Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 200,2 (2025)	22-Aug-2022

Q(β^-)=−2034 *9*; S(n)=7699 *10*; S(p)=2785 *9*; Q(α)=4041 *4* 2021Wa16
S(2n)=17177 *15*, S(2p)=8500 *40* (2021Wa16).

^{154}Ho Levels

Cross Reference (XREF) Flags

A ^{154}Er ε decay
B ^{141}Pr(^{16}O,3nγ)

E(level)†	J$^\pi$‡	$T_{1/2}$	XREF	Comments
0	2$^-$	11.76 min *19*	A	%α=0.019 *5*; %ε+%β^+=99.981 *5* μ=−0.641 *6*; Q=+0.19 *10* $\Delta\langle r^2\rangle$(^{154}Ho−^{156}Ho)=0.334 fm^2 *4* (1989Al27). Others: 0.26 fm^2 (1989OtZZ); 0.4 fm^2 (read from graph of 1988NeZZ). From an evaluation of data on nuclear rms charge radii, 2013An02 report $\langle r^2\rangle^{1/2}$=5.086 fm *33*. J$^\pi$: From hyperfine structure (1988NeZZ and 1989Al27); π from E1 γ from 1$^+$ level. This value conflicts with J=1 reported from atomic-beam magnetic resonance data (1969Ek01). $T_{1/2}$: Weighted average of 11.75 m *20* (1993Al03) and 11.8 m *5* (1968Wa12) from ^{154}Ho ε decay. Others: 11.8 m *10* (1967Ha34) and 12.5 m *5* (1974PeZS) from α decay. %α: From 1974Sc19, who give 0.017 *3* and 0.028 *9*. Other: 0.042 *24* (1968Go13). Eα=3937 *5* (from 1974Sc19 evaluation). μ: From 2019StZV based on the measurement by 1989Al27 by Laser Resonance Ionisation Mass Spectroscopy. Q: From 2019StZV based on the measurement by 1989Al27 by Laser Resonance Ionisation Spectroscopy.
26.9 *2*	1$^+$		A	J$^\pi$: log *ft* ≈ 4.0 from 154Er 2$^-$ ε decay parent and E1 γ to g.s. Additional information 1.
0+x	8$^+$	3.10 min *14*	AB	%ε+%β^+=100; %α<0.001; %IT≈0 μ=+5.63 *6*; Q=−1.0 *5* Additional information 2. $\Delta\langle r^2\rangle$(ground state-isomer)=0.015 fm^2 (1989Al27, 1989OtZZ). E(level): x=243 *28* (2021Ko07). J$^\pi$: J=8 measured by 1989Al27 (using resonance ionization spectroscopy). π=+ from allowed-unhindered (log*ft*=4.9) ε transition to a 7$^+$ state in ^{154}Dy and no, or little, ε decay to 6$^+$ states. $T_{1/2}$: Weighted average of 3.25 m *10* (1968Wa12) and 2.80 m *15* (1993Al03) from ^{154}Ho ε decay and 3.0 m *3* (1971To01) from α decay. %α: From ^{154}Ho α decay (3.10 m) (1974Sc19). Eα=3721 *5* (from evaluations by 1974Sc19 and 2013Ba31). %IT: IT decay is unobserved. μ: From 2019StZV based on the measurement by 1989Al27 by Laser Resonance Ionisation Mass Spectroscopy. Q: From 2019StZV based on the measurement by 1989Al27 by Laser Resonance Ionisation Spectroscopy.
18.8+x *4*			B	
20.9+x *3*			B	
58.7+x *3*			B	J$^\pi$: (7) postulated by 2013Mo35 with no arguments.
213.3+x *3*			B	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{154}Ho Levels (continued)

E(level)[†]	Jπ[‡]	XREF	Comments
285.0+x[#] *2*	(9+)	B	Jπ: ΔJ=1 D(+Q) γ from (10+).
339.3+x[@] *2*	(10+)	B	Jπ: (E2) γ to 8+ isomer.
521.7+x[a] *4*	(11−)	B	Jπ: (11) from D(+Q) γ to (10+); bandhead of (11−) band from systematics.
701.7+x *5*		B	
814.2+x[&] *5*	(12−)	B	Jπ: (11) from D(+Q) γ to (10+): π=(−) based on bandhead of (12−) band from systematics.
854.1+x[#] *4*	(11+)	B	Jπ: in-band (E2) γ to (9+).
890.4+x[@] *4*	(12+)	B	Jπ: in-band E2 γ to (10+).
1097.0+x[a] *5*	(13−)	B	Jπ: in-band E2 γ to (11−).
1198.4+x *5*	(12−,13−)	B	Jπ: γ to (11−) and γ from (14−).
1376.2+x[&] *5*	(14−)	B	Jπ: in-band E2 γ to (12−).
1453.8+x[#] *5*	(13+)	B	Jπ: in-band E2 γ to (11+).
1475.6+x[@] *5*	(14+)	B	Jπ: in-band E2 γ to (12+).
1687.0+x[a] *5*	(15−)	B	Jπ: in-band E2 γ to (13−).
1728.4+x *5*	(14−)	B	Jπ: E2 γ from (16−).
1868.5+x *5*	(14+)	B	Jπ: (E2) γ to (12+).
1973.4+x[&] *5*	(16−)	B	Jπ: in-band E2 γ to (14−).
2187.0+x *5*	(16−)	B	Jπ: (M1+E2) γ to (15−).
2229.9+x[@] *6*	(16+)	B	Jπ: in-band E2 γ to (14+).
2270.4+x[#] *6*	(15+)	B	Jπ: in-band (E2) γ to (13+).
2302.3+x[a] *5*	(17−)	B	Jπ: in-band (E2) γ to (15−).
2385.4+x[b] *5*	(18−)	B	Jπ: in-band E2 γ to (16−).
2439.3+x *5*	(17−)	B	Jπ: (M1+E2) γ to (16−).
2446.2+x *6*	(16+)	B	Jπ: (E2) γ to (14+).
2641.7+x[&] *5*	(18−)	B	Jπ: in-band (E2) γ to (16−).
2741.6+x[c] *6*	(19−)	B	Jπ: (M1+E2) γ from (20−).
3058.3+x[@] *6*	(18+)	B	Jπ: in-band E2 γ to (16+).
3072.4+x[a] *6*	(19−)	B	Jπ: in-band (E2) γ to (17−).
3169.9+x *6*	(18+)	B	Jπ: (E2) γ to (16+).
3217.4+x[b] *6*	(20−)	B	Jπ: (M1+E2) γ to (19−).
3396.6+x[&] *6*	(20−)	B	Jπ: in-band (E2) γ to (18−).
3454.8+x *7*	(20+)	B	Jπ: (E1) γ to (19−).
3458.0+x *6*	(20−)	B	Jπ: E2 γ to (18−).
3638.4+x[c] *6*	(21−)	B	Jπ: in-band (E2) γ to (19−).
3640.4+x *7*	(21+)	B	Jπ: (21) from D(+Q) γ to (20+); π=(+) from expected four quasiparticle configuration assigned by 2013Mo35.
3849.8+x[a] *6*	(21−)	B	Jπ: in-band (E2) γ to (19−).
3997.1+x[b] *6*	(22−)	B	Jπ: in-band (E2) γ to (20−).
4070.8+x *8*	(22+)	B	Jπ: (22) from D(+Q) γ to (21+); π=(+) from expected four quasiparticle configuration assigned by 2013Mo35. $T_{1/2}$: according to 2013Mo35 based on unbalanced intensity between populating / depopulating transitions an isomer with half-life of a few hundreds of ns is expected for (22+) level.
4299.8+x *6*	(22−)	B	Jπ: E2 γ to (20−).
4414.1+x[c] *7*	(23−)	B	Jπ: in-band (E2) γ to (21−).
4552.8+x *8*	(23+)	B	Jπ: (E2) γ to (21+).
4632.4+x[a] *7*	(23−)	B	Jπ: in-band (E2) γ to (21−).
4760.3+x[b] *7*	(24−)	B	Jπ: in-band (E2) γ to (22−).
4930.0+x *8*	(24+)	B	Jπ: E2 γ to (22+).
5171.6+x[c] *7*	(25−)	B	Jπ: in-band (E2) γ to (23−).
5212.8+x *8*	(24+)	B	Jπ: (M1+E2) γ to (23+).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{154}Ho Levels (continued)

E(level)[†]	Jπ[‡]	XREF	Comments
5215.9+x *7*	(25⁻)	B	Jπ: (M1+E2) γ to (24⁻).
5349.0+x *8*	(25⁺)	B	Jπ: E2 γ to (23⁺).
5436.7+x[d] *7*	(27⁻)	B	Six quasiparticles maximum alignment state (2013Mo35). Jπ: E2 γ to (25⁻).
5859.7+x *8*	(26⁺)	B	Jπ: (M1+E2) γ to (25⁺).
5998.6+x[d] *8*	(28)	B	Jπ: D(+Q) γ to (27⁻).
6351.9+x *9*		B	
6454.8+x *8*		B	
6677.0+x *8*	(29⁻)	B	Jπ: (E2) γ to (27⁻).
6882.3+x[d] *8*	(30)	B	Jπ: (E2) γ to (28).
7453.9+x[d] *9*	(32)	B	Jπ: E2 γ to (30).

[†] From least-squares fit to Eγ data (18.8 and 20.9 keV unobserved γ rays not used by fitting procedure).

[‡] Based on multipolarities, assigned configurations and systematic behaviors of neighboring isotopes and isotones, as well as the fact that spin values are generally increasing with excitation energy for heavy-ion induced reactions. According to 2013Mo35 (in ^{141}Pr(^{16}O,3n) dataset) J^{π}'s for the bandheads of the first four bands are consistent with those for the similar collective bands observed in heavier odd-odd isotopes and odd-odd ^{152}Tb. Specific arguments were given by evaluator.

[#] Band(A): $\pi h_{11/2}\otimes\nu f_{7/2}$ band.

[@] Band(B): $\pi h_{11/2}\otimes\nu\ h_{9/2}$ band.

[&] Band(C): $\pi h_{11/2}\otimes\nu\ i_{13/2}$ band,α=0.

[a] Band(c): $\pi h_{11/2}\otimes\nu\ i_{13/2}$ band,α=1.

[b] Band(D): Band based on (18⁻).

[c] Band(E): Band based on (19⁻).

[d] Seq.(F): γ cascade based on (27⁻).

Adopted Levels, Gammas (continued)

γ(^{154}Ho)

Additional information 3.

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[#]	Comments
26.9	1$^+$	26.9 *2*	100	0	2$^-$	E1	2.07 *5*	α(L)=1.62 *4*; α(M)=0.363 *9* α(N)=0.0802 *20*; α(O)=0.00940 *23*; α(P)=0.000267 *6* E_γ: From (1982To14). Other: 27.6 (1982Ba75). Mult.: From α(L)exp=1.50 *15* in ^{154}Er ε decay.
18.8+x		(18.8)	100	0+x	8$^+$			
20.9+x		(20.9)	100	0+x	8$^+$			
58.7+x		58.7 *3*	100	0+x	8$^+$			
213.3+x		154.6 *3*	32 *9*	58.7+x				
		192.4 *3*	100 *9*	20.9+x		D+Q		Additional information 4.
285.0+x	(9$^+$)	71.7 *3*	2.3 *7*	213.3+x				
		264.1 *3*	23 *7*	20.9+x		D(+Q)		Additional information 5.
		266.2 *3*	100 *9*	18.8+x				Additional information 6.
		285.0 *3*	21 *5*	0+x	8$^+$			
339.3+x	(10$^+$)	54.3 *3*	8.0 *20*	285.0+x	(9$^+$)	D(+Q)		Additional information 7.
		318.4 *3*	100 *10*	20.9+x		D		Additional information 8.
		339.3 *3*	16.0 *20*	0+x	8$^+$	(E2)	0.0462 *7*	α(K)=0.0350 *5*; α(L)=0.00862 *12*; α(M)=0.001990 *29* α(N)=0.000455 *7*; α(O)=5.98×10^{-5} *9*; α(P)=1.854×10^{-6} *26* Additional information 9. Mult.: Q or D+Q based on DCO, more likely (E2) (2013Mo35).
521.7+x	(11$^-$)	182.4 *3*	100 *15*	339.3+x	(10$^+$)	D(+Q)		Additional information 10.
701.7+x		180.0 *3*	100	521.7+x	(11$^-$)			
814.2+x	(12$^-$)	292.5 *3*	100	521.7+x	(11$^-$)	D(+Q)		Additional information 11.
854.1+x	(11$^+$)	569.1 *3*	100	285.0+x	(9$^+$)	(E2)	0.01138 *16*	α(K)=0.00922 *13*; α(L)=0.001677 *24*; α(M)=0.000378 *5* α(N)=8.70×10^{-5} *12*; α(O)=1.201×10^{-5} *17*; α(P)=5.19×10^{-7} *7* Additional information 12.
890.4+x	(12$^+$)	551.1 *3*	100	339.3+x	(10$^+$)	E2	0.01233 *17*	α(K)=0.00996 *14*; α(L)=0.001838 *26*; α(M)=0.000415 *6* α(N)=9.54×10^{-5} *13*; α(O)=1.314×10^{-5} *19*; α(P)=5.59×10^{-7} *8* Additional information 13.
1097.0+x	(13$^-$)	575.3 *3*	100	521.7+x	(11$^-$)	E2	0.01108 *16*	α(K)=0.00899 *13*; α(L)=0.001626 *23*; α(M)=0.000366 *5* α(N)=8.43×10^{-5} *12*; α(O)=1.166×10^{-5} *16*; α(P)=5.06×10^{-7} *7* Additional information 14.
1198.4+x	(12$^-$,13$^-$)	101.4 *3*		1097.0+x	(13$^-$)			
		384.2 *3*	60 *20*	814.2+x	(12$^-$)			
		496.7 *3*		701.7+x				
		676.7 *3*	100 *30*	521.7+x	(11$^-$)			
1376.2+x	(14$^-$)	279.2 *3*	100 *17*	1097.0+x	(13$^-$)	D		Additional information 15.
		562.0 *3*	56 *17*	814.2+x	(12$^-$)	E2	0.01174 *17*	α(K)=0.00951 *13*; α(L)=0.001738 *24*; α(M)=0.000392 *6*

$^{154}_{67}Ho_{87}$-4

Adopted Levels, Gammas (continued)

γ(^{154}Ho) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[#]	Comments
								α(N)=9.02×10^{-5} *13*; α(O)=1.244×10^{-5} *18*; α(P)=5.34×10^{-7} *8* Additional information 16.
1453.8+x	(13$^+$)	599.7 *3*	100	854.1+x	(11$^+$)	E2	0.01001 *14*	α(K)=0.00815 *11*; α(L)=0.001448 *20*; α(M)=0.000326 *5* α(N)=7.50×10^{-5} *11*; α(O)=1.040×10^{-5} *15*; α(P)=4.60×10^{-7} *6* Additional information 17.
1475.6+x	(14$^+$)	585.2 *3*	100	890.4+x	(12$^+$)	E2	0.01062 *15*	α(K)=0.00863 *12*; α(L)=0.001550 *22*; α(M)=0.000349 *5* α(N)=8.03×10^{-5} *11*; α(O)=1.112×10^{-5} *16*; α(P)=4.86×10^{-7} *7* Additional information 18.
1687.0+x	(15$^-$)	590.0 *3*	100	1097.0+x	(13$^-$)	E2	0.01041 *15*	α(K)=0.00847 *12*; α(L)=0.001515 *21*; α(M)=0.000341 *5* α(N)=7.85×10^{-5} *11*; α(O)=1.087×10^{-5} *15*; α(P)=4.77×10^{-7} *7* Additional information 19.
1728.4+x	(14$^-$)	530.0 *3*	100	1198.4+x	(12$^-$,13$^-$)			
1868.5+x	(14$^+$)	392.9 *3*	100 *30*	1475.6+x	(14$^+$)	E2	0.0303 *4*	α(K)=0.02352 *33*; α(L)=0.00523 *7*; α(M)=0.001199 *17* α(N)=0.000275 *4*; α(O)=3.67×10^{-5} *5*; α(P)=1.273×10^{-6} *18* Additional information 20.
		978.1 *3*		890.4+x	(12$^+$)	(E2)	0.00335 *5*	α(K)=0.00280 *4*; α(L)=0.000425 *6*; α(M)=9.41×10^{-5} *13* α(N)=2.176×10^{-5} *31*; α(O)=3.11×10^{-6} *4*; α(P)=1.607×10^{-7} *23* Additional information 21.
1973.4+x	(16$^-$)	286.4 *3*	100 *14*	1687.0+x	(15$^-$)	D(+Q)		Additional information 22.
		597.2 *3*	81 *14*	1376.2+x	(14$^-$)	E2	0.01011 *14*	α(K)=0.00823 *12*; α(L)=0.001465 *21*; α(M)=0.000330 *5* α(N)=7.59×10^{-5} *11*; α(O)=1.052×10^{-5} *15*; α(P)=4.64×10^{-7} *7* Additional information 23.
2187.0+x	(16$^-$)	458.6 *3*	33 *10*	1728.4+x	(14$^-$)			
		500.0 *3*	100 *33*	1687.0+x	(15$^-$)	(M1+E2)	0.024 *8*	α(K)=0.020 *7*; α(L)=0.0032 *7*; α(M)=0.00071 *15* α(N)=0.00016 *4*; α(O)=2.3×10^{-5} *6*; α(P)=1.2×10^{-6} *5* Additional information 24.
		810.8 *3*	67 *20*	1376.2+x	(14$^-$)	E2	0.00500 *7*	α(K)=0.00415 *6*; α(L)=0.000661 *9*; α(M)=0.0001471 *21* α(N)=3.40×10^{-5} *5*; α(O)=4.81×10^{-6} *7*; α(P)=2.369×10^{-7} *33* Additional information 25.
2229.9+x	(16$^+$)	754.3 *3*	100	1475.6+x	(14$^+$)	E2	0.00586 *8*	α(K)=0.00485 *7*; α(L)=0.000791 *11*; α(M)=0.0001763 *25* α(N)=4.07×10^{-5} *6*; α(O)=5.73×10^{-6} *8*; α(P)=2.76×10^{-7} *4* Additional information 26.
2270.4+x	(15$^+$)	816.6 *3*	100	1453.8+x	(13$^+$)	(E2)	0.00492 *7*	α(K)=0.00409 *6*; α(L)=0.000650 *9*; α(M)=0.0001445 *20* α(N)=3.34×10^{-5} *5*; α(O)=4.72×10^{-6} *7*; α(P)=2.334×10^{-7} *33* Additional information 27.
2302.3+x	(17$^-$)	615.3 *3*	100	1687.0+x	(15$^-$)	(E2)	0.00941 *13*	α(K)=0.00768 *11*; α(L)=0.001349 *19*; α(M)=0.000303 *4* α(N)=6.98×10^{-5} *10*; α(O)=9.70×10^{-6} *14*; α(P)=4.34×10^{-7} *6* Additional information 28.
2385.4+x	(18$^-$)	83.1 *3*	<1.3	2302.3+x	(17$^-$)			
		198.4 *3*	<1.3	2187.0+x	(16$^-$)			Additional information 29. Mult.: D(+Q) based on DCO value; 2013Mo35 adopted Q.

$^{154}_{67}Ho_{87}$-5

Adopted Levels, Gammas (continued)

γ(^{154}Ho) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[#]	Comments
2385.4+x	(18$^-$)	412.0 *3*	100 *16*	1973.4+x	(16$^-$)	E2	0.0265 *4*	α(K)=0.02074 *29*; α(L)=0.00448 *6*; α(M)=0.001024 *15* α(N)=0.0002346 *33*; α(O)=3.15×10^{-5} *4*; α(P)=1.130×10^{-6} *16* Additional information 30.
2439.3+x	(17$^-$)	252.3 *3*	100	2187.0+x	(16$^-$)	(M1+E2)	0.16 *4*	α(K)=0.12 *4*; α(L)=0.0248 *8*; α(M)=0.00565 *35* α(N)=0.00130 *7*; α(O)=0.000177 *4*; α(P)=7.1×10^{-6} *30* Additional information 31.
		465.9 *3*	100	1973.4+x	(16$^-$)			
2446.2+x	(16$^+$)	216.3 *3*	100	2229.9+x	(16$^+$)			
		970.6 *3*	100	1475.6+x	(14$^+$)	(E2)	0.00340 *5*	α(K)=0.00285 *4*; α(L)=0.000433 *6*; α(M)=9.58×10^{-5} *13* α(N)=2.215×10^{-5} *31*; α(O)=3.16×10^{-6} *4*; α(P)=1.632×10^{-7} *23* Additional information 32.
2641.7+x	(18$^-$)	339.4 *3*	100 *30*	2302.3+x	(17$^-$)	D		Additional information 33.
		668.3 *3*	100 *30*	1973.4+x	(16$^-$)	(E2)	0.00774 *11*	α(K)=0.00635 *9*; α(L)=0.001080 *15*; α(M)=0.0002419 *34* α(N)=5.58×10^{-5} *8*; α(O)=7.79×10^{-6} *11*; α(P)=3.60×10^{-7} *5* Additional information 34.
2741.6+x	(19$^-$)	356.2 *3*	100	2385.4+x	(18$^-$)	D(+Q)		Additional information 35.
3058.3+x	(18$^+$)	828.4 *3*	100	2229.9+x	(16$^+$)	E2	0.00477 *7*	α(K)=0.00396 *6*; α(L)=0.000628 *9*; α(M)=0.0001395 *20* α(N)=3.22×10^{-5} *5*; α(O)=4.57×10^{-6} *6*; α(P)=2.264×10^{-7} *32* Additional information 36.
3072.4+x	(19$^-$)	687.0 *3*	<25	2385.4+x	(18$^-$)	D(+Q)		Additional information 37.
		770.1 *3*	100 *30*	2302.3+x	(17$^-$)	(E2)	0.00560 *8*	α(K)=0.00464 *7*; α(L)=0.000751 *11*; α(M)=0.0001673 *23* α(N)=3.86×10^{-5} *5*; α(O)=5.45×10^{-6} *8*; α(P)=2.64×10^{-7} *4* Additional information 38.
3169.9+x	(18$^+$)	940.0 *3*	<100	2229.9+x	(16$^+$)	(E2)	0.00364 *5*	α(K)=0.00304 *4*; α(L)=0.000466 *7*; α(M)=0.0001032 *14* α(N)=2.385×10^{-5} *33*; α(O)=3.40×10^{-6} *5*; α(P)=1.742×10^{-7} *24* Additional information 39.
3217.4+x	(20$^-$)	475.8 *3*	<167	2741.6+x	(19$^-$)	(M1+E2)	0.027 *9*	α(K)=0.023 *8*; α(L)=0.0036 *8*; α(M)=0.00081 *16* α(N)=0.00019 *4*; α(O)=2.7×10^{-5} *6*; α(P)=1.3×10^{-6} *5* Additional information 40.
		832.0 *3*	100 *33*	2385.4+x	(18$^-$)			
3396.6+x	(20$^-$)	324.2 *3*	10 *3*	3072.4+x	(19$^-$)	D(+Q)		Additional information 41.
		754.9 *3*	100 *30*	2641.7+x	(18$^-$)	(E2)	0.00585 *8*	α(K)=0.00484 *7*; α(L)=0.000789 *11*; α(M)=0.0001760 *25* α(N)=4.06×10^{-5} *6*; α(O)=5.72×10^{-6} *8*; α(P)=2.76×10^{-7} *4* Additional information 42.
3454.8+x	(20$^+$)	713.2 *3*	100	2741.6+x	(19$^-$)	(E1)	2.52×10^{-3} *4*	α(K)=0.002147 *30*; α(L)=0.000292 *4*; α(M)=6.38×10^{-5} *9* α(N)=1.475×10^{-5} *21*; α(O)=2.130×10^{-6} *30*; α(P)=1.177×10^{-7} *17* Additional information 43. Mult.: D interpreted by 2013Mo35 as (E1) from comparison with 279.2γ, 286.4γ, and 356.2γ known (M1(+E2)) transitions with DCO=0.65-0.69 (2013Mo35).
3458.0+x	(20$^-$)	816.2 *3*	50 *15*	2641.7+x	(18$^-$)	(E2)	0.00492 *7*	α(K)=0.00409 *6*; α(L)=0.000651 *9*; α(M)=0.0001447 *20*

$^{154}_{67}Ho_{87}$-6

Adopted Levels, Gammas (continued)

γ(^{154}Ho) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[#]	Comments
								α(N)=3.34×10^{-5} *5*; α(O)=4.73×10^{-6} *7*; α(P)=2.336×10^{-7} *33* Additional information 44.
3458.0+x	(20$^-$)	1072.6 *3*	100 *30*	2385.4+x	(18$^-$)	E2	0.00277 *4*	α(K)=0.002328 *33*; α(L)=0.000346 *5*; α(M)=7.64×10^{-5} *11* α(N)=1.768×10^{-5} *25*; α(O)=2.53×10^{-6} *4*; α(P)=1.335×10^{-7} *19* Additional information 45.
3638.4+x	(21$^-$)	896.8 *3*	100	2741.6+x	(19$^-$)	(E2)	0.00402 *6*	α(K)=0.00335 *5*; α(L)=0.000519 *7*; α(M)=0.0001153 *16* α(N)=2.66×10^{-5} *4*; α(O)=3.79×10^{-6} *5*; α(P)=1.919×10^{-7} *27* Additional information 46.
3640.4+x	(21$^+$)	185.6 *3*	100	3454.8+x	(20$^+$)	D(+Q)		Additional information 47.
3849.8+x	(21$^-$)	777.4 *3*	100	3072.4+x	(19$^-$)	(E2)	0.00548 *8*	α(K)=0.00454 *6*; α(L)=0.000733 *10*; α(M)=0.0001634 *23* α(N)=3.77×10^{-5} *5*; α(O)=5.32×10^{-6} *7*; α(P)=2.59×10^{-7} *4* Additional information 48.
3997.1+x	(22$^-$)	358.7 *3*	100 *30*	3638.4+x	(21$^-$)	D(+Q)		Additional information 49.
		779.7 *3*	100 *30*	3217.4+x	(20$^-$)	(E2)	0.00545 *8*	α(K)=0.00451 *6*; α(L)=0.000728 *10*; α(M)=0.0001622 *23* α(N)=3.74×10^{-5} *5*; α(O)=5.28×10^{-6} *7*; α(P)=2.57×10^{-7} *4* Additional information 50.
4070.8+x	(22$^+$)	430.4 *3*	100	3640.4+x	(21$^+$)	D(+Q)		Additional information 51.
4299.8+x	(22$^-$)	841.8 *3*	100	3458.0+x	(20$^-$)	E2	0.00460 *6*	α(K)=0.00383 *5*; α(L)=0.000604 *8*; α(M)=0.0001342 *19* α(N)=3.10×10^{-5} *4*; α(O)=4.39×10^{-6} *6*; α(P)=2.189×10^{-7} *31* Additional information 52.
4414.1+x	(23$^-$)	775.7 *3*	100 *2*	3638.4+x	(21$^-$)	(E2)	0.00551 *8*	α(K)=0.00456 *6*; α(L)=0.000737 *10*; α(M)=0.0001643 *23* α(N)=3.79×10^{-5} *5*; α(O)=5.35×10^{-6} *8*; α(P)=2.60×10^{-7} *4* Additional information 53.
4552.8+x	(23$^+$)	912.4 *3*	100	3640.4+x	(21$^+$)	(E2)	0.00387 *5*	α(K)=0.00324 *5*; α(L)=0.000499 *7*; α(M)=0.0001106 *16* α(N)=2.56×10^{-5} *4*; α(O)=3.64×10^{-6} *5*; α(P)=1.852×10^{-7} *26* Additional information 54.
4632.4+x	(23$^-$)	782.6 *3*	100	3849.8+x	(21$^-$)	(E2)	0.00540 *8*	α(K)=0.00448 *6*; α(L)=0.000721 *10*; α(M)=0.0001607 *23* α(N)=3.71×10^{-5} *5*; α(O)=5.24×10^{-6} *7*; α(P)=2.55×10^{-7} *4* Additional information 55.
4760.3+x	(24$^-$)	346.2 *3*	100 *30*	4414.1+x	(23$^-$)	D(+Q)		Additional information 56.
		763.2 *3*	60 *20*	3997.1+x	(22$^-$)	(E2)	0.00571 *8*	α(K)=0.00473 *7*; α(L)=0.000768 *11*; α(M)=0.0001712 *24* α(N)=3.95×10^{-5} *6*; α(O)=5.57×10^{-6} *8*; α(P)=2.70×10^{-7} *4* Additional information 57.
4930.0+x	(24$^+$)	377.2 *3*	100 *30*	4552.8+x	(23$^+$)	(M1+E2)	0.050 *16*	α(K)=0.041 *15*; α(L)=0.0071 *11*; α(M)=0.00159 *21* α(N)=0.00037 *5*; α(O)=5.1×10^{-5} *9*; α(P)=2.4×10^{-6} *10* Additional information 58.
		859.2 *3*	30 *10*	4070.8+x	(22$^+$)	E2	0.00440 *6*	α(K)=0.00367 *5*; α(L)=0.000575 *8*; α(M)=0.0001277 *18* α(N)=2.95×10^{-5} *4*; α(O)=4.19×10^{-6} *6*; α(P)=2.098×10^{-7} *29* Additional information 59.
5171.6+x	(25$^-$)	757.5 *3*	100	4414.1+x	(23$^-$)	(E2)	0.00581 *8*	α(K)=0.00481 *7*; α(L)=0.000782 *11*; α(M)=0.0001744 *24*

$^{154}_{67}Ho_{87}$-7

Adopted Levels, Gammas (continued)

γ(^{154}Ho) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[#]	Comments
								α(N)=4.03×10^{-5} *6*; α(O)=5.67×10^{-6} *8*; α(P)=2.74×10^{-7} *4* Additional information 60.
5212.8+x	(24$^+$)	282.8 *3*	100	4930.0+x	(24$^+$)			
		660.0 *3*	100	4552.8+x	(23$^+$)	(M1+E2)	0.012 *4*	α(K)=0.0100 *35*; α(L)=0.0015 *4*; α(M)=3.4×10^{-4} *8* α(N)=7.8×10^{-5} *20*; α(O)=1.12×10^{-5} *31*; α(P)=5.9×10^{-7} *22* Additional information 61.
5215.9+x	(25$^-$)	455.6 *3*	100	4760.3+x	(24$^-$)	(M1+E2)	0.031 *10*	α(K)=0.025 *9*; α(L)=0.0041 *9*; α(M)=0.00092 *18* α(N)=0.00021 *4*; α(O)=3.0×10^{-5} *7*; α(P)=1.5×10^{-6} *6* Additional information 62.
5349.0+x	(25$^+$)	136.2 *3*	50 *50*	5212.8+x	(24$^+$)			
		796.2 *3*	100 *40*	4552.8+x	(23$^+$)	E2	0.00520 *7*	α(K)=0.00431 *6*; α(L)=0.000691 *10*; α(M)=0.0001539 *22* α(N)=3.55×10^{-5} *5*; α(O)=5.02×10^{-6} *7*; α(P)=2.462×10^{-7} *35* Additional information 63.
5436.7+x	(27$^-$)	220.8 *3*	<33	5215.9+x	(25$^-$)	E2	0.1759 *26*	α(K)=0.1200 *17*; α(L)=0.0432 *6*; α(M)=0.01016 *15* α(N)=0.002307 *35*; α(O)=0.000291 *4*; α(P)=5.82×10^{-6} *8* Additional information 64.
		265.1 *3*	100 *33*	5171.6+x	(25$^-$)	E2	0.0979 *14*	α(K)=0.0705 *10*; α(L)=0.02120 *31*; α(M)=0.00495 *7* α(N)=0.001127 *17*; α(O)=0.0001446 *21*; α(P)=3.56×10^{-6} *5* Additional information 65.
5859.7+x	(26$^+$)	510.7 *3*	100	5349.0+x	(25$^+$)	(M1+E2)	0.023 *8*	α(K)=0.019 *7*; α(L)=0.0030 *7*; α(M)=0.00067 *15* α(N)=0.000154 *34*; α(O)=2.2×10^{-5} *6*; α(P)=1.1×10^{-6} *4* Additional information 66.
		646.9 *3*	100	5212.8+x	(24$^+$)	(E2)	0.00835 *12*	α(K)=0.00684 *10*; α(L)=0.001178 *17*; α(M)=0.000264 *4* α(N)=6.09×10^{-5} *9*; α(O)=8.49×10^{-6} *12*; α(P)=3.87×10^{-7} *5* Additional information 67.
5998.6+x	(28)	561.9 *3*	100	5436.7+x	(27$^-$)	D(+Q)		Additional information 68.
6351.9+x		492.2 *3*	100	5859.7+x	(26$^+$)			
6454.8+x		1018.1 *3*	100	5436.7+x	(27$^-$)			
6677.0+x	(29$^-$)	1240.3 *3*	100	5436.7+x	(27$^-$)	(E2)	2.08×10^{-3} *3*	α(K)=0.001749 *24*; α(L)=0.0002530 *35*; α(M)=5.57×10^{-5} *8* α(N)=1.290×10^{-5} *18*; α(O)=1.859×10^{-6} *26*; α(P)=1.003×10^{-7} *14*; α(IPF)=1.005×10^{-5} *15* Additional information 69.
6882.3+x	(30)	883.7 *3*	100	5998.6+x	(28)	(E2)	0.00415 *6*	α(K)=0.00346 *5*; α(L)=0.000538 *8*; α(M)=0.0001194 *17* α(N)=2.76×10^{-5} *4*; α(O)=3.92×10^{-6} *5*; α(P)=1.979×10^{-7} *28* Additional information 70.
7453.9+x	(32)	571.6 *3*	100	6882.3+x	(30)	E2	0.01126 *16*	α(K)=0.00913 *13*; α(L)=0.001656 *23*; α(M)=0.000373 *5* α(N)=8.59×10^{-5} *12*; α(O)=1.187×10^{-5} *17*; α(P)=5.13×10^{-7} *7* Additional information 71.

$^{154}_{67}Ho_{87}$-8

Adopted Levels, Gammas (continued)

$\gamma(^{154}Ho)$ (continued)

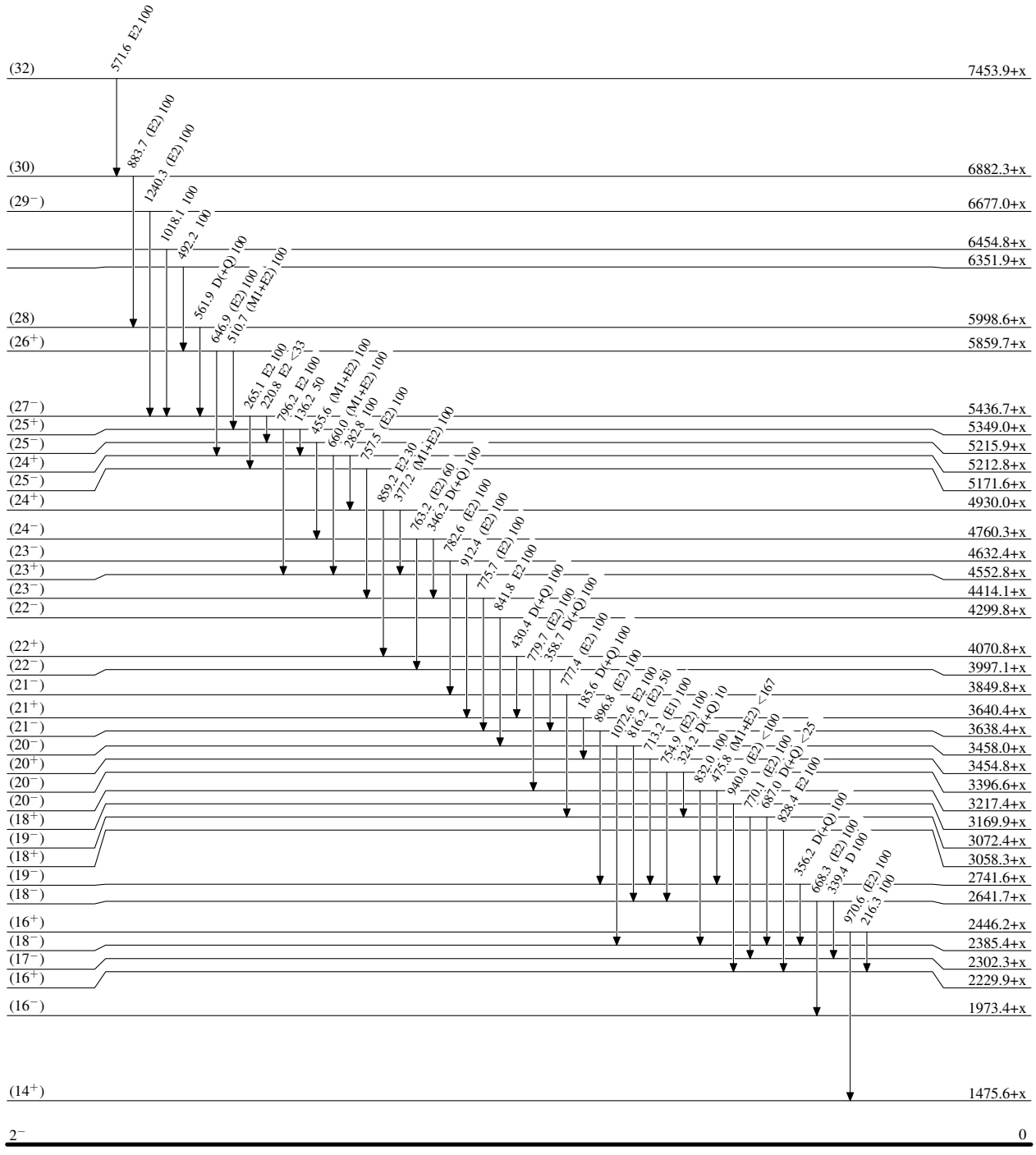
† From $^{141}Pr(^{16}O,3n)$ (2013Mo35).
‡ Adopted by evaluator based on the DCO results from $^{141}Pr(^{16}O,3n)$ dataset (2013Mo35) – see dataset for details.
# Additional information 72.

$^{154}_{67}Ho_{87}$-9

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{154}_{67}Ho_{87}$

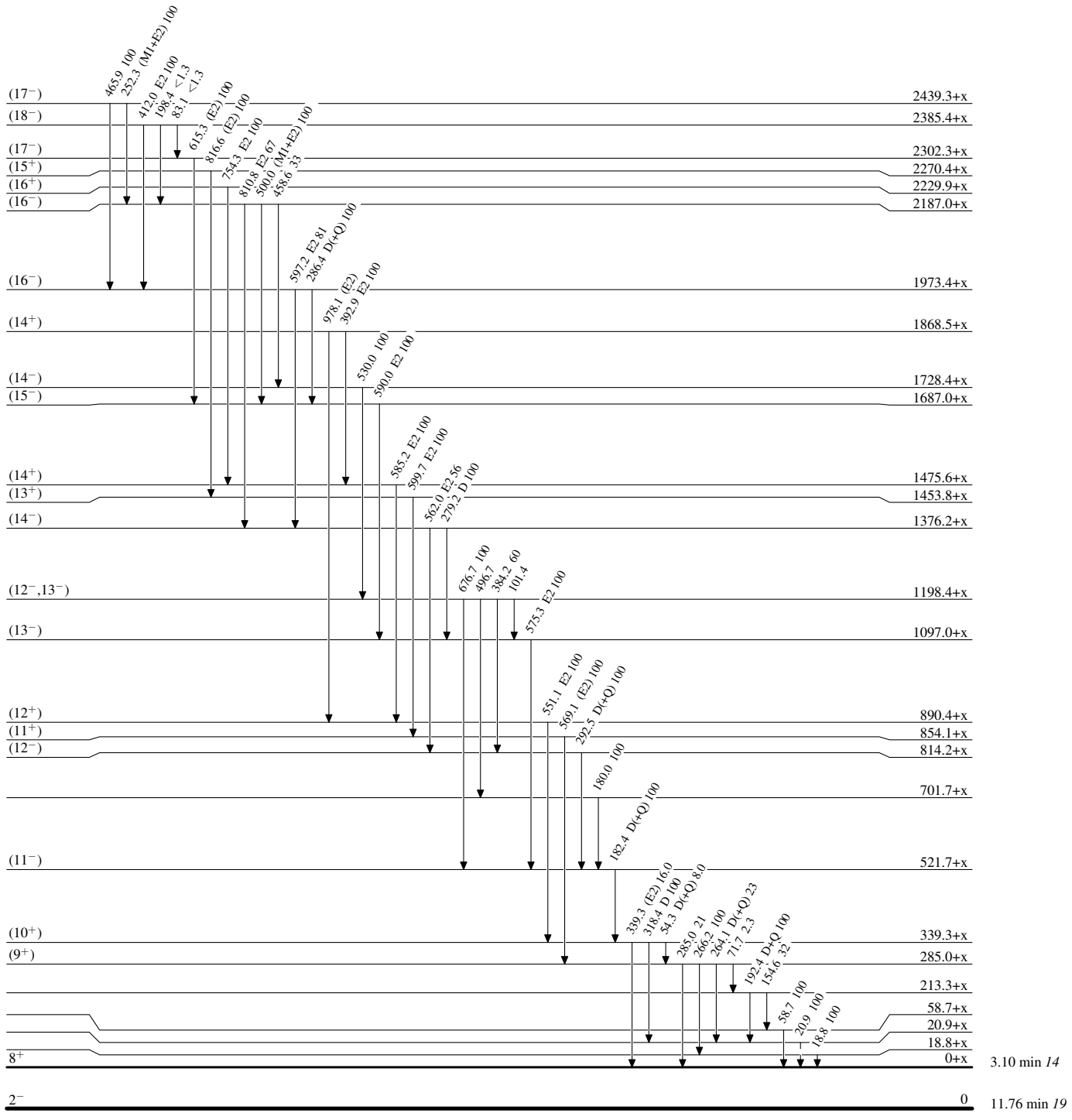
Adopted Levels, Gammas

Legend

Level Scheme (continued)

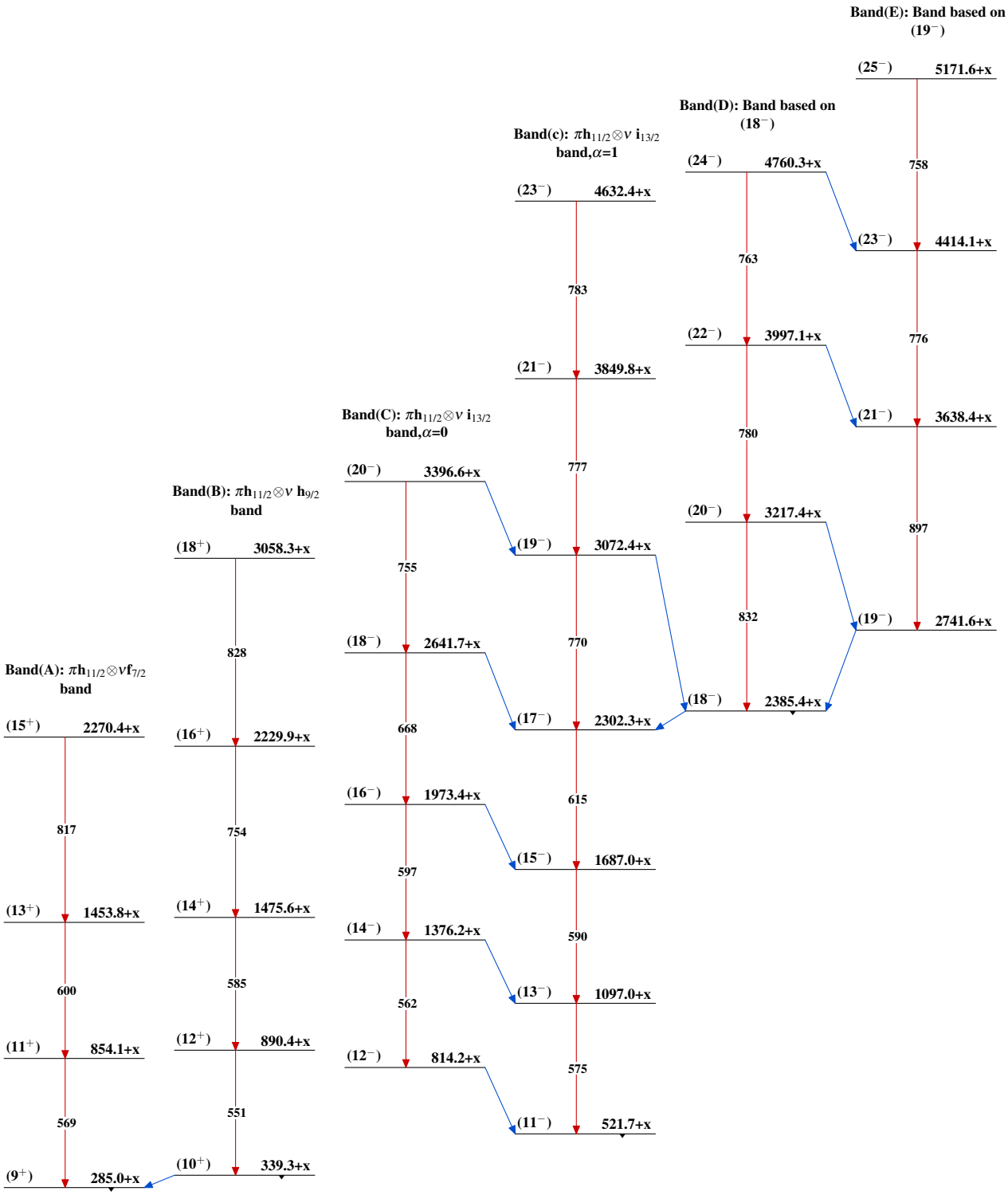
Intensities: Relative photon branching from each level

γ Decay (Uncertain)



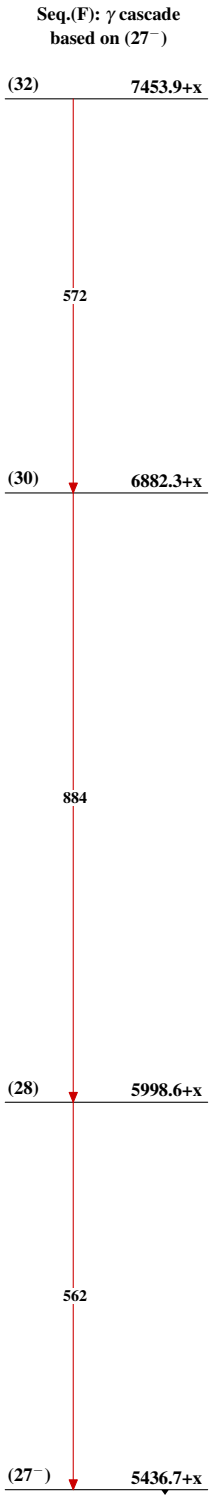
$^{154}_{67}Ho_{87}$

Adopted Levels, Gammas



$^{154}_{67}Ho_{87}$

Adopted Levels, Gammas (continued)



$^{154}_{67}Ho_{87}$