Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	N. Nica and B. Singh	NDS 181, 1 (2022)	9-Mar-2022

Q(β^-)=−1721.4 *23*; S(n)=6341.0 *28*; S(p)=7101 *4*; Q(α)=2311.3 *5* 2021Wa16
S(2n)=14757.3 *10*, S(2p)=12412.0 *5* (2021Wa16).

^{147}Sm Levels

Cross Reference (XREF) Flags

A	^{147}Pm β^- decay (2.6234 y)	F	^{147}Sm(n,n′γ)	K	^{149}Sm(p,t)
B	^{147}Eu ε decay (24.1 d)	G	^{147}Sm(d,d′)	L	^{151}Eu(μ^-,4nγ)
C	^{151}Gd α decay	H	^{148}Sm(p,d)	M	Coulomb excitation
D	^{148}Nd(^{3}He,4nγ), ^{146}Nd(α,3nγ),	I	^{148}Sm(d,t)		
E	^{147}Sm(p,p′)	J	^{148}Sm(^{3}He,α)		

E(level)[†]	J$^\pi$	T$_{1/2}$	XREF	Comments
0.0[@]	7/2$^-$	1.073×10^{11}[#] y *10*	ABCDEFGHIJKLM	%α=100 μ=−0.8090 *14* (2019StZV); Q=−0.26 *3* (2016St14) μ: measured by electron-nuclear double resonance (1972Ch27); other 0.8148 *7* measured by atomic beam magnetic resonance − thermal beam (1966Wo05, as quoted by 2014StZZ). Q: measured by muonic x-ray hyperfine structure (1981Ba28); other: −0.261 7 measured by atomic beam magnetic resonance − thermal beam (re-evaluated data) (1992Le09, 2014StZZ). J$^\pi$: J=7/2 from 1952Bo21 by paramagnetic resonance measurements, π from L(p,t)=0. rms charge radius: 4.9892 fm *35* (2013An02).
121.212[&] *5*	5/2$^-$	0.798 ns *17*	AB DEFG I M	μ=−0.45 *3* (2020StZV); Q=−0.5 *2* (2016St14) μ,Q: measured by Mossbauer effect (1971Pa04, with Q value not listed by 2019StZV). T$_{1/2}$: weighted av. of 0.80 ns *4* (1968Bo47), 0.78 ns *3* (1970Ko38), 0.77 ns *4* (1971Be53), 0.83 ns *3* (1978VyZV), in ^{147}Eu ε decay; 0.79 ns *14* from B(E2)↑ in Coulomb excitation. J$^\pi$: M1+E2 γ to 7/2$^-$, g.s. and $\gamma\gamma(\theta)$ in ^{147}Eu ε decay.
197.284 *5*	3/2$^-$	1.25 ns *4*	AB DEFGHI LM	μ=−0.27 *6* (2014StZZ) μ: measured by integral perturbed angular correlations (value not listed by 2019StZV). J$^\pi$: E2 γ to 7/2$^-$, g.s. and $\gamma\gamma(\theta)$ in ^{147}Eu ε decay. T$_{1/2}$: 1.25 ns *3*, weighted av. of 1.25 ns *4* (^{147}Eu ε decay) and 1.25 ns *5* (Coulomb excitation), adopted as 1.25 ns *4* (uncertainty not smaller than the smallest measured value).
716.62[@] *4*	11/2$^-$	2.35 ps *5*	B DEFG I M	T$_{1/2}$: from B(E2)↑ in Coulomb excitation. J$^\pi$: E2 γ to 7/2$^-$, g.s. and ΔJ=2 band member.
720	(1/2$^+$)[‡]		H	
798.731 *4*	3/2$^-$	1.00 ps *21*	B DEFGHIJ M	T$_{1/2}$: from B(E2)↑ in Coulomb excitation. J$^\pi$: M1+E2, ΔJ=1 677γ (^{147}Sm(n,n′γ) to 5/2$^-$, 121; M1(+E2) γ to 3/2$^-$, 197.
809.358[&] *13*	9/2$^-$	3.1 ps *5*	B D FG IJ M	J$^\pi$: E2, ΔJ=2 γ to 5/2$^-$, 121; M1+E2, ΔJ=1 γ to 7/2$^-$, g.s. T$_{1/2}$: from B(E2)↑ in Coulomb excitation.
884	(1/2$^+$)[‡]		H	

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Adopted Levels, Gammas (continued)

^{147}Sm Levels (continued)

E(level)†	Jπ	XREF	Comments
900?		E	
922.73 *15*	(1/2⁻)	EF H	Jπ: from L(p,d)=(1) and analogy with ^{145}Nd in ^{147}Sm(n,n′γ).
932.0 *5*	11/2⁺	D FG M	Jπ: E1, ΔJ=0 γ to 11/2⁻, 716.
978?		E	
1020		E	
1030.70[a] *14*	13/2⁺	D FG IJ M	Jπ: E1, ΔJ=1 γ to 11/2⁻, 717; E1, ΔJ=1 γ from 15/2⁻, 1458.
1043.528 *9*	1/2⁻,3/2⁻	B H	Jπ: 1/2⁻,3/2⁻ from L(p,d)=1.
1054.217 *6*	3/2⁺	B EFG I	Jπ: E1, ΔJ=0 γ to 3/2⁻, 197.
1063.389 *6*	5/2⁺	B FGHI	Jπ: E1, ΔJ=0 γ to 5/2⁻, 121.
1069.05? *10*	9/2⁻	F	Jπ: E2, ΔJ=2 γ to 5/2⁻, 121; M1+E2, ΔJ=1 γ to 7/2⁻, g.s.
1077.049 *5*	5/2⁻	B F	Jπ: M1+E2 γ to 7/2⁻, g.s., and M1+E2 γ to 3/2⁻, 197.
1106.861 *17*	(3/2⁻ to 9/2⁻)	B EFG M	Jπ: 3/2⁻ to 11/2⁻ compatible with B(E2)↑ (from 7/2⁻) in Coulomb excitation; 11/2⁻ excluded from log *ft*=10.3 from 5/2⁺ g.s. in ^{147}Eu ε. $T_{1/2}$: 0.43 ps *5* in Coulomb excitation (from w. av. of B(E2)↑′s) These values are to be corrected for M1 mixing, unless 1107γ is pure E2.
1162		E I	
1169	(⁻)	G I	Jπ: from shape of angular distribution in ^{147}Sm(d,d′).
1172.66 *5*	(⁻)	B FG	Jπ: from shape of angular distribution in ^{147}Sm(d,d′).
1180.253 *7*	5/2⁺	B F	Jπ: 5/2⁺,7/2⁺ from E1 γ to 7/2⁻, g.s. and M1 γ from 3/2⁺,5/2⁺ 1549; 7/2⁺ less likely from γ from 3/2⁻, 1453.
1219.797 *11*	1/2⁺	B E GHI	XREF: E(1214)I(1210). Jπ: from L(p,d)=0 (forward peaking and good DWBA fit).
1258		H	
1317.677 *10*	1/2⁻,3/2⁻,5/2⁻	B efg i M	Jπ: M1(+E2) γ to 3/2⁻, 197.
1317.859 *13*	5/2⁻,7/2⁻,9/2⁻	B e g i	Jπ: M1 γ to 7/2⁻, g.s.
1318.076 *12*	3/2⁻,5/2⁻	B efg i	Jπ: E2 γ to 5/2⁻, 121; γ to 3/2⁺, 1054; γ to 7/2⁻, g.s.
1349.649 *16*	(3/2⁻,5/2⁻)	B E GHI	XREF: E(1341)H(1333). Jπ: π=(−) from ^{147}Sm(d,d′); γ to 5/2⁺, 1064; γ to 3/2⁺, 1054; γ to 3/2⁻, 197.
1430		E g i	
1438	(⁻)	E g i	Jπ: from shape of angular distribution in ^{147}Sm(d,d′).
1449.113 *11*	7/2⁻	B eFg	Jπ: M1 γ to 7/2⁻, g.s.; γ to 5/2⁺, 1064; γ to 11/2⁻, 717.
1453.220 *8*	3/2⁻	B eFg I	Jπ: 1/2⁻,3/2⁻,5/2⁻ from M1+E2 γ to 3/2⁻, 197; 3/2⁻ from M1+E2, ΔJ=1 γ to 5/2⁻, 121.
1458.17[@] *16*	15/2⁻	D F	Jπ: E2, ΔJ=2 γ to 11/2⁻, 717 and ΔJ=2 band member.
1464	3/2⁺,5/2⁺	H	Jπ: L(p,d)=2.
1471.417 *15*	3/2⁻,5/2⁻,7/2⁻	B f	Jπ: M1+E2 γ to 5/2⁻, 121.
1471.885 *14*	⁻	B f	Jπ: π=− from E2 γ to 7/2⁻.
1548.634 *7*	3/2⁺,5/2⁺	B E HI	XREF: E(1541)H(1553)I(1542). Jπ: M1 γ to 3/2⁺, 1054; E1 γ to 5/2⁻, 1077.
1551.4[&] *6*	13/2⁻	D J	Jπ: (M1(+E2)), ΔJ=1 γ to 11/2⁻, 717; (E2), ΔJ=2 γ to 9/2⁻, 809, and band member.
1600.937 *21*	3/2(⁻),5/2(+)	B E G	XREF: E(1588). Jπ: 3/2,5/2,7/2,9/2⁻ from log *ft*=8.5 from 5/2⁺ g.s. of parent in ^{147}Eu ε; 3/2(⁻),5/2(+) from γ to 7/2⁻, g.s. and γ to 1/2⁺, 1220.
1641.95 *7*		B E	XREF: E(1629).
1668	1/2+‡	HI	XREF: I(1659).
1690		E	
1716.2[a] *7*	17/2⁺	D g	Jπ: E2, ΔJ=2 γ to 13/2⁺, D, ΔJ=1 γ to 15/2⁻, 1458.
1717.3 *4*	9/2⁻	Fg I	Jπ: M1+E2, ΔJ=1 γ to 7/2⁻, g.s.; γ to 5/2⁻, 121.
1728	(⁻)	G I	Jπ: from shape of angular distribution in ^{147}Sm(d,d′).
1748.8 *4*		F	
1762.0 *7*	15/2⁺	DE G	XREF: E(1747). Jπ: 7/2⁺, 15/2⁺ from E2, ΔJ=2 γ to 11/2⁺, 932; 7/2⁺ excluded from γ to 13/2⁺, 1031.
1762.73 *18*		F	

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Adopted Levels, Gammas (continued)

^{147}Sm Levels (continued)

E(level)[†]	Jπ	XREF	Comments
1776	(+)	G	Jπ: π=(+) from ^{147}Sm(d,d′).
1803.3 *11*	(13/2)	D G	Jπ: (9/2,13/2) from (D+Q), ΔJ=1 γ to 11/2+, 932; (9/2) excluded (lower than yrast).
1843.77 *23*	5/2−	FGHI	Jπ: 5/2−,9/2− from M1+E2, ΔJ=1 γ to 7/2−, g.s.; 9/2− excluded from γ to 3/2−, 197.
1848	(1/2+)[‡]	GHI	
1868		G	
1896.2 *9*	15/2−	D	Jπ: 7/2−,15/2− from E2, ΔJ=2 γ to 11/2−, 717; 7/2− excluded (lower than yrast).
1899		Gh	
1919	(1/2+)[‡]	Gh	
1946		G	
1975	(3/2+,5/2+)	E GH	Jπ: L(p,d)=(2).
1983.09 *15*		F J	
2011.0 *9*	17/2	D	Jπ: 13/2,17/2 from D+Q, ΔJ=1 γ to 15/2−, 1458; 13/2 excluded (lower than yrast).
2055		G	
2064.9 *5*	(3/2+,5/2+)	FGH	Jπ: L(p,d)=(2).
2070.00 *16*	(7/2−)	F	Jπ: γ to 3/2−, 197; γ from 11/2−, 717.
2089.80 *25*		D F	
2097	(1/2−,3/2−)	H	Jπ: L(p,d)=(1).
2109.4[&] *4*	17/2−	D F	Jπ: (E2), ΔJ=2 γ to 13/2−, 1551; M1, ΔJ=1 γ to 15/2−, 1458.
2114	(9/2−)	J	Jπ: from (^{3}He,α)/(d,t) cross-section ratios and association with Nilsson orbitals in ^{148}Sm(^{3}He,α) (1977Se04, 1976BjZY).
2202.89 *14*	(3/2−,5/2,7/2)	F	Jπ: γ′s to 5/2+, 1064, 5/2−, 121, and 7/2−, g.s., respectively.
2207		H	
2265	(+)	G	Jπ: from shape of angular distribution in ^{147}Sm(d,d′).
2297.8 *13*	(17/2)	D	Jπ: (13/2,17/2) from (D), ΔJ=1 γ to 15/2+, 1762; (13/2) excluded (lower than yrast).
2374		G	
2430.4[a] *9*	21/2+	D	Jπ: E2, ΔJ=2 γ to 17/2+, 1717 and ΔJ=2 band member.
2450.4[@] *9*	19/2−	D	Jπ: (E2), ΔJ=2 γ to 15/2−, 1458 and ΔJ=2 band member.
2470.0 *13*	19/2	D	Jπ: 15/2,19/2 from M1+E2, ΔJ=1 γ to 17/2, 2011; 15/2 excluded (lower than yrast).
2514		H	
2555		G	
2558.6[&] *8*	21/2−	D	Jπ: E2, ΔJ=2 γ to 17/2−, 2109 and ΔJ=2 band member.
2566		H	
2592.2 *10*	(19/2+)	D	Jπ: (E2), ΔJ=2 γ to 15/2+, 1762; γ to 21/2+, 2430.
2595		G	
2689.0 *13*		D	
2702		H	
2704.2 *11*	(19/2−)	D	Jπ: (11/2−,19/2−) from E2, ΔJ=2 γ to 15/2−, 1458; (11/2−) excluded (lower than yrast).
2720		J	
2765.6 *17*	21/2	D	Jπ: 17/2,21/2 from M1, ΔJ=1 γ to 19/2, 2470; 17/2 excluded (lower than yrast).
2800		H	
2845		H	
2940		J	
2978.6 *20*	23/2	D	Jπ: 19/2,23/2 from M1, ΔJ=1 γ to 21/2, 2765; 19/2 excluded (lower than yrast).
3057.4 *13*	(23/2+)	D	Jπ: (19/2+,23/2+) from (M1(+E2)), ΔJ=1 γ to 21/2+, 2432; 19/2+ excluded (lower than yrast).
3206.7 *10*	23/2(+)	D	Jπ: 19/2+,23/2+ from E1, ΔJ=1 γ to 21/2−, 2558; 19/2+ excluded (lower than yrast).
3309.5[a] *12*	25/2+	D	Jπ: E2, ΔJ=2 γ to 21/2+, 2430 and ΔJ=2 band member.
3310		J	

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Adopted Levels, Gammas (continued)

^{147}Sm Levels (continued)

E(level)†	Jπ	XREF	Comments
3467.8 *12*	27/2(+)	D	Jπ: E2, ΔJ=2 γ to 23/2+, 2306; (M1(+E2)), ΔJ=1 γ to 25/2+, 3310.
4400		J	

† From least-squares fit to Eγ's; normalized χ^2=1.9 is greater than critical χ^2=1.4.

‡ (1/2+) from L(p,d)=(0).

Weighted average of: 1.079×10^{11} y *26* (2017Wi01), 1.065×10^{11} y *10* (2010Su30, average of 1.06×10^{11} y *1* for metal samarium and 1.07×10^{11} y *1* for Sm_2O_3), 1.070×10^{11} y *9* (2009Ko15), 1.17×10^{11} y *2* (2003Ki26), 1.06×10^{11} y *4* (1992Ma26, whose initial result 1.23×10^{11} y *4* was corrected by 2001Be81 by a factor of 0.86), 1.05×10^{11} y *4* (1987Al28), 1.06×10^{11} y *2* (1970Gu14, scin, 1.08×10^{11} y *2* (1965Va16, scin, ic), 1.04×10^{11} y *3* (1964Do01, scin), 1.05×10^{11} y *2* (1961Wr02, scin). Other previously measured values not considered to the average of above group (generally less precise values many corrected and superseded by the more recent papers of the first group): 1.15×10^{11} y *5* (1961Ma05) and 1.17×10^{11} y *5* (1960Ka23), of which 1965Va16 and 1970Gu14 show that both should be corrected for a 10% contribution from ^{146}Sm α branch counted with ^{147}Sm a peak, 1.14×10^{11} y *5* (1960Ka27, superseded by 1960Ka23), 1.28×10^{11} y *4* (corrected by 1961Wr02 and superseded by 1987Al28), 1.15×10^{11} y *3* (1954Le55), 1.25×10^{11} y *6* (1954Be69, superseded by 1958Be78). Comment on 2003Ki26 (kept in the first group): used Si surface barrier detector (very good energy resolution, low background) relative to ^{210}Po, ^{238}U, and ^{241}Am internal standards using four different alliquots of samarium; they also used scin and found consistent result (1.15×10^{11} y *2*). This is the only relatively recent result > 1.10×10^{11} y considered in the adopted weighted average. Weighted average of all 15 values (9 of first group and 6 of second group) is 1.081×10^{11} y *12*.

@ Band(A): 7/2− g.s. band.

& Band(B): 5/2− band.

a Band(C): 13/2+ band.

Adopted Levels, Gammas (continued)

γ(^{147}Sm)

For unplaced γ's see ^{147}Eu ε decay, ^{147}Sm(n,n′γ), and ^{148}Nd(^{3}He,4nγ) datasets.

E_i(level)	J_i^π	E_γ	I_γ[#]	E_f	J_f^π	Mult.	δ[‡@]	α[†]	Comments
121.212	5/2−	121.220[&] *17*	100	0.0	7/2−	M1+E2[a]	−0.33 *3*	0.996 *15*	B(M1)(W.u.)=0.00700 *21*; B(E2)(W.u.)=28.9 *+49−46* α(K)=0.814 *12*; α(L)=0.143 *5*; α(M)=0.0312 *12* α(N)=0.00702 *25*; α(O)=0.00101 *3*; α(P)=5.06×10^{-5} *8* δ: −0.33 *3* from ^{147}Eu ε decay (1962Sc09); −0.278 *20* (same dataset, 1989Ad10) not adopted because adopted $T_{1/2}$ would be different from $T_{1/2}$(B(E2)↑) (see $T_{1/2}$ comment in Coulomb excitation).
197.284	3/2−	76.073[&] *10*	3.44 *11*	121.212	5/2−	M1+E2[a]	+0.655 *34*	4.53 *9*	B(M1)(W.u.)=6.83×10^{-4} *37*; B(E2)(W.u.)=28.3 *24* α(K)=2.91 *5*; α(L)=1.26 *7*; α(M)=0.288 *15* α(N)=0.064 *4*; α(O)=0.0083 *4*; α(P)=0.000170 *4*
		197.299[&] *12*	100 *3*	0.0	7/2−	E2[a]		0.218	B(E2)(W.u.)=23.3 *6* α(K)=0.1565 *22*; α(L)=0.0482 *7*; α(M)=0.01092 *16* α(N)=0.00241 *4*; α(O)=0.000320 *5*; α(P)=7.73×10^{-6} *11*
716.62	11/2−	716.45[&e] *5*	100	0.0	7/2−	E2[a]		0.00522	B(E2)(W.u.)=27.5 *6* α(K)=0.00437 *7*; α(L)=0.000664 *10*; α(M)=0.0001436 *20* α(N)=3.23×10^{-5} *5*; α(O)=4.73×10^{-6} *7*; α(P)=2.57×10^{-7} *4*
798.731	3/2−	601.450[&] *4*	60.2 *19*	197.284	3/2−	M1(+E2)[a]	0.005 *8*	0.01354	B(M1)(W.u.)=0.029 *+8−5*; B(E2)(W.u.)<0.0095 α(K)=0.01156 *17*; α(L)=0.001563 *22*; α(M)=0.000334 *5* α(N)=7.58×10^{-5} *11*; α(O)=1.141×10^{-5} *16*; α(P)=7.21×10^{-7} *10* δ: from ^{147}Eu ε (1989Ad10). Others (same dataset): 0.00 *4* from A_2=+0.056 *9* (1970Va38) (601γ)(197γ)(θ), −0.08 *6* from A_2=+0.075 11 (1970Be67), −0.03 *9* from A_2=+0.064 *19* (1966Go26).
		677.516[&] *7*	100 *3*	121.212	5/2−	M1+E2[a]	−0.48 *2*	0.00931 *14*	B(M1)(W.u.)=0.027 *+7−5*; B(E2)(W.u.)=7.6 *+21−14* α(K)=0.00793 *12*; α(L)=0.001087 *16*; α(M)=0.000233 *4* α(N)=5.27×10^{-5} *8*; α(O)=7.90×10^{-6} *12*; α(P)=4.91×10^{-7} *8* δ: from ^{147}Eu ε (1989Ad10). Others (same dataset): −0.47 *4* from A_2=+0.126 *4* (1970Va38), −0.47 *5* from A_2=+0.128 *11* (1966Go26), −0.48 *5* from A_2=+0.130 *8* (1970Be67) via (678γ)(121γ)(θ); see also 1962Al19, 1962Sc09, 1964Mc17.
		798.729[&] *5*	49.6 *16*	0.0	7/2−	E2[a]		0.00406	B(E2)(W.u.)=8.8 *+23−16*; B(E2)(W.u.)<0.0099 α(K)=0.00342 *5*; α(L)=0.000505 *7*; α(M)=0.0001089 *16* α(N)=2.46×10^{-5} *4*; α(O)=3.61×10^{-6} *5*; α(P)=2.02×10^{-7} *3*
809.358	9/2−	688.15[&] *4*	25.0 *19*	121.212	5/2−	E2[d]		0.00574	B(E2)(W.u.)=5.1 *+10−8* α(K)=0.00480 *7*; α(L)=0.000737 *11*; α(M)=0.0001595 *23* α(N)=3.59×10^{-5} *5*; α(O)=5.24×10^{-6} *8*; α(P)=2.82×10^{-7} *4*

$^{147}_{62}Sm_{85}$-5

Adopted Levels, Gammas (continued)

γ(^{147}Sm) (continued)

E_i(level)	J_i^π	E_γ	I_γ[#]	E_f	J_f^π	Mult.	δ[‡@]	α[†]	Comments
809.358	9/2⁻	809.380[&] *16*	100 *4*	0.0	7/2⁻	M1+E2[a]	0.46	0.00608	B(M1)(W.u.)=0.0088 *+18−14*; B(E2)(W.u.)=1.6 *+7−5* α(K)=0.00519 *8*; α(L)=0.000703 *10*; α(M)=0.0001503 *21* α(N)=3.41×10^{-5} *5*; α(O)=5.11×10^{-6} *8*; α(P)=3.21×10^{-7} *5*
922.73	(1/2⁻)	725.44[b] *15*	100	197.284	3/2⁻				
932.0	11/2⁺	122.8[c]	30[c] *6*	809.358	9/2⁻	D[d]			
		215.3[c]	100.0[c] *20*	716.62	11/2⁻	E1[d]		0.0347	α(K)=0.0296 *5*; α(L)=0.00408 *6*; α(M)=0.000872 *13* α(N)=0.000196 *3*; α(O)=2.85×10^{-5} *4*; α(P)=1.577×10^{-6} *22*
		931.6[c]	2.0[c] *8*	0.0	7/2⁻	[M2+E3]		0.0091 *28*	α(K)=0.0076 *25*; α(L)=0.0012 *3*; α(M)=0.00025 *6* α(N)=5.7×10^{-5} *14*; α(O)=8.4×10^{-6} *22*; α(P)=4.9×10^{-7} *17* Mult.: E3 component established in Coulomb excitation.
1030.70	13/2⁺	98.9[c]	6.0[c] *10*	932.0	11/2⁺	D[d]			
		314.10[b] *15*	100[c] *3*	716.62	11/2⁻	E1[d]		0.01311	α(K)=0.01118 *16*; α(L)=0.001515 *22*; α(M)=0.000323 *5* α(N)=7.28×10^{-5} *11*; α(O)=1.070×10^{-5} *15*; α(P)=6.17×10^{-7} *9*
1043.528	1/2⁻,3/2⁻	244.832[&] *17*	34.5 *15*	798.731	3/2⁻				
		846.242[&] *11*	100 *3*	197.284	3/2⁻	M1+E2[a]	−0.24 *6*	0.00574 *11*	α(K)=0.00491 *9*; α(L)=0.000658 *12*; α(M)=0.0001406 *24* α(N)=3.19×10^{-5} *6*; α(O)=4.80×10^{-6} *9*; α(P)=3.04×10^{-7} *6*
		922.36[&] *12*	3.8 *8*	121.212	5/2⁻				
1054.217	3/2⁺	255.64[&] *15*	0.06 *1*	798.731	3/2⁻				
		856.929[&] *5*	78.5 *23*	197.284	3/2⁻	E1[a]		1.39×10^{-3}	α(K)=0.001191 *17*; α(L)=0.0001540 *22*; α(M)=3.27×10^{-5} *5* α(N)=7.40×10^{-6} *11*; α(O)=1.107×10^{-6} *16*; α(P)=6.88×10^{-8} *10*
		933.005[&] *8*	100 *3*	121.212	5/2⁻	E1[a]		1.18×10^{-3}	α(K)=0.001011 *15*; α(L)=0.0001303 *19*; α(M)=2.77×10^{-5} *4* α(N)=6.26×10^{-6} *9*; α(O)=9.37×10^{-7} *14*; α(P)=5.85×10^{-8} *9*
		1054.35[&] *24*	0.06 *4*	0.0	7/2⁻				

Adopted Levels, Gammas (continued)

γ(^{147}Sm) (continued)

E_i(level)	J_i^π	E_γ	I_γ[#]	E_f	J_f^π	Mult.	δ[‡@]	α[†]	Comments
1063.389	5/2$^+$	254.09[&] *4*	5.2 *3*	809.358	9/2$^-$				
		942.177[&] *7*	100 *3*	121.212	5/2$^-$	E1[a]		1.15×10^{-3}	α(K)=0.000992 *14*; α(L)=0.0001278 *18*; α(M)=2.72×10^{-5} *4* α(N)=6.14×10^{-6} *9*; α(O)=9.19×10^{-7} *13*; α(P)=5.74×10^{-8} *8*
		1063.380[&] *9*	85 *3*	0.0	7/2$^-$	E1[a]		9.20×10^{-4}	α(K)=0.000791 *11*; α(L)=0.0001015 *15*; α(M)=2.15×10^{-5} *3* α(N)=4.88×10^{-6} *7*; α(O)=7.30×10^{-7} *11*; α(P)=4.59×10^{-8} *7*
1069.05?	9/2$^-$	947.9[bf] *1*	100[b] *14*	121.212	5/2$^-$	E2		0.00279	α(K)=0.00236 *4*; α(L)=0.000336 *5*; α(M)=7.22×10^{-5} *11* α(N)=1.630×10^{-5} *23*; α(O)=2.41×10^{-6} *4*; α(P)=1.401×10^{-7} *20* Mult.: E2, ΔJ=2 from ^{147}Sm(n,n′γ) based on γ(θ).
		1069.05[bf] *10*	93[b] *14*	0.0	7/2$^-$	M1+E2		0.0028 *6*	α(K)=0.0024 *6*; α(L)=0.00032 *7*; α(M)=6.8×10^{-5} *14* α(N)=1.5×10^{-5} *3*; α(O)=2.3×10^{-6} *5*; α(P)=1.4×10^{-7} *4* Mult.: M1+E2, ΔJ=1 from ^{147}Sm(n,n′γ) based on γ(θ).
1077.049	5/2$^-$	267.74[&] *3*	0.19 *1*	809.358	9/2$^-$	(E2)[a]		0.0804	α(K)=0.0615 *9*; α(L)=0.01474 *21*; α(M)=0.00330 *5* α(N)=0.000733 *11*; α(O)=9.99×10^{-5} *14*; α(P)=3.24×10^{-6} *5*
		278.352[&] *14*	0.84 *3*	798.731	3/2$^-$	M1+E2[a]	0.086 *48*	0.0985	α(K)=0.0837 *12*; α(L)=0.01165 *17*; α(M)=0.00250 *4* α(N)=0.000567 *8*; α(O)=8.50×10^{-5} *12*; α(P)=5.29×10^{-6} *8*
		879.761[&] *8*	3.19 *9*	197.284	3/2$^-$	M1+E2[a]	−0.124 *7*	0.00531	α(K)=0.00454 *7*; α(L)=0.000607 *9*; α(M)=0.0001297 *19* α(N)=2.94×10^{-5} *5*; α(O)=4.43×10^{-6} *7*; α(P)=2.82×10^{-7} *4*
		955.832[&] *5*	62.5 *17*	121.212	5/2$^-$	M1+E2[a]	+0.16 *4*	0.00434 *7*	α(K)=0.00371 *6*; α(L)=0.000495 *8*; α(M)=0.0001057 *16* α(N)=2.40×10^{-5} *4*; α(O)=3.61×10^{-6} *6*; α(P)=2.30×10^{-7} *4* δ: via (956γ)(121γ)(θ) (1966Go26). +0.18 *+5−4* from (1970Be67). Others: 1962Sc09, 1964Mc17, 1970Va38.
		1077.043[&] *6*	100 *3*	0.0	7/2$^-$	M1+E2[a]	−0.071 *5*	0.00330	α(K)=0.00282 *4*; α(L)=0.000374 *6*; α(M)=7.99×10^{-5} *12* α(N)=1.81×10^{-5} *3*; α(O)=2.73×10^{-6} *4*; α(P)=1.743×10^{-7} *25*

$^{147}_{62}Sm_{85}$-7

Adopted Levels, Gammas (continued)

γ(^{147}Sm) (continued)

E_i(level)	J_i^π	E_γ	I_γ[#]	E_f	J_f^π	Mult.	δ[‡@]	α[†]	Comments
1106.861	(3/2$^-$ to 9/2$^-$)	985.34[&] *12*	12.5 *11*	121.212	5/2$^-$				
		1106.863[&] *17*	100 *3*	0.0	7/2$^-$	(E2(+M1))		0.0026 *6*	α(K)=0.0022 *5*; α(L)=0.00029 *6*; α(M)=6.3×10^{-5} *13* α(N)=1.4×10^{-5} *3*; α(O)=2.1×10^{-6} *5*; α(P)=1.3×10^{-7} *4*; α(IPF)=4.27×10^{-7} *16* δ: compatible with B(E2)↑ (from 7/2$^-$) in Coulomb excitation.
1172.66	(−)	1172.63[&] *6*	100	0.0	7/2$^-$				
1180.253	5/2$^+$	371.2[b] *3*	5.9[b] *19*	809.358	9/2$^-$				
		982.97[&] *5*	4.9 *3*	197.284	3/2$^-$				
		1059.041[&] *12*	40.1 *13*	121.212	5/2$^-$				
		1180.231[&] *10*	100 *3*	0.0	7/2$^-$	E1[a]		7.79×10^{-4}	α(K)=0.000655 *10*; α(L)=8.37×10^{-5} *12*; α(M)=1.776×10^{-5} *25* α(N)=4.02×10^{-6} *6*; α(O)=6.03×10^{-7} *9*; α(P)=3.80×10^{-8} *6*; α(IPF)=1.83×10^{-5} *3*
1219.797	1/2$^+$	165.558[&] *28*	50 *3*	1054.217	3/2$^+$				
		421.064[&] *17*	100 *17*	798.731	3/2$^-$				
		1022.47[&] *4*	41.5 *23*	197.284	3/2$^-$				
1317.677	1/2$^-$,3/2$^-$,5/2$^-$	518.96[&] *3*	9.9 *6*	798.731	3/2$^-$	M1[a]		0.0196	α(K)=0.01671 *24*; α(L)=0.00227 *4*; α(M)=0.000486 *7* α(N)=0.0001103 *16*; α(O)=1.658×10^{-5} *24*; α(P)=1.046×10^{-6} *15*
		1120.387[&] *9*	100 *3*	197.284	3/2$^-$	M1(+E2)[a]	−0.018 *17*	0.00301	α(K)=0.00258 *4*; α(L)=0.000341 *5*; α(M)=7.28×10^{-5} *11* α(N)=1.652×10^{-5} *24*; α(O)=2.49×10^{-6} *4*; α(P)=1.591×10^{-7} *23*; α(IPF)=7.24×10^{-7} *11*
1317.859	5/2$^-$,7/2$^-$,9/2$^-$	1317.853[&] *13*	100	0.0	7/2$^-$	M1[a]		0.00209	α(K)=0.001766 *25*; α(L)=0.000233 *4*; α(M)=4.97×10^{-5} *7* α(N)=1.126×10^{-5} *16*; α(O)=1.698×10^{-6} *24*; α(P)=1.088×10^{-7} *16*; α(IPF)=2.57×10^{-5} *4*
1318.076	3/2$^-$,5/2$^-$	263.95[&] *15*	0.39 *10*	1054.217	3/2$^+$				
		1196.858[&] *11*	100 *3*	121.212	5/2$^-$	E2[a]		1.72×10^{-3}	α(K)=0.001462 *21*; α(L)=0.000200 *3*; α(M)=4.29×10^{-5} *6* α(N)=9.70×10^{-6} *14*; α(O)=1.444×10^{-6} *21*; α(P)=8.71×10^{-8} *13*; α(IPF)=5.38×10^{-6} *8*

Adopted Levels, Gammas (continued)

γ(^{147}Sm) (continued)

E_i(level)	J_i^π	E_γ	I_γ[#]	E_f	J_f^π	Mult.	δ[‡@]	α[†]	Comments
									Mult.: M1+E2 in ^{147}Sm(n,n′γ) not adopted.
1318.076	3/2$^-$,5/2$^-$	1318.2[b] *2*	40 *10*	0.0	7/2$^-$				
1349.649	(3/2$^-$,5/2$^-$)	286.28[&] *2*	100 *4*	1063.389	5/2$^+$				
		295.40[&] *6*	24 *3*	1054.217	3/2$^+$				
		1152.330[&] *26*	64 *3*	197.284	3/2$^-$				
1449.113	7/2$^-$	385.69[&] *10*	1.2 *3*	1063.389	5/2$^+$				
		732.33[&e] *5*	3.6 *3*	716.62	11/2$^-$				
		1251.841[&] *24*	35.5 *12*	197.284	3/2$^-$	[E2]		1.58×10^{-3}	α(K)=0.001337 *19*; α(L)=0.000182 *3*; α(M)=3.90×10^{-5} *6* α(N)=8.81×10^{-6} *13*; α(O)=1.314×10^{-6} *19*; α(P)=7.96×10^{-8} *12*; α(IPF)=1.250×10^{-5} *18* Mult.: M1+E2, ΔJ=0,1 in ^{147}Sm(n,n′γ) not adopted.
		1327.98[&] *5*	6.1 *9*	121.212	5/2$^-$				I_γ: 22 *9* from ^{147}Sm(n,n′γ).
		1449.106[&] *12*	100 *4*	0.0	7/2$^-$	M1[a]		1.72×10^{-3}	α(K)=0.001420 *20*; α(L)=0.000187 *3*; α(M)=3.98×10^{-5} *6* α(N)=9.03×10^{-6} *13*; α(O)=1.362×10^{-6} *19*; α(P)=8.73×10^{-8} *13*; α(IPF)=6.37×10^{-5} *9*
1453.220	3/2$^-$	273.14[&] *16*	0.24 *5*	1180.253	5/2$^+$				
		389.90[&] *8*	0.44 *5*	1063.389	5/2$^+$				
		654.55[&] *11*	0.47 *7*	798.731	3/2$^-$				
		1255.930[&] *8*	100 *3*	197.284	3/2$^-$	M1+E2		0.0019 *4*	α(K)=0.0017 *4*; α(L)=0.00022 *4*; α(M)=4.7×10^{-5} *9* α(N)=1.07×10^{-5} *20*; α(O)=1.6×10^{-6} *3*; α(P)=1.00×10^{-7} *22*; α(IPF)=1.36×10^{-5} *5* Mult.: M1+E2 ΔJ=0,1 from ^{147}Sm(n,n′γ) based on γ(θ). δ: δ=−1.5 *6* if ΔJ=0 or −1.6 *16* if ΔJ=1 from ^{147}Sm(n,n′γ).
		1331.997[&] *13*	36.1 *12*	121.212	5/2$^-$	M1+E2	1.7 *11*	0.0016 *3*	α(K)=0.0013 *3*; α(L)=0.00018 *4*; α(M)=3.8×10^{-5} *7* α(N)=8.6×10^{-6} *16*; α(O)=1.28×10^{-6} *24*; α(P)=8.0×10^{-8} *17*; α(IPF)=2.75×10^{-5} *11* Mult.,δ: M1+E2, ΔJ=1 from ^{147}Sm(n,n′γ) based on γ(θ).
		1453.24[&] *4*	2.79 *12*	0.0	7/2$^-$				
1458.17	15/2$^-$	427.5[b] *2*	23.5 *16*	1030.70	13/2$^+$	E1[d]		0.00619	α(K)=0.00529 *8*; α(L)=0.000707 *10*; α(M)=0.0001507 *22* α(N)=3.40×10^{-5} *5*; α(O)=5.03×10^{-6} *7*; α(P)=2.98×10^{-7} *5*

$^{147}_{62}Sm_{85}$-9

Adopted Levels, Gammas (continued)

$\gamma(^{147}Sm)$ (continued)

E_i(level)	J_i^π	E_γ	I_γ[#]	E_f	J_f^π	Mult.	α[†]	Comments
								I_γ: from ^{148}Nd(^{3}He,4nγ) dataset; 11 *3* in ^{147}Sm(n,n′γ).
1458.17	15/2$^-$	741.5[b] *2*	100 *5*	716.62	11/2$^-$	E2	0.00481	α(K)=0.00404 *6*; α(L)=0.000608 *9*; α(M)=0.0001314 *19* α(N)=2.96×10^{-5} *5*; α(O)=4.34×10^{-6} *6*; α(P)=2.38×10^{-7} *4*
								Mult.: from ^{147}Sm(n,n′γ) based on $\gamma(\theta)$.
1471.417	3/2$^-$,5/2$^-$,7/2$^-$	1350.198[&] *14*	100	121.212	5/2$^-$	M1+E2	0.0017 *3*	α(K)=0.0014 *3*; α(L)=0.00019 *4*; α(M)=4.0×10^{-5} *7* α(N)=9.1×10^{-6} *16*; α(O)=1.36×10^{-6} *25*; α(P)=8.6×10^{-8} *18*; α(IPF)=3.23×10^{-5} *13*
								Mult.: M1+E2, ΔJ=0,1 from ^{147}Sm(n,n′γ) based on $\gamma(\theta)$. δ: δ=−1.0 *7* if ΔJ=1; −0.10 *+15−12* or 2.1 *10* 6 if ΔJ=0 from ^{147}Sm(n,n′γ).
1471.885	–	1274.592[&] *14*	100 *3*	197.284	3/2$^-$	E2[a]	1.53×10^{-3}	α(K)=0.001291 *18*; α(L)=0.0001754 *25*; α(M)=3.75×10^{-5} *6* α(N)=8.48×10^{-6} *12*; α(O)=1.265×10^{-6} *18*; α(P)=7.69×10^{-8} *11*; α(IPF)=1.606×10^{-5} *23*
		1471.90[&] *4*	5.9 *3*	0.0	7/2$^-$			
1548.634	3/2$^+$,5/2$^+$	328.828[&] *13*	14.2 *4*	1219.797	1/2$^+$	M1[a]	0.0635	α(K)=0.0540 *8*; α(L)=0.00746 *11*; α(M)=0.001598 *23* α(N)=0.000362 *5*; α(O)=5.44×10^{-5} *8*; α(P)=3.41×10^{-6} *5*
		368.360[&] *12*	29.1 *9*	1180.253	5/2$^+$	M1[a]	0.0472	α(K)=0.0401 *6*; α(L)=0.00552 *8*; α(M)=0.001183 *17* α(N)=0.000268 *4*; α(O)=4.03×10^{-5} *6*; α(P)=2.53×10^{-6} *4*
		471.600[&] *12*	21.6 *7*	1077.049	5/2$^-$	E1[a]	0.00493	α(K)=0.00422 *6*; α(L)=0.000560 *8*; α(M)=0.0001194 *17* α(N)=2.69×10^{-5} *4*; α(O)=3.99×10^{-6} *6*; α(P)=2.39×10^{-7} *4*
		494.419[&] *16*	15.3 *5*	1054.217	3/2$^+$	M1[a]	0.0221	α(K)=0.0189 *3*; α(L)=0.00257 *4*; α(M)=0.000550 *8* α(N)=0.0001248 *18*; α(O)=1.88×10^{-5} *3*; α(P)=1.183×10^{-6} *17*
		505.121[&] *11*	35.8 *11*	1043.528	1/2$^-$,3/2$^-$	E1[a]	0.00422	α(K)=0.00361 *5*; α(L)=0.000478 *7*; α(M)=0.0001018 *15* α(N)=2.30×10^{-5} *4*; α(O)=3.41×10^{-6} *5*; α(P)=2.05×10^{-7} *3*
		749.895[&] *17*	100 *3*	798.731	3/2$^-$	E1[a]	0.00181	α(K)=0.001552 *22*; α(L)=0.000202 *3*; α(M)=4.29×10^{-5} *6* α(N)=9.70×10^{-6} *14*; α(O)=1.448×10^{-6} *21*; α(P)=8.93×10^{-8} *13*
		1427.408[&] *17*	45.0 *14*	121.212	5/2$^-$	(E1)[a]	7.01×10^{-4}	α(K)=0.000470 *7*; α(L)=5.96×10^{-5} *9*; α(M)=1.264×10^{-5} *18* α(N)=2.86×10^{-6} *4*; α(O)=4.30×10^{-7} *6*; α(P)=2.73×10^{-8} *4*; α(IPF)=0.0001561 *22*
		1548.51[&] *16*	0.17 *3*	0.0	7/2$^-$			
1551.4	13/2$^-$	742.2[c]		809.358	9/2$^-$	(E2)[d]	0.00480	α(K)=0.00403 *6*; α(L)=0.000606 *9*; α(M)=0.0001311 *19*

$^{147}_{62}Sm_{85}$-10

Adopted Levels, Gammas (continued)

γ(^{147}Sm) (continued)

E_i(level)	J_i^π	E_γ	I_γ[#]	E_f	J_f^π	Mult.	δ[‡@]	α[†]	Comments
									α(N)=2.95×10^{-5} *5*; α(O)=4.33×10^{-6} *6*; α(P)=2.38×10^{-7} *4* Mult.: E2, ΔJ=2 (^{148}Nd(^{3}He,4nγ), 1996Ur01).
1551.4	13/2$^-$	835.0[c]		716.62	11/2$^-$	(M1(+E2))[d]		0.0049 *12*	α(K)=0.0041 *11*; α(L)=0.00057 *12*; α(M)=0.00012 *3* α(N)=2.8×10^{-5} *6*; α(O)=4.1×10^{-6} *9*; α(P)=2.53×10^{-7} *69* Mult.: M1+E2, ΔJ=1 (^{148}Nd(^{3}He,4nγ), 1996Ur01).
1600.937	3/2$^{(-)}$,5/2$^{(+)}$	380.83[&] *25*	76 *22*	1219.797	1/2$^+$				
		420.69[&] *4*	100 *31*	1180.253	5/2$^+$				
		428.24[&] *7*	28 *4*	1172.66	(−)				
		537.22[&] *16*	20 *7*	1063.389	5/2$^+$				
		1479.71[&] *3*	35.8 *13*	121.212	5/2$^-$				
		1601.00[&] *5*	68 *3*	0.0	7/2$^-$				
1641.95		1520.58[&] *13*	32 *6*	121.212	5/2$^-$				
		1641.98[&] *7*	100 *6*	0.0	7/2$^-$				
1716.2	17/2$^+$	258.2[c]	8.3[c] *18*	1458.17	15/2$^-$	D[d]			Mult.: D, ΔJ=1 (^{148}Nd(^{3}He,4nγ), 1980Ko07).
		686.0[c]	100[c] *3*	1030.70	13/2$^+$	E2[d]		0.00578	α(K)=0.00483 *7*; α(L)=0.000743 *11*; α(M)=0.0001609 *23* α(N)=3.62×10^{-5} *5*; α(O)=5.28×10^{-6} *8*; α(P)=2.84×10^{-7} *4* Mult.: E2, ΔJ=2 (^{148}Nd(^{3}He,4nγ), 1980Ko07).
1717.3	9/2$^-$	1596.0[b] *4*	100[b] *28*	121.212	5/2$^-$				
		1717.8[b] *5*	80[b] *20*	0.0	7/2$^-$	M1+E2	1.5 *7*	0.00110 *9*	α(K)=0.00080 *8*; α(L)=0.000105 *10*; α(M)=2.25×10^{-5} *20* α(N)=5.1×10^{-6} *5*; α(O)=7.7×10^{-7} *7*; α(P)=4.8×10^{-8} *5*; α(IPF)=0.000165 *6* Mult.,δ: M1+E2, ΔJ=1 from ^{147}Sm(n,n′γ) based on γ(θ).
1748.8		430.2[b] *6*	61[b] *28*	1318.076	3/2$^-$,5/2$^-$				
		1627.4[b] *8*	32[b] *11*	121.212	5/2$^-$				
		1749.2[b] *5*	100[b] *30*	0.0	7/2$^-$				
1762.0	15/2$^+$	731.2[c]	4.8[c] *10*	1030.70	13/2$^+$				
		829.7[c]	100[c] *8*	932.0	11/2$^+$	E2[d]		0.00373	α(K)=0.00314 *5*; α(L)=0.000460 *7*; α(M)=9.92×10^{-5} *14* α(N)=2.24×10^{-5} *4*; α(O)=3.29×10^{-6} *5*;

$^{147}_{62}Sm_{85}$-11

Adopted Levels, Gammas (continued)

γ(^{147}Sm) (continued)

E_i(level)	J_i^π	E_γ	I_γ[#]	E_f	J_f^π	Mult.	δ[‡@]	α[†]	Comments
									α(P)=1.86×10^{-7} *3* Mult.: E2, ΔJ=2 (^{148}Nd(^{3}He,4nγ), 1980Ko07).
1762.73		684.6[b] *5*	39[b] *16*	1077.049	5/2$^-$				
		1641.8[b] *2*	100[b] *19*	121.212	5/2$^-$				
		1762.0[b] *5*	15[b] *6*	0.0	7/2$^-$				
1803.3	(13/2)	871.3[c]	100	932.0	11/2$^+$	(D+Q)[d]			Mult.: (D+Q), ΔJ=1 (^{148}Nd(^{3}He,4nγ), 1980Ko07).
1843.77	5/2$^-$	663.5[b] *3*	56[b] *16*	1180.253	5/2$^+$				
		1646.3[b] *4*	54[b] *15*	197.284	3/2$^-$				
		1844.2[b] *6*	100[b] *25*	0.0	7/2$^-$	M1+E2	1.6 *9*	0.00103 *10*	α(K)=0.00069 *8*; α(L)=9.1×10^{-5} *10*; α(M)=1.93×10^{-5} *20* α(N)=4.4×10^{-6} *5*; α(O)=6.6×10^{-7} *7*; α(P)=4.2×10^{-8} *5*; α(IPF)=0.000223 *10* Mult.,δ: M1+E2, ΔJ=1 ^{147}Sm(n,n′γ) based on γ(θ).
1896.2	15/2$^-$	1180.0[c]	100	716.62	11/2$^-$	E2[d]		1.77×10^{-3}	α(K)=0.001504 *21*; α(L)=0.000207 *3*; α(M)=4.42×10^{-5} *7* α(N)=1.000×10^{-5} *14*; α(O)=1.488×10^{-6} *21*; α(P)=8.95×10^{-8} *13*; α(IPF)=3.76×10^{-6} *6* Mult.: E2, ΔJ=2 (^{148}Nd(^{3}He,4nγ), 1980Ko07).
1983.09		534.00[b] *15*	100[b] *20*	1449.113	7/2$^-$				
		1861.6[b] *5*	30[b] *9*	121.212	5/2$^-$				
2011.0	17/2	115.1[c]	100[c] *15*	1896.2	15/2$^-$	(D+Q)[d]			Mult.: (D+Q), ΔJ=1 (^{148}Nd(^{3}He,4nγ), 1980Ko07).
		552.4[c]	15[c] *4*	1458.17	15/2$^-$	D+Q[d]			Mult.: D+Q, ΔJ=1 (^{148}Nd(^{3}He,4nγ), 1980Ko07).
2064.9	(3/2$^+$,5/2$^+$)	1010.7[b] *5*	100[b]	1054.217	3/2$^+$				
2070.00	(7/2$^-$)	1260.8[b] *2*	32[b] *9*	809.358	9/2$^-$				
		1353.6[b] *5*	100[b] *29*	716.62	11/2$^-$				
		1870.7[b] *8*	18[b] *8*	197.284	3/2$^-$				
		2069.8[b] *3*	32[b] *9*	0.0	7/2$^-$				
2089.80		1059.1[b] *2*	100[b]	1030.70	13/2$^+$				
2109.4	17/2$^-$	558.3[c]		1551.4	13/2$^-$	(E2)[d]		0.00961	α(K)=0.00795 *12*; α(L)=0.001305 *19*; α(M)=0.000284 *4* α(N)=6.39×10^{-5} *9*; α(O)=9.21×10^{-6} *13*; α(P)=4.62×10^{-7} *7* Mult.: E2, ΔJ=2 (^{148}Nd(^{3}He,4nγ), (1996Ur01)).
		651.2[b] *3*		1458.17	15/2$^-$	M1[d]		0.01112	α(K)=0.00949 *14*; α(L)=0.001281 *18*; α(M)=0.000274 *4*

$^{147}_{62}Sm_{85}$-12

Adopted Levels, Gammas (continued)

γ(^{147}Sm) (continued)

E_i(level)	J_i^π	E_γ	I_γ[#]	E_f	J_f^π	Mult.	α[†]	Comments
								α(N)=6.21×10^{-5} *9*; α(O)=9.35×10^{-6} *14*; α(P)=5.92×10^{-7} *9* Mult.: M1, ΔJ=1 (^{148}Nd(^{3}He,4nγ), (1980Ko07)).
2202.89	(3/2$^-$,5/2,7/2)	1138.7[be] *2*	100[b] *20*	1063.389	5/2$^+$			
		2082.5[be] *2*	67[b] *20*	121.212	5/2$^-$			
		2202.7[b] *4*	60[b] *20*	0.0	7/2$^-$			
2297.8	(17/2)	535.8[c]	100[c]	1762.0	15/2$^+$	(D)[d]		Mult.: (D), ΔJ=1 (^{148}Nd(^{3}He,4nγ), 1996Ur01).
2430.4	21/2$^+$	714.8[c]	100[c]	1716.2	17/2$^+$	E2[d]	0.00524	α(K)=0.00439 *7*; α(L)=0.000668 *10*; α(M)=0.0001444 *21* α(N)=3.25×10^{-5} *5*; α(O)=4.76×10^{-6} *7*; α(P)=2.59×10^{-7} *4* Mult.: E2, ΔJ=2 (^{148}Nd(^{3}He,4nγ), 1980Ko07).
2450.4	19/2$^-$	734[cf]		1716.2	17/2$^+$			
		992.3[c]		1458.17	15/2$^-$	(E2)[d]	0.00253	α(K)=0.00214 *3*; α(L)=0.000303 *5*; α(M)=6.50×10^{-5} *9* α(N)=1.467×10^{-5} *21*; α(O)=2.17×10^{-6} *3*; α(P)=1.273×10^{-7} *18* Mult.: E2, ΔJ=2 (^{148}Nd(^{3}He,4nγ), 1996Ur01).
2470.0	19/2	459.0[c]	100[c]	2011.0	17/2	M1+E2[d]	0.021 *6*	α(K)=0.0180 *49*; α(L)=0.0027 *4*; α(M)=0.00059 *8* α(N)=0.000133 *19*; α(O)=2.0×10^{-5} *4*; α(P)=1.09×10^{-6} *34*
2558.6	21/2$^-$	108.2[c]		2450.4	19/2$^-$	M1(+E2)[d]	1.56 *21*	α(K)=1.05 *10*; α(L)=0.39 *24*; α(M)=0.090 *55* α(N)=0.020 *12*; α(O)=0.0026 *15*; α(P)=5.7×10^{-5} *16* Mult.: M1(+E2), ΔJ=1 (^{148}Nd(^{3}He,4nγ), 1996Ur01).
		449.0[c]	100[c]	2109.4	17/2$^-$	E2[d]	0.01717	α(K)=0.01398 *20*; α(L)=0.00250 *4*; α(M)=0.000549 *8* α(N)=0.0001230 *18*; α(O)=1.748×10^{-5} *25*; α(P)=7.96×10^{-7} *12* Mult.: E2, ΔJ=2 (^{148}Nd(^{3}He,4nγ), 1980Ko07).
2592.2	(19/2$^+$)	162.3[c]		2430.4	21/2$^+$			
		829.6[c]		1762.0	15/2$^+$	(E2)[d]	0.00373	α(K)=0.00314 *5*; α(L)=0.000460 *7*; α(M)=9.92×10^{-5} *14* α(N)=2.24×10^{-5} *4*; α(O)=3.29×10^{-6} *5*; α(P)=1.86×10^{-7} *3* Mult.: (E2), ΔJ=2 (^{148}Nd(^{3}He,4nγ), 1996Ur01).
2689.0		678.0[c]	100[c]	2011.0	17/2			
2704.2	(19/2$^-$)	1246.0[c]		1458.17	15/2$^-$	(E2)[d]	1.60×10^{-3}	α(K)=0.001350 *19*; α(L)=0.000184 *3*; α(M)=3.94×10^{-5} *6* α(N)=8.90×10^{-6} *13*; α(O)=1.327×10^{-6} *19*; α(P)=8.04×10^{-8} *12*; α(IPF)=1.164×10^{-5} *17* Mult.: (E2), ΔJ=2 (^{148}Nd(^{3}He,4nγ), 1996Ur01).
2765.6	21/2	295.6[c]		2470.0	19/2	M1[d]	0.0841	α(K)=0.0715 *10*; α(L)=0.00991 *14*; α(M)=0.00212 *3* α(N)=0.000482 *7*; α(O)=7.23×10^{-5} *11*; α(P)=4.52×10^{-6} *7* Mult.: M1, ΔJ=1 (^{148}Nd(^{3}He,4nγ), 1980Ko07).
2978.6	23/2	213.0[c]	100[c]	2765.6	21/2	M1[d]	0.203	α(K)=0.1725 *25*; α(L)=0.0241 *4*; α(M)=0.00518 *8* α(N)=0.001174 *17*; α(O)=0.0001761 *25*; α(P)=1.095×10^{-5} *16* Mult.: M1, ΔJ=1 (^{148}Nd(^{3}He,4nγ), 1980Ko07).

$^{147}_{62}Sm_{85}$-13

Adopted Levels, Gammas (continued)

$\gamma(^{147}Sm)$ (continued)

E_i(level)	J_i^π	E_γ	I_γ[#]	E_f	J_f^π	Mult.	α[†]	Comments
3057.4	(23/2$^+$)	627.0[c]		2430.4	21/2$^+$	(M1(+E2))[d]	0.0097 *26*	α(K)=0.0082 *23*; α(L)=0.00118 *24*; α(M)=0.00025 *5* α(N)=5.7×10^{-5} *12*; α(O)=8.5×10^{-6} *18*; α(P)=5.0×10^{-7} *15* Mult.: (M1(+E2)), ΔJ=1 (^{148}Nd(^{3}He,4nγ), 1996Ur01).
3206.7	23/2$^{(+)}$	648.0[c]	100[c]	2558.6	21/2$^-$	(E1)[d]	0.00245	α(K)=0.00210 *3*; α(L)=0.000275 *4*; α(M)=5.84×10^{-5} *9* α(N)=1.320×10^{-5} *19*; α(O)=1.97×10^{-6} *3*; α(P)=1.202×10^{-7} *17* Mult.: (E1), ΔJ=1 (^{148}Nd(^{3}He,4nγ), 1996Ur01); (M1), ΔJ=1 (^{148}Nd(^{3}He,4nγ), 1980Ko07).
		776.5[c]		2430.4	21/2$^+$	(M1(+E2))[d]	0.0058 *15*	α(K)=0.0049 *13*; α(L)=0.00068 *15*; α(M)=0.00015 *3* α(N)=3.3×10^{-5} *7*; α(O)=5.0×10^{-6} *11*; α(P)=2.99×10^{-7} *85* Mult.: M1(+E2), ΔJ=1 (^{148}Nd(^{3}He,4nγ), 1996Ur01).
3309.5	25/2$^+$	879.1[c]	100[c]	2430.4	21/2$^+$	E2[d]	0.00328	α(K)=0.00277 *4*; α(L)=0.000401 *6*; α(M)=8.62×10^{-5} *12* α(N)=1.95×10^{-5} *3*; α(O)=2.87×10^{-6} *4*; α(P)=1.643×10^{-7} *23* Mult.: E2, ΔJ=2 (^{148}Nd(^{3}He,4nγ), 1996Ur01).
3467.8	27/2$^{(+)}$	158.2[c]		3309.5	25/2$^+$	(M1(+E2))[d]	0.462	α(K)=0.35 *5*; α(L)=0.087 *33*; α(M)=0.0196 *78* α(N)=0.0044 *17*; α(O)=5.9×10^{-4} *20*; α(P)=1.97×10^{-5} *53* Mult.: M1(+E2), ΔJ=1 (^{148}Nd(^{3}He,4nγ), 1996Ur01).
		261.1[c]	100[c]	3206.7	23/2$^{(+)}$	E2[d]	0.0871	α(K)=0.0664 *10*; α(L)=0.01620 *23*; α(M)=0.00363 *5* α(N)=0.000806 *12*; α(O)=0.0001095 *16*; α(P)=3.48×10^{-6} *5* Mult.: E2, ΔJ=2 (^{148}Nd(^{3}He,4nγ), 1980Ko07).

† Additional information 1.
‡ Additional information 2.
# From ^{147}Eu ε decay, unless noted otherwise.
@ From ^{147}Eu ε decay (1989Ad10), unless noted otherwise.
& From ^{147}Eu ε decay.
a From ^{147}Eu ε decay from α(K)exp.
b From ^{147}Sm(n,n′γ).
c From ^{148}Nd(^{3}He,4nγ).
d From ^{148}Nd(^{3}He,4nγ): from $\gamma(\theta)$, α(K)exp (1980Ko07); from DCO, linear polarization (1996Ur01) (see comments).
e Differ by 3σ or more from calculated value.
f Placement of transition in the level scheme is uncertain.

$^{147}_{62}Sm_{85}$-14

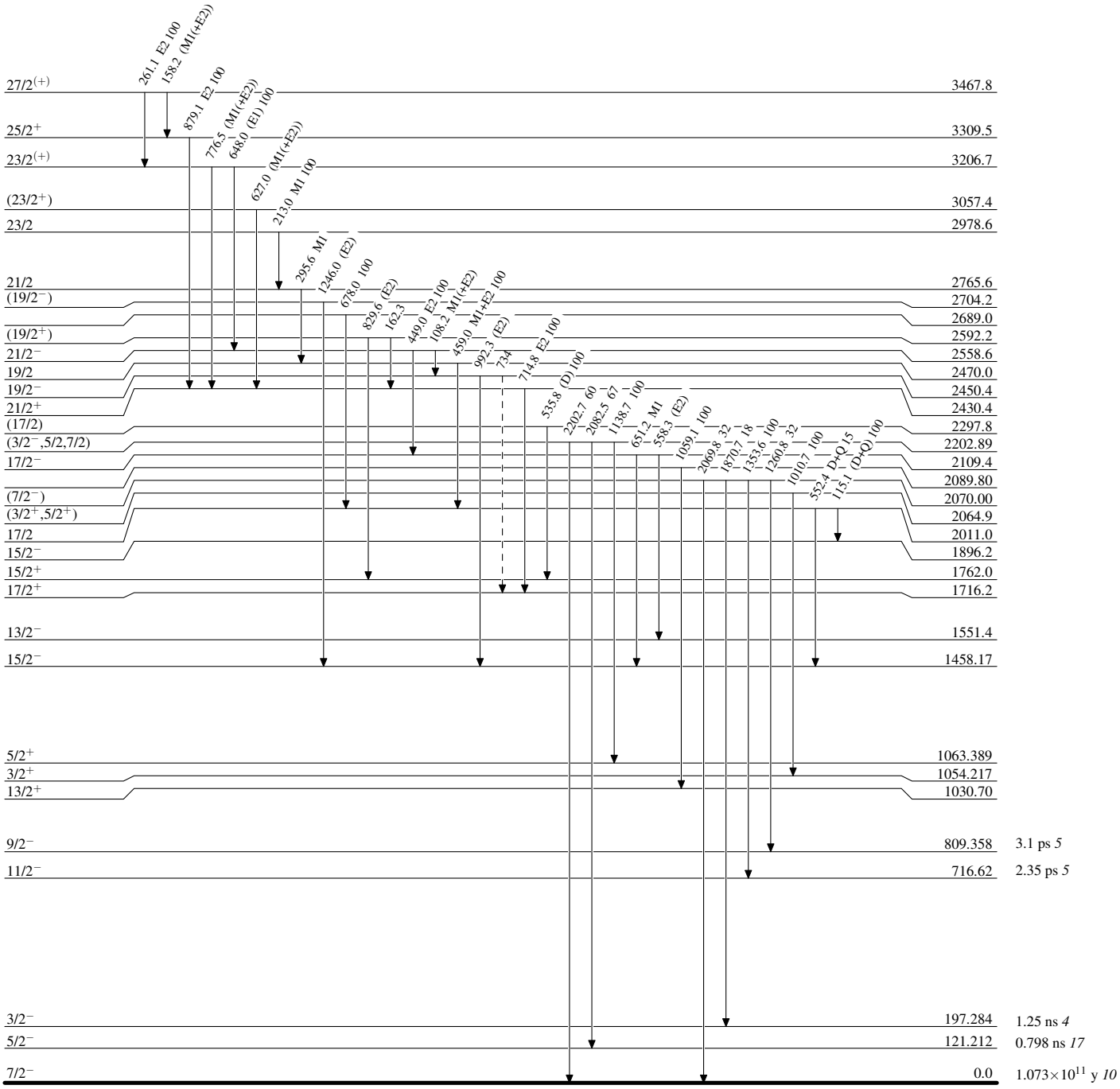
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{147}_{62}Sm_{85}$

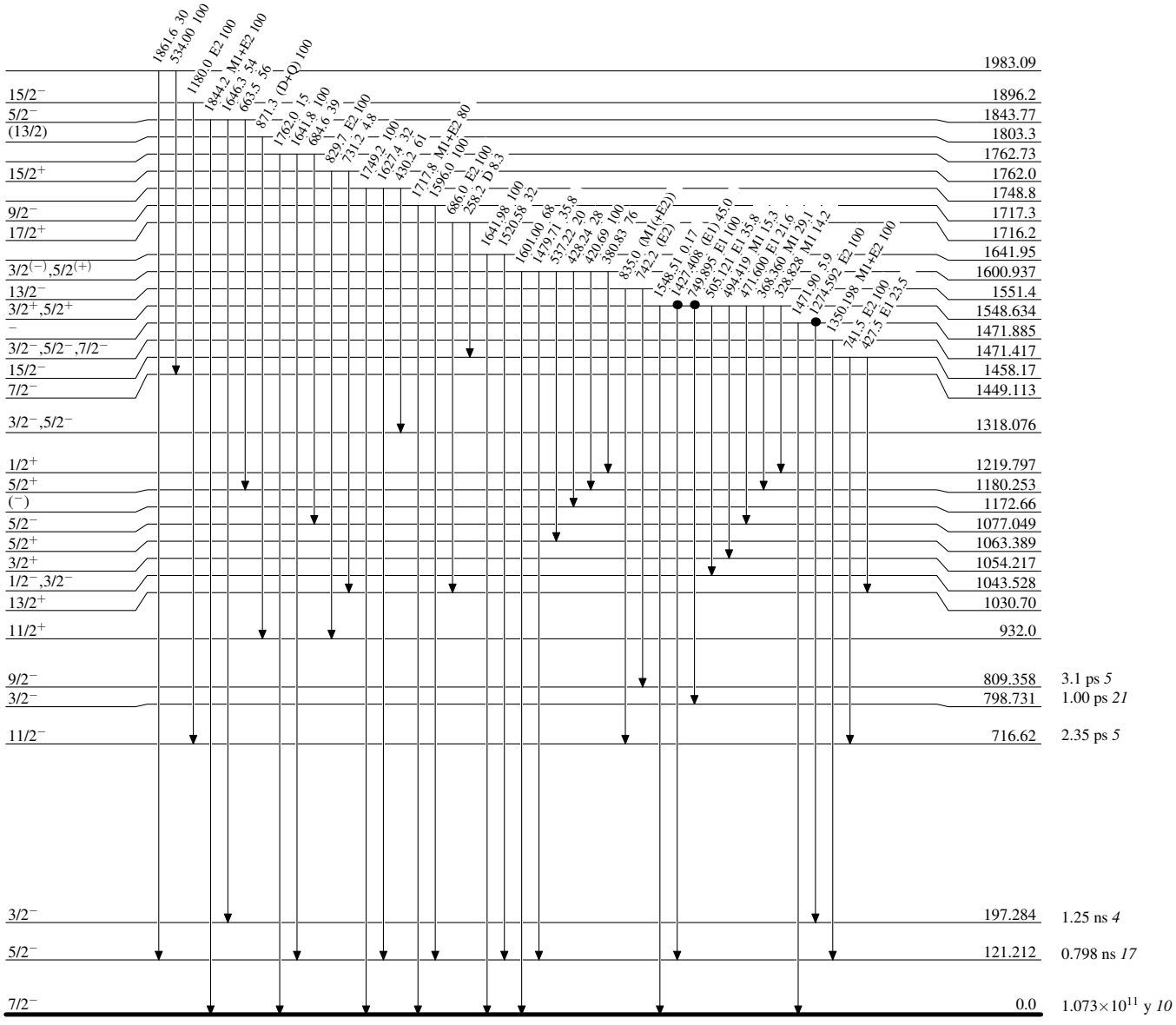
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

● Coincidence



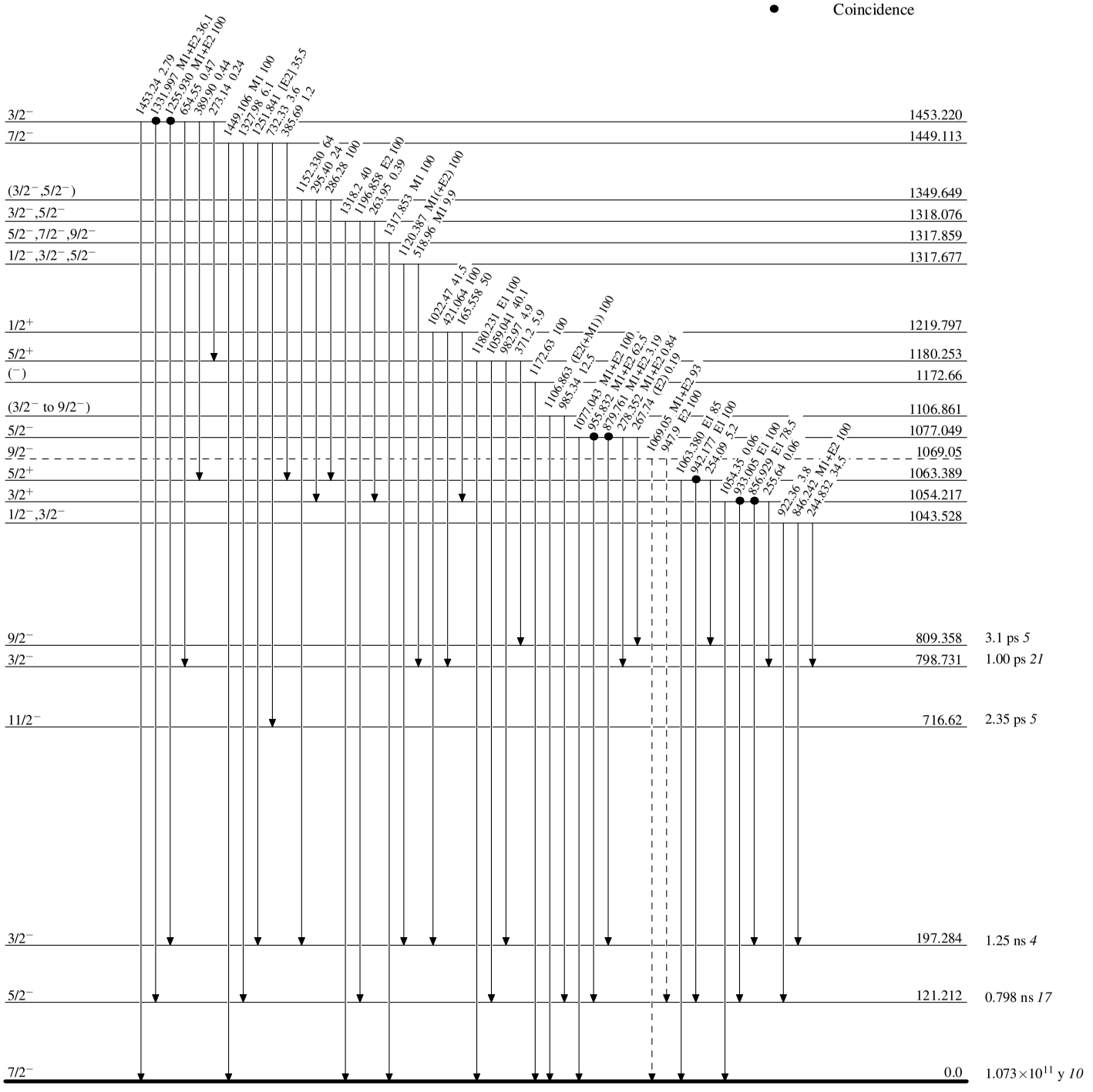
$^{147}_{62}Sm_{85}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

Legend: ------► γ Decay (Uncertain); ● Coincidence



$^{147}_{62}Sm_{85}$

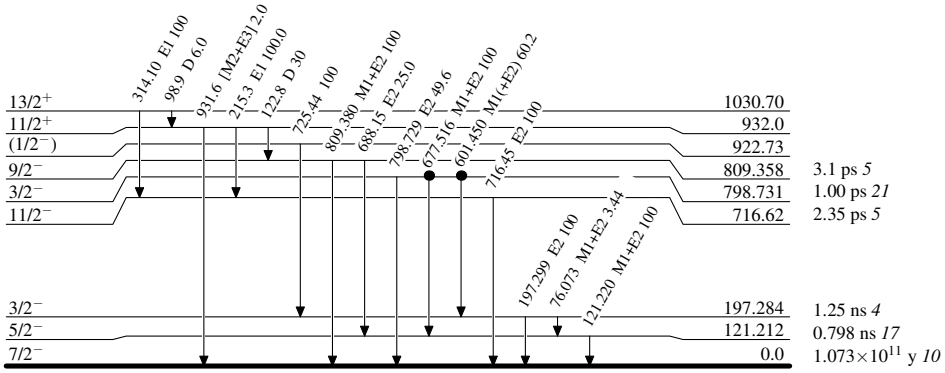
Adopted Levels, Gammas

Legend

Level Scheme (continued)

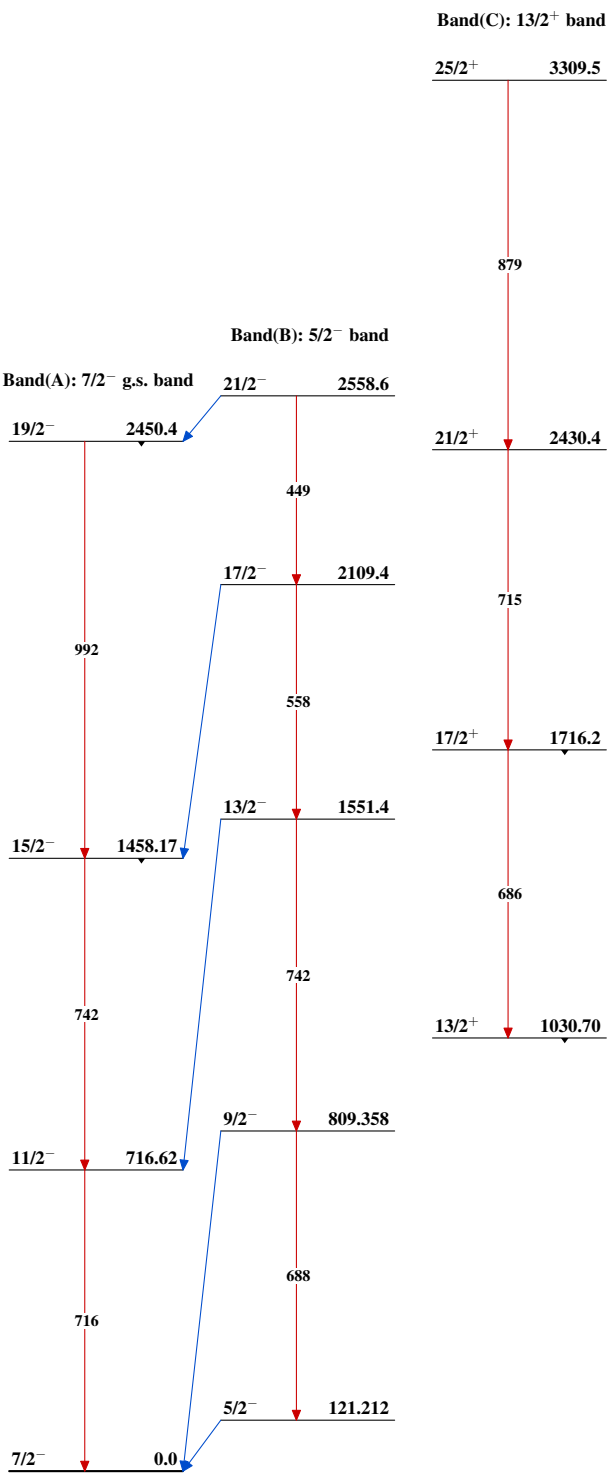
Intensities: Relative photon branching from each level

● Coincidence



$^{147}_{62}Sm_{85}$

Adopted Levels, Gammas



$^{147}_{62}Sm_{85}$