sn IT decay.
2688.50	0^+	558.81 *12*	28.2 *13*	2129.596	2^+	E2			Mult.: γ(θ) in (n,n′γ) and RUL.
		1556.77[&] *5*	100.0 *13*	1131.739	2^+				
2701.78	5^-	133.52[&] *13*	9.5 *8*	2568.15	6^-				
		497.16[&] *2*	100 *8*	2204.620	(5^-)	M1(+E2)	−0.01 *4*	0.00804	α(K)=0.00699 *10*; α(L)=0.000851 *12*; α(M)=0.0001664 *24*; α(N+..)=3.41×10^{-5} *5* α(N)=3.13×10^{-5} *5*; α(O)=2.75×10^{-6} *4*
2703.187	2^+	573.89 *12*	12.0 *13*	2129.596	2^+	D+Q	−0.4 *+4−8*		
		601.4[&] *2*	4.4 *5*	2101.711	4^+	[E2]		0.00444	B(E2)(W.u.)=17 *+5−17* α(K)=0.00382 *6*; α(L)=0.000500 *7*; α(M)=9.82×10^{-5} *14*; α(N+..)=1.98×10^{-5} *3* α(N)=1.83×10^{-5} *3*; α(O)=1.484×10^{-6} *21*
		1571.43 *2*	100.0 *13*	1131.739	2^+	M1+E2	−0.27 *4*	6.79×10^{-4}	B(M1)(W.u.)=0.01046 *21*; B(E2)(W.u.)=0.22 *6* α(K)=0.000505 *8*; α(L)=5.96×10^{-5} *9*; α(M)=1.161×10^{-5} *17*; α(N+..)=0.0001029 *15* α(N)=2.19×10^{-6} *4*; α(O)=1.94×10^{-7} *3*; α(IPF)=0.0001006 *15*
		2703.31[&] *8*	21.3 *14*	0.0	0^+	E2		8.22×10^{-4}	B(E2)(W.u.)=0.046 *+14−5* α(K)=0.0001639 *23*; α(L)=1.91×10^{-5} *3*; α(M)=3.71×10^{-6} *6*; α(N+..)=0.000635 *9* α(N)=7.00×10^{-7} *10*; α(O)=6.17×10^{-8} *9*; α(IPF)=0.000634 *9* Mult.: from (n,n′γ) and RUL of relevant levels. E_γ: there is an unplaced 2699.6 *4* γ in β^- decay with Iγ=22 *2*. It may correspond to 2703γ from (n,n′γ).
2753.05	4^-	150.3[&] *2*	2.6 *3*	2602.495	3^-	(M1+E2)		0.28 *10*	α(K)=0.23 *8*; α(L)=0.042 *22*; α(M)=0.008 *5*; α(N+..)=0.0016 *9* α(N)=0.0015 *8*; α(O)=9.E−5 *4* Mult.: from (n,n′γ) and π′s of relevant levels. δ: −0.02 *20* or −4 *+18−3*.
		548.43[&] *2*	100 *8*	2204.620	(5^-)	M1+E2	−0.46 *3*	0.00622	α(K)=0.00540 *8*; α(L)=0.000666 *10*; α(M)=0.0001302 *19*; α(N+..)=2.66×10^{-5} *4* α(N)=2.45×10^{-5} *4*; α(O)=2.12×10^{-6} *3*
2819.3	(6^+)	717.6 *5*	100	2101.711	4^+	E2			Mult.: from γ(θ) in (n,n′γ) and RUL.
2836.58	3^+	614.76 *6*	34.5 *18*	2221.75	4^+	(M1+E2)		0.0045 *4*	α(K)=0.0039 *3*; α(L)=0.000489 *20*; α(M)=9.6×10^{-5} *4*; α(N+..)=1.95×10^{-5} *9* α(N)=1.79×10^{-5} *8*; α(O)=1.52×10^{-6} *13* I_γ: other: 32.0 *25* in ^{124}In β^- decay (3.11 s).

$^{124}_{50}Sn_{74}$-10

Adopted Levels, Gammas (continued)

γ(^{124}Sn) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[b]	E_f	J_f^π	Mult.[b]	δ[b]	α[d]	Comments
									Mult.: from (n,n′γ) and π′s of relevant levels.
									δ: +0.4 *2* or +1.9 *10*.
2836.58	3+	706.98 *4*	100.0 *17*	2129.596	2+	M1+E2	+2.1 *3*	0.00302	B(M1)(W.u.)<0.028; B(E2)(W.u.)<1.5×10^2
									α(K)=0.00261 *5*; α(L)=0.000330 *5*; α(M)=6.45×10^{-5} *10*; α(N+..)=1.310×10^{-5} *21*
									α(N)=1.209×10^{-5} *19*; α(O)=1.013×10^{-6} *18*
		735.34[&] *18*	18.6 *17*	2101.711	4+	(M1+E2)	−0.94 *10*	0.00292 *5*	α(K)=0.00253 *5*; α(L)=0.000312 *5*; α(M)=6.10×10^{-5} *10*; α(N+..)=1.244×10^{-5} *20*
									α(N)=1.146×10^{-5} *19*; α(O)=9.84×10^{-7} *18*
									B(M1)(W.u.)<0.012?; B(E2)(W.u.)<14?
									Mult.: from (n,n′γ) and π′s of relevant levels.
		1704.87 *11*	27.8 *10*	1131.739	2+	(M1+E2)	+1.5 *3*	6.11×10^{-4} *10*	α(K)=0.000393 *8*; α(L)=4.65×10^{-5} *9*; α(M)=9.05×10^{-6} *18*; α(N+..)=0.0001619 *25*
									α(N)=1.71×10^{-6} *4*; α(O)=1.50×10^{-7} *3*; α(IPF)=0.0001600 *25*
									B(M1)(W.u.)<0.0012?; B(E2)(W.u.)<0.58?
									I_γ: other: 45 *4* in ^{124}In β^- decay (3.11 s).
									Mult.: from (n,n′γ) and π′s of relevant levels.
2855.13	6−	650.51[&] *4*	100	2204.620	(5−)	M1(+E2)	+0.02 *3*	0.00421	α(K)=0.00366 *6*; α(L)=0.000443 *7*; α(M)=8.65×10^{-5} *13*; α(N+..)=1.773×10^{-5} *25*
									α(N)=1.630×10^{-5} *23*; α(O)=1.434×10^{-6} *20*
2875.37	2+	1743.62 *4*	100 *8*	1131.739	2+	M1+E2	+5.6 *+11−8*	5.96×10^{-4}	B(M1)(W.u.)=0.0009 *4*; B(E2)(W.u.)=6.29 *8*
									α(K)=0.000363 *6*; α(L)=4.29×10^{-5} *6*; α(M)=8.35×10^{-6} *12*; α(N+..)=0.000182 *3*
									α(N)=1.573×10^{-6} *23*; α(O)=1.376×10^{-7} *20*; α(IPF)=0.000180 *3*
									δ: preferred value. Other: −0.20 *6*.
		2875.8[&] *4*	13.3 *13*	0.0	0+	E2		8.80×10^{-4}	B(E2)(W.u.)=0.071 *+19−39*
									α(K)=0.0001474 *21*; α(L)=1.714×10^{-5} *24*; α(M)=3.33×10^{-6} *5*; α(N+..)=0.000712 *10*
									α(N)=6.28×10^{-7} *9*; α(O)=5.54×10^{-8} *8*; α(IPF)=0.000712 *10*
2878.65	2+	656.8 *5*	8.2 *5*	2221.75	4+	E2			Mult.: from (n,n′γ) and π′s of relevant levels.
		686.2 *2*	13.4 *6*	2192.17	0+				Mult.: from γ(θ) in (n,n′γ) and RUL.
		749.05[&] *10*	23.1 *22*	2129.596	2+	D,D+Q			
		776.7[&] *2*	13.1 *6*	2101.711	4+	Q			
		1746.94 *6*	100.0 *10*	1131.739	2+	M1+E2	+0.67 *8*	6.17×10^{-4} *24*	α(K)=0.000384 *25*; α(L)=4.5×10^{-5} *3*; α(M)=8.8×10^{-6} *6*; α(N+..)=0.000178 *6*
									α(N)=1.66×10^{-6} *11*; α(O)=1.46×10^{-7} *11*; α(IPF)=0.000177 *6*
									δ: +0.67 *8* if J^π=2+ or +2.6 *4* if J^π=3+.

$^{124}_{50}Sn_{74}$-11

Adopted Levels, Gammas (continued)

γ(^{124}Sn) (continued)

E_i(level)	J_i^π	E_γ †	I_γ [b]	E_f	J_f^π	Mult.[b]	δ[b]	α[d]	Comments
2878.65	2+	2878.6 *5*	4.7 *4*	0.0	0+	E2			Mult.: from γ(θ) in (n,n′γ) and RUL.
2958.11	4+	531.1& *2*	26 *3*	2426.316	2+	(Q)			
		737.4 *5*	43 *6*	2221.75	4+	D+Q	+0.6 *9*		
		856.55& *13*	35.7 *26*	2101.711	4+	(M1+E2)		0.00203 *20*	α(K)=0.00176 *18*; α(L)=0.000215 *18*; α(M)=4.2×10^{-5} *4*; α(N+..)=8.6×10^{-6} *8* α(N)=7.9×10^{-6} *7*; α(O)=6.8×10^{-7} *7* δ: −1.0 *4* or −6 *+18−14*.
		1826.38& *7*	100 *5*	1131.739	2+				
2988.03	3−	234.95& *7*	16.5 *11*	2753.05	4−	(M1+E2)	−0.07 *11*	0.0542 *11*	α(K)=0.0470 *9*; α(L)=0.00588 *17*; α(M)=0.00115 *4*; α(N+..)=0.000235 *7* α(N)=0.000217 *6*; α(O)=1.88×10^{-5} *4* B(M1)(W.u.)<0.28?; B(E2)(W.u.)<72? Mult.: from (n,n′γ) and RUL of relevant levels. δ: preferred value. Other: −4 *+2−8*.
		373.75& *13*	10.5 *10*	2614.45	4−	(M1+E2)		0.0170 *7*	α(K)=0.0145 *5*; α(L)=0.00195 *21*; α(M)=0.00038 *5*; α(N+..)=7.7×10^{-5} *8* α(N)=7.1×10^{-5} *8*; α(O)=5.74×10^{-6} *15* Mult.: from (n,n′γ) and RUL of relevant levels. δ: −0.01 *12* or −8 *+4−92*.
		385.38& *5*	53 *4*	2602.495	3−	M1+E2	+1.7 *3*	0.01577 *24*	α(K)=0.01347 *20*; α(L)=0.00186 *4*; α(M)=0.000367 *8*; α(N+..)=7.33×10^{-5} *14* α(N)=6.80×10^{-5} *14*; α(O)=5.30×10^{-6} *8* B(M1)(W.u.)<0.066; B(E2)(W.u.)<7.8×10^{2}
		1856.33& *3*	100 *8*	1131.739	2+	E1(+M2)	−0.02 *2*	6.87×10^{-4}	α(K)=0.0001639 *24*; α(L)=1.90×10^{-5} *3*; α(M)=3.68×10^{-6} *6*; α(N+..)=0.000501 *7* α(N)=6.94×10^{-7} *11*; α(O)=6.08×10^{-8} *9*; α(IPF)=0.000500 *7* B(E1)(W.u.)<4.3×10^{-5}?; B(M2)(W.u.)<0.068?
3011.1	(7,8,9)	432.7@ *3*	100	2578.44	8(+)				
3109.5	1,2+	3109.5# *5*	100	0.0	0+				
3143.86	4+	717.68& *8*	100 *8*	2426.316	2+	[E2]		0.00281	B(E2)(W.u.)=3.7×10^{2} *+14−31* α(K)=0.00243 *4*; α(L)=0.000310 *5*; α(M)=6.07×10^{-5} *9*; α(N+..)=1.228×10^{-5} *18* α(N)=1.134×10^{-5} *16*; α(O)=9.39×10^{-7} *14*
		2011.96& *8*	100 *8*	1131.739	2+	[E2]		6.23×10^{-4}	B(E2)(W.u.)=2.1 *+8−18* α(K)=0.000277 *4*; α(L)=3.26×10^{-5} *5*; α(M)=6.34×10^{-6} *9*; α(N+..)=0.000307 *5* α(N)=1.194×10^{-6} *17*; α(O)=1.047×10^{-7} *15*; α(IPF)=0.000306 *5*
3214.36	2+	2082.66 *18*	17.4 *17*	1131.739	2+	M1+E2	+1.2 *5*	6.44×10^{-4} *10*	B(M1)(W.u.)=0.006 *4*; B(E2)(W.u.)=1.4 *6*

$^{124}_{50}Sn_{74}$-12

Adopted Levels, Gammas (continued)

γ(^{124}Sn) (continued)

E_i(level)	J_i^π	E_γ †	I_γ [b]	E_f	J_f^π	Mult.[b]	δ[b]	α[d]	Comments
									α(K)=0.000270 *8*; α(L)=3.17×10^{-5} *9*; α(M)=6.18×10^{-6} *18*; α(N+..)=0.000336 *6* α(N)=1.16×10^{-6} *4*; α(O)=1.03×10^{-7} *4*; α(IPF)=0.000335 *6*
3214.36	2$^+$	3214.29 *12*	100 *8*	0.0	0$^+$	E2		9.97×10^{-4}	Mult.: from (n,n′γ) and RUL of relevant levels. B(E2)(W.u.)=1.5 *4* α(K)=0.0001221 *17*; α(L)=1.416×10^{-5} *20*; α(M)=2.75×10^{-6} *4*; α(N+..)=0.000858 *12* α(N)=5.19×10^{-7} *8*; α(O)=4.59×10^{-8} *7*; α(IPF)=0.000857 *12*
3227.95		1098.4[&] *2*	67 *17*	2129.596	2$^+$				
		2096.22[&] *16*	100 *8*	1131.739	2$^+$				
3240.36	(7,8,9)	915.35[@] *20*	100	2325.01	(7$^-$)				
3264.49	2$^+$	3264.44 *11*	100	0.0	0$^+$	E2		1.01×10^{-3}	B(E2)(W.u.)=0.22 *+16−12* α(K)=0.0001190 *17*; α(L)=1.380×10^{-5} *20*; α(M)=2.68×10^{-6} *4*; α(N+..)=0.000879 *13* α(N)=5.06×10^{-7} *7*; α(O)=4.47×10^{-8} *7*; α(IPF)=0.000878 *13*
3267.13	1,2,3	2135.37[&] *8*	100	1131.739	2$^+$	D,D+Q			
3293.42	2,3	1163.82 *9*	100 *13*	2129.596	2$^+$	D,D+Q			
		2161.7[&] *3*	38 *4*	1131.739	2$^+$				
3312.99?	2,3,4	1183.39[&] *6*	100	2129.596	2$^+$				
3330.41	2,3	2198.65[&] *9*	100	1131.739	2$^+$				
3333.54	2$^{(+)}$	630.35[&] *14*	207 *21*	2703.187	2$^+$	D+Q			δ: +2.3 *12* or 0.0 *3*.
		1204.1[#] *3*	33 *7*	2129.596	2$^+$				
		2201.79 *13*	100 *12*	1131.739	2$^+$	(M1+E2)	+1.1 *6*	6.72×10^{-4} *11*	α(K)=0.000244 *8*; α(L)=2.86×10^{-5} *9*; α(M)=5.57×10^{-6} *18*; α(N+..)=0.000393 *7* α(N)=1.05×10^{-6} *4*; α(O)=9.3×10^{-8} *4*; α(IPF)=0.000392 *7*
		3333.3 *3*	106 *11*	0.0	0$^+$	(Q)			I_γ: other: 38 *7* in ^{124}In β^- decay (3.12 s).
3346.46	(3,4)	1244.71[&] *6*	100 *8*	2101.711	4$^+$				
		2215.0[&] *2*	29 *3*	1131.739	2$^+$				
3362.3	(7,8,9)	784.0[@] *6*	70 *10*	2578.44	8$^{(+)}$				I_γ: from ^{124}In β^- decay (3.7 s).
		1037.3[@] *3*	100 *10*	2325.01	(7$^-$)				I_γ: from ^{124}In β^- decay (3.7 s).
3363.59	3$^{(+)}$	1261.30[&] *16*	37 *4*	2101.711	4$^+$	(M1+E2)	−1.1 *6*	0.00087 *6*	α(K)=0.00074 *5*; α(L)=8.9×10^{-5} *6*; α(M)=1.73×10^{-5} *10*; α(N+..)=1.87×10^{-5} *5* α(N)=3.26×10^{-6} *20*; α(O)=2.85×10^{-7} *20*; α(IPF)=1.52×10^{-5} *7*

$^{124}_{50}Sn_{74}$-13

Adopted Levels, Gammas (continued)

γ(^{124}Sn) (continued)

E_i(level)	J_i^π	E_γ †	I_γ [b]	E_f	J_f^π	Mult.[b]	δ[b]	α[d]	Comments
3363.59	3(+)	2231.97& *8*	100 *8*	1131.739	2+	D(+Q)	−0.01 *3*		
3396.5	1,2+	3396.5# *8*	100	0.0	0+				
3410.14	1	1280.37& *15*	61 *6*	2129.596	2+				
		3410.4& *2*	100 *9*	0.0	0+	D,D+Q			
3490.18	1−	3490.13& *14*	100	0.0	0+	E1		1.52×10^{-3}	α(K)=6.47×10^{-5} *9*; α(L)=7.42×10^{-6} *11*; α(M)=1.440×10^{-6} *21*; α(N+..)=0.001447 *21* α(N)=2.72×10^{-7} *4*; α(O)=2.39×10^{-8} *4*; α(IPF)=0.001447 *21* Mult.: from (γ,γ′).
3498.58	1,2,3	1369.2& *2*	62 *6*	2129.596	2+				
		2366.6& *2*	100 *9*	1131.739	2+	D,D+Q			
3509.15	3(+)	1379.58& *9*	100 *8*	2129.596	2+	(M1+E2)	+2.4 *4*	7.12×10^{-4} *12*	α(K)=0.000584 *10*; α(L)=6.98×10^{-5} *12*; α(M)=1.361×10^{-5} *23*; α(N+..)=4.46×10^{-5} *7* α(N)=2.56×10^{-6} *5*; α(O)=2.23×10^{-7} *4*; α(IPF)=4.19×10^{-5} *7* δ: preferred value. Other: +0.68 *8*.
		2377.2& *2*	55 *5*	1131.739	2+	(M1+E2)	+10 *+90−5*	7.17×10^{-4}	α(K)=0.000205 *3*; α(L)=2.40×10^{-5} *4*; α(M)=4.67×10^{-6} *7*; α(N+..)=0.000483 *7* α(N)=8.80×10^{-7} *13*; α(O)=7.75×10^{-8} *11*; α(IPF)=0.000482 *7* δ: preferred value. Other: +0.32 *11*.
3524.02	(7−,8−)	955.90@ *10*	100 *8*	2568.15	6−				I_γ: from ^{124}In β^- decay (3.7 s).
		1198.97@ *10*	71 *6*	2325.01	(7−)				I_γ: from ^{124}In β^- decay (3.7 s).
3551.53	(3−)	1330.0 *3*	100 *9*	2221.75	4+				
		1421.7& *2*	56 *6*	2129.596	2+				
		1450.1 *3*	86 *10*	2101.711	4+	(D,D+Q)			I_γ: weighted av of 79 *8* from (n,n′γ) and 100 *11* from ^{124}In β^- decay (3.12 s).
		2419.77# *20*	220 *20*	1131.739	2+				I_γ: from ^{124}Sn β^- decay (3.12 s).
3583.66	2+	355.75& *12*	71 *7*	3227.95		(Q)			
		1453.5& *3*	100 *8*	2129.596	2+	(M1+E2)		0.00070 *5*	α(K)=0.00056 *5*; α(L)=6.6×10^{-5} *5*; α(M)=1.29×10^{-5} *10*; α(N+..)=6.5×10^{-5} *3* α(N)=2.43×10^{-6} *19*; α(O)=2.13×10^{-7} *19*; α(IPF)=6.2×10^{-5} *3* Mult.: from (n,n′γ) and RUL of relevant levels. δ: −20 *31* or −0.4 *3*.
		2452.3& *3*	51 *5*	1131.739	2+	(M1+E2)		7.43×10^{-4}	α(K)=0.000200 *7*; α(L)=2.34×10^{-5} *8*; α(M)=4.55×10^{-6} *16*; α(N+..)=0.000515 *9* α(N)=8.6×10^{-7} *3*; α(O)=7.6×10^{-8} *3*;

$^{124}_{50}Sn_{74}$-14

Adopted Levels, Gammas (continued)

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

E_i(level)	J_i^π	E_γ[†]	I_γ[b]	E_f	J_f^π	Mult.[b]	α[d]	Comments
								α(IPF)=0.000514 *9* Mult.: from (n,n′γ) and RUL of relevant levels. δ: −6 −15 or −0.5 *3*.
3583.66	2^+	3583.6[&] *4*	69 *7*	0.0	0^+	(E2)	1.12×10^{-3}	α(K)=0.0001020 *15*; α(L)=1.180×10^{-5} *17*; α(M)=2.29×10^{-6} *4*; α(N+..)=0.001004 *14* α(N)=4.33×10^{-7} *6*; α(O)=3.83×10^{-8} *6*; α(IPF)=0.001004 *14* Mult.: from (n,n′γ) and RUL of relevant levels.
3603.86	2,3	1177.3[&] *3*	27 *4*	2426.316	2^+			
		2472.2[&] *2*	100 *8*	1131.739	2^+			
3643.4	(7,8,9)	403.01[@] *20*	100	3240.36	(7,8,9)			
3655.20	2,3	952.4[&e] *2*		2703.187	2^+			
		1433.3[&] *3*	80 *11*	2221.75	4^+			
		1525.6 *2*	100 *13*	2129.596	2^+	D,D+Q		
		1553.6[&] *3*	48 *9*	2101.711	4^+			
3684.91	(7^-)	1106.9[@] *6*	2.6 *5*	2578.44	$8^{(+)}$			
		1116.77[@] *10*	40 *4*	2568.15	6^-			
		1359.86[@] *10*	100 *8*	2325.01	(7^-)			
3697.3	1	2565.4[&] *6*	17 *4*	1131.739	2^+			
		3697.3[&] *4*	100 *9*	0.0	0^+	D		Mult.: from (γ,γ').
3710.39	2^+	2578.6[&] *3*	29 *4*	1131.739	2^+			
		3710.34 *24*	100 *9*	0.0	0^+	E2	1.16×10^{-3}	B(E2)(W.u.)=0.6 *+3−2* α(K)=9.63×10^{-5} *14*; α(L)=1.114×10^{-5} *16*; α(M)=2.16×10^{-6} *3*; α(N+..)=0.001055 *15* α(N)=4.08×10^{-7} *6*; α(O)=3.61×10^{-8} *5*; α(IPF)=0.001055 *15*
3724.7	$1,2^+$	2593.1 *4*	100 *21*	1131.739	2^+			
		3724.5[#] *4*	95 *21*	0.0	0^+			
3741.62	$(2)^+$	1138.4[#] *3*	47 *15*	2602.495	3^-			
		1519.53 *25*	100 *13*	2221.75	4^+			
		1611.3[#] *4*	36 *3*	2129.596	2^+			
		1640.46 *19*	161 *15*	2101.711	4^+			
		2609.89[#] *15*	60 *6*	1131.739	2^+			
3760.27	$(0^+,1,2)$	2628.50[#] *20*	100	1131.739	2^+			
3761.83	2^+	2630.3[&] *4*	41 *5*	1131.739	2^+	D,D+Q		
		3761.68 *24*	100 *9*	0.0	0^+	E2	1.18×10^{-3}	B(E2)(W.u.)=0.29 *+18−3* α(K)=9.42×10^{-5} *14*; α(L)=1.089×10^{-5} *16*; α(M)=2.12×10^{-6} *3*; α(N+..)=0.001076 *15* α(N)=3.99×10^{-7} *6*; α(O)=3.53×10^{-8} *5*; α(IPF)=0.001075 *15*
3765.14	$(7^-,8^-,9^-)$	1186.6[@] *4*	8.7 *22*	2578.44	$8^{(+)}$			

Adopted Levels, Gammas (continued)

γ(^{124}Sn) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[b]	E_f	J_f^π	Mult.[b]
3765.14	(7⁻,8⁻,9⁻)	1440.13[@] *10*	100 *9*	2325.01	(7⁻)	
3802.54	2,3	1673.3[&] *3*	18 *3*	2129.596	2⁺	
		2670.6[&] *2*	100 *9*	1131.739	2⁺	
3809.71	(7,8,9)	1484.69[@] *20*	100	2325.01	(7⁻)	
3831.4	2,3,4	1702.6[&] *4*	49 *5*	2129.596	2⁺	
		2698.9[&] *4*	100 *9*	1131.739	2⁺	Q
3834.3	1,2⁺	3834.2[#] *7*	100	0.0	0⁺	
3864.26	1,2⁺	1734.69[#] *20*	68 *7*	2129.596	2⁺	
		2732.36[#] *20*	77 *7*	1131.739	2⁺	
		3864.4 *3*	100 *9*	0.0	0⁺	
3888.0	1,2⁺	3887.9[#] *8*	100	0.0	0⁺	
3910.7	2⁺	3910.6[#] *9*	100	0.0	0⁺	
3917.27	2⁺	1042.12[#] *15*	27 *2*	2875.37	2⁺	
		1214.26[#] *20*	14 *1*	2703.187	2⁺	
		1314.73[#] *5*	100 *9*	2602.495	3⁻	
		1490.9[#] *4*	4.2 *4*	2426.316	2⁺	
		1695.63[#] *20*	8.4 *9*	2221.75	4⁺	
		1787.71[#] *20*	9.8 *9*	2129.596	2⁺	
		1815.3[#] *3*	4.2 *9*	2101.711	4⁺	
		3917.0[#] *3*	42 *4*	0.0	0⁺	
3931.5	(7,8,9)	569.11[@] *15*	100	3362.3	(7,8,9)	
3963.6	1,2	2831.9[&] *3*	100 *12*	1131.739	2⁺	(D,D+Q)
		3963.0[&] *6*	94 *10*	0.0	0⁺	
4043.8	1,2⁺	4043.7[#] *5*	100	0.0	0⁺	
4074.4	2	2942.4[&] *4*	100 *10*	1131.739	2⁺	(D,D+Q)
		4075.3[&] *8*	85 *9*	0.0	0⁺	(Q)
4094.2	2,3	2962.4[&] *3*	100	1131.739	2⁺	
4156.1	2⁺	3024.4 *3*	34 *7*	1131.739	2⁺	
		4155.8[#] *6*	100 *11*	0.0	0⁺	
4208.1	2,3	3076.3[&] *3*	100	1131.739	2⁺	
4219.2	1	4219.1[a] *6*		0.0	0⁺	D
4227.57	1,2⁺	1352.11 *16*	100 *12*	2875.37	2⁺	D,D+Q
		4228.0[#] *4*	72 *16*	0.0	0⁺	
4263.5	1	4263.4[a] *6*		0.0	0⁺	D
4264.1	1,2⁺	4264.0[#] *3*	100	0.0	0⁺	
4269.82	(4)	686.2[&] *2*	100 *11*	3583.66	2⁺	

$^{124}_{50}Sn_{74}$-16

Adopted Levels, Gammas (continued)

γ(^{124}Sn) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[b]	E_f	J_f^π	Mult.[b]	α[d]	Comments
4269.82	(4)	3137.8[&] *5*	52 *6*	1131.739	2^+			
4331.4	$1,2^+$	4331.3[#] *4*	100	0.0	0^+			
4359.58	0^+ to 4^+	3227.8[&] *2*	100	1131.739	2^+			
4470.3	$1,2^+$	4470.2[#] *4*	100	0.0	0^+			
4528.8	$1,2^+$	4528.7[#] *4*	100	0.0	0^+			
4604.6	$1,2^+$	4604.5[#] *7*	100	0.0	0^+			
4605.8		4605.7[a] *6*		0.0	0^+			
4953.8	1	4953.7[a] *7*		0.0	0^+	D		
5064.8		5064.7[a] *7*		0.0	0^+			
5842.6	1^-	5842.5[a] *7*		0.0	0^+	E1[c]	0.00229	α(K)=3.30×10^{-5} *5*; α(L)=3.77×10^{-6} *6*; α(M)=7.31×10^{-7} *11*; α(N+..)=0.00225 *4* α(N)=1.378×10^{-7} *20*; α(O)=1.218×10^{-8} *17*; α(IPF)=0.00225 *4*
5869.8	(1)	5869.7[a] *8*		0.0	0^+	(D)		
5902.7	1	5902.5[a] *7*		0.0	0^+	D		
5951.9	1	5951.7[a] *7*		0.0	0^+	D		
5968.6	1	5968.4[a] *7*		0.0	0^+	D		
6002.2	1	6002.0[a] *7*		0.0	0^+	D		
6129.2	1	6129.0[a] *7*		0.0	0^+	D		
6171.0	1	6170.8[a] *12*		0.0	0^+	D		
6184.2	1^-	6184.0[a] *6*		0.0	0^+	E1[c]		
6236.7	1	6236.5[a] *7*		0.0	0^+	D		
6287.3	1	6287.1[a] *7*		0.0	0^+	D		
6321.8	1^-	6321.6[a] *7*		0.0	0^+	E1[c]		
6369.3	1^-	6369.1[a] *7*		0.0	0^+	E1[c]		
6453.3	1	6453.1[a] *7*		0.0	0^+	D		
6467.7	1	6467.5[a] *6*		0.0	0^+	D		
6503.4	1	6503.2[a] *6*		0.0	0^+	D		
6524.2	1^-	6524.0[a] *5*		0.0	0^+	E1[c]		
6548.7	1	6548.5[a] *5*		0.0	0^+	D		
6561.0	1^-	6560.8[a] *7*		0.0	0^+	E1[c]		
6566.0	1	6565.8[a] *8*		0.0	0^+	D		
6584.3	1^-	6584.1[a] *6*		0.0	0^+	E1[c]		
6600.0	1	6599.8[a] *7*		0.0	0^+	D		
6635.8	1^-	6635.6[a] *6*		0.0	0^+	E1[c]		
6678.1	1^-	6677.9[a] *7*		0.0	0^+	E1[c]		
6683.5	1^-	6683.3[a] *8*		0.0	0^+	E1[c]		
6705.6	1^-	6705.4[a] *8*		0.0	0^+	E1[c]		
6713.8	1^-	6713.6[a] *7*		0.0	0^+	E1[c]		
6722.5	1	6722.3[a] *6*		0.0	0^+	D		
6764.4	1^-	6764.2[a] *8*		0.0	0^+	E1[c]		
6775.8	1	6775.6[a] *8*		0.0	0^+	D		

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Adopted Levels, Gammas (continued)

γ(^{124}Sn) (continued)

E_i(level)	J_i^π	E_γ †	E_f	J_f^π	Mult.[b]
6790.8	1⁻	6790.6[a] 8	0.0	0⁺	E1[c]
6808.2	1(+)	6808.0[a] 6	0.0	0⁺	(M1)[c]
6847.3	1⁻	6847.1[a] 8	0.0	0⁺	E1[c]
6902.3	1⁻	6902.1[a] 8	0.0	0⁺	E1[c]
6928.4	(1)	6928.2[a] 8	0.0	0⁺	(D)
6939.1	1	6938.9[a] 8	0.0	0⁺	D
6947.7	1	6947.5[a] 8	0.0	0⁺	D
7018.2	1	7018.0[a] 8	0.0	0⁺	D
7032.7	1⁻	7032.5[a] 7	0.0	0⁺	E1[c]
7062.4	1	7062.2[a] 9	0.0	0⁺	D
7071.3	1	7071.1[a] 8	0.0	0⁺	D
7086.7	1	7086.5[a] 7	0.0	0⁺	D
7125.9	1	7125.7[a] 7	0.0	0⁺	D
7234.0	1	7233.8[a] 8	0.0	0⁺	D
7258.8	1	7258.6[a] 10	0.0	0⁺	D
7295.7	1⁻	7295.5[a] 7	0.0	0⁺	E1[c]
7308.7	1	7308.5[a] 9	0.0	0⁺	D
7326.4	1	7326.2[a] 7	0.0	0⁺	D
7337.7	1⁻	7337.5[a] 7	0.0	0⁺	E1[c]
7344.6	1	7344.4[a] 7	0.0	0⁺	D
7394.7	1⁻	7394.5[a] 4	0.0	0⁺	E1[c]
7487.8	1⁻	7487.6[a] 7	0.0	0⁺	E1[c]
7536.7	1⁻	7536.5[a] 7	0.0	0⁺	E1[c]
7551.1	1⁻	7550.9[a] 6	0.0	0⁺	E1[c]
7567.1	1	7566.9[a] 10	0.0	0⁺	D
7576.1	1⁻	7575.9[a] 7	0.0	0⁺	E1[c]
7596.6	1⁻	7596.4[a] 10	0.0	0⁺	E1[c]
7604.0	1⁻	7603.7[a] 8	0.0	0⁺	E1[c]
7642.9	1⁻	7642.6[a] 8	0.0	0⁺	E1[c]
7666.3	1	7666.0[a] 7	0.0	0⁺	D
7679.1	1	7678.8[a] 14	0.0	0⁺	D
7684.2	1⁻	7683.9[a] 11	0.0	0⁺	E1[c]
7691.5	1	7691.2[a] 7	0.0	0⁺	D
7702.9	1	7702.6[a] 9	0.0	0⁺	D
7747.7	1⁻	7747.4[a] 7	0.0	0⁺	E1[c]
7759.4	1⁻	7759.1[a] 4	0.0	0⁺	E1[c]
7770.9	1	7770.6[a] 6	0.0	0⁺	D
7778.4	1	7778.1[a] 9	0.0	0⁺	D
7788.6	1	7788.3[a] 5	0.0	0⁺	D
7815.6	1⁻	7815.3[a] 5	0.0	0⁺	E1[c]
7863.7	1⁻	7863.4[a] 8	0.0	0⁺	E1[c]
7872.4	1	7872.1[a] 6	0.0	0⁺	D
7880.5	1⁻	7880.2[a] 5	0.0	0⁺	E1[c]
7905.4	1	7905.1[a] 12	0.0	0⁺	D
7913.4	1	7913.1[a] 8	0.0	0⁺	D
7939.3	1	7939.0[a] 12	0.0	0⁺	D
7957.4	1	7957.1[a] 9	0.0	0⁺	D
7999.2	1⁻	7998.9[a] 9	0.0	0⁺	E1[c]
8112.1	1	8111.8[a] 16	0.0	0⁺	D
8119.1	1	8118.8[a] 8	0.0	0⁺	D
8132.0	1	8131.7[a] 15	0.0	0⁺	D
8162.5	1	8162.2[a] 8	0.0	0⁺	D
8214.6	1	8214.3[a] 12	0.0	0⁺	D
8229.2	1	8228.9[a] 6	0.0	0⁺	D
8257.2	1	8256.9[a] 9	0.0	0⁺	D
8270.1	1(+)	8269.8[a] 7	0.0	0⁺	(M1)[c]
8350.4	1	8350.1[a] 13	0.0	0⁺	D
8376.5	1⁻	8376.2[a] 11	0.0	0⁺	E1[c]
8423.1	1	8422.8[a] 7	0.0	0⁺	D
8433.5	1	8433.2[a] 10	0.0	0⁺	D

† From weighted av from (n,n′γ) and ^{124}In β^- decay (3.12 s), unless otherwise noted.
‡ From weighted av from (n,n′γ) and ^{124}In β^- decay (3.7 s).
# From ^{124}In β^- decay (3.12 s); not observed in 3.7-s decay and in (n,n′γ).
@ From ^{124}In β^- decay (3.7 s); not observed in 3.12-s decay and in (n,n′γ).
& From (n,n′γ).
[a] From (γ,γ′).
[b] From (n,n′γ), unless otherwise noted.

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Adopted Levels, Gammas (continued)

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

[c] From (γ,γ').
[d] 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.
[e] Placement of transition in the level scheme is uncertain.

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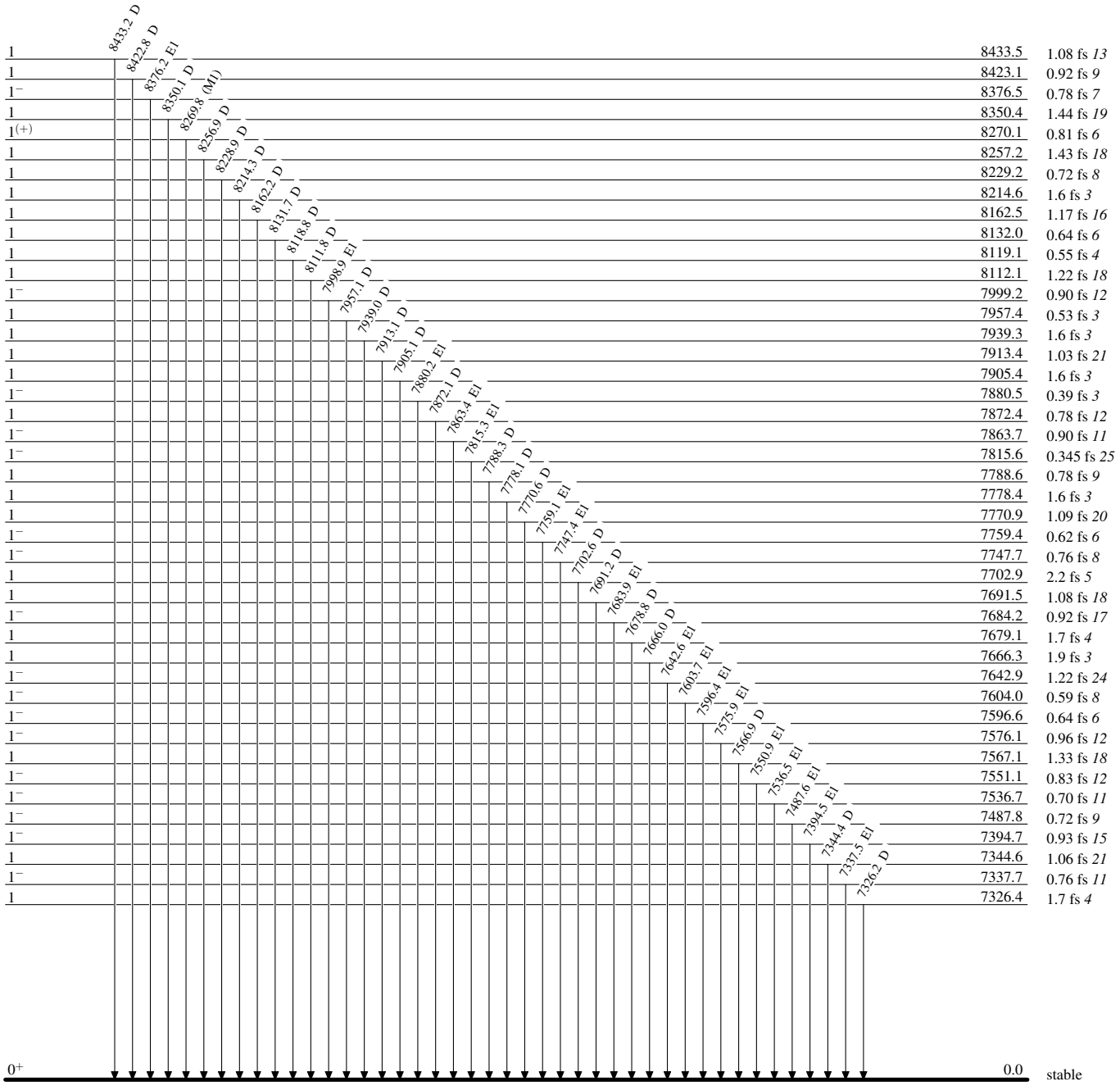
Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

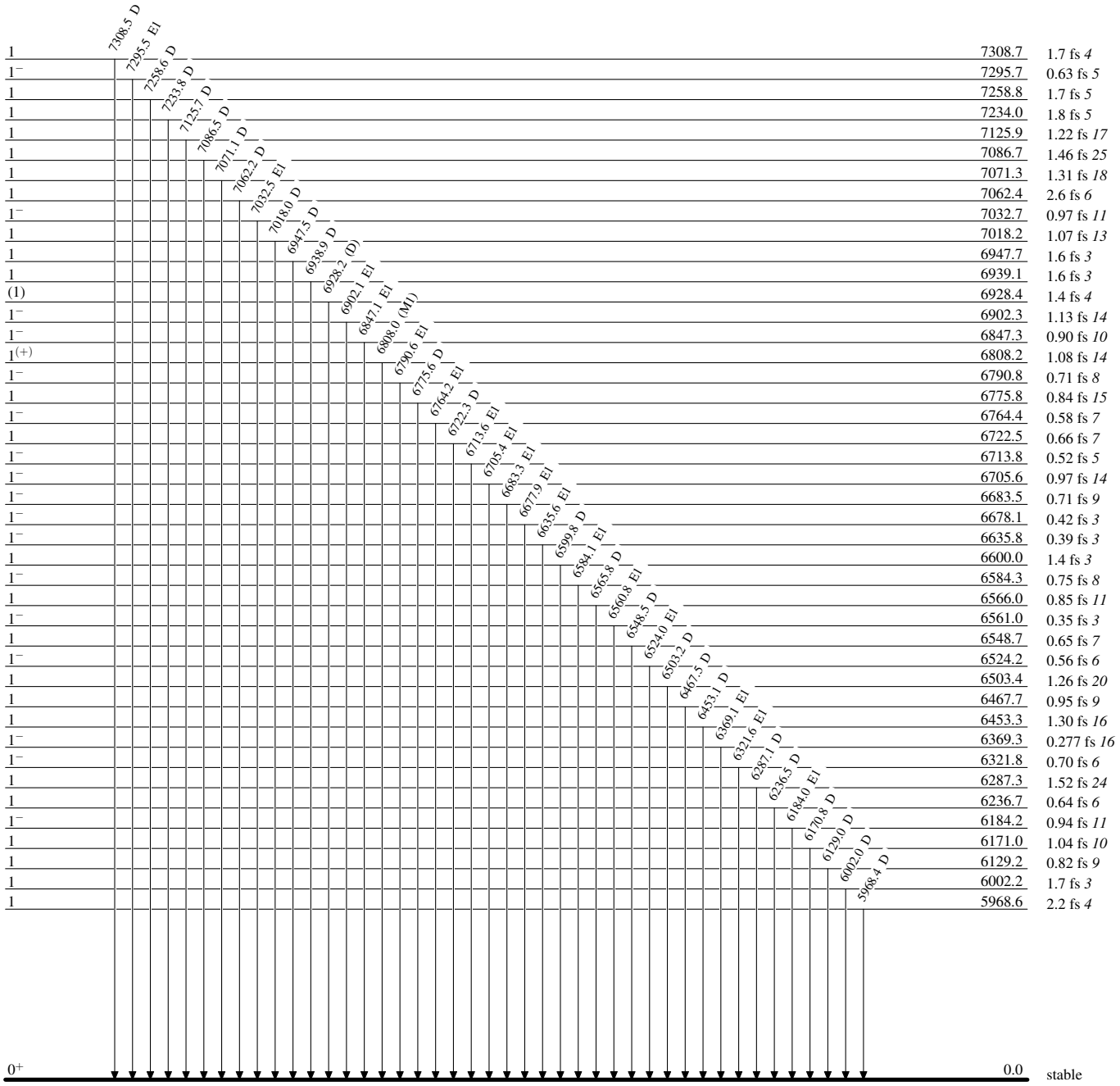


$^{124}_{50}Sn_{74}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



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

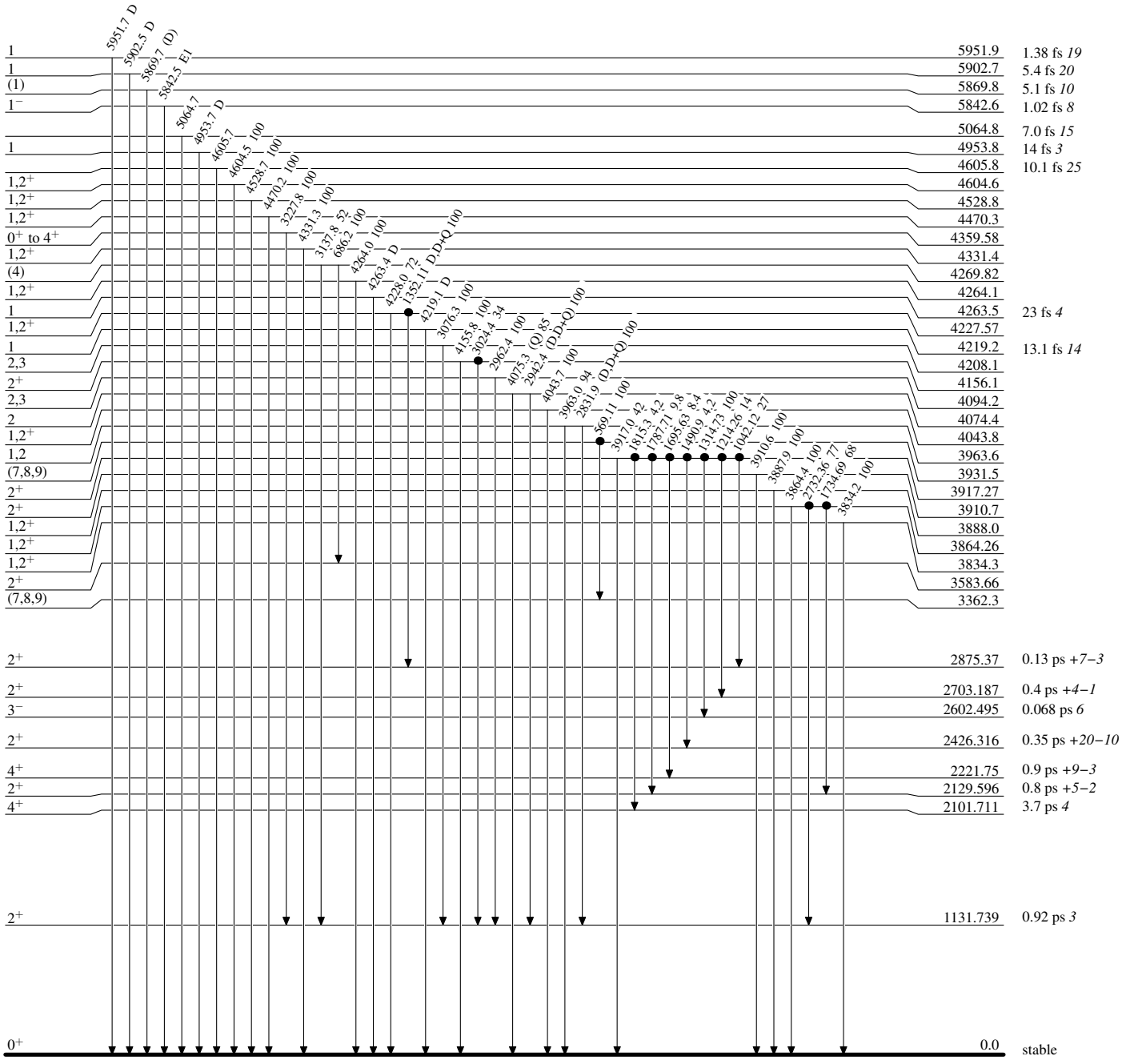
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

● Coincidence



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

Legend

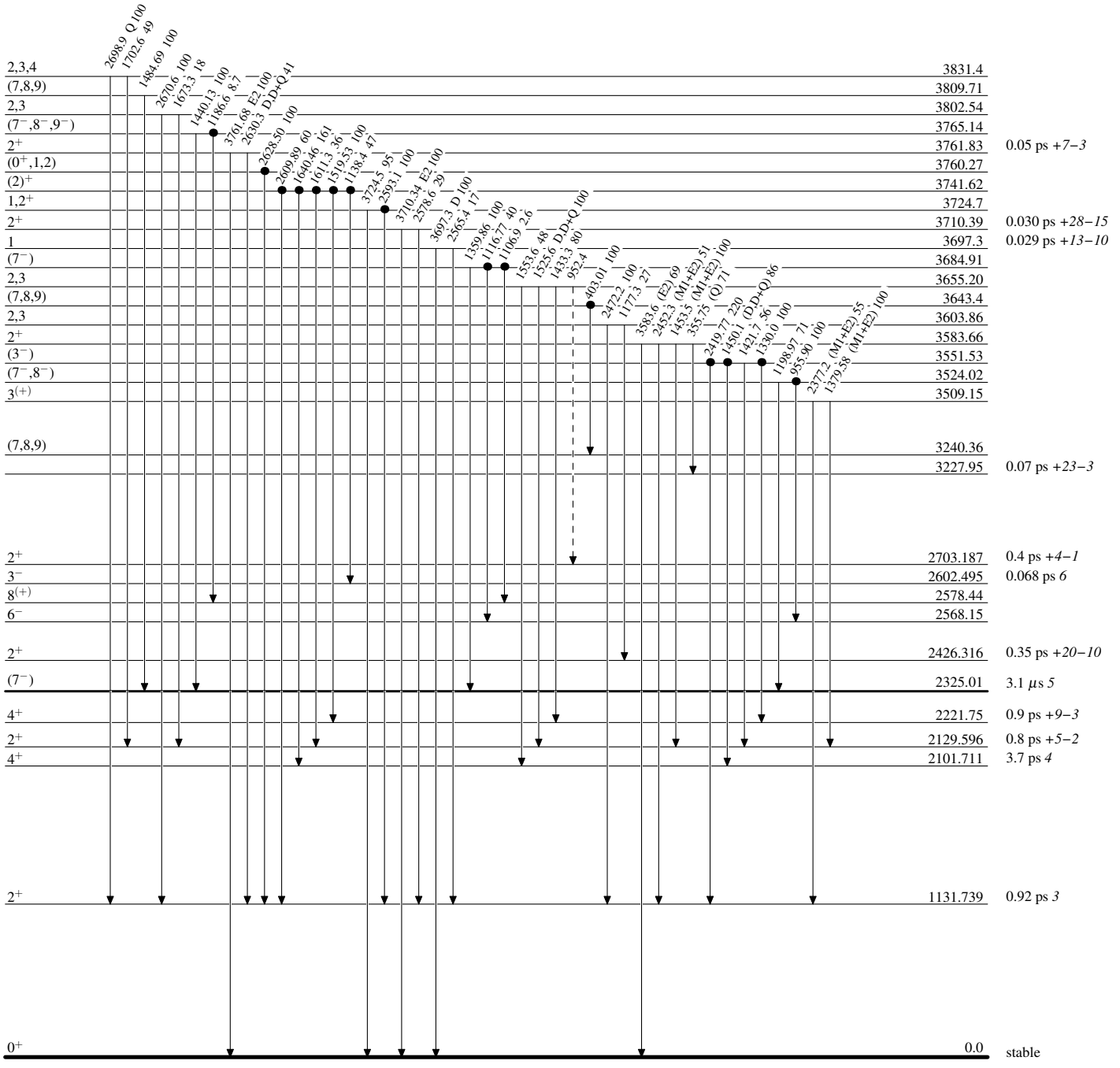
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)

● Coincidence



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

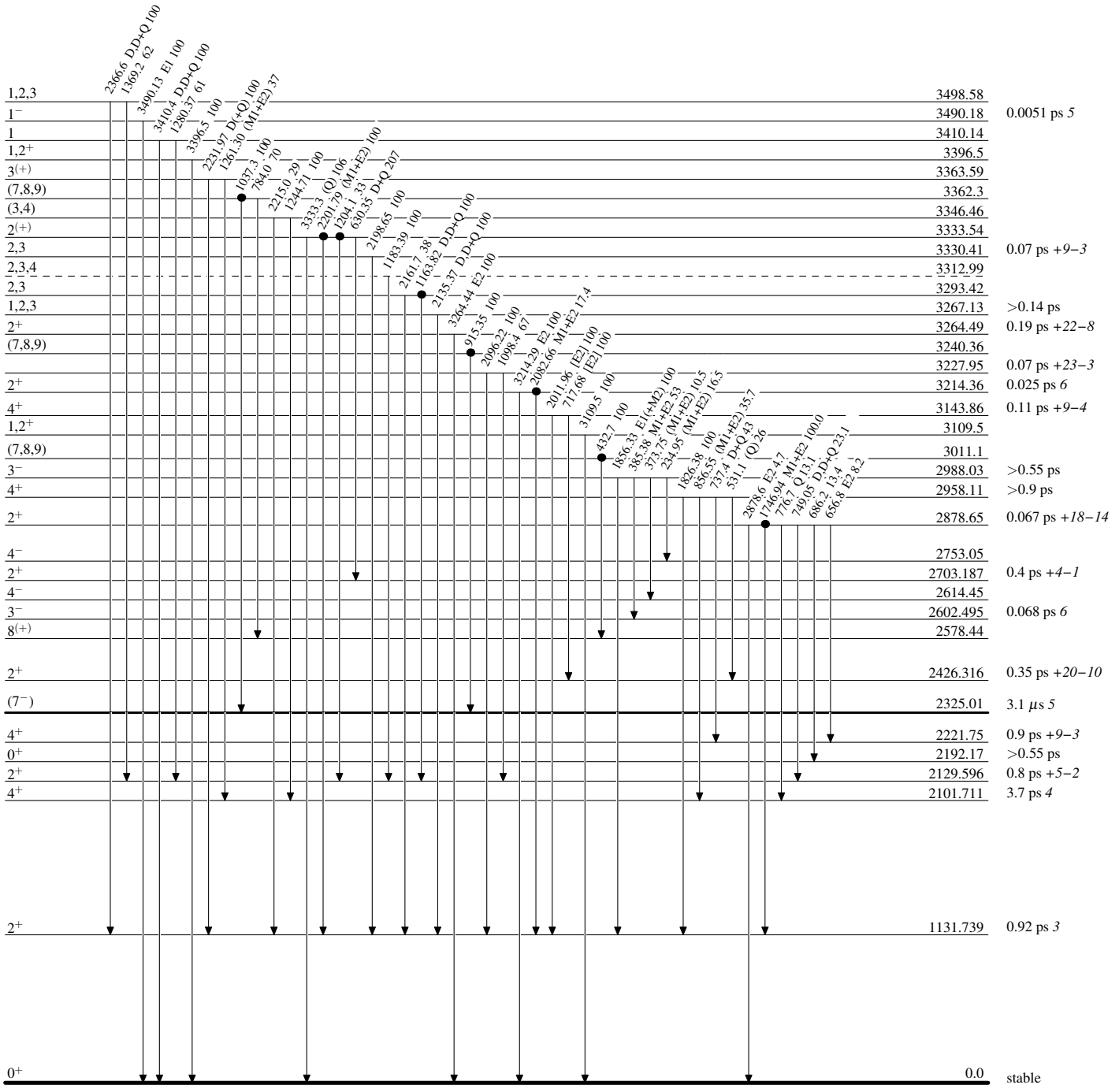
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

● Coincidence



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

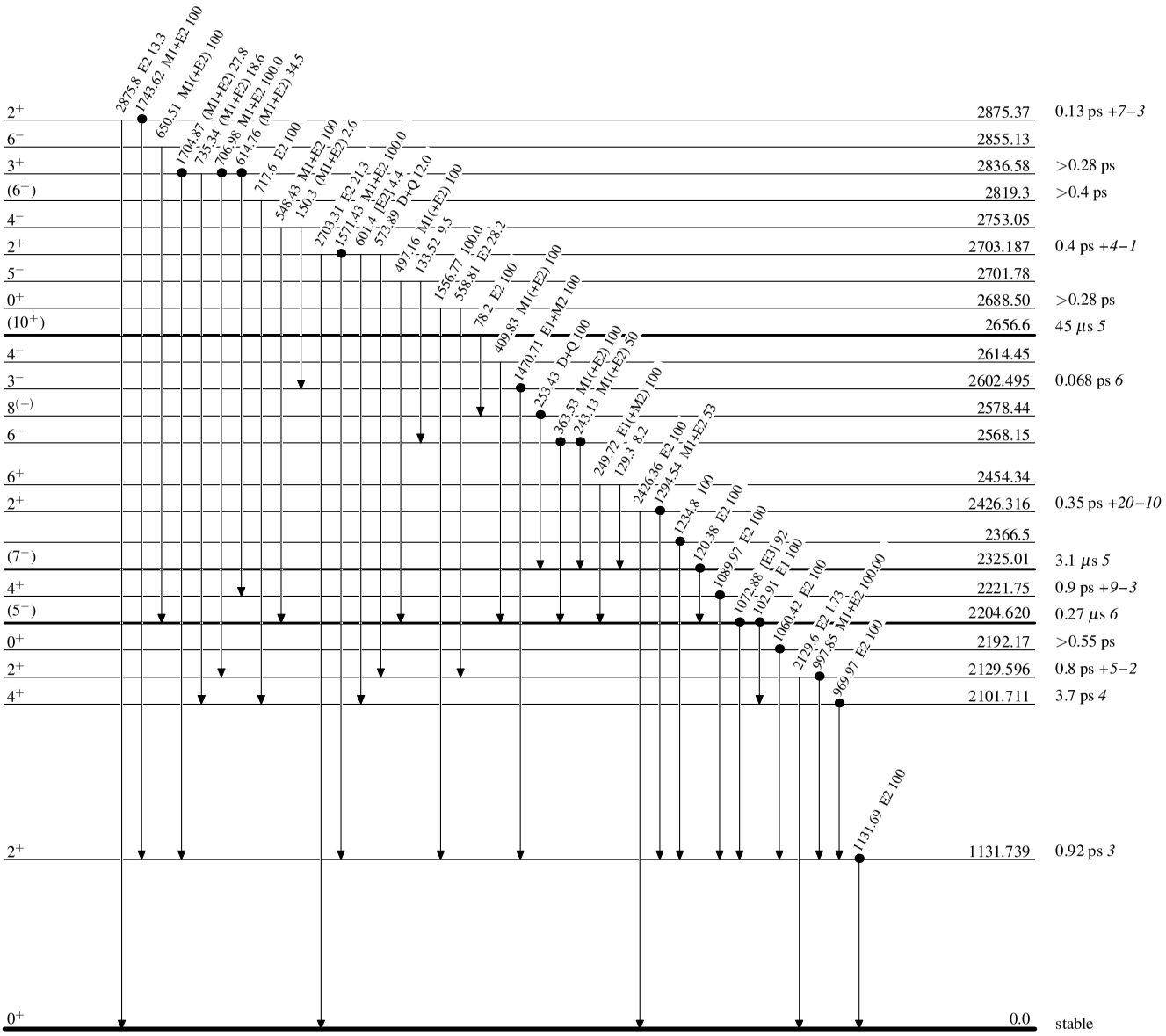
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

● Coincidence



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