Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	S. K. Basu, A. A. Sonzogni	NDS 114, 435 (2013)	1-Apr-2013

Q(β^-)=−2259 *6*; S(n)=7986.7 *4*; S(p)=8275.8 *19*; Q(α)=1449.8 *10* 2017Wa10
S(2n)=13857.5 *4*; S(2p)=14221.1 *19* 2017Wa10
Additional information 1.
Levels reported in scattering, pickup, and stripping reactions with uncertainties such that they overlap levels observed in Coul. ex., β decay, (n,γ), or heavy ion (compound nucleus formation) reactions have been assumed to be the same as the latter levels, unless other evidence to the contrary exists.
α: Additional information 2.

^{150}Sm Levels

Cross Reference (XREF) Flags

A	^{150}Pm β^- decay (2.68 h)	H	^{149}Sm(n,γ) E=resonance	O	^{151}Sm(^{3}He,α) E=24 MeV
B	^{150}Eu ε decay (12.8 h)	I	^{149}Sm(d,p)	P	^{152}Sm(p,t) E=19 MeV
C	^{150}Eu ε decay (36.9 y)	J	^{150}Nd(α,4nγ) E=45 MeV	Q	^{150}Sm(p,p′), (d,d′)
D	^{148}Nd(α,2nγ) E=26 MeV	K	^{150}Sm(p,p′),(p,p′γ)	R	^{150}Sm(γ,γ')
E	^{148}Sm(t,p) E=12 MeV	L	^{150}Sm(d,d′)	S	^{149}Sm(n,γ):high resolution
F	^{149}Sm(n,γ): av res	M	Coulomb excitation	T	^{136}Xe(^{18}O,4nγ)
G	^{149}Sm(n,γ) E=thermal	N	^{151}Sm(d,t) E=12 MeV		

E(level)‡#	Jπ†	$T_{1/2}$	XREF	Comments
0.0[a]	0+	stable	ABCDE G IJKLMN P ST	
333.955[a] *10*	2+	48.4 ps *11*	ABCDEFGHIJKLMNOP ST	Q=−1.32 *19*; μ=+0.77 *5* (1989Ra17) Jπ: from $\gamma\gamma(\theta)$, Coul. ex. and measured conversion coefficients. μ: Others: from g-factor: 0.76 *5* (1987Be08), 0.81 *6* (1987By02). Q: Other: −1.25 *20* (1978LeZA).
740.464 *19*	0+	19.7[l] ps *19*	ABCDEFG I KLMN P S	Jπ: from E0 transition to g.s.
773.374[a] *12*	4+	6.5 ps *10*	A CDEFGHIJKLMNOP ST	μ=+1.43 *20* (1989Ra17) XREF: E(780). Jπ: from E2 γ to 2+, member of g.s. band. B(E2)↑: B(E2) (from 334 keV (2+) level)=0.96 *10*. μ: g-factor/g-factor(2+)=1.60 *12* (1993Va10) from $\gamma(\theta$,H,t). The authors state the value to be consistent between their number of different measurements but is too large as compared with earlier measured as well as theoretical values.
1046.148 *13*	2+	0.86[l] ps *+31−21*	ABCDEFGHI KLMN P S	μ=+0.72 *17* (1989Ra17) Jπ: from E2 γ to 0+. 272.8 γ not adopted following ^{149}Sm(n,γ):high resolution.
1071.406[b] *12*	3−	0.11 ps *+13−5*	A CDEFG IJKLM PQ ST	B(E3)↑=0.31 *3* $T_{1/2}$: from DSA in ^{150}Sm(n,n′γ) E=1.3 MeV (1993Ju04). See 1993Ju01 for various values from Doppler broadening techniques. Jπ: from E1 γ's to 2+, 4+. B(E3)↑: From Coul. ex.
1165.791 *17*	1−	0.06 ps *+3−2*	ABCD FG KL PQ S	XREF: K(1172). Jπ: from E1 γ to 0+. $T_{1/2}$: from DSA in ^{150}Sm(n,n′γ) E=1.3 MeV (1993Ju04). See 1993Ju01 for various values from Doppler

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Adopted Levels, Gammas (continued)

^{150}Sm Levels (continued)

E(level)[‡#]	J$^{\pi}$[†]	$T_{1/2}$	XREF	Comments
				broadening techniques.
1193.843 *12*	2^+	1.3[l] ps *3*	ABC FGH KLMN P S	μ=+0.83 *14* (1989Ra17) J$^{\pi}$: from E2 γ to 0^+. $T_{1/2}$: from B(E2)=0.048 *10* and branching(1193)=0.52 *3* from (n,γ).
1255.512 *20*	0^+		AB FG OP S	XREF: O(1268). J$^{\pi}$: E0 transitions to 0^+ state at 740 keV and g.s.
1278.922[a] *14*	6^+	2.4 ps *7*	CD FG J P ST	μ=+2.3 *5* (1989Ra17) J$^{\pi}$: from E2 γ to 4^+, member of g.s. band; not 2^+ to 5^+ from (n,γ): av res. μ: g-factor/g-factor(2^+)=1.14 *34* (1993Va10) from $\gamma(\theta$,H,t). See comment on 4^+ level.
1357.710[b] *13*	5^-		CD FG IJ L OPQ ST	XREF: I(1369)O(1354). J$^{\pi}$: from E1 γ's to 4^+ and 6^+.
1417.346 *13*	2^+		A C FGHI P S	XREF: I(1425). E(level): this level was observed in β-decay studies of ^{150}Sm and was adopted by 1976Ba18. All transitions assigned to this level were observed by 1966Sm03. J$^{\pi}$: from E1 γ's to 1^- and 3^-. 370.8 and 676.8 gammas not adopted following ^{149}Sm(n,γ):high resolution.
1449.182 *13*	4^+	1.8 ps *8*	CD FGHIJ L P S	XREF: I(1460). J$^{\pi}$: from L(d,d′)=4.
1504.572 *13*	3^+		A C FGHI S	XREF: I(1515). J$^{\pi}$: from γ's to 2^+ and $\gamma(\theta)$ aligned.
1603 *4*			P	
1642.611 *12*	4^+	0.54 ps *25*	C EFGHI L P S	XREF: E(1649)I(1652). J$^{\pi}$: from E2 γ to 2^+ and E1 γ to 3^-. Confirmed by 1969Re11 through $\gamma(\theta)$ studies. 475.9 γ not adopted following ^{149}Sm(n,γ):high resolution.
1658.39 *3*	$2^{(-)}$		A G	J$^{\pi}$: from γ's to 1^-,3^-, but not 0^+,4^+.
1672.717? *22*	(4^+)		FG I S	XREF: I(1686). J$^{\pi}$: from (E2+E0) γ to 4^+ and γ's to 2^+,3^+,4^+,6^+; not consistent with (2^-,5^-) from ^{149}Sm(n,γ) av res. (1970Bu19). 168.2, 223.5 and 393.9 γ's not adopted following ^{149}Sm(n,γ):high resolution.
1684.162 *17*	3^-		A C EFG I KL O Q	XREF: I(1697)K(1697). J$^{\pi}$: from E1 γ's to 2^+ and 4^+.
1713.51 *5*	1		A C G	J$^{\pi}$: from γ's to 0^+ and 2^+, and $\gamma\gamma(\theta)$ in ^{150}Pm β^- inconsistent with J=2.
1760.060 *19*	(3^-)		FG I OP	XREF: I(1760). J$^{\pi}$: 3^-,4^-,(2^-),(5^-) from (n,γ) av res. Excited in (p,t) so probably not 2^-,4^-. Possible 565γ to 2^+ so J≠5.
1764.89[b] *4*	7^-[i]		CD G J T	J$^{\pi}$: (E1) γ to 6^+ in (α,xnγ), γ to 5^- in (α,2nγ) establish J=(5^- 6^-,7^-). Assumed member of K=0 octupole band.
1773.3?	2^-,5^-,(3^-,4^-)		F	
1786.30 *13*	(≤3)		AB I O	XREF: I(1790). J$^{\pi}$: from γ's to 1^-,2^+ and absence in (n,γ) res (1976Ba18).
1794.30 *3*	2^+		FGH P	J$^{\pi}$: $J^{\pi}=2^+$,5^+ in (n,γ) av res. γ's to 0^+,2^+, so J≠5. The 515 γ is not adopted.
1819.510 *13*	4^+		C eFGHI L OP S	XREF: I(1826). J$^{\pi}$: E1 γ's to 3^- and 5^-.

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Adopted Levels, Gammas (continued)

^{150}Sm Levels (continued)

E(level)[‡#]	Jπ[†]	$T_{1/2}$	XREF	Comments
				1045.9, 135.16 gammas not adopted following ^{149}Sm(n,γ):high resolution.
1821.894 *19*	$(4)^+$		C e G i S	Jπ: from E1 γ to 5^- and (E2) γ to 6^+.
1822.472 *19*	$(3)^-$		C e G i O	Jπ: from E1 γ to 4^+ and M1(+E2) γ to 3^-. The population in (t,p) suggests natural parity.
1833.01 *3*	$(2)^+$		C H P	Jπ: from M1(+E0+E2) γ to 2^+ and (E2) γ to 0^+.
1837.03[a] *10*	8^+	1.3 ps *7*	D J ST	Jπ: from E2 γ to 6^+.
1883.3	$2^+,5^+$		F	
1927.33? *9*	(2^+)		GH P	Primary γ to level of this energy seen in (n,γ) E=res, but not in (n,γ) E=th. However, 510- and 761-keV γ′s observed by 1966Sm03 in (n,γ) can be placed here. Jπ: from (n,γ) E=resonance (1974Be37).
1952.46 *3*	3^-[j]		FG L PQ	
1963.72[&] *4*	$1^{(-)}$		AB	Jπ: β⁻ from (1^-) (log *ft*=7.4) allows J=0,1,2. Two γ′s to 0^+ disallow J=0. log *ft*>8.6 for several β⁻ decays to 2^+ levels indicate 2^+ not likely thus requiring γ decays to 0^+ states to be M2. β⁻ decays to other 1^- states have log *ft*=7.3 or 7.5 making an assignment of $1^{(-)}$ reasonable.
1970.465 *16*	4^+		C EFGHi L P	This level established in (d,d′), (p,t) and (n,γ) E=res. In (n,γ) E=th, 1966Sm03 see several of the γ rays deexciting it. Jπ: L(d,d′)=4 and E1 γ to 3^-.
1979.3	$3^-,4^-$		F i	
2005.5 *8*	2^+		F H P	E(level),Jπ: from ^{149}Sm(n,γ) E=res and av res.
2020.377 *14*	5^+		C FGH L P	Jπ: from ^{149}Sm(n,γ) E=res and av res.
2024.663 *13*	4^+		C FGHI L	Jπ: E0 component in γ to 4^+.
2035.42 *3*	5^-		C E G L	XREF: E(2038)L(2033). Jπ: E1 γ′s to 4^+ and 6^+.
2044.0 *10*	$(3^+,4^+)$		C eF H	Jπ: from ^{149}Sm(n,γ) E=res.
2054.5?	$(2^+,5^+)$		F	
2062.80? *4*	$(3)^+$		FGHi	Jπ,E(level): from ^{149}Sm(n,γ) E=res, $J^\pi=3^+,4^+$, but from γ(θ) aligned $J^\pi=3^+,5^+$.
2070.270[&] *23*	$2^{(-)}$		A C i	Jπ: from γ′s to $1^-,2^+,3^-,4^-$ but not $0^+,4^+$.
2095.33 *3*	$(5)^+$		C FGH	Jπ: 5^+ from γ(θ) aligned and E2(+M1) γ′s to $4^+,6^+$. 1974Be37 suggest $J^\pi=3^+,4^+$ in (n,γ) res. $J^\pi=2^+,5^+$ from (n,γ) av res.
2107.449 *19*	$(6)^+$		C F L	Jπ: E1 γ to 5^-, E2 γ to 4^+.
2108.9?	2^- to5^-		F	
2113 *4*			L	
2117.030 *15*	4^+		C GHI L	E(level): from ^{149}Sm(n,γ) E=res and ^{150}Eu ε decay (36.9 y). Jπ: E2 γ to 2^+, γ to 6^+.
2119.36 *3*	(3^-)		C E	E(level): from ^{150}Eu ε decay (36.9 y) and ^{148}Sm(t,p). Jπ: (E2) γ to 5^-.
2152.56 *3*	4^+		C EFGHI L	XREF: E(2166). Jπ: from γ(θ) aligned.
2160 *2*	1^-[j]		Q	
2174? *10*			P	E(level): from ^{152}Sm(p,t) and ^{148}Sm(t,p).
2190.9 *3*	4^+		FG	Fed directly in (n,γ) E=th (1969Re11). Jπ: E2 to 2^+, γ(θ) aligned.
2193.51 *3*	(4^+)		C EFGHI L P	XREF: I(2205).
2199.7 *11*	2,3,4		H	
2227? *5*	$^-$		FG L P	XREF: L(2220)P(2220). Jπ: from (n,γ) E=av res.
2232.37[b] *18*	9^-		D J T	E(level): from (α,4nγ). Jπ: from E2 γ to 7^-, E1 γ to 8^+.
2233.5	2^- to 5^-		F	

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Adopted Levels, Gammas (continued)

^{150}Sm Levels (continued)

E(level)[‡#]	Jπ[†]	$T_{1/2}$	XREF	Comments
2250.4? *6*	(3+,4+)		FGHI	1963Gr18 see primary γ ray to this level. E is from (n,γ) E=res. Jπ: from (n,γ) av res and res.
2259.94 *4*	(1−)		A	Jπ: γ's to 0+,2+ and β− from (1−), similar to 1963.7 level.
2262.4? *10*	4(+)		FGHI l	XREF: I(2290). Jπ: J from γ(θ) aligned, π from 3+,4+ in (n,γ) av res and res. E(level): 1963Gr18 see primary γ ray to this level in (n,γ) E=th.
2264? *8*	4(+)		G	Jπ: from γ(θ) aligned (1969Re11).
2271 *4*			i L	
2280.800 *19*	(3−)		C F Hi L P	E(level): from ^{150}Eu ε decay (36.9 y), (d,d′), and (d,p). Jπ: from γ's to 1− and 5−.
2289.5 *6*	3+,4+		H	
2292.2 *8*	3+,4+		FGH	Jπ: from (n,γ) av res and res.
2294 *5*	3−*j*		Q	
2328.1	3−,4−		F	
2342.0 *6*	2+,3+,4+		GHI	XREF: I(2334). Jπ: from (n,γ) res.
2360.3 *4*	3+,4+		FGH P	Jπ: from ^{149}Sm(n,γ) res.
2367.43[&] *8*	(3+)		A FGHI	XREF: H(2371.2)I(2372). Level fed by primary γ ray in (n,γ) E=th. Jπ: Jπ=(3+,4+) in (n,γ) av res, (3+,5+) in γ(θ) aligned, and ≤3 from γ's to 1−,2+.
2395.9 *4*	3+,4+		HI	XREF: I(2400). E(level),Jπ: from ^{149}Sm(n,γ) E=resonance.
2433.19[a] *20*	10+		D F J P T	E(level): from (α,4nγ). Jπ: member of g.s. band.
2444 *10*			E	
2455.5? *5*	3+		FGHI P	XREF: I(2468). 1963Gr18 see primary γ ray to this level. Jπ: from γ(θ) aligned in (n,γ) E=th.
2465.3 *4*	3+,4+		H	Jπ: from (n,γ) resonance.
2472.4 *5*	3+,4+		FGH	1963Gr18 see primary γ ray to this level. Jπ: from (n,γ) av res.
2480.5 *4*	3+,4+		H	Jπ: from (n,γ) res.
2482 *5*	3−*j*		E Q	XREF: E(2485).
2495.6? *7*	(3)+		FGH	From (n,γ) res and av res. Jπ: from Jπ (n,γ) res=3+,4+ and Jπ (n,γ) aligned=3+,5+.
2507.27[&] *18*	(1−,2+)		A H	Level placed by energy fitting. Jπ: from decay of level to known low-lying levels.
2507.5 *6*	3+,4+		H	E(level),Jπ: from (n,γ) res.
2522.3 *6*	3+,4+		HI	E(level),Jπ: from ^{149}Sm(n,γ) E=res.
2529.4[&] *3*	1,2+		A	Jπ: from γ's to 0+, 2+.
2550.57[&] *23*	1(−)*k*	11×10−3*m* eV *4*	A R	Jπ: from γ's to 0+, 2+.
2556.0 *6*	3+,4+		H	E(level),Jπ: from ^{149}Sm(n,γ) res.
2565.3 *7*	3+,4+		H	E(level),Jπ: from ^{149}Sm(n,γ) res.
2575.3? *7*	3+,4+		E GHI	1963Gr18 see primary γ ray to this level from 4−. Jπ: from ^{149}Sm(n,γ) res.
2587.3? *5*	3+,4+		GH	1963Gr18 see primary γ ray to this level from 4−. Jπ: from ^{149}Sm(n,γ) res.
2589.12[c] *20*	(8−)*g*		J	
2602.5[&] *4*	(1+,2,3)		A	Jπ: γ's to 1 and 3+.
2612? *8*			G I	XREF: I(2624).

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Adopted Levels, Gammas (continued)

^{150}Sm Levels (continued)

E(level)[‡#]	Jπ[†]	$T_{1/2}$	XREF	Comments
2627 *5*	5^{-} *j*		E Q	
2655? *7*	(3,5)		E G I	Jπ: from γ(θ) aligned in (n,γ) E=th.
2665 *5*	5^{-} *j*		Q	
2668.8 *5*	$1^{(-)}$ *k*	26×10^{-3} *m* eV *5*	R	
2679.6[&] *3*	3		A G	Jπ: γ′s to 2^+ and 4^+, primary γ from 4^- in (n,γ), gamma from $1^{(-)}$.
2701.3 *5*			R	
2715 *4*	3^{-} *j*		G I Q	
2731? *9*			G R	XREF: R(2725.4).
2744.35[b] *22*	11^{-} *i*		D IJ T	
2754? *7*			G R	XREF: R(2761.8).
2812.88[&] *10*	(1^-,2)		A G I P	XREF: I(2821)P(2798). Jπ: log *ft*=6.6 from (1^-). γ′s to 1^- and 3^-. Primary γ from 4^- in (n,γ).
2861? *7*			G I	XREF: I(2865).
2880.9 *5*	$1^{(-)}$ *k*	9×10^{-3} *m* eV *5*	R	
2885.7 *5*	$1^{(+)}$ *k*	17×10^{-3} *m* eV *4*	R	
2893.1[&] *3*	(1^-,2)		A R	Jπ: log *ft*=6.7 from (1^-). γ′s to 1^- and 3^-.
2910.5 *21*	3^{-} *j*		G I PQ	XREF: Q(2903).
2929.24[@c] *22*	$(10)^{-}$ *g*		J	Jπ: from closed loops of interband and intraband transitions in ^{150}Nd(α,4nγ) E=45 MeV.
2937? *20*			G I P	XREF: I(2934)P(2925).
2976.3 *5*	$1^{(+)}$ *k*	12×10^{-3} *m* eV *3*	R	
2995.9 *3*	$11^{(-)}$		G IJ	
3012.30[&] *24*			A	
3023.7[&] *5*	2^+		A G I P	XREF: G(3030)I(3005)P(3015). Jπ: from γ′s to 0^+ and 2^+ and $4^{(+)}$.
3038.2[&] *4*	$1,2^+$		A I	XREF: I(3046). Jπ: from β⁻ decay from (1^-) state and γ′s to 0^+ and 2^+.
3048.4[a] *3*	12^+		D J T	Jπ: member of g.s. band.
3050.0[&] *3*	$1^{(-)}$ *k*		A G QR	XREF: G(3050.1).
3080.9[&] *4*	$1^{(+)}$ *k*		A G I R	XREF: G(3080.5)I(3088).
3089.4[&] *3*	$1,2^+$		A I	XREF: I(3104). Jπ: from β⁻ decay from (1^-) state and γ′s to 0^+ and 2^+.
3113.2 *5*	$1^{(+)}$ *k*		R	
3137.6[&] *3*	(1,2)		A G I	XREF: I(3135). Jπ: from β⁻ decay from (1^-) state and γ′s to 0^+,2^+.
3182? *6*			G I	
3212.5[&] *4*	$1^{(-)}$ *k*		A I R	
3226? *7*			G	
3238.8 *5*			R	
3244.7? *5*			G I R	
3258.3 *5*	$1^{(-)}$ *k*	28×10^{-3} *m* eV *10*	R	
3276? *7*			G I	
3293.3[b] *3*	13^{-} *i*		D J T	
3322.9 *5*	$1^{(+)}$ *k*	21×10^{-3} *m* eV *4*	G I R	
3347 *11*			I	
3366 *11*			I	
3384.2?[@c] *3*	(12^-) *g*		J	
3389? *8*			G I	XREF: I(3404).
3416.9	1	21×10^{-3} eV *8*	R	

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Adopted Levels, Gammas (continued)

^{150}Sm Levels (continued)

E(level)[‡#]	Jπ[†]	$T_{1/2}$	XREF	Comments
3431 *5*	1(−)[k]	*m*	I R	
3448? *8*			G I	XREF: I(3465).
3492.2 *5*	1(−)[k]	97×10^{-3}*m* eV *9*	G I R	XREF: I(3488).
3522.7?[e] *4*	(12)[h]		G J	
3528 *11*			I	
3566? *7*			G I	XREF: I(3556).
3592.1 *5*	1(+)[k]	25×10^{-3}*m* eV *6*	G I R	XREF: I(3586).
3600.9 *5*	1(−)[k]	22×10^{-3}*m* eV *12*	I R	XREF: I(3586).
3611.7 *5*			R	
3646.5 *21*			G I	
3675.9[a] *3*	14+		IJ T	Jπ: E2 to 12+, member of g.s. band.
3702.0 *5*	1(−)[k]	78×10^{-3}*m* eV *16*	G I R	XREF: I(3688).
3730? *6*			G I	XREF: I(3740).
3753? *7*			G	
3777 *7*			G I R	XREF: I(3780)R(3768.7).
3790.2 *5*	1(−)[k]	65×10^{-3}*m* eV *12*	R	
3835.0[d] *3*	14+		G IJ T	
3876? *7*			G I	XREF: I(3867).
3907? *7*			G I	XREF: I(3896).
3914.1[b] *3*	15−[i]		J T	
3925 *11*			I	
3941.2[c] *4*	(14−)[g]		G J	
3943 *7*			G I	XREF: I(3948).
3970? *7*			G I	XREF: I(3976).
4000? *7*			G I	
4025.2[e] *4*	(14)[h]		J	
4035.4 *5*	(1)	19×10^{-3}*m* eV *10*	R	
4305.8[d] *4*	16+		J T	
4386.3[a] *3*	16+		J T	
4576.2[c] *5*	(16−)[g]		J	
4605.7[@b] *4*	17−[i]		J T	
4612.0[e] *5*	(16)[h]		J	
4929.1[d] *4*	18+		J T	
5046.0[a] *6*	(18+)		J T	
5251.0?[e] *6*	[h]		J	
5276.7[c] *6*	(18−)[g]		J	
5346.1[b] *5*	19−[i]		J T	
5580.9[f] *7*	(19−)		J T	
5592.7[d] *11*	20+		J T	
5739.3[a] *7*	(20+)		J T	
5937.0[f] *8*	(21−)		T	
6021.7?[c] *7*	(20−)[g]		J	
6064.9 *8*			J	
6106.4?[b] *8*	(21−)[i]		J T	
6308.3[d] *15*	(22+)		T	
6420.4[f] *13*	(23−)		T	
6421.0 *13*			J	
6448.9[a] *10*	(22+)		T	
7057.9[f] *16*	(25−)		T	

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Adopted Levels, Gammas (continued)

^{150}Sm Levels (continued)

E(level)‡#	Jπ†	XREF	E(level)‡#	Jπ†	XREF
7068.3[d] *18*	(24+)	T	8586.9[d] *23*	(28+)	T
7837.5[d] *20*	(26+)	T	8760.9[f] *21*	(29−)	T
7854.1[f] *19*	(27−)	T	9736.9[f] *24*	(31−)	T
7986.4 *18*	3−,4−	F			

† In (n,γ) E=th, 1969Re11 studied the directional anisotropy of capture γ rays from aligned ^{149}Sm nuclei. J^{π} were assigned by combining these data with α(exp) data. This work is referred to as γ(θ) aligned. 1970Bu19 inferred multipolarities of primary capture γ rays to low-lying states from the relative average intensity of γ transitions in (n,γ) in a large number of neutron resonances. π of final state is inferred and limits set on J (referred to as (n,γ) av res.). 1974Be37 analyzed γ spectra from (n,γ) in 16 resonances and set limits on J,π from analyses of γ transition intensities in individual resonances. (referred to as (n,γ) res.).

‡ From least-squares fit to Eγ. Some discrepancy exists between Eγ and energy-level differences. This could be due to rather high precision quoted by the authors.

Levels at 2937 and higher are from (d,p) reaction and presence of possible primary γ ray in (n,γ) E=th, unless otherwise noted.

@ From ^{150}Nd(α,4nγ).

& From ^{150}Pm β^- decay (2.68 h).

[a] Band(A): g.s. rotational band.

[b] Band(B): K=0 octupole band.

[c] Band(C): Even-spin negative-parity side band.

[d] Band(D): Even-spin even-parity side band.

[e] Band(E): Even-spin side band.

[f] Band(c): Negative-parity side band.

[g] Even-spin negative-parity side band. The moment of inertia versus angular frequency plot resembles that of a rotational band based on a state with intrinsic spin 6.

[h] Member of even-spin side band with branching to even-spin even-parity side band and the odd-spin odd-parity octupole band.

[i] Odd-spin odd-parity band with a cascade of E2 transitions from J=(21) down to possibly 3− and E1 transitions to the g.s. band members.

[j] From L in (p,p′), (d,d′).

[k] From γ(θ) in (γ,γ′).

[l] From B(E2) in Coul. ex.

[m] From(γ,γ′) with the assumption that the levels decay only to g.s. and the first 2+ state.

Adopted Levels, Gammas (continued)

$\gamma(^{150}Sm)$

E_i(level)	J_i^π	E_γ[†]	I_γ[d]	E_f	J_f^π	Mult.[‡]	α	$I_{(\gamma+ce)}$	Comments
333.955	2^+	333.961 *11*	100 *3*	0.0	0^+	E2	0.0405		α(K)=0.0320 *5*; α(L)=0.00665 *10*; α(M)=0.001475 *21*; α(N)=0.000329 *5*; α(O)=4.57×10^{-5} *7* α(P)=1.749×10^{-6} *25*; α(N+..)=0.000376 *6* B(E2)(W.u.)=57.1 *13* E_γ: weighted average of 333.92 *3* (^{150}Pm β^- decay (2.68 h)), 333.9 *1* (^{150}Eu ε decay (12.8 h)), 333.971 *12* (^{150}Eu ε decay (36.9 y)), 333.9 *2* (^{148}Nd(α,2nγ) E=26 MeV), 333.94 *4* (^{149}Sm(n,γ) E=thermal), 333.9 *3* (^{150}Nd(α,4nγ) E=45 MeV). Mult.: from K/L of 1967Pr08.. B(E2)(W.u.): From B(E2)(↑)=1.32 *6* (Coul. ex.).
740.464	0^+	406.508 *22*	100	333.955	2^+	E2	0.0227		α(K)=0.0183 *3*; α(L)=0.00343 *5*; α(M)=0.000756 *11*; α(N)=0.0001691 *24*; α(O)=2.39×10^{-5} *4* α(P)=1.031×10^{-6} *15*; α(N+..)=0.000194 *3* B(E2)(W.u.)=53 *5* E_γ: weighted average of 406.51 *3* (^{150}Pm β^- decay (2.68 h)), 406.5 *1* (^{150}Eu ε decay (12.8 h)), 406.52 *5* (^{150}Eu ε decay (36.9 y)), 406.49 5 (^{149}Sm(n,γ) E=thermal). B(E2)(W.u.): From B(E2)(2^+ to 0^+)=0.051 *5* (Coul. ex.).
		740.59 *10*		0.0	0^+	E0		1.37 *14*	E_γ: weighted average of 740.4 *5* (^{150}Eu ε decay (12.8 h)), 740.6 *1* (^{149}Sm(n,γ) E=thermal). $I_{(\gamma+ce)}$,Mult.: from ^{150}Eu ε decay (36.9 y).
773.374	4^+	439.400 *14*	100	333.955	2^+	E2	0.0182		α(K)=0.01482 *21*; α(L)=0.00268 *4*; α(M)=0.000588 *9*; α(N)=0.0001317 *19*; α(O)=1.87×10^{-5} *3* α(P)=8.41×10^{-7} *12*; α(N+..)=0.0001512 *22* B(E2)(W.u.)=110 *17* E_γ: weighted average of 439.38 *7* (^{150}Pm β^- decay (2.68 h)), 439.401 *15* (^{150}Eu ε decay (36.9 y)), 439.3 *2* (^{148}Nd(α,2nγ) E=26 MeV), 439.39 *7* (^{149}Sm(n,γ) E=thermal), 439.6 *3* (^{150}Nd(α,4nγ) E=45 MeV). Mult.: from ^{149}Sm(n,γ) E=th. B(E2)(W.u.): From B(E2)(2^+ to 4^+)=0.96 *10*.
1046.148	2^+	305.68 *3*	2.5[a] *5*	740.464	0^+	E2	0.0530		α(K)=0.0414 *6*; α(L)=0.00909 *13*; α(M)=0.00202 *3*; α(N)=0.000451 *7*; α(O)=6.21×10^{-5} *9* α(P)=2.23×10^{-6} *4*; α(N+..)=0.000515 *8* B(E2)(W.u.)=1.1×10^2 *+4−3* E_γ: weighted average of 305.7 *2* (^{150}Pm β^- decay (2.68 h)), 305.4 *4* (^{150}Eu ε decay (12.8 h)), 305.70 *8* (^{150}Eu ε decay (36.9 y)), 305.68 3 (^{149}Sm(n,γ) E=thermal),
		712.207 *14*	100[a] *6*	333.955	2^+	E2+E0+M1	0.0071 *19*		α(K)=0.0060 *16*; α(L)=0.00085 *18*; α(M)=0.00018 *4*;

$^{150}_{62}Sm_{88}$-8

Adopted Levels, Gammas (continued)

γ(^{150}Sm) (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [d]	E_f	J_f^π	Mult. [‡]	α	Comments
								α(N)=4.1×10^{-5} *9*; α(O)=6.1×10^{-6} *14* α(P)=3.7×10^{-7} *11*; α(N+..)=4.8×10^{-5} *10* E_γ: weighted average of 712.22 *4* (^{150}Pm β$^-$ decay (2.68 h)), 712.2 *1* (^{150}Eu ε decay (12.8 h)), 712.205 *15* (^{150}Eu ε decay (36.9 y)), 712.2 *3* (^{148}Nd(α,2nγ) E=26 MeV), 712.23 *15* (^{149}Sm(n,γ) E=thermal).
1046.148	2$^+$	1046.16 [e] *14*	8.1 [a] *9*	0.0	0$^+$	(E2)	0.00226 *4*	α(K)=0.00192 *3*; α(L)=0.000269 *4*; α(M)=5.76×10^{-5} *8*; α(N)=1.302×10^{-5} *19*; α(O)=1.93×10^{-6} *3* α(P)=1.142×10^{-7} *16*; α(N+..)=1.507×10^{-5} *21* B(E2)(W.u.)=0.81 *+26−21* E_γ: weighted average of 1046.12 *8* (^{150}Pm β$^-$ decay (2.68 h)), 1046.2 *3* (^{150}Eu ε decay (12.8 h)), 1046.12 *8* (^{150}Eu ε decay (36.9 y)), 1047.9 *4* (^{149}Sm(n,γ) E=thermal). Mult.: from 1973PrZI.
1071.406	3$^-$	298.060 *13*	6.70 *23*	773.374	4$^+$	E1	0.01496	α(K)=0.01276 *18*; α(L)=0.001733 *25*; α(M)=0.000370 *6*; α(N)=8.32×10^{-5} *12* α(O)=1.222×10^{-5} *18*; α(P)=7.01×10^{-7} *10*; α(N+..)=9.61×10^{-5} *14* B(E1)(W.u.)=0.005 *+4−3* E_γ: weighted average of 297.9 *2* (^{150}Pm β$^-$ decay (2.68 h)), 298.061 *14* (^{150}Eu ε decay (36.9 y)), 298.06 *3* (^{149}Sm(n,γ) E=thermal). I_γ: weighted average of 5.1 *9* (^{150}Pm β$^-$ decay (2.68 h)), 6.71 *16* (^{150}Eu ε decay (36.9 y)), 7.6 *8* (^{149}Sm(n,γ) E=thermal).
		737.457 *15*	100.0 *19*	333.955	2$^+$	E1	0.00187 *3*	α(K)=0.001606 *23*; α(L)=0.000209 *3*; α(M)=4.44×10^{-5} *7*; α(N)=1.005×10^{-5} *14* α(O)=1.499×10^{-6} *21*; α(P)=9.24×10^{-8} *13*; α(N+..)=1.164×10^{-5} *17* B(E1)(W.u.)=0.005 *+4−3* E_γ: weighted average of 737.50 *8* (^{150}Pm β$^-$ decay (2.68 h)), 737.455 *15* (^{150}Eu ε decay (36.9 y)), 737.5 *3* (^{148}Nd(α,2nγ) E=26 MeV), 737.47 *17* (^{149}Sm(n,γ) E=thermal), 737.6 *3* (^{150}Nd(α,4nγ) E=45 MeV). I_γ: weighted average of 100 *7* (^{150}Pm β$^-$ decay (2.68 h)), 100.0 *20* (^{150}Eu ε decay (36.9 y)), 100 *8* (^{149}Sm(n,γ) E=thermal).
1165.791	1$^-$	425.22 *8*	2.7 *3*	740.464	0$^+$			E_γ: weighted average of 425.33 *7* (^{150}Pm β$^-$ decay (2.68 h)), 425.3 *3* (^{150}Eu ε decay (12.8 h)), 425.10 *7* (^{149}Sm(n,γ) E=thermal). I_γ: weighted average of 3.0 *3* (^{150}Pm β$^-$ decay (2.68 h)), 3.1 *6* (^{150}Eu ε decay (12.8 h)), 2.2 *3* (^{149}Sm(n,γ) E=thermal).
		831.83 [e] *5*	75 [a] *3*	333.955	2$^+$	(E1)	0.001470 *21*	α=0.001470 *21*; α(K)=0.001262 *18*; α(L)=0.0001635 *23*; α(M)=3.47×10^{-5} *5* α(O)=1.174×10^{-6} *17*; α(P)=7.28×10^{-8} *11*; α(N+..)=9.10×10^{-6} B(E1)(W.u.)=0.0029 *+14−10* E_γ: weighted average of 831.85 *4* (^{150}Pm β$^-$ decay (2.68 h)), 831.8 *1* (^{150}Eu ε decay (12.8 h)), 831.92 *25* (^{150}Eu ε decay (36.9 y)), 831.28 *24* (^{149}Sm(n,γ) E=thermal). Mult.: from 1966Sm03 in (n,γ) mult=E2 on basis of α(K)exp. From 1973PrZI, mult=E1 on basis of α(K)exp. Mult=E1 on basis of γ(θ) and α(K)exp from 1969Re11.

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Adopted Levels, Gammas (continued)

γ(^{150}Sm) (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [d]	E_f	J_f^π	Mult. [‡]	α	Comments
1165.791	1⁻	1165.74 *3*	100[a] *4*	0.0	0⁺	E1	0.000792 *11*	α=0.000792 *11*; α(K)=0.000670 *10*; α(L)=8.56×10^{-5} *12*; α(M)=1.82×10^{-5} *3*; α(N)=4.11×10^{-6} *6* α(O)=6.16×10^{-7} *9*; α(P)=3.88×10^{-8} *6*; α(N+..)=1.82×10^{-5} *3* B(E1)(W.u.)=0.0014 *+7−5* Mult.: on basis of α(K)exp, 1966Sm03 give mult=E2, but other authors assign E1. On basis of γ(θ) and α(K)exp, 1969Re11 assign E1. E_γ: weighted average of 1165.77 *6* (^{150}Pm β$^-$ decay (2.68 h)), 1165.7 *2* (^{150}Eu ε decay (12.8 h)), 1165.74 *3* (^{150}Eu ε decay (36.9 y)), 1165.1 *13* (^{149}Sm(n,γ) E=thermal).
1193.843	2⁺	147.73 *4*	0.15 *8*	1046.148	2⁺	M1(+E0)		E_γ,I_γ: from ^{149}Sm(n,γ) E=thermal.
		420.47 *9*	1.8 *5*	773.374	4⁺	(E2)	0.0206	α(K)=0.01670 *24*; α(L)=0.00308 *5*; α(M)=0.000677 *10*; α(N)=0.0001516 *22* α(O)=2.14×10^{-5} *3*; α(P)=9.44×10^{-7} *14*; α(N+..)=0.0001739 *25* B(E2)(W.u.)=7 *3* E_γ,I_γ: weighted average of 420.1 *5* (^{150}Pm β$^-$ decay (2.68 h)), 420.48 *9* (^{149}Sm(n,γ) E=thermal). I_γ: weighted average of 2.3 *4* (^{150}Pm β$^-$ decay (2.68 h)), 1.3 *4* (^{149}Sm(n,γ) E=thermal).
		453.40 *5*	3.4 *4*	740.464	0⁺	(E2)	0.01672	α(K)=0.01362 *19*; α(L)=0.00243 *4*; α(M)=0.000532 *8*; α(N)=0.0001193 *17* α(O)=1.696×10^{-5} *24*; α(P)=7.76×10^{-7} *11*; α(N+..)=0.0001370 *20* B(E2)(W.u.)=9.1 *24* E_γ: weighted average of 453.48 *16* (^{150}Pm β$^-$ decay (2.68 h)), 453.38 *10* (^{150}Eu ε decay (36.9 y)), 453.40 *6* (^{149}Sm(n,γ) E=thermal). Mult.: α(K)exp allows E1 or E2 but E1 ruled out by decay scheme. I_γ: weighted average of 3.0 *6* (^{150}Pm β$^-$ decay (2.68 h)), 3.3 *6* (^{150}Eu ε decay (36.9 y)), 4.1 *8* (^{149}Sm(n,γ) E=thermal).
		859.88 *3*	73.3 *16*	333.955	2⁺	E2+M1(+E0)	0.0045 *11*	α(K)=0.0039 *10*; α(L)=0.00053 *12*; α(M)=0.000114 *24*; α(N)=2.6×10^{-5} *6*; α(O)=3.9×10^{-6} *9* α(P)=2.4×10^{-7} *7*; α(N+..)=3.0×10^{-5} *7* E_γ: weighted average of 859.95 *4* (^{150}Pm β$^-$ decay (2.68 h)), 860.1 *5* (^{150}Eu ε decay (12.8 h)), 859.867 *18* (^{150}Eu ε decay (36.9 y)), 859.28 *20* (^{149}Sm(n,γ) E=thermal). I_γ: weighted average of 70 *4* (^{150}Pm β$^-$ decay (2.68 h)), 50 *13* (^{150}Eu ε decay (12.8 h)), 73.5 *12* (^{150}Eu ε decay (36.9 y)), 85 *8* (^{149}Sm(n,γ) E=thermal).
		1193.830 *22*	100 *3*	0.0	0⁺	E2	0.001731 *25*	α=0.001731 *25*; α(K)=0.001470 *21*; α(L)=0.000201 *3*; α(M)=4.31×10^{-5} *6* α(O)=1.452×10^{-6} *21*; α(P)=8.75×10^{-8} *13*; α(N+..)=1.635×10^{-5} *2* B(E2)(W.u.)=2.1 *5*

$^{150}_{62}Sm_{88}$-10

Adopted Levels, Gammas (continued)

γ(^{150}Sm) (continued)

E_i(level)	J_i^π	E_γ †	I_γ d	E_f	J_f^π	Mult. ‡	α	$I_{(\gamma+ce)}$	Comments
									E_γ: weighted average of 1193.87 *6* (^{150}Pm β^- decay (2.68 h)), 1193.7 *2* (^{150}Eu ε decay (12.8 h)), 1193.826 *24* (^{150}Eu ε decay (36.9 y)), 1193.1 *7* (^{149}Sm(n,γ) E=thermal). Mult.: γ(θ) studies support E2 (1969Re11). I_γ: weighted average of 100 *6* (^{150}Pm β^- decay (2.68 h)), 100 *22* (^{150}Eu ε decay (12.8 h)), 100 *4* (^{150}Eu ε decay (36.9 y)), 100 *10* (^{149}Sm(n,γ) E=thermal).
1255.512	0^+	209.364 *19*	8.9 *16*	1046.148	2^+	[E2]	0.179		α(K)=0.1303 *19*; α(L)=0.0380 *6*; α(M)=0.00859 *12*; α(N)=0.00190 *3*; α(O)=0.000253 *4* α(P)=6.52×10^{-6} *10*; α(N+..)=0.00216 *3* E_γ: weighted average of 209.45 *12* (^{150}Pm β^- decay (2.68 h)), 209.4 *1* (^{150}Eu ε decay (12.8 h)), 209.36 *2* (^{149}Sm(n,γ) E=thermal). I_γ: weighted average of 7.2 *16* (^{150}Pm β^- decay (2.68 h)), 10.4 *15* (^{150}Eu ε decay (12.8 h)).
		515.3 *8*	≤25.0	740.464	0^+	E0		13 *4*	E_γ,I_γ: from (^{150}Eu ε decay (12.8 h).
		921.55 *13*	100 *7*	333.955	2^+	E2	0.00296 *5*		α(K)=0.00250 *4*; α(L)=0.000359 *5*; α(M)=7.71×10^{-5} *11*; α(N)=1.741×10^{-5} *25*; α(O)=2.57×10^{-6} *4* α(P)=1.486×10^{-7} *21*; α(N+..)=2.01×10^{-5} *3* E_γ: weighted average of 921.61 *16* (^{150}Pm β^- decay (2.68 h)), 921.7 *3* (^{150}Eu ε decay (12.8 h)), 921.2 *3* (^{149}Sm(n,γ) E=thermal). I_γ: weighted average of 100 *8* (^{150}Eu ε decay (12.8 h)), 100 *13* (^{149}Sm(n,γ) E=thermal).
		1256.3 *3*		0.0	0^+	E0		0.9 *3*	E_γ,I_γ: observed only in (^{149}Sm(n,γ) E=thermal). E_γ: E0 transition to ground state reported by 1963Gr18. Energy and intensity as given are from 1976Ba18.
1278.922	6^+	505.508 *23*	100	773.374	4^+	E2	0.01246		α(K)=0.01024 *15*; α(L)=0.001743 *25*; α(M)=0.000381 *6*; α(N)=8.55×10^{-5} *12* α(O)=1.225×10^{-5} *18*; α(P)=5.89×10^{-7} *9*; α(N+..)=9.83×10^{-5} *14* B(E2)(W.u.)=1.5×10^2 *5* E_γ: weighted average of 505.521 *25* (^{150}Eu ε decay (36.9 y)), 505.4 *1* (^{148}Nd(α,2nγ) E=26 MeV), 505.44 *8* (^{149}Sm(n,γ) E=thermal), 505.5 *3* (^{150}Nd(α,4nγ) E=45 MeV). Mult.: from K/L in ^{150}Eu ε decay (36.9 y).
1357.710	5^-	78.76 *1*	0.158 *18*	1278.922	6^+	E1	0.525		α(K)=0.440 *7*; α(L)=0.0669 *10*; α(M)=0.01434 *20*; α(N)=0.00318 *5*; α(O)=0.000444 *7* α(P)=2.06×10^{-5} *3*; α(N+..)=0.00365 *6* E_γ: weighted average of 78.7 *3* (^{150}Eu ε decay (36.9 y)), 78.76 *1* (^{149}Sm(n,γ) E=thermal). I_γ: weighted average of 0.157 *15* (^{150}Eu ε decay (36.9 y)), 0.37 *18* (^{149}Sm(n,γ) E=thermal).

$^{150}_{62}Sm_{88}$-11

Adopted Levels, Gammas (continued)

γ(^{150}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[d]	E_f	J_f^π	Mult.[‡]	α	Comments
1357.710	5⁻	286.290[e] *13*	0.20 *3*	1071.406	3⁻			E_γ: weighted average of 286.293 *15* (^{150}Eu ε decay (36.9 y)), 286.28 *3* (^{149}Sm(n,γ) E=thermal). I_γ: weighted average of 0.19 *3* (^{150}Eu ε decay (36.9 y)), 0.28 *10* (^{149}Sm(n,γ) E=thermal).
		584.274 *12*	100 *3*	773.374	4⁺	E1	0.00305 *5*	α(K)=0.00262 *4*; α(L)=0.000344 *5*; α(M)=7.33×10^{-5} *11*; α(N)=1.655×10^{-5} *24*; α(O)=2.46×10^{-6} *4* α(P)=1.495×10^{-7} *21*; α(N+..)=1.92×10^{-5} *3* E_γ: weighted average of 584.274 *12* (^{150}Eu ε decay (36.9 y)), 584.3 *2* (^{148}Nd(α,2nγ) E=26 MeV), 584.24 *10* (^{149}Sm(n,γ) E=thermal), 584.5 *3* (^{150}Nd(α,4nγ) E=45 MeV). I_γ: weighted average of 100 *3* (^{150}Eu ε decay (36.9 y)), 100 *8* (^{149}Sm(n,γ) E=thermal). Mult.: from γ(θ) and α(K)exp mult=E1 (1969Re11).
1417.346	2⁺	161.84[h] *3*	3 *1*	1255.512	0⁺	(E2)	0.428	α(K)=0.288 *4*; α(L)=0.1088 *16*; α(M)=0.0248 *4*; α(N)=0.00548 *8*; α(O)=0.000714 *10* α(P)=1.360×10^{-5} *19*; α(N+..)=0.00621 *9* E_γ,I_γ: From ^{149}Sm(n,γ) E=thermal.
		223.51[f] *2*	1.7[f] *3*	1193.843	2⁺	(E2+E0)[c]		E_γ: from ^{149}Sm(n,γ) E=thermal. E_γ,I_γ: from ^{149}Sm(n,γ) E=th.
		251.582 *19*	43.7 *18*	1165.791	1⁻	E1	0.0231	α(K)=0.0197 *3*; α(L)=0.00270 *4*; α(M)=0.000575 *8*; α(N)=0.0001294 *19*; α(O)=1.89×10^{-5} *3* α(P)=1.066×10^{-6} *15*; α(N+..)=0.0001494 *21* E_γ: weighted average of 251.60 *10* (^{150}Pm β$^-$ decay (2.68 h)), 251.596 *25* (^{150}Eu ε decay (36.9 y)), 251.56 *3* (^{149}Sm(n,γ) E=thermal). I_γ: weighted average of 41 *6* (^{150}Pm β$^-$ decay (2.68 h)), 43.4 *22* (^{150}Eu ε decay (36.9 y)), 46 *4* (^{149}Sm(n,γ) E=thermal).
		345.950 *17*	100 *10*	1071.406	3⁻	E1	0.01031	α(K)=0.00880 *13*; α(L)=0.001187 *17*; α(M)=0.000253 *4*; α(N)=5.70×10^{-5} *8*; α(O)=8.40×10^{-6} *12* α(P)=4.89×10^{-7} *7*; α(N+..)=6.59×10^{-5} *10* E_γ: weighted average of 345.93 *8* (^{150}Pm β$^-$ decay (2.68 h)), 345.955 *19* (^{150}Eu ε decay (36.9 y)), 345.93 *4* (^{149}Sm(n,γ) E=thermal). I_γ: weighted average of 100 *11* (^{150}Pm β$^-$ decay (2.68 h)), 100 *4* (^{150}Eu ε decay (36.9 y)), 100 *10* (^{149}Sm(n,γ) E=thermal).
		1083.34 *4*	70 *8*	333.955	2⁺	(E2+E0)		E_γ: weighted average of 1083.33 *8* (^{150}Pm β$^-$ decay (2.68 h)), 1083.34 *3* (^{150}Eu ε decay (36.9 y)), 1082.6 *4* (^{149}Sm(n,γ) E=thermal). I_γ: weighted average of 41 *6* (^{150}Pm β$^-$ decay (2.68 h)), 41.0 *24* (^{150}Eu ε decay (36.9 y)), 44 *6* (^{149}Sm(n,γ) E=thermal).
		1417.0[b]	0.06 *4*	0.0	0⁺			E_γ,I_γ: from ^{150}Eu ε decay (36.9 y).
1449.182	4⁺	170.23[h] *2*	0.26 *4*	1278.922	6⁺	E2	0.360	α(K)=0.247 *4*; α(L)=0.0881 *13*; α(M)=0.0201 *3*; α(N)=0.00443 *7*; α(O)=0.000580 *9*

$^{150}_{62}Sm_{88}$-12

Adopted Levels, Gammas (continued)

γ(^{150}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[d]	E_f	J_f^π	Mult.[‡]	α	Comments
								α(P)=1.178×10^{-5} *17*; α(N+..)=0.00502 *7* B(E2)(W.u.)=8.E+1 *4* E_γ,I_γ: from ^{149}Sm(n,γ) E=thermal.
1449.182	4$^+$	255.34[e] *3*	1.06 *15*	1193.843	2$^+$	(E2)	0.0936	α(K)=0.0710 *10*; α(L)=0.01761 *25*; α(M)=0.00395 *6*; α(N)=0.000877 *13* α(O)=0.0001190 *17*; α(P)=3.70×10^{-6} *6*; α(N+..)=0.001000 *14* B(E2)(W.u.)=42 *20* E_γ,I_γ: from ^{149}Sm(n,γ) E=thermal.
		377.73 *3*	3.0 *3*	1071.406	3$^-$			E_γ: weighted average of 377.73 *3* (^{150}Eu ε decay (36.9 y)), 377.74 *5* (^{149}Sm(n,γ) E=thermal). I_γ: from ^{149}Sm(n,γ) E=thermal.
		403.05 *16*	46.9 *18*	1046.148	2$^+$	E2	0.0233	α(K)=0.0188 *3*; α(L)=0.00353 *5*; α(M)=0.000778 *11*; α(N)=0.0001739 *25*; α(O)=2.45×10^{-5} *4* α(P)=1.054×10^{-6} *15*; α(N+..)=0.000200 *3* B(E2)(W.u.)=1.9×10^2 *9* E_γ: weighted average of 403.36 *10* (^{150}Eu ε decay (36.9 y)), 402.97 *5* (^{149}Sm(n,γ) E=thermal). Mult.: confirmed by 1969Re11 through γ(θ) studies. I_γ: weighted average of 47.2 *19* (^{150}Eu ε decay (36.9 y)), 45 *5* (^{149}Sm(n,γ) E=thermal).
		675.853 *24*	100 *2*	773.374	4$^+$	E2+E0+M1	0.0081 *21*	α(K)=0.0068 *19*; α(L)=0.00097 *20*; α(M)=0.00021 *5*; α(N)=4.7×10^{-5} *10*; α(O)=7.0×10^{-6} *16* α(P)=4.2×10^{-7} *13*; α(N+..)=5.5×10^{-5} *12* E_γ: weighted average of 675.856 *25* (^{150}Eu ε decay (36.9 y)), 676.1 *3* (^{148}Nd(α,2nγ) E=26 MeV), 675.77 *14* (^{149}Sm(n,γ) E=thermal), 675.6 *3* (^{150}Nd(α,4nγ) E=45 MeV). I_γ: weighted average of 100.0 *19* (^{150}Eu ε decay (36.9 y)), 100 *10* (^{149}Sm(n,γ) E=thermal).
1504.572	3$^+$	310.75[e] *4*	2.2 *4*	1193.843	2$^+$			E_γ: weighted average of 310.82 *8* (^{150}Eu ε decay (36.9 y)), 310.73 *4* (^{149}Sm(n,γ) E=thermal). I_γ: from ^{150}Eu ε decay (36.9 y).
		458.27 *7*	3.5 *8*	1046.148	2$^+$	E2	0.01623	α(K)=0.01324 *19*; α(L)=0.00235 *4*; α(M)=0.000515 *8*; α(N)=0.0001154 *17* α(O)=1.642×10^{-5} *23*; α(P)=7.55×10^{-7} *11*; α(N+..)=0.0001324 *19* E_γ: weighted average of 458.4 *2* (^{150}Pm β$^-$ decay (2.68 h)), 458.36 *6* (^{150}Eu ε decay (36.9 y)), 458.17 *6* (^{149}Sm(n,γ) E=thermal). I_γ: weighted average of 3.2 *6* (^{150}Pm β$^-$ decay (2.68 h)), 3.3 *4* (^{150}Eu ε decay (36.9 y)), 10.0 *19* (^{149}Sm(n,γ) E=thermal).
		731.218 *23*	25.6 *12*	773.374	4$^+$	E2	0.00497 *7*	α(K)=0.00417 *6*; α(L)=0.000630 *9*; α(M)=0.0001362 *19*; α(N)=3.07×10^{-5} *5*; α(O)=4.49×10^{-6} *7* α(P)=2.46×10^{-7} *4*; α(N+..)=3.54×10^{-5} *5* E_γ: weighted average of 731.06 *16* (^{150}Pm β$^-$ decay (2.68 h)), 731.220 *24* (^{150}Eu ε decay (36.9 y)), 731.31 *16* (^{149}Sm(n,γ) E=thermal).

$^{150}_{62}Sm_{88}$-13

Adopted Levels, Gammas (continued)

γ(^{150}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[d]	E_f	J_f^π	Mult.[‡]	α	Comments
								Mult.: confirmed by 1969Re11 through γ(θ) studies. I_γ: weighted average of 26 *4* (^{150}Pm β^- decay (2.68 h)), 25.2 *7* (^{150}Eu ε decay (36.9 y)), 33 *3* (^{149}Sm(n,γ) E=thermal).
1504.572	3^+	1170.589 *24*	100.0 *14*	333.955	2^+	E2(+M1)	0.0023 *5*	α(K)=0.0019 *4*; α(L)=0.00026 *5*; α(M)=5.5×10^{-5} *11*; α(N)=1.25×10^{-5} *24*; α(O)=1.9×10^{-6} *4* α(P)=1.2×10^{-7} *3*; α(N+..)=1.8×10^{-5} *3* E_γ: weighted average of 1170.9 *3* (^{150}Pm β^- decay (2.68 h)), 1170.587 *24* (^{150}Eu ε decay (36.9 y)), 1170.2 *10* (^{149}Sm(n,γ) E=thermal). Mult.: confirmed by 1969Re11 through γ(θ) studies. I_γ: weighted average of 100 *12* (^{150}Pm β^- decay (2.68 h)), 100.0 *14* (^{150}Eu ε decay (36.9 y)), 100 *19* (^{149}Sm(n,γ) E=thermal).
1642.611	4^+	138.05[h] *4*	0.11 *5*	1504.572	3^+			E_γ,I_γ: from ^{149}Sm(n,γ) E=thermal.
		193.46 *2*	0.70 *17*	1449.182	4^+	(E2+E0)		E_γ,I_γ: from ^{149}Sm(n,γ) E=thermal.
		225.34 *2*	0.39 *8*	1417.346	2^+	[E2]	0.1404	α(K)=0.1040 *15*; α(L)=0.0285 *4*; α(M)=0.00641 *9*; α(N)=0.001421 *20*; α(O)=0.000191 *3* α(P)=5.29×10^{-6} *8*; α(N+..)=0.001617 *23* B(E2)(W.u.)=7.E+1 *4* E_γ,I_γ: from ^{149}Sm(n,γ) E=thermal.
		284.001 *20*	9.3 *9*	1357.710	5^-	E1	0.01691	α(K)=0.01442 *21*; α(L)=0.00196 *3*; α(M)=0.000419 *6*; α(N)=9.43×10^{-5} *14*; α(O)=1.382×10^{-5} *20* α(P)=7.89×10^{-7} *11*; α(N+..)=0.0001079 *16* B(E1)(W.u.)=0.0009 *5* Mult.: from ^{150}Eu ε decay (36.9 y). E_γ: weighted average of 284.995 *26* (^{150}Eu ε decay (36.9 y)), 285.01 *3* (^{149}Sm(n,γ) E=thermal). I_γ: weighted average of 9.0 *4* (^{150}Eu ε decay (36.9 y)), 11.5 *10* (^{149}Sm(n,γ) E=thermal).
		448.785 *21*	14.0 *5*	1193.843	2^+			E_γ: weighted average of 448.789 *12* (^{150}Eu ε decay (36.9 y)), 448.68 *6* (^{149}Sm(n,γ) E=thermal). I_γ: from ^{150}Eu ε decay (36.9 y).
		571.258 *15*	22.4 *6*	1071.406	3^-	(E1)	0.00321 *5*	α(K)=0.00275 *4*; α(L)=0.000362 *5*; α(M)=7.70×10^{-5} *11*; α(N)=1.740×10^{-5} *25*; α(O)=2.59×10^{-6} *4* α(P)=1.568×10^{-7} *22*; α(N+..)=2.01×10^{-5} *3* B(E1)(W.u.)=0.00027 *13* E_γ: weighted average of 571.259 *15* (^{150}Eu ε decay (36.9 y)), 571.21 *10* (^{149}Sm(n,γ) E=thermal). Mult.: confirmed in γ(θ) aligned. I_γ: weighted average of 22.3 *5* (^{150}Eu ε decay (36.9 y)), 26 *3* (^{149}Sm(n,γ) E=thermal).
		596.52 *4*	2.8 *5*	1046.148	2^+	[E2]	0.00813 *12*	α(K)=0.00675 *10*; α(L)=0.001083 *16*; α(M)=0.000235 *4*; α(N)=5.29×10^{-5}

$^{150}_{62}Sm_{88}$-14

Adopted Levels, Gammas (continued)

γ(^{150}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[d]	E_f	J_f^π	Mult.[‡]	α	Comments
								8; α(O)=7.66×10^{-6} *11* α(P)=3.94×10^{-7} *6*; α(N+..)=6.10×10^{-5} *9* B(E2)(W.u.)=4.1 *21* E_γ: weighted average of 596.53 *4* (^{150}Eu ε decay (36.9 y)), 596.34 *18* (^{149}Sm(n,γ) E=thermal). I_γ: from ^{149}Sm(n,γ) E=thermal.
1642.611	4$^+$	869.256 *14*	100 *1*	773.374	4$^+$	E2+E0(+M1)	0.0044 *11*	α(K)=0.0038 *10*; α(L)=0.00052 *11*; α(M)=0.000111 *23*; α(N)=2.5×10^{-5} *6*; α(O)=3.8×10^{-6} *9* α(P)=2.3×10^{-7} *7*; α(N+..)=2.9×10^{-5} *7* E_γ: weighted average of 869.256 *14* (^{150}Eu ε decay (36.9 y)), 869.21 *20* (^{149}Sm(n,γ) E=thermal). Mult.: confirmed in γ(θ) aligned. I_γ: from ^{150}Eu ε decay (36.9 y)).
		1308.675 *23*	48.2 *10*	333.955	2$^+$	E2	0.001459 *21*	α=0.001459 *21*; α(K)=0.001226 *18*; α(L)=0.0001660 *24*; α(M)=3.55×10^{-5} *5* α(O)=1.198×10^{-6} *17*; α(P)=7.30×10^{-8} *11*; α(N+..)=3.14×10^{-5} B(E2)(W.u.)=1.4 *7* E_γ: weighted average of 1308.675 *23* (^{150}Eu ε decay (36.9 y)), 1308.1 *9* (^{149}Sm(n,γ) E=thermal). Mult.: confirmed by 1969Re11 through γ(θ) aligned. I_γ: weighted average of 48.2 *10* (^{150}Eu ε decay (36.9 y)), 48 *5* (^{149}Sm(n,γ) E=thermal).
1658.39	2$^{(-)}$	153.78[h] *4*	0.14 *3*	1504.572	3$^+$			E_γ,I_γ: observed only in ^{149}Sm(n,γ) E=thermal. I_γ: from Iγ(153)/Iγ(492) in (n,γ).
		241.5[a] *4*	≈0.08	1417.346	2$^+$			
		465.1[a] *6*	0.27 *4*	1193.843	2$^+$			
		492.53[a] *8*	2.0 *2*	1165.791	1$^-$			E_γ: weighted average of 492.56 *8* (^{150}Pm β^- decay (2.68 h)), 492.33 *21* (^{149}Sm(n,γ) E=thermal).
		587.02[a] *8*	7.7 *5*	1071.406	3$^-$			
		612.25[a] *8*	5.3 *4*	1046.148	2$^+$			
		1324.51[a] *6*	100 *4*	333.955	2$^+$			
1672.717?	(4$^+$)	626.67[#] *22*	8×10^1 *6*	1046.148	2$^+$			
		899.6[e#h] *3*	10×10^1 *8*	773.374	4$^+$			E_γ: from ^{149}Sm(n,γ) E=thermal.
1684.162	3$^-$	612.69 *3*	54[b] *3*	1071.406	3$^-$			
		637.85 *12*	8[b] *4*	1046.148	2$^+$			
		910.88 *4*	50[b] *6*	773.374	4$^+$	E1	0.001232 *18*	α=0.001232 *18*; α(K)=0.001058 *15*; α(L)=0.0001365 *20*; α(M)=2.90×10^{-5} *4* α(O)=9.81×10^{-7} *14*; α(P)=6.12×10^{-8} *9*; α(N+..)=7.60×10^{-6} E_γ: weighted average of 911.0 *6* (^{150}Pm β^- decay (2.68 h)),

$^{150}_{62}Sm_{88}$-15

Adopted Levels, Gammas (continued)

γ(^{150}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[d]	E_f	J_f^π	Mult.[‡]	α	Comments
								910.88 *4* (^{150}Eu ε decay (36.9 y)), 910.73 *25* (^{149}Sm(n,γ) E=thermal).
1684.162	3⁻	944	4[b] *3*	740.464	0⁺			
		1350.28[h] *10*	100[b] *6*	333.955	2⁺	E1	0.000704 *10*	α=0.000704 *10*; α(K)=0.000517 *8*; α(L)=6.57×10^{-5} *10*; α(M)=1.394×10^{-5} *20* α(O)=4.74×10^{-7} *7*; α(P)=3.00×10^{-8} *5*; α(N+..)=0.0001076 E_γ: weighted average of 1350.7 *5* (^{150}Pm β^- decay (2.68 h)), 1350.29 *3* (^{150}Eu ε decay (36.9 y)), 1347.9 *5* (^{149}Sm(n,γ) E=thermal). Mult.: confirmed in γ(θ) aligned.
1713.51	1	548.59[#] *11*	1.3[a] *4*	1165.791	1⁻			
		667.31 *13*	5.0[a] *9*	1046.148	2⁺			
		972.2 *8*	3.0[a] *4*	740.464	0⁺			
		1379.22 *8*	100[a] *7*	333.955	2⁺	(E2+M1)	0.0016 *3*	α(K)=0.00135 *25*; α(L)=0.00018 *3*; α(M)=3.8×10^{-5} *7*; α(N)=8.7×10^{-6} *15*; α(O)=1.30×10^{-6} *23* α(P)=8.2×10^{-8} *16*; α(N+..)=5.0×10^{-5} *4* Mult.: from ^{150}Eu ε decay (36.9 y).
		1713.31 *12*	11.2[a] *13*	0.0	0⁺			
1760.060	(3⁻)	117.58[#h] *2*	3 *2*	1642.611	4⁺			
		255.34[e#h] *3*	55 *8*	1504.572	3⁺			
		310.74[e#h] *4*	5.×10^1 *4*	1449.182	4⁺			
		565.91[h] *14*	42 *13*	1193.843	2⁺			
		688.30[#] *14*	100 *16*	1071.406	3⁻	(E2)	0.00573 *8*	α(K)=0.00480 *7*; α(L)=0.000736 *11*; α(M)=0.0001594 *23*; α(N)=3.59×10^{-5} *5*; α(O)=5.24×10^{-6} *8* α(P)=2.82×10^{-7} *4*; α(N+..)=4.14×10^{-5} *6* Mult.: from ce(K) data of 1966El05.
1764.89	7⁻	407.4[&] *3*	3[&]	1357.710	5⁻	E2	0.0226	α(K)=0.0182 *3*; α(L)=0.00341 *5*; α(M)=0.000751 *11*; α(N)=0.0001679 *24*; α(O)=2.37×10^{-5} *4* α(P)=1.025×10^{-6} *15*; α(N+..)=0.000193 *3* E_γ,I_γ: from (α,4nγ) (1986UrZY).
		485.8[&] *3*	100[&] *4*	1278.922	6⁺	E1	0.00460 *7*	α(K)=0.00394 *6*; α(L)=0.000523 *8*; α(M)=0.0001114 *16*; α(N)=2.51×10^{-5} *4*; α(O)=3.73×10^{-6} *6* α(P)=2.23×10^{-7} *4*; α(N+..)=2.91×10^{-5} *4*
1786.30	(≤3)	620.40[a] *20*	95[a] *16*	1165.791	1⁻			
		740.4 *5*		1046.148	2⁺			
		1452.32[a] *20*	1.0×10^2[a] *3*	333.955	2⁺			
1794.30	2⁺	151.64[#h] *4*	0.39 *19*	1642.611	4⁺			
		600.43[#] *25*	15 *3*	1193.843	2⁺			
		722.65[#] *18*	24 *4*	1071.406	3⁻			

$^{150}_{62}Sm_{88}$-16

Adopted Levels, Gammas (continued)

γ(^{150}Sm) (continued)

E_i(level)	J_i^π	E_γ †	I_γ d	E_f	J_f^π	Mult.‡	α	Comments
1794.30	2+	1798# *4*	100 *19*	0.0	0+			
1819.510	4+	315.0 *2*	0.33b *11*	1504.572	3+			E_γ: from ^{150}Eu ε decay (36.9 y).
		370.721 *25*	2.07b *17*	1449.182	4+			E_γ: from ^{150}Eu ε decay (36.9 y).
		402.152 *12*	15.1b *2*	1417.346	2+	(E2)	0.0234	α(K)=0.0189 *3*; α(L)=0.00356 *5*; α(M)=0.000783 *11*; α(N)=0.0001752 *25*; α(O)=2.47×10^{-5} *4* α(P)=1.061×10^{-6} *15*; α(N+..)=0.000201 *3* E_γ: from ^{150}Eu ε decay (36.9 y).
		461.75 *4*	15.9b *4*	1357.710	5−	E1	0.00517 *8*	α(K)=0.00443 *7*; α(L)=0.000589 *9*; α(M)=0.0001255 *18*; α(N)=2.83×10^{-5} *4*; α(O)=4.19×10^{-6} *6* α(P)=2.50×10^{-7} *4*; α(N+..)=3.27×10^{-5} *5* E_γ: weighted average of 461.761 *15* (^{150}Eu ε decay (36.9 y)), 461.59 *6* (^{149}Sm(n,γ) E=thermal). Mult.: determined by 1973MeZX from α(K)exp data.
		540.55 *6*	1.67b *13*	1278.922	6+			E_γ: from ^{150}Eu ε decay (36.9 y).
		625.568 *20*	5.98b *13*	1193.843	2+	(E2)	0.00723 *11*	α(K)=0.00602 *9*; α(L)=0.000950 *14*; α(M)=0.000206 *3*; α(N)=4.64×10^{-5} *7*; α(O)=6.74×10^{-6} *10* α(P)=3.52×10^{-7} *5*; α(N+..)=5.35×10^{-5} *8* E_γ: from ^{150}Eu ε decay (36.9 y). Mult.: from ^{150}Eu ε decay (36.9 y).
		748.06 *9*	100b *2*	1071.406	3−	E1b	0.00182 *3*	α(K)=0.001560 *22*; α(L)=0.000203 *3*; α(M)=4.31×10^{-5} *6*; α(N)=9.75×10^{-6} *14* α(O)=1.456×10^{-6} *21*; α(P)=8.98×10^{-8} *13*; α(N+..)=1.130×10^{-5} *16* E_γ: weighted average of 748.057 *12* (^{150}Eu ε decay (36.9 y)), 749.31 *17* (^{149}Sm(n,γ) E=thermal).
		773.29e *4*	11.7b *2*	1046.148	2+	E2	0.00437 *7*	α(K)=0.00368 *6*; α(L)=0.000547 *8*; α(M)=0.0001181 *17*; α(N)=2.66×10^{-5} *4*; α(O)=3.91×10^{-6} *6* α(P)=2.17×10^{-7} *3*; α(N+..)=3.07×10^{-5} *5* E_γ: weighted average of 773.283 *15* (^{150}Eu ε decay (36.9 y)), 773.97 *24* (^{149}Sm(n,γ) E=thermal). Mult.: from ^{150}Eu ε decay (36.9 y).
		1485.50 *14*	36.7b *15*	333.955	2+	E2	0.001193 *17*	α=0.001193 *17*; α(K)=0.000960 *14*; α(L)=0.0001282 *18*; α(M)=2.74×10^{-5} *4* α(O)=9.26×10^{-7} *13*; α(P)=5.72×10^{-8} *8*; α(N+..)=7.76×10^{-5} E_γ: weighted average of 1485.49 *3* (^{150}Eu ε decay (36.9 y)), 1489.3 *8* (^{149}Sm(n,γ) E=thermal). This and some of the other γ rays which are shown as originating at the 1819-keV level could energetically be assigned to the 1821- or the 1822-keV level instead. 1966Sm03 assigned the 1489-keV transition to the 1821-keV level in (n,γ), but 1977Si12 assigned it to the 1819-keV level in ε decay.

$^{150}_{62}Sm_{88}$-17

Adopted Levels, Gammas (continued)

γ(^{150}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[d]	E_f	J_f^π	Mult.[‡]	α	Comments
								Mult.: 1966Sm03 suggest (E2)(M1) mixture (doublet) on basis of α(K)exp while 1973MeZX give E2 on basis of α(K)exp and α(L)exp data.
1821.894	(4)$^+$	179.26 *5*	0.40[b] *21*	1642.611	4$^+$			E_γ: from ^{149}Sm(n,γ) E=thermal.
		372.732 *22*	62.2[b] *23*	1449.182	4$^+$			E_γ: weighted average of 372.728 *25* (^{150}Eu ε decay (36.9 y)), 372.75 *5* (^{149}Sm(n,γ) E=thermal).
		464.10 *5*	100[b] *20*	1357.710	5$^-$	E1	0.00511 *8*	α(K)=0.00438 *7*; α(L)=0.000582 *9*; α(M)=0.0001240 *18*; α(N)=2.80×10^{-5} *4*; α(O)=4.14×10^{-6} *6* α(P)=2.47×10^{-7} *4*; α(N+..)=3.23×10^{-5} *5* E_γ: weighted average of 464.11 *7* (^{150}Eu ε decay (36.9 y)), 464.09 *8* (^{149}Sm(n,γ) E=thermal).
		542.970 *24*	35.0[b] *18*	1278.922	6$^+$	(E2)	0.01033	α(K)=0.00853 *12*; α(L)=0.001414 *20*; α(M)=0.000308 *5*; α(N)=6.92×10^{-5} *10* α(O)=9.96×10^{-6} *14*; α(P)=4.94×10^{-7} *7*; α(N+..)=7.97×10^{-5} *12* E_γ: weighted average of 542.972 *25* (^{150}Eu ε decay (36.9 y)), 542.95 *9* (^{149}Sm(n,γ) E=thermal). Mult.: from (n,γ) and ^{150}Eu ε decay.
1822.472	(3)$^-$	751.07[ebh] *2*	39.8[b] *9*	1071.406	3$^-$	M1(+E2)	0.0063 *16*	α(K)=0.0053 *14*; α(L)=0.00074 *16*; α(M)=0.00016 *4*; α(N)=3.6×10^{-5} *8*; α(O)=5.4×10^{-6} *12* α(P)=3.2×10^{-7} *10*; α(N+..)=4.2×10^{-5} *9* Mult.: from ^{150}Eu ε decay (36.9 y).
		1049.04[b] *3*	100[b] *4*	773.374	4$^+$	E1	0.000944 *14*	α=0.000944 *14*; α(K)=0.000812 *12*; α(L)=0.0001041 *15*; α(M)=2.21×10^{-5} *3* α(O)=7.49×10^{-7} *11*; α(P)=4.70×10^{-8} *7*; α(N+..)=5.80×10^{-6} Mult.: from ^{150}Eu ε decay (36.9 y).
1833.01	(2)$^+$	667.05[b] *3*	100[b] *4*	1165.791	1$^-$			
		788[bh]	1.48[b] *15*	1046.148	2$^+$			E_γ: from ^{150}Eu ε decay (36.9 y). In 1973MeZX but not 1978MeZK.
		1499.35[b] *10*	15.2[b] *7*	333.955	2$^+$	M1(+E0+E2)[b]	0.00140 *22*	α(K)=0.00113 *19*; α(L)=0.000149 *24*; α(M)=3.2×10^{-5} *5*; α(N)=7.2×10^{-6} *12*; α(O)=1.08×10^{-6} *18* α(P)=6.8×10^{-8} *13*; α(N+..)=8.7×10^{-5} *5*
		1833.30[b] *15*	1.00[b] *19*	0.0	0$^+$	(E2)[b]	0.000966 *14*	α=0.000966 *14*; α(K)=0.000647 *9*; α(L)=8.48×10^{-5} *12*; α(M)=1.81×10^{-5} *3*; α(N)=4.09×10^{-6} *6* α(O)=6.14×10^{-7} *9*; α(P)=3.85×10^{-8} *6*; α(N+..)=0.000216 *3*
1837.03	8$^+$	558.1 *1*	100	1278.922	6$^+$	E2	0.00962 *14*	α(K)=0.00796 *12*; α(L)=0.001306 *19*; α(M)=0.000285 *4*; α(N)=6.39×10^{-5} *9*; α(O)=9.22×10^{-6} *13* α(P)=4.62×10^{-7} *7*; α(N+..)=7.36×10^{-5} *11* B(E2)(W.u.)=1.7×10^2 *9* E_γ: weighted average of 558.1 *1* (^{148}Nd(α,2nγ) E=26 MeV), 558.1 *3* (^{150}Nd(α,4nγ) E=45 MeV).

$^{150}_{62}Sm_{88}$-18

Adopted Levels, Gammas (continued)

γ(^{150}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[d]	E_f	J_f^π	Mult.[‡]	α	Comments
1927.33?	(2$^+$)	510.01[e#h] *9*	≤83	1417.346	2$^+$			Observed by 1966Sm03, placed in decay scheme by evaluator.
		761.2[#h] *3*	1.0×10^2 *3*	1165.791	1$^-$	(E1)	0.001754 *25*	α=0.001754 *25*; α(K)=0.001506 *22*; α(L)=0.000196 *3*; α(M)=4.16×10^{-5} *6* α(O)=1.405×10^{-6} *20*; α(P)=8.67×10^{-8} *13*; α(N+..)=1.090×10^{-5} *1* E_γ: Observed by 1966Sm03, placed in decay scheme by evaluators. Mult.: from (n,γ) E=th.
1952.46	3$^-$	308.05[#] *4*	2.2 *3*	1642.611	4$^+$			
		1176.6[#h] *13*	100 *20*	773.374	4$^+$	E1	0.000782 *11*	α=0.000782 *11*; α(K)=0.000659 *10*; α(L)=8.41×10^{-5} *12*; α(M)=1.79×10^{-5} *3*; α(N)=4.04×10^{-6} *6* α(O)=6.06×10^{-7} *9*; α(P)=3.82×10^{-8} *6*; α(N+..)=2.17×10^{-5} *6* Mult.: from (n,γ) E=th.
1963.72	1$^{(-)}$	917.46 *15*	17[a] *2*	1046.148	2$^+$			E_γ: weighted average of 917.44 *16* (^{150}Pm β$^-$ decay (2.68 h)), 917.7 *6* (^{150}Eu ε decay).
		1223.26 *8*	100[a] *7*	740.464	0$^+$			E_γ: weighted average of 1223.28 *6* (^{150}Pm β$^-$ decay (2.68 h)), 1223.0 *2* (^{150}Eu ε decay (12.8 h)).
		1629.78 *5*	28[a] *2*	333.955	2$^+$			E_γ: weighted average of 1629.79 *4* (^{150}Pm β$^-$ decay (2.68 h)), 1629.4 *3* (^{150}Eu ε decay (12.8 h)).
		1963.66 *18*	52[a] *4*	0.0	0$^+$			E_γ: weighted average of 1963.71 *8* (^{150}Pm β$^-$ decay (2.68 h)), 1963.0 *3* (^{150}Eu ε decay (12.8 h)).
1970.465	4$^+$	151.06[#h] *4*	0.33 *17*	1819.510	4$^+$			
		286.290[eh] *13*	6[b] *3*	1684.162	3$^-$			
		553.20 *10*	2.9[b] *6*	1417.346	2$^+$			
		612.69[f] *3*	8.2[fb] *5*	1357.710	5$^-$			
		777	0.6[b] *3*	1193.843	2$^+$			
		899.07[e] *3*	83.1[b] *8*	1071.406	3$^-$	E1	0.001263 *18*	α=0.001263 *18*; α(K)=0.001085 *16*; α(L)=0.0001401 *20*; α(M)=2.98×10^{-5} *5* α(O)=1.007×10^{-6} *14*; α(P)=6.27×10^{-8} *9*; α(N+..)=7.80×10^{-6}
		1197.11 *3*	100[b] *3*	773.374	4$^+$	(E2+E0+M1)	0.0022 *5*	α(K)=0.0018 *4*; α(L)=0.00025 *5*; α(M)=5.3×10^{-5} *10*; α(N)=1.19×10^{-5} *23*; α(O)=1.8×10^{-6} *4* α(P)=1.12×10^{-7} *25*; α(N+..)=1.9×10^{-5} *3* Placed in decay scheme in ^{150}Eu ε decay (36.9 y).
		1636.53 *3*	64[b] *2*	333.955	2$^+$	E2	0.001060 *15*	α=0.001060 *15*; α(K)=0.000799 *12*; α(L)=0.0001058 *15*; α(M)=2.25×10^{-5} *4* α(O)=7.65×10^{-7} *11*; α(P)=4.76×10^{-8} *7*; α(N+..)=0.000132 Placed in decay scheme by 1977Si12, energy taken from 1978MeZK. Mult.: ^{150}Eu ε decay (36.9 y).

$^{150}_{62}Sm_{88}$-19

Adopted Levels, Gammas (continued)

γ(^{150}Sm) (continued)

E_i(level)	J_i^π	E_γ †	I_γ [d]	E_f	J_f^π	Mult. ‡	α	Comments
2020.377	5+	377.73 *3*	5.9[b] *4*	1642.611	4+			
		515.79[h] *1*	51.8[b] *10*	1504.572	3+	E2	0.01181	α(K)=0.00972 *14*; α(L)=0.001642 *23*; α(M)=0.000359 *5*; α(N)=8.05×10^{-5} *12* α(O)=1.155×10^{-5} *17*; α(P)=5.61×10^{-7} *8*; α(N+..)=9.26×10^{-5} *13* Mult.: based on ^{150}Eu ε decay (36.9 y) α(K)exp and α(L)exp data.
		571.26 *2*	21.6 *5*	1449.182	4+			
		662.66[h] *15*	0.8[b] *2*	1357.710	5−	(E1)[b]	0.00233 *4*	α(K)=0.00200 *3*; α(L)=0.000262 *4*; α(M)=5.57×10^{-5} *8*; α(N)=1.259×10^{-5} *18*; α(O)=1.88×10^{-6} *3* α(P)=1.148×10^{-7} *16*; α(N+..)=1.458×10^{-5} *21*
		741.47[h] *2*	44.7[b] *5*	1278.922	6+	E2(+M1)[b]	0.0065 *17*	α(K)=0.0055 *15*; α(L)=0.00077 *16*; α(M)=0.00016 *4*; α(N)=3.7×10^{-5} *8*; α(O)=5.6×10^{-6} *13* α(P)=3.3×10^{-7} *10*; α(N+..)=4.3×10^{-5} *9*
		1246.97[h] *3*	100[b] *3*	773.374	4+	E2	0.001593 *23*	α=0.001593 *23*; α(K)=0.001348 *19*; α(L)=0.000184 *3*; α(M)=3.93×10^{-5} *6* α(O)=1.324×10^{-6} *19*; α(P)=8.03×10^{-8} *12*; α(N+..)=2.21×10^{-5} *3*
2024.663	4+	205.21[h] *2*	5.6 *7*	1819.510	4+	M1[b]	0.225	α(K)=0.191 *3*; α(L)=0.0267 *4*; α(M)=0.00574 *8*; α(N)=0.001301 *19*; α(O)=0.000195 *3* α(P)=1.213×10^{-5} *17*; α(N+..)=0.001508 *22*
		340.38[h] *4*	29[b] *3*	1684.162	3−			
		381.99[h] *3*	21.1[b] *14*	1642.611	4+			
		520.09 *2*	86.6[b] *18*	1504.572	3+	E2+M1	0.016 *4*	α(K)=0.013 *4*; α(L)=0.0019 *4*; α(M)=0.00042 *7*; α(N)=9.4×10^{-5} *16*; α(O)=1.4×10^{-5} *3* α(P)=7.9×10^{-7} *25*; α(N+..)=0.000109 *19*
		575.51[e] *8*	5.8[b] *14*	1449.182	4+	(E2+E0)		
		607.32 *3*	31.4[b] *9*	1417.346	2+	(E2)[b]	0.00777 *11*	α(K)=0.00646 *9*; α(L)=0.001030 *15*; α(M)=0.000224 *4*; α(N)=5.04×10^{-5} *7*; α(O)=7.30×10^{-6} *11* α(P)=3.77×10^{-7} *6*; α(N+..)=5.80×10^{-5} *9*
		667.05[e] *3*	48.7[b] *18*	1357.710	5−			
		830.82[eh] *2*	100[b] *2*	1193.843	2+	(E2)	0.00372 *6*	α(K)=0.00313 *5*; α(L)=0.000459 *7*; α(M)=9.88×10^{-5} *14*; α(N)=2.23×10^{-5} *4*; α(O)=3.28×10^{-6} *5* α(P)=1.85×10^{-7} *3*; α(N+..)=2.58×10^{-5} *4*
		953.20 *8*	8.5[b] *13*	1071.406	3−			
		978.47 *5*	3.8[b] *9*	1046.148	2+			
		1251.25 *3*	30.7[b] *18*	773.374	4+	(M1)[b]	0.00234 *4*	α(K)=0.00199 *3*; α(L)=0.000263 *4*; α(M)=5.61×10^{-5} *8*; α(N)=1.272×10^{-5} *18*; α(O)=1.92×10^{-6} *3* α(P)=1.227×10^{-7} *18*; α(N+..)=2.80×10^{-5} *4*
		1690.67 *2*	29[b] *9*	333.955	2+	(E2)	0.001027 *15*	α=0.001027 *15*; α(K)=0.000752 *11*; α(L)=9.92×10^{-5} *14*;

$^{150}_{62}Sm_{88}$-20

Adopted Levels, Gammas (continued)

γ(^{150}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[d]	E_f	J_f^π	Mult.[‡]	α	Comments
								α(M)=2.11×10^{-5} *3*; α(N)=4.79×10^{-6} *7* α(O)=7.18×10^{-7} *10*; α(P)=4.48×10^{-8} *7*; α(N+..)=0.0001541
2035.42	5$^-$	756.51[eh] *3*	≤25[b]	1278.922	6$^+$	(E1)[b]	0.001776 *25*	α=0.001776 *25*; α(K)=0.001525 *22*; α(L)=0.000198 *3*; α(M)=4.22×10^{-5} *6* α(O)=1.422×10^{-6} *20*; α(P)=8.78×10^{-8} *13*; α(N+..)=1.104×10^{-5} *1* E_γ: weighted average of 756.51 *3* (^{150}Eu ε decay (36.9 y)), 756.2 *3* (^{149}Sm(n,γ) E=thermal).
		1261.98 *6*	100[b] *2*	773.374	4$^+$	E1	0.000730 *11*	α=0.000730 *11*; α(K)=0.000581 *9*; α(L)=7.41×10^{-5} *11*; α(M)=1.572×10^{-5} *22* α(O)=5.34×10^{-7} *8*; α(P)=3.38×10^{-8} *5*; α(N+..)=5.92×10^{-5} *9* E_γ: weighted average of 1261.98 *3* (^{150}Eu ε decay (36.9 y)), 1263.2 *6* (^{149}Sm(n,γ) E=thermal).
2044.0	(3$^+$,4$^+$)	1710[bh]	1.0×10^2[b] *3*	333.955	2$^+$			
2062.80?	(3)$^+$	268.51[#h] *3*	1.3 *2*	1794.30	2$^+$			
		558.13[#h] *9*	44 *8*	1504.572	3$^+$	(E2+M1)	0.013 *4*	α(K)=0.011 *3*; α(L)=0.0016 *3*; α(M)=0.00034 *6*; α(N)=7.8×10^{-5} *14*; α(O)=1.15×10^{-5} *23* α(P)=6.7×10^{-7} *21*; α(N+..)=9.0×10^{-5} *17* Mult.: E2+M1 suggested by 1966Sm03 on basis of α(K)exp.
		869.21[f#h] *20*	2.5×10^2[f] *4*	1193.843	2$^+$			Assigned to 2062 level by energy fit.
		1016.3[f#h] *5*	100[f] *13*	1046.148	2$^+$	E2	0.00240 *4*	α(K)=0.00204 *3*; α(L)=0.000287 *4*; α(M)=6.15×10^{-5} *9*; α(N)=1.390×10^{-5} *20*; α(O)=2.06×10^{-6} *3* α(P)=1.212×10^{-7} *17*; α(N+..)=1.608×10^{-5} *23*
2070.270	2$^{(-)}$	565.70[a] *3*	18.0[a] *14*	1504.572	3$^+$			
		652.84[a] *9*	4.6[a] *6*	1417.346	2$^+$			
		876.41[a] *4*	100[a] *5*	1193.843	2$^+$			
		904.46[a] *8*	12.5[a] *9*	1165.791	1$^-$			
		999.0[ah] *10*	0.8[a] *3*	1071.406	3$^-$			
		1024.13[a] *6*	10.0[a] *8*	1046.148	2$^+$			
		1736.40[a] *8*	95[a] *5*	333.955	2$^+$			
2095.33	(5)$^+$	125[b]	1.1[b] *6*	1970.465	4$^+$			
		272.82[eh] *3*	13[b] *4*	1822.472	(3)$^-$			E_γ: weighted average of 272.79 *9* (^{150}Eu ε decay (36.9 y)), 272.82 *3* (^{149}Sm(n,γ) E=thermal).
		335.7 *1*	21[b] *8*	1760.060	(3$^-$)			
		590.79[h] *7*	18[b] *3*	1504.572	3$^+$			E_γ: weighted average of 590.71 *11* (^{150}Eu ε decay (36.9 y)), 590.85 *10* (^{149}Sm(n,γ) E=thermal).
		816.41[h] *8*	28[b] *3*	1278.922	6$^+$	E2+M1	0.0051 *13*	α(K)=0.0044 *11*; α(L)=0.00061 *13*; α(M)=0.00013 *3*; α(N)=2.9×10^{-5} *7*; α(O)=4.4×10^{-6} *10*

$^{150}_{62}Sm_{88}$-21

Adopted Levels, Gammas (continued)

γ(^{150}Sm) (continued)

E_i(level)	J_i^π	E_γ †	I_γ [d]	E_f	J_f^π	Mult.‡	α	Comments
								α(P)=2.7×10^{-7} *8*; α(N+..)=3.4×10^{-5} *8* E_γ: weighted average of 816.44 *8* (^{150}Eu ε decay (36.9 y)), 816.19 *23* (^{149}Sm(n,γ) E=thermal).
2095.33	(5)$^+$	1321.91[h] *7*	100[b] *6*	773.374	4$^+$	(E2)	0.001433 *20*	α=0.001433 *20*; α(K)=0.001202 *17*; α(L)=0.0001626 *23*; α(M)=3.48×10^{-5} *5* α(O)=1.173×10^{-6} *17*; α(P)=7.16×10^{-8} *10*; α(N+..)=3.39×10^{-5} E_γ: weighted average of 1321.91 *3* (^{150}Eu ε decay (36.9 y)), 1323.6 *7* (^{149}Sm(n,γ) E=thermal).
2107.449	(6)$^+$	342.56[h] *4*	25[b] *2*	1764.89	7$^-$			
		464.11 *7*	68[b] *10*	1642.611	4$^+$			
		749.80[eh] *3*	100[b] *2*	1357.710	5$^-$	E1	0.00181 *3*	α(K)=0.001552 *22*; α(L)=0.000202 *3*; α(M)=4.29×10^{-5} *6*; α(N)=9.71×10^{-6} *14* α(O)=1.449×10^{-6} *21*; α(P)=8.94×10^{-8} *13*; α(N+..)=1.125×10^{-5} *16*
		828.56 *2*	87[b] *3*	1278.922	6$^+$			
		1334.06 *3*	61[b] *2*	773.374	4$^+$	E2[b]	0.001411 *20*	α=0.001411 *20*; α(K)=0.001181 *17*; α(L)=0.0001595 *23*; α(M)=3.41×10^{-5} *5* α(O)=1.151×10^{-6} *17*; α(P)=7.03×10^{-8} *10*; α(N+..)=3.64×10^{-5}
2117.030	4$^+$	474.49 *3*	5.6[b] *3*	1642.611	4$^+$	(E2+M1+E0)	0.020 *5*	α(K)=0.017 *5*; α(L)=0.0025 *4*; α(M)=0.00054 *8*; α(N)=0.000121 *18*; α(O)=1.8×10^{-5} *3* α(P)=1.0×10^{-6} *4*; α(N+..)=0.000140 *21* Mult.: from (n,γ).
		612.69[f] *3*	3.59[fb] *22*	1504.572	3$^+$			
		667.05 *3*	≤10.0[b]	1449.182	4$^+$			
		699.5[h] *3*	0.22[b] *15*	1417.346	2$^+$			
		759.57 *9*	3.0[b] *3*	1357.710	5$^-$			
		838.40 *8*	2.2[b] *4*	1278.922	6$^+$			
		923.27[eh] *2*	11.9[b] *4*	1193.843	2$^+$	(E2)[b]	0.00295 *5*	α(K)=0.00249 *4*; α(L)=0.000357 *5*; α(M)=7.68×10^{-5} *11*; α(N)=1.733×10^{-5} *25*; α(O)=2.56×10^{-6} *4* α(P)=1.480×10^{-7} *21*; α(N+..)=2.00×10^{-5} *3*
		1045.87[e] *6*	35[b] *3*	1071.406	3$^-$			
		1071.00[eh] *3*	5.6[b] *4*	1046.148	2$^+$	(E2)	0.00215 *3*	α(K)=0.00183 *3*; α(L)=0.000255 *4*; α(M)=5.47×10^{-5} *8*; α(N)=1.236×10^{-5} *18*; α(O)=1.83×10^{-6} *3* α(P)=1.088×10^{-7} *16*; α(N+..)=1.430×10^{-5} *20* Mult.: from α(K)exp in ^{150}Eu ε decay (36.9 y).
		1343.78 *22*	100[b] *3*	773.374	4$^+$	M1+E2[b]	0.0017 *3*	α(K)=0.0014 *3*; α(L)=0.00019 *4*; α(M)=4.1×10^{-5} *7*; α(N)=9.2×10^{-6} *16*; α(O)=1.38×10^{-6} *25* α(P)=8.7×10^{-8} *18*; α(N+..)=4.1×10^{-5} *3*

$^{150}_{62}Sm_{88}$-22

Adopted Levels, Gammas (continued)

γ(^{150}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[d]	E_f	J_f^π	Mult.[‡]	α	Comments
2117.030	4+	1783.19 *5*	3.96[b] *11*	333.955	2+	E2[b]	0.000983 *14*	α=0.000983 *14*; α(K)=0.000681 *10*; α(L)=8.95×10^{-5} *13*; α(M)=1.91×10^{-5} *3*; α(N)=4.32×10^{-6} *6* α(O)=6.47×10^{-7} *9*; α(P)=4.06×10^{-8} *6*; α(N+..)=0.000194 *3*
2119.36	(3−)	286.29[e] *2*	20×10[1][b] *14*	1833.01	(2)+			E_γ: given 2119-keV level origin only by 1973MeZX in ^{150}Eu ε decay (36.9 y).
		476.89[e] *13*	≤63[b]	1642.611	4+			
		762.03 *9*	1.0×10[2][b] *3*	1357.710	5−	(E2)[b]	0.00452 *7*	α(K)=0.00380 *6*; α(L)=0.000567 *8*; α(M)=0.0001226 *18*; α(N)=2.76×10^{-5} *4*; α(O)=4.05×10^{-6} *6* α(P)=2.24×10^{-7} *4*; α(N+..)=3.19×10^{-5} *5*
		1346.40 *7*	100[b] *23*	773.374	4+			
2152.56	4+	509.88[e#h] *7*	31 *6*	1642.611	4+			E_γ: weighted average of 509.84 *5* (^{150}Eu ε decay (36.9 y)), 510.01 *9* (^{149}Sm(n,γ) E=thermal).
		647.81[#h] *13*	16 *5*	1504.572	3+	(E2)	0.00663 *10*	α(K)=0.00553 *8*; α(L)=0.000865 *13*; α(M)=0.000188 *3*; α(N)=4.22×10^{-5} *6*; α(O)=6.14×10^{-6} *9* α(P)=3.24×10^{-7} *5*; α(N+..)=4.87×10^{-5} *7*
		795.30[#h] *19*	14.2 *21*	1357.710	5−			
		958.25[h] *20*	41[b] *17*	1193.843	2+			
		1081.46[h] *8*	23[b] *8*	1071.406	3−			
		1379.12[e#h] *6*	100 *12*	773.374	4+	(E2)	0.001334 *19*	α=0.001334 *19*; α(K)=0.001107 *16*; α(L)=0.0001490 *21*; α(M)=3.18×10^{-5} *5* α(O)=1.076×10^{-6} *15*; α(P)=6.59×10^{-8} *10*; α(N+..)=4.68×10^{-5} I_γ: used to normalize branching in (n,γ) and ε decay(36.9 y). Mult.: from (n,γ) and ^{150}Eu ε decay (36.9 y).
		1818.52[h] *8*	9.8[b] *17*	333.955	2+			
2190.9	4+	997.1[#h] *3*	100	1193.843	2+	E2	0.00250 *4*	α(K)=0.00212 *3*; α(L)=0.000299 *5*; α(M)=6.42×10^{-5} *9*; α(N)=1.451×10^{-5} *21*; α(O)=2.15×10^{-6} *3* α(P)=1.260×10^{-7} *18*; α(N+..)=1.679×10^{-5} *24*
2193.51	(4+)	240.03[#h] *3*	0.8 *3*	1952.46	3−			
		509.86[e#] *5*	38 *8*	1684.162	3−			
		836.58[#] *3*	68 *10*	1357.710	5−		0.00366 *6*	I_γ: Iγ(836)/Iγ(1123)=0.68 *9* in (n,γ) E=th as compared with 0.91 *3* in ε decay.
		915.28 *12*	5[b] *2*	1278.922	6+			
		1122.3[#] *4*	100 *10*	1071.406	3−			
		1420[h]	2[b]	773.374	4+			
2227?	−	2227[#h] *5*	0.12	0.0	0+			

$^{150}_{62}Sm_{88}$-23

Adopted Levels, Gammas (continued)

γ(^{150}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[d]	E_f	J_f^π	Mult.[‡]	δ	α	Comments
2232.37	9⁻	395.1[@] *3*	100[@] *6*	1837.03	8⁺	E1(+M2)	+0.03 *5*	0.0076 *8*	α(K)exp=0.0078 *10* α(K)=0.0065 *7*; α(L)=0.00087 *10*; α(M)=0.000186 *22*; α(N)=4.2×10⁻⁵ *5*; α(O)=6.2×10⁻⁶ *8* α(P)=3.6×10⁻⁷ *5*; α(N+..)=4.8×10⁻⁵ *6* Mult.,δ: from ^{150}Nd(α,4nγ) E=45 MeV.
		467.5[@] *3*	17.6[@] *9*	1764.89	7⁻	E2		0.01537	α(K)exp=0.014 *4* α(K)=0.01256 *18*; α(L)=0.00221 *4*; α(M)=0.000484 *7*; α(N)=0.0001084 *16* α(O)=1.545×10⁻⁵ *22*; α(P)=7.18×10⁻⁷ *11*; α(N+..)=0.0001246 *18* Mult.: from ^{150}Nd(α,4nγ) E=45 MeV.
2259.94	(1⁻)	842.55[a] *12*	39[a] *5*	1417.346	2⁺				
		1004.44[a] *12*	78[a] *5*	1255.512	0⁺				
		1066.00[a] *16*	43[a] *5*	1193.843	2⁺				
		1093.5[a] *8*	7.2[a] *13*	1165.791	1⁻				
		1213.72[a] *8*	100[a] *7*	1046.148	2⁺				
		1519.53[a] *12*	26[a] *5*	740.464	0⁺				
		1926.04[a] *8*	33[a] *7*	333.955	2⁺				
		2259.8[a] *8*	7[a] *2*	0.0	0⁺				
2280.800	(3⁻)	596.53[gb] *4*	7[gb] *4*	1684.162	3⁻				
		637.83[ebh] *3*	4.7[b] *22*	1642.611	4⁺				
		923.27[fb] *2*	100[fb] *3*	1357.710	5⁻	(E2)[b]		0.00295 *5*	α(K)=0.00249 *4*; α(L)=0.000357 *5*; α(M)=7.68×10⁻⁵ *11*; α(N)=1.733×10⁻⁵ *25*; α(O)=2.56×10⁻⁶ *4* α(P)=1.480×10⁻⁷ *21*; α(N+..)=2.00×10⁻⁵ *3*
		1115.4[b] *3*	5.0[b] *19*	1165.791	1⁻				
		1209.5[b] *2*	1.1[b] *5*	1071.406	3⁻				
2367.43	(3⁺)	1201.8[ah] *5*	7.7[a] *14*	1165.791	1⁻				
		2033.46[a] *8*	100[a] *7*	333.955	2⁺				
2433.19	10⁺	200.6[&] *3*	7.7[&]	2232.37	9⁻	M1+E2	+0.05 *20*	0.239	α(K)=0.203 *5*; α(L)=0.0285 *11*; α(M)=0.00612 *25*; α(N)=0.00139 *6*; α(O)=0.000208 *6* α(P)=1.29×10⁻⁵ *4*; α(N+..)=0.00161 *6* Mult.,δ: from internal conversion and γ(θ).
		596.3[&] *3*	100[&] *4*	1837.03	8⁺	E2		0.00814 *12*	α(K)=0.00676 *10*; α(L)=0.001084 *16*; α(M)=0.000236 *4*; α(N)=5.30×10⁻⁵ *8*; α(O)=7.67×10⁻⁶ *11* α(P)=3.94×10⁻⁷ *6*; α(N+..)=6.11×10⁻⁵ *9* Mult.: from internal conversion and γ(θ).
2507.27	(1⁻,2⁺)	848.1[ah] *5*	≈5[a]	1658.39	2(⁻)				
		1340.9[a] *5*	21[a] *5*	1165.791	1⁻				
		1436.6[a] *4*	100[a] *18*	1071.406	3⁻				

$^{150}_{62}Sm_{88}$-24

Adopted Levels, Gammas (continued)

γ(^{150}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[d]	E_f	J_f^π	Mult.[‡]	δ	α	Comments
2507.27	(1⁻,2⁺)	1766.7[ea] *3*	≤72[a]	740.464	0⁺				
		2173.7[a] *8*	21[a] *8*	333.955	2⁺				
		2507.3[a] *6*	21[a] *8*	0.0	0⁺				
2529.4	1,2⁺	1789.8[a] *8*	4[a] *2*	740.464	0⁺				
		2195.6[a] *6*	27[a] *6*	333.955	2⁺				
		2529.2[a] *3*	100[a] *12*	0.0	0⁺				
2550.57	1⁽⁻⁾	1810.5[a] *6*	17[a] *6*	740.464	0⁺				
		2216.5[a] *3*	100[a] *17*	333.955	2⁺				
		2550.5[a] *5*	51[a] *11*	0.0	0⁺				
2589.12	(8⁻)	752.1[&] *3*	100[&]	1837.03	8⁺	M2		0.0213	α(K)=0.0179 *3*; α(L)=0.00263 *4*; α(M)=0.000569 *8*; α(N)=0.0001291 *19*; α(O)=1.93×10⁻⁵ *3* α(P)=1.193×10⁻⁶ *17*; α(N+..)=0.0001497 *21*
		824.3[&] *3*	21[&]	1764.89	7⁻				
2602.5	(1⁺,2,3)	532.3[eah] *8*	19[a] *10*	2070.270	2⁽⁻⁾				
		889.2[a] *5*	100[a] *19*	1713.51	1				
		1097.1[a] *10*	24[a] *10*	1504.572	3⁺				
2679.6	3	1485.6[a] *8*	64[a] *18*	1193.843	2⁺				
		1906.3[a] *6*	100[a] *18*	773.374	4⁺				
		2679.5[eah] *6*	≤64[a]	0.0	0⁺				
2744.35	11⁻	311.23[&] *17*	77[&]	2433.19	10⁺	E1(+M2)	≥−0.1	0.16 *15*	α(K)=0.13 *12*; α(L)=0.022 *21*; α(M)=0.005 *5*; α(N)=0.0011 *11*; α(O)=0.00017 *16* α(P)=1.0×10⁻⁵ *9*; α(N+..)=0.0013 *12* E_γ: weighted average of 311.2 *2* (^{148}Nd(α,2nγ) E=26 MeV), 311.3 *3* (^{150}Nd(α,4nγ) E=45 MeV). Mult.: from α(K)exp in (α,2nγ).
		512.0[&] *3*	100[&]	2232.37	9⁻	E2		0.01204	α(K)exp=0.0075 *20* α(K)=0.00990 *14*; α(L)=0.001678 *24*; α(M)=0.000367 *6*; α(N)=8.23×10⁻⁵ *12* α(O)=1.180×10⁻⁵ *17*; α(P)=5.71×10⁻⁷ *8*; α(N+..)=9.47×10⁻⁵ *14* E_γ: weighted average of 511.9 *5* (^{148}Nd(α,2nγ) E=26 MeV), 512.1 *3* (^{150}Nd(α,4nγ) E=45 MeV). I_γ: due to the overlap of the 512.1-keV peak with the annihilation peak, the authors obtained this relative intensity from coincidence data.
2812.88	(1⁻,2)	1128.6[ea] *8*	≤10[a]	1684.162	3⁻				
		1154.64[a] *16*	100[a] *7*	1658.39	2⁽⁻⁾				
		1647.20[a] *25*	37[a] *6*	1165.791	1⁻				
		1766.7[ea] *3*	28[a] *5*	1046.148	2⁺				
		2478.6[a] *2*	55[a] *6*	333.955	2⁺				
2893.1	(1⁻,2)	633.5[a] *6*	32[a] *6*	2259.94	(1⁻)				

$^{150}_{62}Sm_{88}$-25

Adopted Levels, Gammas (continued)

γ(^{150}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[d]	E_f	J_f^π	Mult.[‡]	α	Comments
2893.1	(1⁻,2)	1179.6[a] *6*	48[a] *10*	1713.51	1			
		1726.9[a] *6*	90[a] *16*	1165.791	1⁻			
		1821.9[a] *8*	16[a] *10*	1071.406	3⁻			
		2893.1[a] *5*	100[a] *16*	0.0	0⁺			
2929.24	(10)⁻	340.2[&] *3*	77[&]	2589.12	(8⁻)			
		495.8[&] *3*	100[&] *20*	2433.19	10⁺	E1	0.00440 *7*	α(K)=0.00376 *6*; α(L)=0.000499 *7*; α(M)=0.0001063 *15*; α(N)=2.40×10⁻⁵ *4*; α(O)=3.56×10⁻⁶ *5* α(P)=2.14×10⁻⁷ *3*; α(N+..)=2.78×10⁻⁵ *4* Mult.: from (α,4nγ).
		696.9[&] *3*	48[&]	2232.37	9⁻			
2995.9	11(⁻)	251.6[&] *3*	18[&]	2744.35	11⁻			
		562.8[&] *3*	100[&]	2433.19	10⁺			
		763.5[&] *3*	18[&]	2232.37	9⁻			
3012.30		1507.1[h] *6*	≈100	1504.572	3⁺			
		1848.0[h] *10*	≈5	1165.791	1⁻			
		1940.6 *3*	100 *20*	1071.406	3⁻			
		2679.5[e] *6*	≤70	333.955	2⁺			
3023.7	2⁺	761.3 *8*	100 *19*	2262.4?	4(⁺)			
		1364.1[h] *8*	19 *6*	1658.39	2(⁻)			
		2691.0[h] *8*	6 *5*	333.955	2⁺			
		3022.7 *20*	25 *6*	0.0	0⁺			
3038.2	1,2⁺	225.0[h] *8*	≈17	2812.88	(1⁻,2)			
		358.8 *8*	8.×10¹ *3*	2679.6	3			
		2704.6 *7*	1.0×10² *5*	333.955	2⁺			
		3037.8 *10*	33 *17*	0.0	0⁺			
3048.4	12⁺	303.9[&] *3*	10[&] *3*	2744.35	11⁻	D		
		615.1[&] *3*	100[&] *6*	2433.19	10⁺	E2	0.00753 *11*	α(K)=0.00627 *9*; α(L)=0.000995 *14*; α(M)=0.000216 *3*; α(N)=4.86×10⁻⁵ *7*; α(O)=7.05×10⁻⁶ *10* α(P)=3.66×10⁻⁷ *6*; α(N+..)=5.60×10⁻⁵ *8* Mult.: from (α,4nγ).
3050.0	1(⁻)	237.4 *6*	100 *17*	2812.88	(1⁻,2)			
		499.4 *10*	≈33	2550.57	1(⁻)			
		542.9 *8*	1.0×10² *3*	2507.27	(1⁻,2⁺)			
		2003.4 *10*	7.×10¹ *3*	1046.148	2⁺			
		2716.1 *8*	17 *8*	333.955	2⁺			
		3049.7 *10*	33 *17*	0.0	0⁺			
3080.9	1(⁺)	572.8[h] *8*	≈18	2507.27	(1⁻,2⁺)			
		1915.9[h] *6*	100 *18*	1165.791	1⁻			

$^{150}_{62}Sm_{88}$-26

Adopted Levels, Gammas (continued)

γ(^{150}Sm) (continued)

E_i(level)	J_i^π	E_γ †	I_γ d	E_f	J_f^π	Mult.‡	α	Comments
3080.9	$1^{(+)}$	3079.8 *10*	18 *9*	0.0	0^+			
3089.4	1,2^+	276.5 *5*	1.0×10^2 *4*	2812.88	$(1^-,2)$			
		1128.6eh *8*	71 *14*	1963.72	$1^{(-)}$			
		1670.7 *5*	93 *14*	1417.346	2^+			
		1833.3 *10*	29 *21*	1255.512	0^+			
		3090.5 *10*	7	0.0	0^+			
3137.6	(1,2)	1350.7 *5*	100 *15*	1786.30	(≤3)			
		2804.2 *5*	54 *23*	333.955	2^+			
		3137.3 *10*	≈2	0.0	0^+			
3212.5	$1^{(-)}$	532.3e *8*	≤36	2679.6	3			
		1499.6 *6*	100 *18*	1713.51	1			
		2017.8 *8*	55 *18*	1193.843	2^+			
		2878.7 *8*	36 *18*	333.955	2^+			
3293.3	13^-	244.7& *3*	23&	3048.4	12^+	D		I_γ: intensity obtained from coincidence data.
		549.4& *3*	100&	2744.35	11^-	E2	0.01002	α(K)=0.00828 *12*; α(L)=0.001366 *20*; α(M)=0.000298 *5*; α(N)=6.69×10^{-5} *10* α(O)=9.64×10^{-6} *14*; α(P)=4.80×10^{-7} *7*; α(N+..)=7.70×10^{-5} *11* E_γ: weighted average of 549.0 *5* (^{148}Nd(α,2nγ) E=26 MeV), 549.5 *3* (^{150}Nd(α,4nγ) E=45 MeV). Mult.: from (α,4nγ).
3384.2?	(12^-)	335.9 *3*	12	3048.4	12^+			
		454.8&h *3*	100&	2929.24	$(10)^-$			
3522.7?	(12)	778.4 *3*	100	2744.35	11^-			
3675.9	14^+	382.4&	16&	3293.3	13^-	E1	0.00808 *12*	α(K)=0.00690 *10*; α(L)=0.000926 *13*; α(M)=0.000197 *3*; α(N)=4.45×10^{-5} *7*; α(O)=6.57×10^{-6} *10* α(P)=3.86×10^{-7} *6*; α(N+..)=5.15×10^{-5} *8* Mult.: from (α,4nγ).
		627.5& *3*	100&	3048.4	12^+	E2	0.00717 *10*	α(K)=0.00597 *9*; α(L)=0.000942 *14*; α(M)=0.000205 *3*; α(N)=4.60×10^{-5} *7*; α(O)=6.68×10^{-6} *10* α(P)=3.49×10^{-7} *5*; α(N+..)=5.30×10^{-5} *8* Mult.: from (α,4nγ).
3835.0	14^+	541.8& *3*	100&	3293.3	13^-	E1	0.00360 *5*	α(K)=0.00309 *5*; α(L)=0.000407 *6*; α(M)=8.68×10^{-5} *13*; α(N)=1.96×10^{-5} *3*; α(O)=2.91×10^{-6} *4* α(P)=1.758×10^{-7} *25*; α(N+..)=2.27×10^{-5} *4*
		786.4& *3*	20&	3048.4	12^+			
3914.1	15^-	238.3& *3*	11&	3675.9	14^+	E1	0.0266	α(K)=0.0227 *4*; α(L)=0.00311 *5*; α(M)=0.000664 *10*; α(N)=0.0001493 *22*; α(O)=2.18×10^{-5} *4* α(P)=1.221×10^{-6} *18*; α(N+..)=0.0001724 *25* Mult.: from (α,4nγ).
		620.8& *3*	100&	3293.3	13^-	E2	0.00736 *11*	α(K)=0.00613 *9*; α(L)=0.000970 *14*; α(M)=0.000211 *3*; α(N)=4.74×10^{-5}

$^{150}_{62}Sm_{88}$-27

Adopted Levels, Gammas (continued)

γ(^{150}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[d]	E_f	J_f^π	Mult.[‡]	α	Comments
								7; α(O)=6.88×10^{-6} *10* α(P)=3.58×10^{-7} *5*; α(N+..)=5.46×10^{-5} *8* Mult.: from (α,4nγ).
3941.2	(14$^-$)	557.0[&] *3*	100[&]	3384.2?	(12$^-$)			
4025.2	(14)	190.1 *3*	28	3835.0	14$^+$			
		502.5	100	3522.7?	(12)			
		732.1[h]	17	3293.3	13$^-$			
4305.8	16$^+$	470.5		3835.0	14$^+$			
		630.0[&] *3*	100[&] *6*	3675.9	14$^+$	E2	0.00710 *10*	α(K)=0.00591 *9*; α(L)=0.000932 *14*; α(M)=0.000202 *3*; α(N)=4.55×10^{-5} *7*; α(O)=6.61×10^{-6} *10* α(P)=3.46×10^{-7} *5*; α(N+..)=5.25×10^{-5} *8* Mult.: from (α,4nγ).
4386.3	16$^+$	472.2[&] *3*	88[&]	3914.1	15$^-$	E1	0.00491 *7*	α(K)=0.00421 *6*; α(L)=0.000559 *8*; α(M)=0.0001190 *17*; α(N)=2.69×10^{-5} *4*; α(O)=3.98×10^{-6} *6* α(P)=2.38×10^{-7} *4*; α(N+..)=3.11×10^{-5} *5*
		551.2[&] *3*	59[&]	3835.0	14$^+$			
		710.4[&] *3*	100[&]	3675.9	14$^+$	E2	0.00532 *8*	α(K)=0.00446 *7*; α(L)=0.000678 *10*; α(M)=0.0001468 *21*; α(N)=3.31×10^{-5} *5*; α(O)=4.83×10^{-6} *7* α(P)=2.62×10^{-7} *4*; α(N+..)=3.82×10^{-5} *6*
4576.2	(16$^-$)	635.0 *3*	100	3941.2	(14$^-$)			
4605.7	17$^-$	219.7		4386.3	16$^+$			
		691.6[&] *3*	100[&]	3914.1	15$^-$	E2	0.00567 *8*	α(K)=0.00474 *7*; α(L)=0.000727 *11*; α(M)=0.0001575 *23*; α(N)=3.55×10^{-5} *5*; α(O)=5.17×10^{-6} *8* α(P)=2.79×10^{-7} *4*; α(N+..)=4.09×10^{-5} *6* Mult.: from (α,4nγ).
4612.0	(16)	586.8[&] *3*	100[&]	4025.2	(14)			
4929.1	18$^+$	323.4[&] *3*	20[&]	4605.7	17$^-$	E1	0.01218	α(K)=0.01040 *15*; α(L)=0.001407 *20*; α(M)=0.000300 *5*; α(N)=6.76×10^{-5} *10* α(O)=9.94×10^{-6} *15*; α(P)=5.75×10^{-7} *9*; α(N+..)=7.81×10^{-5} *11*
		542.7[&h] *3*	9[&]	4386.3	16$^+$			
		623.3[&] *3*	100[&]	4305.8	16$^+$	E2	0.00729 *11*	α(K)=0.00607 *9*; α(L)=0.000960 *14*; α(M)=0.000208 *3*; α(N)=4.69×10^{-5} *7*; α(O)=6.80×10^{-6} *10* α(P)=3.55×10^{-7} *5*; α(N+..)=5.40×10^{-5} *8*
5046.0	(18$^+$)	439.8		4605.7	17$^-$			
		659.5	100	4386.3	16$^+$			
		739.8		4305.8	16$^+$			
5251.0?		639.0[&] *3*	100[&]	4612.0	(16)			
5276.7	(18$^-$)	700.5[&] *3*	100[&]	4576.2	(16$^-$)			
5346.1	19$^-$	299.0		5046.0	(18$^+$)			
		740.6[&] *3*	100[&]	4605.7	17$^-$	E2	0.00483 *7*	α(K)=0.00405 *6*; α(L)=0.000610 *9*; α(M)=0.0001318 *19*; α(N)=2.97×10^{-5} *5*;

$^{150}_{62}Sm_{88}$-28

Adopted Levels, Gammas (continued)

γ(^{150}Sm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[d]	E_f	J_f^π	Mult.[‡]	α	Comments
								α(O)=4.35×10^{-6} *7* α(P)=2.39×10^{-7} *4*; α(N+..)=3.43×10^{-5} *5* Mult.: from (α,4nγ).
5580.9	(19$^-$)	651.8	100	4929.1	18$^+$			
		975.0		4605.7	17$^-$			
5592.7	20$^+$	663.6[&]	100[&]	4929.1	18$^+$	E2	0.00626 *9*	α(K)=0.00523 *8*; α(L)=0.000811 *12*; α(M)=0.0001757 *25*; α(N)=3.96×10^{-5} *6*; α(O)=5.76×10^{-6} *8* α(P)=3.07×10^{-7} *5*; α(N+..)=4.56×10^{-5} *7*
5739.3	(20$^+$)	393.3		5346.1	19$^-$			
		693.2	100	5046.0	(18$^+$)			
5937.0	(21$^-$)	197.8		5739.3	(20$^+$)			
		355.9		5580.9	(19$^-$)			
		591.0		5346.1	19$^-$			
6021.7?	(20$^-$)	745.0[&] *3*	100[&]	5276.7	(18$^-$)			
6064.9		484.0[&] *3*	100[&]	5580.9	(19$^-$)			
6106.4?	(21$^-$)	367.0		5739.3	(20$^+$)			
		760.3[&]	100[&]	5346.1	19$^-$	E2	0.00454 *7*	α(K)=0.00382 *6*; α(L)=0.000571 *8*; α(M)=0.0001233 *18*; α(N)=2.78×10^{-5} *4*; α(O)=4.07×10^{-6} *6* α(P)=2.25×10^{-7} *4*; α(N+..)=3.21×10^{-5} *5*
6308.3	(22$^+$)	715.6	100	5592.7	20$^+$			
6420.4	(23$^-$)	483.4	100	5937.0	(21$^-$)			
6421.0		356.1[&]	100[&]	6064.9				
6448.9	(22$^+$)	342.6		6106.4?	(21$^-$)			
		709.5		5739.3	(20$^+$)			
7057.9	(25$^-$)	637.5	100	6420.4	(23$^-$)			
7068.3	(24$^+$)	760.0	100	6308.3	(22$^+$)			
7837.5	(26$^+$)	769.2	100	7068.3	(24$^+$)			
7854.1	(27$^-$)	796.2		7057.9	(25$^-$)			
8586.9	(28$^+$)	749.4	100	7837.5	(26$^+$)			
8760.9	(29$^-$)	906.8	100	7854.1	(27$^-$)			
9736.9	(31$^-$)	976.0	100	8760.9	(29$^-$)			

[†] Eγ≤1833 keV are from ^{150}Eu ε decay (36.9 y), unless otherwise noted. γ rays with Eγ≥3980 keV are taken from (n,γ). From 2259-keV level and up, Eγ and Iγ are from ^{150}Pm β$^-$ decay (2.68 h), unless otherwise specified.
[‡] From ^{149}Sm(n,γ) E=th, unless otherwise noted.
[#] From ^{149}Sm(n,γ) E=thermal.
[@] From (α,2nγ).
[&] From ^{150}Nd(α,4nγ).

$^{150}_{62}Sm_{88}$-29

Adopted Levels, Gammas (continued)

$\gamma(^{150}Sm)$ (continued)

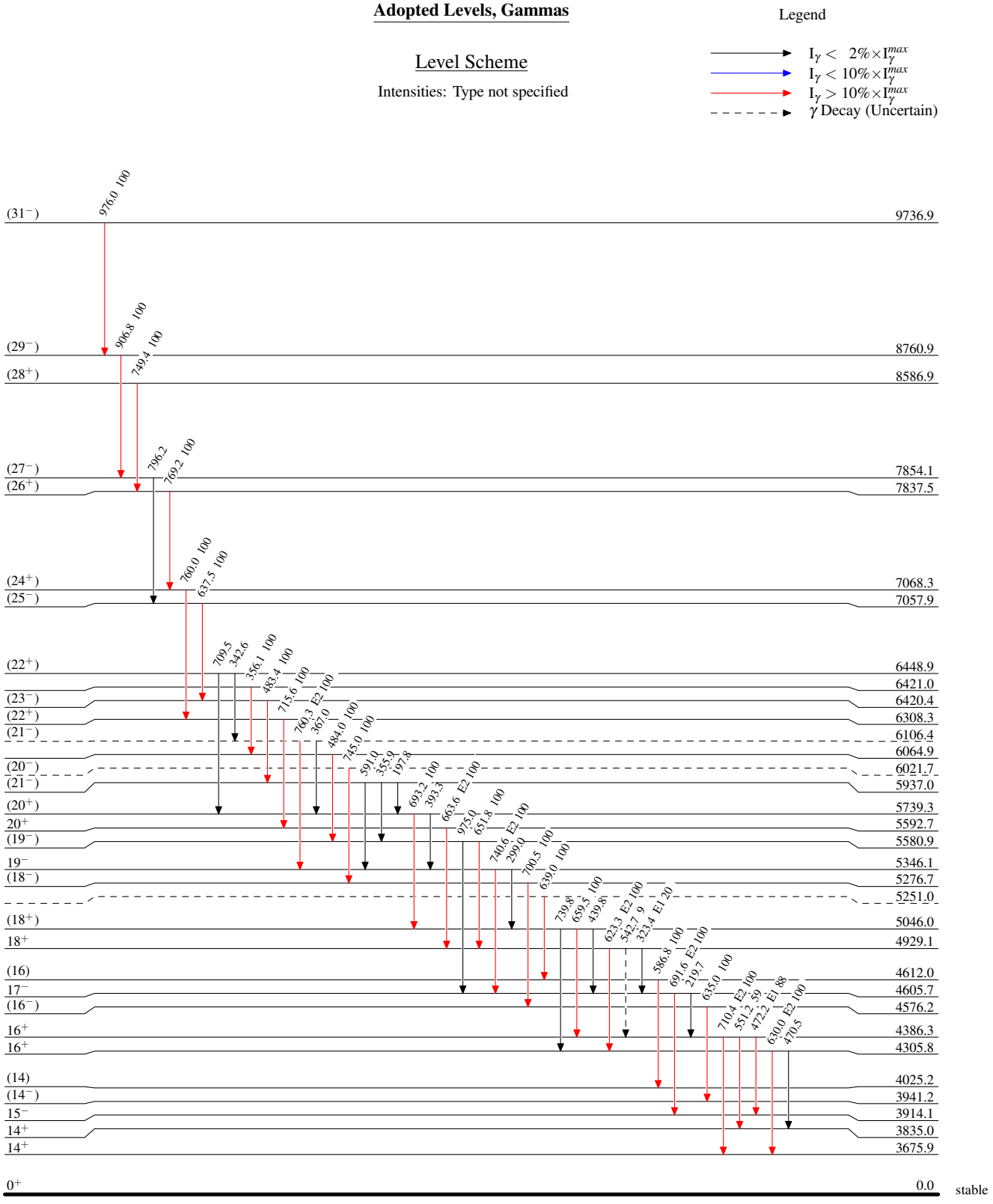
[a] From ^{150}Pm β^- decay (2.68 h).
[b] From ^{150}Eu ε decay (36.9 y).
[c] Multipolarity equals (E2+E0) for the doubly placed 223.51γ. Use of this multipolarity for J^π(1672 level) could be misleading.
[d] Relative branching from each level. Data are from $^{149}Sm(n,\gamma)$ E=th, unless otherwise noted.
[e] Multiply placed.
[f] Multiply placed with undivided intensity.
[g] Multiply placed with intensity suitably divided.
[h] Placement of transition in the level scheme is uncertain.

$^{150}_{62}Sm_{88}$-30

Adopted Levels, Gammas

Level Scheme

Intensities: Type not specified

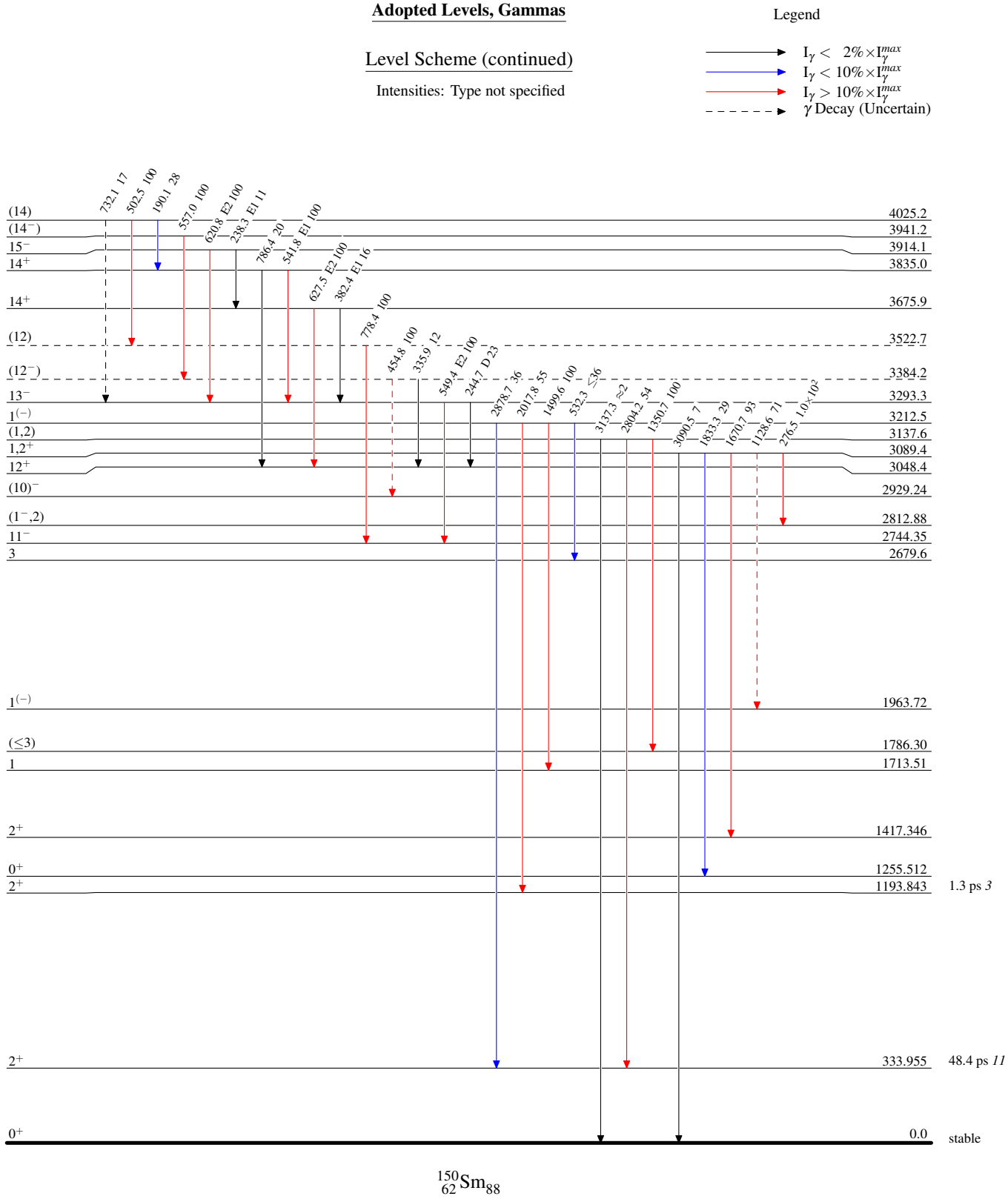


$^{150}_{62}Sm_{88}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified



$^{150}_{62}Sm_{88}$

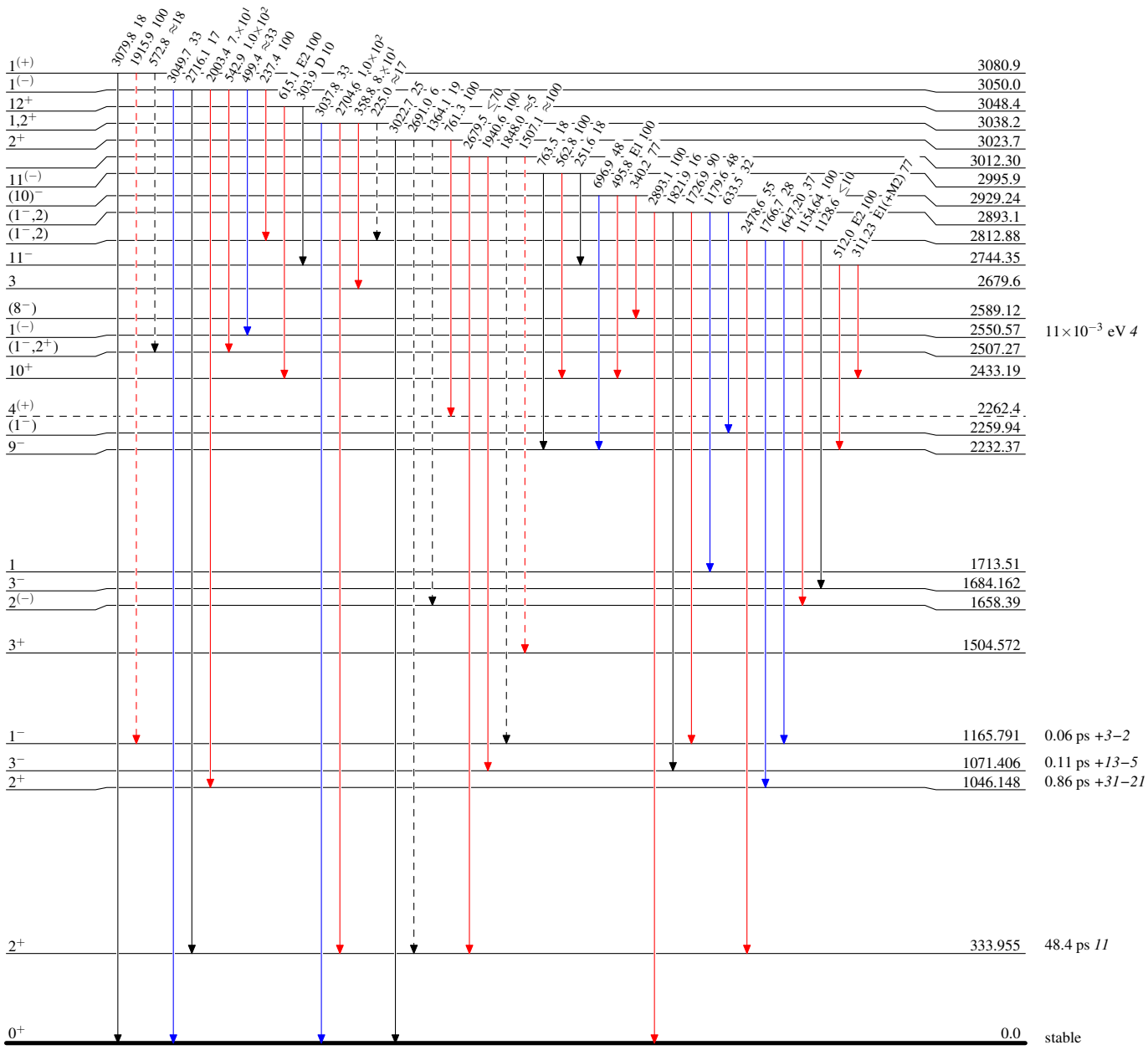
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)

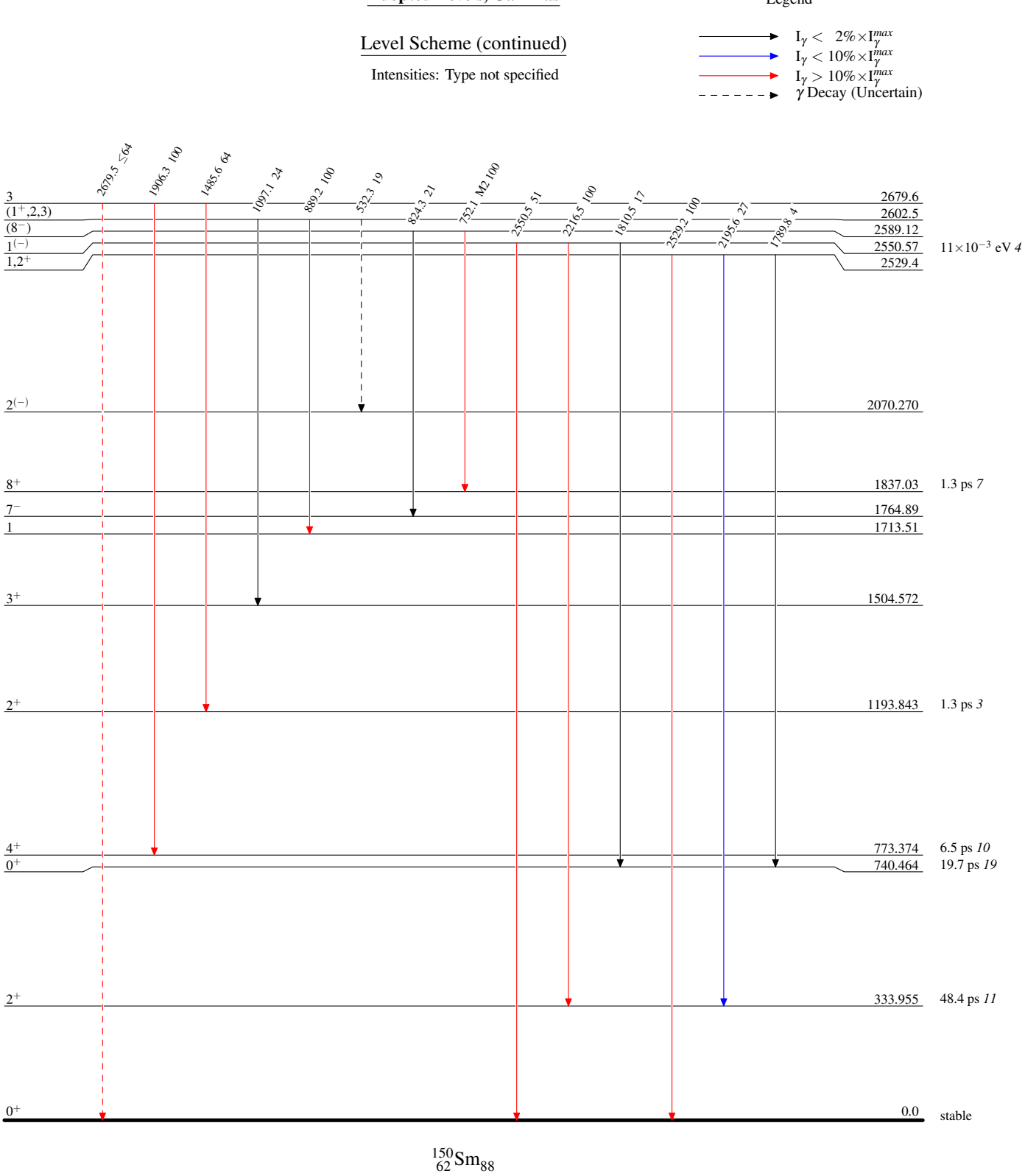


$^{150}_{62}Sm_{88}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified



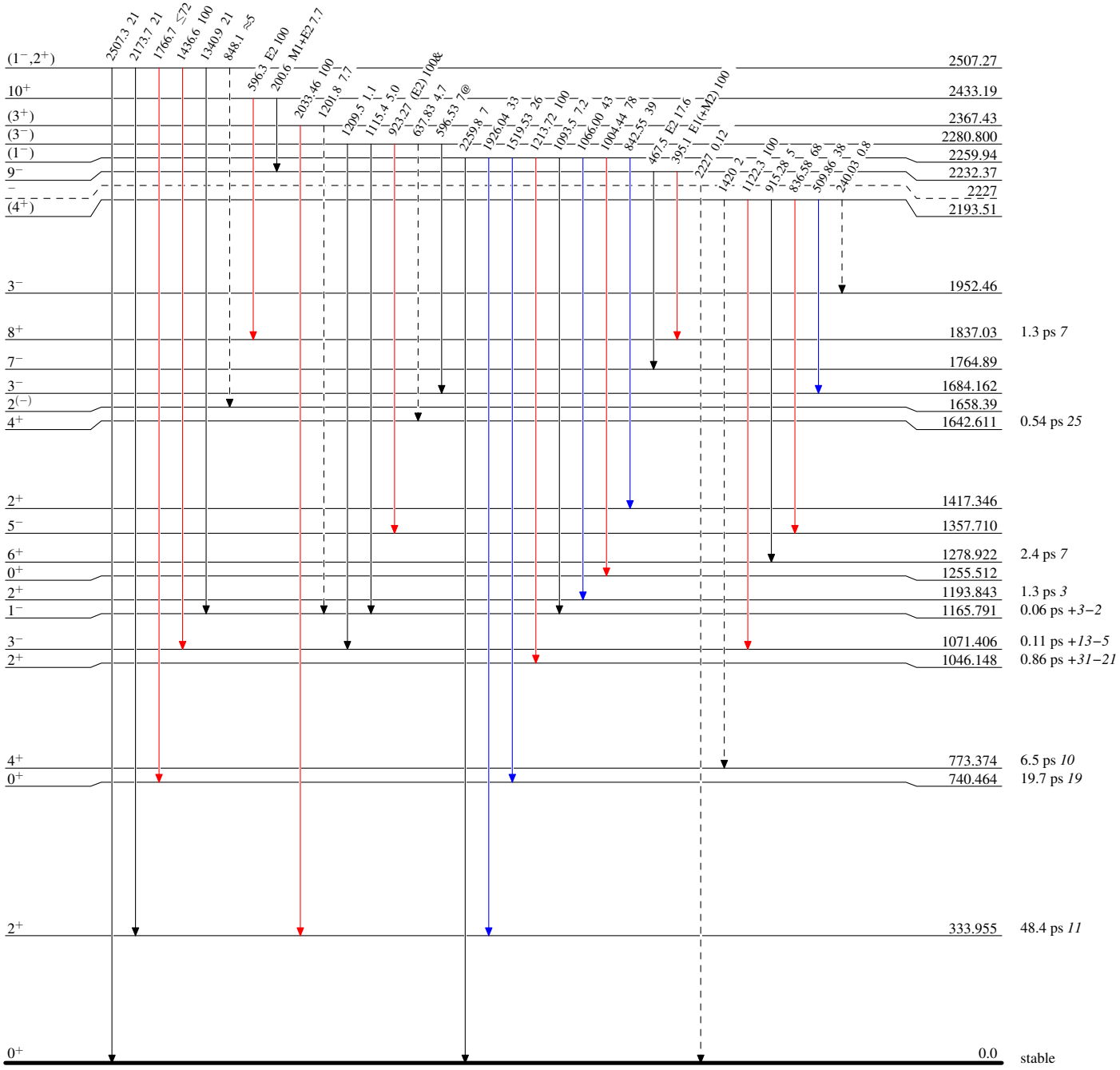
$^{150}_{62}Sm_{88}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)



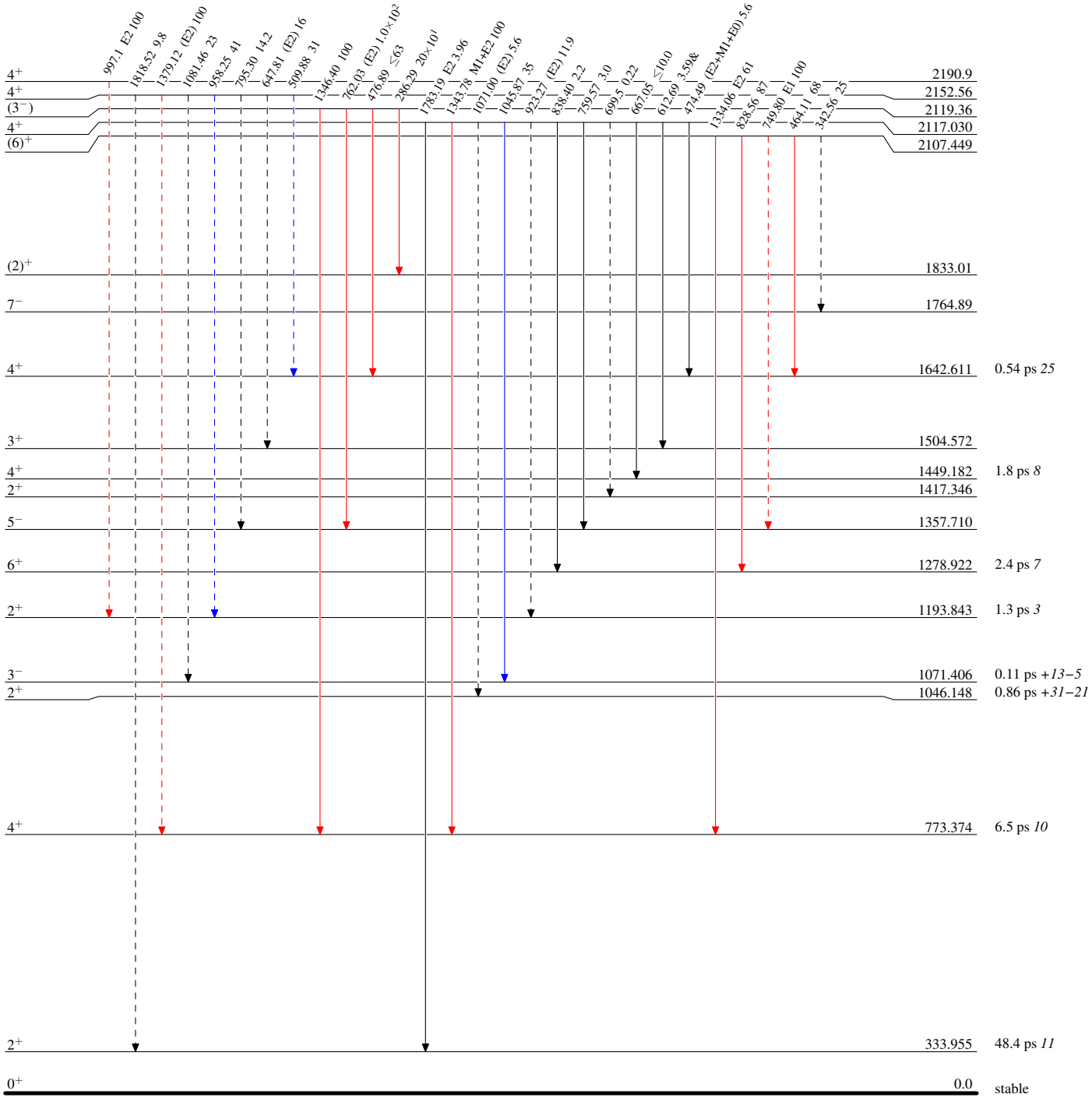
$^{150}_{62}Sm_{88}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)



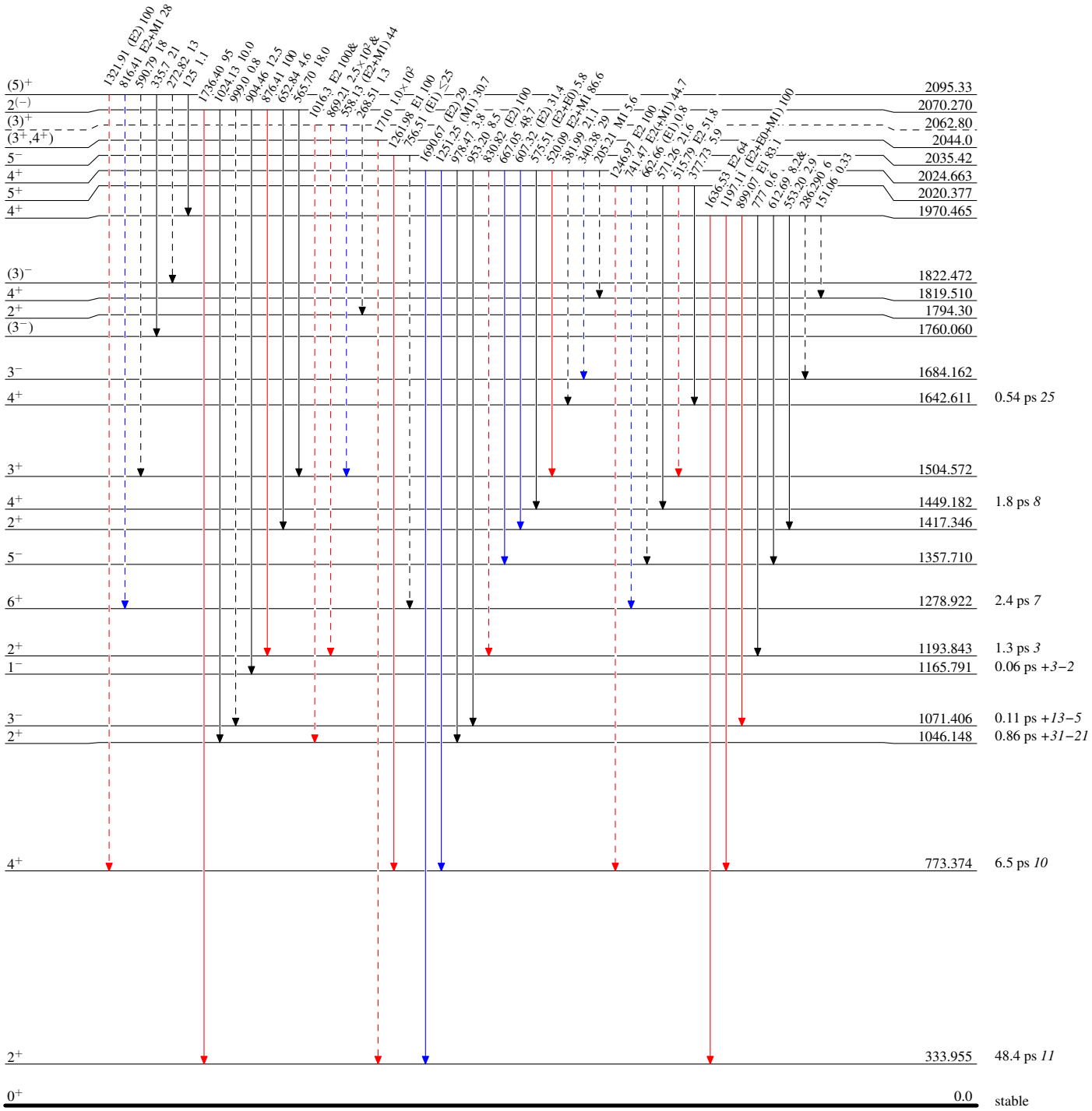
$^{150}_{62}Sm_{88}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)



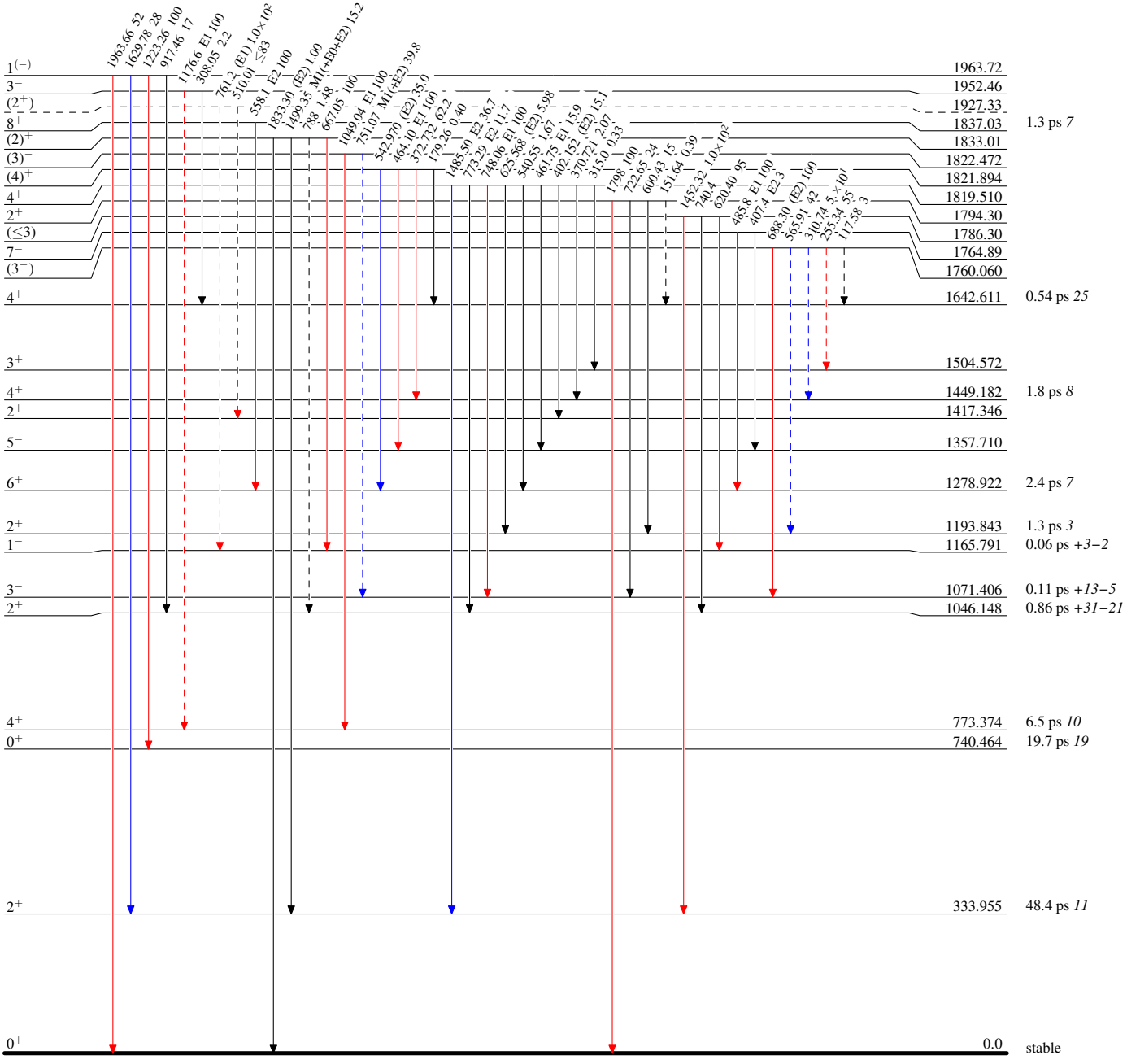
$^{150}_{62}Sm_{88}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)



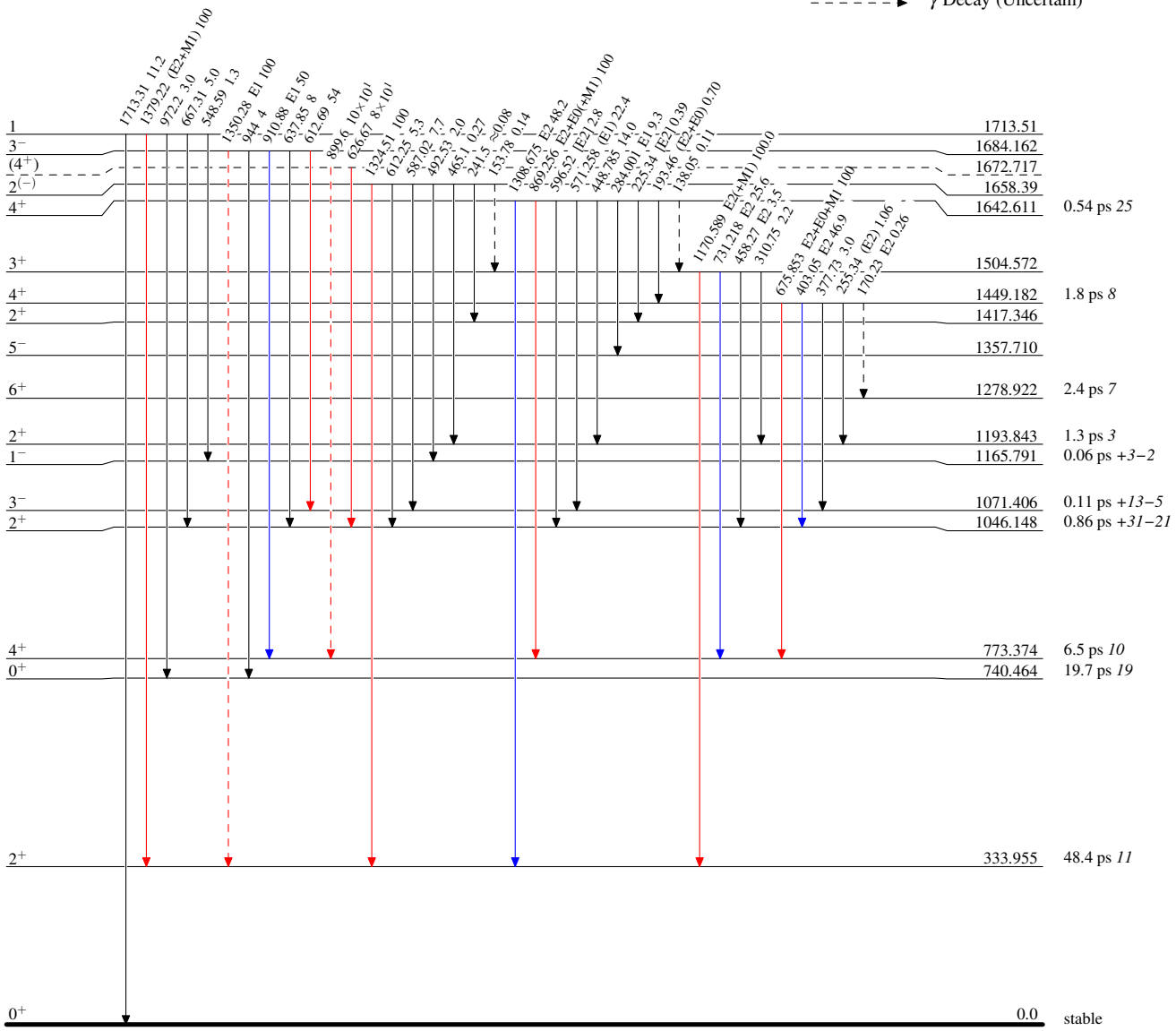
$^{150}_{62}Sm_{88}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)

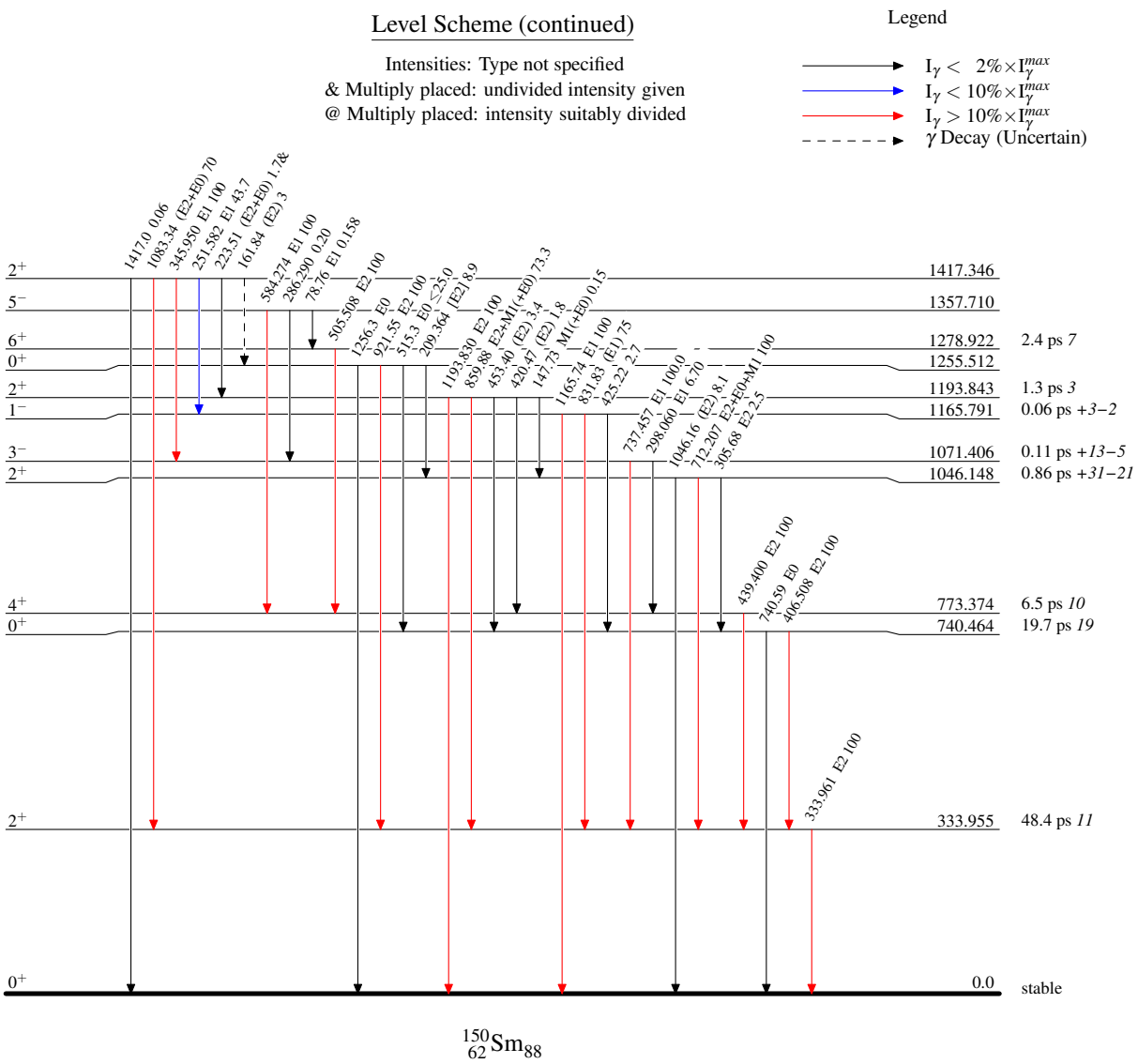


$^{150}_{62}Sm_{88}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided



Adopted Levels, Gammas