

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS	110, 507 (2009)	1-Oct-2008

$Q(\beta^-) = -616.3$; $S(n) = 7922.7$ 16; $S(p) = 4808.3$; $Q(\alpha) = 2324.3$ 2012Wa38

Note: Current evaluation has used the following Q record.

$Q(\beta^-) = -616.24$; $S(n) = 7924.0$ 15; $S(p) = 4809.6$ 22; $Q(\alpha) = 2322.2$ 26 2003Au03

Production Cross Section: 2004AdZX.

 ^{145}Pm LevelsCross Reference (XREF) Flags

A	^{145}Sm ε decay	D	$^{146}\text{Nd}(p, 2n\gamma)$
B	$^{144}\text{Nd}(^3\text{He}, d)$	E	(HI, xn γ)
C	$^{145}\text{Nd}(p, n\gamma)$		

E(level) ^{†@}	J ^π #	T _{1/2}	XREF	Comments
0.0&	5/2 ⁺	17.7 y 4	ABCDE	% ε =100; % α = 2.8×10^{-7} (1962Nu01) T _{1/2} : from 1959Br65. J ^π : L=2 in ($^3\text{He}, d$), log ft=6.7 to 7/2 ⁻ . Configuration=(π d _{5/2}).
61.25 ^a 5	7/2 ⁺	2.64 ns 6	ABCDE	J ^π : L=4 in ($^3\text{He}, d$), γ to 5/2 ⁺ is M1+E2. Configuration=(π g _{7/2}). T _{1/2} : from ^{145}Sm ε decay. Other: 2.5 ns 3 (p, 2n γ) (1980Ko16).
492.31 ^b 15	3/2 ⁺		ABCDE	J ^π : L=2 in ($^3\text{He}, d$), γ from 1/2 ⁺ is M1+E2.
660.5 ^b 5	(5/2) ⁺		CDE	J ^π : γ to 5/2 ⁺ is $\Delta J=1$ M1+(E2), γ to 7/2 ⁺ is (E2). Band member in (HI, xn γ).
669.7& 3	7/2 ⁺		CDE	J ^π : $\Delta J=1$, M1+E2 γ from 669.7 to 5/2 ⁺ , M1+E2 γ from 1101 to 11/2 ⁻ and a $\Delta J=1$, E1 γ connecting 1101 and 669.7 levels uniquely establish J ^π (669.7)=7/2 ⁺ and J ^π (1101)=9/2 ⁻ .
713.6 ^a 5	9/2 ⁺		CDE	J ^π : γ to 7/2 ⁺ is $\Delta J=1$, M1+E2; γ from 9/2 ⁻ .
726.5 4	1/2 ⁺		B DE	J ^π : L=0 in ($^3\text{He}, d$).
750.4& 3	9/2 ⁺		CDE	J ^π : γ to 5/2 ⁺ is $\Delta J=2$, E2; γ to 7/2 ⁺ .
773	(3/2) ⁺ ‡		B	
794.6 ^c 4	11/2 ⁻	17.1 ns 10	BCDE	T _{1/2} : weighted average of 16.3 ns 15 (1980Ko16) and 18.3 ns 19 (1976Sh05) in (p, xn γ), 17 ns 2 (1996Ur03). J ^π : γ to 7/2 ⁺ is M2, L=5 in ($^3\text{He}, d$).
823.5 ^b 5	5/2 ⁺		D	J ^π : γ to 7/2 ⁺ and 3/2 ⁺ are M1+E2. Band member in (HI, xn γ).
836.5 ^a 5	11/2 ⁺		CDE	J ^π : γ to 7/2 ⁺ is $\Delta J=2$, E2; γ to 9/2 ⁺ .
883.8 3	7/2 ⁺ , 5/2 ⁺		CD	J ^π : γ to 5/2 ⁺ is $\Delta J=1$, M1+E2, γ to 7/2 ⁺ is M1+E2.
958.0 4	(3/2) ⁺		BCD	J ^π : L=2 in ($^3\text{He}, d$), γ to 5/2 ⁺ is $\Delta J=(1)$, M1+E2.
1057.3 5	1/2 ⁺		B D	J ^π : L=0 in ($^3\text{He}, d$).
1101.8 6	9/2 ⁻		CDE	J ^π : see comment to 669.7 level.
1206.8& 6	11/2 ⁺		CDE	J ^π : $\Delta J=1$, M1+E2 γ from 1207 level to 9/2 ⁺ , $\Delta J=2$, E2 γ from 1397 to 9/2 ⁺ , and a $\Delta J=1$, M1 γ connecting the 1397 and 1207 levels are consistent with J ^π (1207):J ^π (1397)=7/2 ⁺ :5/2 ⁺ or 11/2 ⁺ :13/2 ⁺ . The absence of feeding from either level to levels with J<7/2 rules out the first alternative.
1215.2 5			D	
1233.9 5	(3/2) ⁺ ‡		B D	
1260 5			B	
1284.0 6	(11/2) ⁻		CDE	J ^π : γ to 9/2 ⁺ is $\Delta J=1$, E1; uncertain 62.0 γ from 13/2 ⁺ .
1291.9 6			D	
1311.7 6			D	
1346.9 ^a 6	13/2 ⁺		CDE	J ^π : γ to 9/2 ⁺ is $\Delta J=2$, E2; γ to 11/2 ⁺ .

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Adopted Levels, Gammas (continued) ^{145}Pm Levels (continued)

E(level) ^{†@}	J ^π #	XREF	Comments
1365.9 6		D	
1384.9 7	7/2 ⁻	B DE	J ^π : L=3 in (³ He,d); γ to 9/2 ⁻ is M1+E2.
1388.5 8		D	
1397.2& 7	13/2 ⁺	CDE	J ^π : see 1207 level.
1447.91 ^c 14	15/2 ⁻	E	
1455.7 8		D	
1489	(3/2 ⁺) [‡]	B	
1493.6 8	13/2 ⁺	CDE	J ^π : γ to 11/2 ⁺ is ΔJ=1, M1; no γ to J<11/2 ⁺ .
1502.0 ^a 8	15/2 ⁺	DE	J ^π : γ to 11/2 ⁺ is ΔJ=2, E2; γ to 13/2 ⁺ .
1507	(3/2 ⁺) [‡]	B	
1558.3 8		D	
1563		B	
1582.61 23		E	
1648.7& 9	15/2 ⁺	CDE	J ^π : γ to 13/2 ⁺ is ΔJ=1, D; 442γ to 11/2 ⁺ .
1716	1/2 ⁺	B	J ^π : L=0 in (³ He,d).
1753	1/2 ⁺	B	J ^π : L=0+5 in (³ He,d) for doublet, shell model.
1753	(11/2) ⁻	B	J ^π : L=0+5 in (³ He,d) for doublet, shell model.
1809	(1/2 ⁺)	B	J ^π : L=(0) in (³ He,d).
1836.64 24		E	
1844.76 ^a 16	17/2 ⁺	E	
1849		B	
1896.57& 24	17/2 ⁺	E	
1978	1/2 ⁺	B	J ^π : L=0 in (³ He,d).
2008	(3/2 ⁺) [‡]	B	
2013.47 4		E	
2026.01 ^c 17	19/2 ⁻	E	
2112	1/2 ⁺	B	J ^π : L=0 in (³ He,d).
2124.70 ^a 18	19/2 ⁺	E	
2168		B	
2190	(3/2 ⁺) [‡]	B	
2210	(3/2 ⁺) [‡]	B	
2282	(3/2 ⁺) [‡]	B	
2294	(3/2 ⁺) [‡]	B	J ^π : L=2 for doublet 2282+2294.
2329		B	
2401		B	
2431		B	
2441.57 ^d 22	21/2 ⁽⁺⁾	E	
2448.60 ^c 19	23/2 ⁻	E	
2474		B	
2562		B	
2615.29 25	(21/2 ⁺)	E	
2811.57 ^d 23	23/2 ⁽⁺⁾	E	
3052.42 ^c 20	27/2 ⁻	E	
3159.93 ^d 22	25/2 ⁽⁺⁾	E	
3497.06 ^d 24	27/2 ⁽⁺⁾	E	
3665.34 ^e 25	(25/2)	E	
3760.41 ^d 24	29/2 ⁽⁺⁾	E	
3850.9 3	(27/2)	E	
4013.8 ^d 3	(31/2 ⁺)	E	
4086.25 ^e 25	(27/2)	E	
4223.7 ^c 3	(29/2)	E	J ^π : 1171γ is ΔJ=1 (1996Ur03).

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Adopted Levels, Gammas (continued) ^{145}Pm Levels (continued)

E(level) ^{†@}	J ^π [#]	XREF	Comments
4362.6 ^d 3	(31/2 ⁺ ,33/2 ⁺)	E	J ^π : from DCO(1337γ) (1996Ur03).
4389.71 ^e 25	(29/2)	E	
4701.4 ^e 3	(31/2)	E	
4760.3 ^d 4	(35/2 ⁺ ,37/2 ⁺)	E	
4935.1 ^e 4	(33/2)	E	
5030.5 ^c 4		E	
5482.7 4	(35/2 ⁺ ,37/2 ⁺)	E	
5727.3 5		E	
5891.7 4	(39/2 ⁺ ,41/2 ⁺)	E	
6130.7 5		E	
6853.7 5		E	
7216.8 6		E	

[†] Deduced by evaluators from least-squares fit to adopted γ-ray energies, unless otherwise specified.

[‡] L=2 in (³He,d). Since almost all expected strength for L=2, d5/2 levels was observed in the transition to the 5/2⁺ g.s., the other L=2 levels are probably 3/2⁺ (d3/2).

[#] Unless explicitly given, J^π are from (HI,xnγ) based on mult, DCO ratios, band assignments. See [1996Ur03](#) for shell model configuration assignments.

[@] Deduced by evaluators from least-squares fit to adopted γ-ray energies, unless otherwise specified.

[&] Band(A): 5/2⁺, g.s. band.

^a Band(B): 7/2⁺ band.

^b Band(C): 3/2⁺ band.

^c Band(D): 11/2⁻ band.

^d Band(E): 21/2⁺ band.

^e Band(F): (25/2) band.

Adopted Levels, Gammas (continued)

$\gamma(^{145}\text{Pm})$

Most γ -ray data are from (HI,xn γ), ¹⁴⁶Nd(p,2n γ), and ¹⁴⁵Nd(p,n γ), unless otherwise specified.

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	δ	$\alpha^\dagger$	Comments
61.25	7/2 ⁺	61.23 2	100	0.0	5/2 ⁺	M1+(E2)	<0.045	6.38	$\alpha(\text{K})=5.40$ 8; $\alpha(\text{L})=0.773$ 14; $\alpha(\text{M})=0.165$ 3; $\alpha(\text{N}+..)=0.0431$ 8 $\alpha(\text{N})=0.0372$ 7; $\alpha(\text{O})=0.00559$ 10; $\alpha(\text{P})=0.000349$ 5 B(M1)(W.u.)>0.0048; B(E2)(W.u.)<1.5 E_γ , Mult., δ : From ¹⁴⁵ Sm ϵ Decay. I_γ : From ¹⁴⁵ Sm ϵ Decay.
492.31	3/2 ⁺	431.4 5 492.55 7	1.6 1 100	61.25 7/2 ⁺ 0.0 5/2 ⁺	7/2 ⁺ 5/2 ⁺	M1(+E2)		0.017 4	$\alpha(\text{K})=0.014$ 4; $\alpha(\text{L})=0.0021$ 3; $\alpha(\text{M})=0.00045$ 6; $\alpha(\text{N}+..)=0.000116$ 17 $\alpha(\text{N})=0.000100$ 15; $\alpha(\text{O})=1.48 \times 10^{-5}$ 25; $\alpha(\text{P})=9.E-7$ 3 E_γ , I_γ : From ¹⁴⁵ Sm ϵ Decay.
660.5	(5/2) ⁺	168.04 5 599.1 5	9.5 8 100 8	492.31 3/2 ⁺ 61.25 7/2 ⁺	3/2 ⁺ 7/2 ⁺	M1+E2 [‡] (E2)		0.361 7 0.00769 11	$\alpha(\text{K})=0.28$ 3; $\alpha(\text{L})=0.065$ 23; $\alpha(\text{M})=0.014$ 6; $\alpha(\text{N}+..)=0.0036$ 13 $\alpha(\text{N})=0.0032$ 12; $\alpha(\text{O})=0.00044$ 13; $\alpha(\text{P})=1.6 \times 10^{-5}$ 4 $\alpha=0.00769$ 11; $\alpha(\text{K})=0.00641$ 9; $\alpha(\text{L})=0.001007$ 15; $\alpha(\text{M})=0.000217$ 3; $\alpha(\text{N}+..)=5.60 \times 10^{-5}$ 8 $\alpha(\text{N})=4.86 \times 10^{-5}$ 7; $\alpha(\text{O})=7.10 \times 10^{-6}$ 10; $\alpha(\text{P})=3.77 \times 10^{-7}$ 6
669.7	7/2 ⁺	608.6 4 669.7 3	19 2 100 5	61.25 7/2 ⁺ 0.0 5/2 ⁺	7/2 ⁺ 5/2 ⁺	M1+E2	0.44 7	0.00899 21	$\alpha=0.00899$ 21; $\alpha(\text{K})=0.00767$ 19; $\alpha(\text{L})=0.001039$ 22; $\alpha(\text{M})=0.000221$ 5; $\alpha(\text{N}+..)=5.78 \times 10^{-5}$ 12 $\alpha(\text{N})=4.98 \times 10^{-5}$ 11; $\alpha(\text{O})=7.52 \times 10^{-6}$ 16; $\alpha(\text{P})=4.79 \times 10^{-7}$ 12 $\alpha=0.00909$ 15; $\alpha(\text{K})=0.00774$ 13; $\alpha(\text{L})=0.001064$ 17; $\alpha(\text{M})=0.000227$ 4; $\alpha(\text{N}+..)=5.92 \times 10^{-5}$ 10 $\alpha(\text{N})=5.10 \times 10^{-5}$ 8; $\alpha(\text{O})=7.68 \times 10^{-6}$ 13; $\alpha(\text{P})=4.81 \times 10^{-7}$ 9
726.5	1/2 ⁺	234.00 6	100	492.31 3/2 ⁺	3/2 ⁺				
750.4	9/2 ⁺	80.76 5 750.4 3	2.3 3 100 5	669.7 7/2 ⁺ 0.0 5/2 ⁺	7/2 ⁺ 5/2 ⁺	M1+E2 [‡] E2		3.9 11 0.00446 7	$\alpha(\text{K})=2.27$ 17; $\alpha(\text{L})=1.3$ 10; $\alpha(\text{M})=0.29$ 22; $\alpha(\text{N}+..)=0.07$ 6 $\alpha(\text{N})=0.06$ 5; $\alpha(\text{O})=0.008$ 6; $\alpha(\text{P})=0.00012$ 4 $\alpha=0.00446$ 7; $\alpha(\text{K})=0.00376$ 6; $\alpha(\text{L})=0.000555$ 8; $\alpha(\text{M})=0.0001190$ 17; $\alpha(\text{N}+..)=3.08 \times 10^{-5}$ 5 $\alpha(\text{N})=2.67 \times 10^{-5}$ 4; $\alpha(\text{O})=3.94 \times 10^{-6}$ 6; $\alpha(\text{P})=2.24 \times 10^{-7}$ 4
794.6	11/2 ⁻	(44.2)		750.4 9/2 ⁺	9/2 ⁺				E_γ : transition is not seen but is required to account for the delayed component in 750.4 γ . E_γ is from E(level) difference.
		80.7 [#] 3	6 3	713.6 9/2 ⁺	9/2 ⁺	E1		0.479 9	$\alpha(\text{K})=0.402$ 7; $\alpha(\text{L})=0.0600$ 11; $\alpha(\text{M})=0.01277$ 23; $\alpha(\text{N}+..)=0.00324$ 6 $\alpha(\text{N})=0.00282$ 5; $\alpha(\text{O})=0.000398$ 7; $\alpha(\text{P})=1.92 \times 10^{-5}$ 4 B(E1)(W.u.)=1.4 $\times 10^{-6}$ 8
		733.4 3	100 10	61.25 7/2 ⁺	7/2 ⁺	M2		0.0211	$\alpha(\text{K})=0.0178$ 3; $\alpha(\text{L})=0.00259$ 4; $\alpha(\text{M})=0.000557$ 8; $\alpha(\text{N}+..)=0.0001459$ 21 $\alpha(\text{N})=0.0001257$ 18; $\alpha(\text{O})=1.90 \times 10^{-5}$ 3; $\alpha(\text{P})=1.196 \times 10^{-6}$ 17 B(M2)(W.u.)=0.27 4
		794.6 5	4.8 19	0.0 5/2 ⁺	5/2 ⁺	E3		0.00903 13	$\alpha=0.00903$ 13; $\alpha(\text{K})=0.00735$ 11; $\alpha(\text{L})=0.001323$ 19;

Adopted Levels, Gammas (continued)

$\gamma(^{145}\text{Pm})$ (continued)

<u>E_i(level)</u>	<u>J_i^{π}</u>	<u>E_{γ}</u>	<u>I_{γ}</u>	<u>E_f</u>	<u>J_f^{π}</u>	<u>Mult.</u>	<u>δ</u>	<u>$\alpha^{\dagger}$</u>	<u>Comments</u>
									$\alpha(\text{M})=0.000289$ 4; $\alpha(\text{N}+..)=7.45\times 10^{-5}$ 11 $\alpha(\text{N})=6.47\times 10^{-5}$ 10; $\alpha(\text{O})=9.37\times 10^{-6}$ 14; $\alpha(\text{P})=4.60\times 10^{-7}$ 7 $\text{B}(\text{E}3)(\text{W.u.})=12$ 5
823.5	5/2 ⁺	153.78 5 163.3 3 331.00 8	11 2 31 16 100 8	669.7 660.5 492.31	7/2 ⁺ (5/2) ⁺ 3/2 ⁺	E2 [‡]		0.0056 14	$\alpha=0.0056$ 14; $\alpha(\text{K})=0.0048$ 12; $\alpha(\text{L})=0.00066$ 14; $\alpha(\text{M})=0.00014$ 3; $\alpha(\text{N}+..)=3.7\times 10^{-5}$ 8 $\alpha(\text{N})=3.2\times 10^{-5}$ 7; $\alpha(\text{O})=4.8\times 10^{-6}$ 10; $\alpha(\text{P})=3.0\times 10^{-7}$ 8
836.5	11/2 ⁺	122.80 5 775.3 3	1.2 2 100 5	713.6 61.25	9/2 ⁺ 7/2 ⁺	M1+E2 [‡] E2		0.97 12 0.00414 6	$\alpha(\text{K})=0.70$ 4; $\alpha(\text{L})=0.22$ 12; $\alpha(\text{M})=0.05$ 3; $\alpha(\text{N}+..)=0.012$ 7 $\alpha(\text{N})=0.011$ 6; $\alpha(\text{O})=0.0014$ 7; $\alpha(\text{P})=3.8\times 10^{-5}$ 9 $\alpha=0.00414$ 6; $\alpha(\text{K})=0.00349$ 5; $\alpha(\text{L})=0.000511$ 8; $\alpha(\text{M})=0.0001096$ 16; $\alpha(\text{N}+..)=2.84\times 10^{-5}$ 4
883.8	7/2 ⁺ ,5/2 ⁺	223.50 8 883.8 3	19 2 100 12	660.5 0.0	(5/2) ⁺ 5/2 ⁺			0.0047 11 0.0039 4	$\alpha(\text{N})=2.46\times 10^{-5}$ 4; $\alpha(\text{O})=3.63\times 10^{-6}$ 6; $\alpha(\text{P})=2.08\times 10^{-7}$ 3 $\alpha=0.0047$ 11; $\alpha(\text{K})=0.0040$ 10; $\alpha(\text{L})=0.00055$ 11; $\alpha(\text{M})=0.000117$ 23; $\alpha(\text{N}+..)=3.1\times 10^{-5}$ 7 $\alpha(\text{N})=2.6\times 10^{-5}$ 6; $\alpha(\text{O})=4.0\times 10^{-6}$ 9; $\alpha(\text{P})=2.5\times 10^{-7}$ 7 $\alpha=0.0039$ 4; $\alpha(\text{K})=0.0033$ 4; $\alpha(\text{L})=0.00045$ 4; $\alpha(\text{M})=9.7\times 10^{-5}$ 9; $\alpha(\text{N}+..)=2.53\times 10^{-5}$ 23
958.0	(3/2) ⁺	465.5 4	100	492.31	3/2 ⁺			0.0033 8	$\alpha(\text{N})=2.18\times 10^{-5}$ 20; $\alpha(\text{O})=3.3\times 10^{-6}$ 3; $\alpha(\text{P})=2.04\times 10^{-7}$ 24 $\alpha=0.0033$ 8; $\alpha(\text{K})=0.0028$ 7; $\alpha(\text{L})=0.00038$ 8; $\alpha(\text{M})=8.1\times 10^{-5}$ 16; $\alpha(\text{N}+..)=2.1\times 10^{-5}$ 5
1057.3	1/2 ⁺	564.8 3	100	492.31	3/2 ⁺	M1+E2		0.012 3	$\alpha(\text{N})=1.8\times 10^{-5}$ 4; $\alpha(\text{O})=2.8\times 10^{-6}$ 6; $\alpha(\text{P})=1.7\times 10^{-7}$ 5 $\alpha(\text{K})=0.010$ 3; $\alpha(\text{L})=0.00143$ 25; $\alpha(\text{M})=0.00031$ 5; $\alpha(\text{N}+..)=8.0\times 10^{-5}$ 14
1101.8	9/2 ⁻	307.26 8 388.1 4 432.1 2	57 7 20 5 86 9	794.6 713.6 669.7	11/2 ⁻ 9/2 ⁺ 7/2 ⁺	M1+E2 E1	0.34 5	0.0678 11 0.00578 9	$\alpha(\text{N})=6.9\times 10^{-5}$ 12; $\alpha(\text{O})=1.03\times 10^{-5}$ 20; $\alpha(\text{P})=6.1\times 10^{-7}$ 18 $\alpha(\text{K})=0.0574$ 10; $\alpha(\text{L})=0.00817$ 12; $\alpha(\text{M})=0.001748$ 25; $\alpha(\text{N}+..)=0.000456$ 7 $\alpha(\text{N})=0.000393$ 6; $\alpha(\text{O})=5.90\times 10^{-5}$ 9; $\alpha(\text{P})=3.62\times 10^{-6}$ 7 $\alpha=0.00578$ 9; $\alpha(\text{K})=0.00495$ 7; $\alpha(\text{L})=0.000654$ 10; $\alpha(\text{M})=0.0001386$ 20; $\alpha(\text{N}+..)=3.60\times 10^{-5}$ 5
1206.8	11/2 ⁺	1040.7 5 370.3 4 456.4 2 493.2 5	100 11 10.4 28 100 6 18 3	61.25 836.5 750.4 713.6	7/2 ⁺ 11/2 ⁺ 9/2 ⁺ 9/2 ⁺	M1+E2 [‡] M1+E2 M1+E2 [‡]		0.036 8 0.0250 0.017 4	$\alpha(\text{N})=3.11\times 10^{-5}$ 5; $\alpha(\text{O})=4.64\times 10^{-6}$ 7; $\alpha(\text{P})=2.82\times 10^{-7}$ 4 $\alpha(\text{K})=0.030$ 7; $\alpha(\text{L})=0.0047$ 3; $\alpha(\text{M})=0.00101$ 5; $\alpha(\text{N}+..)=0.000261$ 17 $\alpha(\text{N})=0.000226$ 13; $\alpha(\text{O})=3.3\times 10^{-5}$ 3; $\alpha(\text{P})=1.8\times 10^{-6}$ 6 $\alpha(\text{K})=0.0213$ 3; $\alpha(\text{L})=0.00289$ 4; $\alpha(\text{M})=0.000614$ 9; $\alpha(\text{N}+..)=0.0001608$ 23 $\alpha(\text{N})=0.0001385$ 20; $\alpha(\text{O})=2.10\times 10^{-5}$ 3; $\alpha(\text{P})=1.347\times 10^{-6}$ 19 $\alpha(\text{K})=0.014$ 4; $\alpha(\text{L})=0.0021$ 3; $\alpha(\text{M})=0.00044$ 6;

Adopted Levels, Gammas (continued)

$\gamma(^{145}\text{Pm})$ (continued)

<u>E_i(level)</u>	<u>J^{π}_i</u>	<u>E_{γ}</u>	<u>I_{γ}</u>	<u>E_f</u>	<u>J^{π}_f</u>	<u>Mult.</u>	<u>$\alpha^{\dagger}$</u>	<u>Comments</u>
								$\alpha(\text{N}+..)=0.000115$ 17 $\alpha(\text{N})=0.000100$ 15; $\alpha(\text{O})=1.48\times 10^{-5}$ 25; $\alpha(\text{P})=8.6\times 10^{-7}$ 25
1206.8	11/2 ⁺	537.0 4	20 3	669.7	7/2 ⁺			
1215.2		545.5 4	14 3	669.7	7/2 ⁺			
		1154.1 5	28 5	61.25	7/2 ⁺			
		1215.2 5	100 10	0.0	5/2 ⁺			
1233.9	(3/2) ⁺	410.4 2	52 9	823.5	5/2 ⁺	E2+(M1)	0.027 6	$\alpha(\text{K})=0.023$ 6; $\alpha(\text{L})=0.0035$ 4; $\alpha(\text{M})=0.00075$ 7; $\alpha(\text{N}+..)=0.000193$ 19 $\alpha(\text{N})=0.000167$ 16; $\alpha(\text{O})=2.5\times 10^{-5}$ 3; $\alpha(\text{P})=1.4\times 10^{-6}$ 4
1284.0	(11/2) ⁻	1233.6 5	100 13	0.0	5/2 ⁺			
		570.4 3	100	713.6	9/2 ⁺	E1	0.00307 5	$\alpha=0.00307$ 5; $\alpha(\text{K})=0.00264$ 4; $\alpha(\text{L})=0.000344$ 5; $\alpha(\text{M})=7.29\times 10^{-5}$ 11; $\alpha(\text{N}+..)=1.90\times 10^{-5}$ 3 $\alpha(\text{N})=1.636\times 10^{-5}$ 23; $\alpha(\text{O})=2.45\times 10^{-6}$ 4; $\alpha(\text{P})=1.522\times 10^{-7}$ 22
1291.9		468.4 3	70 16	823.5	5/2 ⁺			
		622.3 4	100 14	669.7	7/2 ⁺			
		799.4 5	80 16	492.31	3/2 ⁺			
1311.7		819.2 5	100 13	492.31	3/2 ⁺			
		1311.7 6	54 8	0.0	5/2 ⁺			
1346.9	13/2 ⁺	62.0 @ 3		1284.0	(11/2) ⁻			
		510.4 4	75 13	836.5	11/2 ⁺	(M1+E2)	0.015 4	$\alpha(\text{K})=0.013$ 4; $\alpha(\text{L})=0.0019$ 3; $\alpha(\text{M})=0.00040$ 6; $\alpha(\text{N}+..)=0.000105$ 16 $\alpha(\text{N})=9.1\times 10^{-5}$ 14; $\alpha(\text{O})=1.35\times 10^{-5}$ 23; $\alpha(\text{P})=7.9\times 10^{-7}$ 23
		633.3 3	100 13	713.6	9/2 ⁺	E2	0.00669 10	$\alpha=0.00669$ 10; $\alpha(\text{K})=0.00560$ 8; $\alpha(\text{L})=0.000865$ 13; $\alpha(\text{M})=0.000186$ 3; $\alpha(\text{N}+..)=4.81\times 10^{-5}$ 7 $\alpha(\text{N})=4.17\times 10^{-5}$ 6; $\alpha(\text{O})=6.11\times 10^{-6}$ 9; $\alpha(\text{P})=3.31\times 10^{-7}$ 5
1365.9		529.4 3	44 5	836.5	11/2 ⁺			
		652.4 4	100 16	713.6	9/2 ⁺			
1384.9	7/2 ⁻	283.17 7	100	1101.8	9/2 ⁻	M1+E2	0.076 11	$\alpha(\text{K})=0.062$ 12; $\alpha(\text{L})=0.0107$ 6; $\alpha(\text{M})=0.00233$ 17; $\alpha(\text{N}+..)=0.00060$ 4 $\alpha(\text{N})=0.00052$ 4; $\alpha(\text{O})=7.50\times 10^{-5}$ 17; $\alpha(\text{P})=3.7\times 10^{-6}$ 10
1388.5		674.9 5	100	713.6	9/2 ⁺			
1397.2	13/2 ⁺	190.35 5	82 8	1206.8	11/2 ⁺	M1	0.254	$\alpha(\text{K})=0.216$ 3; $\alpha(\text{L})=0.0300$ 5; $\alpha(\text{M})=0.00639$ 9; $\alpha(\text{N}+..)=0.001673$ 24 $\alpha(\text{N})=0.001441$ 21; $\alpha(\text{O})=0.000218$ 3; $\alpha(\text{P})=1.382\times 10^{-5}$ 20
		646.8 4	100 12	750.4	9/2 ⁺	E2	0.00636 9	$\alpha=0.00636$ 9; $\alpha(\text{K})=0.00532$ 8; $\alpha(\text{L})=0.000817$ 12; $\alpha(\text{M})=0.0001759$ 25; $\alpha(\text{N}+..)=4.54\times 10^{-5}$ 7 $\alpha(\text{N})=3.94\times 10^{-5}$ 6; $\alpha(\text{O})=5.78\times 10^{-6}$ 9; $\alpha(\text{P})=3.15\times 10^{-7}$ 5
1447.91	15/2 ⁻	653.1 1	100 5	794.6	11/2 ⁻	E2	0.00621 9	$\alpha=0.00621$ 9; $\alpha(\text{K})=0.00520$ 8; $\alpha(\text{L})=0.000796$ 12; $\alpha(\text{M})=0.0001713$ 24; $\alpha(\text{N}+..)=4.43\times 10^{-5}$ 7 $\alpha(\text{N})=3.83\times 10^{-5}$ 6; $\alpha(\text{O})=5.63\times 10^{-6}$ 8; $\alpha(\text{P})=3.07\times 10^{-7}$ 5
1455.7		742.1 5	100	713.6	9/2 ⁺			
1493.6	13/2 ⁺	657.1 5	100	836.5	11/2 ⁺	M1	0.01005	$\alpha(\text{K})=0.00860$ 13; $\alpha(\text{L})=0.001148$ 17; $\alpha(\text{M})=0.000244$ 4; $\alpha(\text{N}+..)=6.39\times 10^{-5}$ 9 $\alpha(\text{N})=5.50\times 10^{-5}$ 8; $\alpha(\text{O})=8.34\times 10^{-6}$ 12; $\alpha(\text{P})=5.40\times 10^{-7}$ 8
1502.0	15/2 ⁺	155.15 4	11.3 13	1346.9	13/2 ⁺	M1+E2 [‡]	0.463 18	$\alpha(\text{K})=0.35$ 3; $\alpha(\text{L})=0.09$ 4; $\alpha(\text{M})=0.019$ 8; $\alpha(\text{N}+..)=0.0049$ 20 $\alpha(\text{N})=0.0043$ 18; $\alpha(\text{O})=0.00059$ 21; $\alpha(\text{P})=2.0\times 10^{-5}$ 5

Adopted Levels, Gammas (continued)

$\gamma(^{145}\text{Pm})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	$\alpha^\dagger$	Comments
1502.0	15/2 ⁺	665.5 4	100 8	836.5	11/2 ⁺	E2	0.00593 9	$\alpha=0.00593$ 9; $\alpha(\text{K})=0.00497$ 7; $\alpha(\text{L})=0.000757$ 11; $\alpha(\text{M})=0.0001629$ 23; $\alpha(\text{N}+..)=4.21\times 10^{-5}$ 6 $\alpha(\text{N})=3.65\times 10^{-5}$ 6; $\alpha(\text{O})=5.36\times 10^{-6}$ 8; $\alpha(\text{P})=2.94\times 10^{-7}$ 5
1558.3		721.8 5	100	836.5	11/2 ⁺			
1582.61		787.8 2	100	794.6	11/2 ⁻		0.00399 6	$\alpha=0.00399$ 6; $\alpha(\text{K})=0.00337$ 5; $\alpha(\text{L})=0.000491$ 7; $\alpha(\text{M})=0.0001053$ 15; $\alpha(\text{N}+..)=2.73\times 10^{-5}$ 4 $\alpha(\text{N})=2.36\times 10^{-5}$ 4; $\alpha(\text{O})=3.49\times 10^{-6}$ 5; $\alpha(\text{P})=2.01\times 10^{-7}$ 3
1648.7	15/2 ⁺	251.48 7	100	1397.2	13/2 ⁺	M1+E2 [‡]	0.107 12	$\alpha(\text{K})=0.087$ 15; $\alpha(\text{L})=0.0157$ 18; $\alpha(\text{M})=0.0034$ 5; $\alpha(\text{N}+..)=0.00088$ 11 $\alpha(\text{N})=0.00076$ 10; $\alpha(\text{O})=0.000110$ 9; $\alpha(\text{P})=5.1\times 10^{-6}$ 14
1836.64		334.1 2	100	1502.0	15/2 ⁺			
1844.76	17/2 ⁺	342.2 1	100 15	1502.0	15/2 ⁺	M1+E2	0.044 9	$\alpha(\text{K})=0.037$ 8; $\alpha(\text{L})=0.00593$ 21; $\alpha(\text{M})=0.00128$ 3; $\alpha(\text{N}+..)=0.000331$ 12 $\alpha(\text{N})=0.000287$ 9; $\alpha(\text{O})=4.2\times 10^{-5}$ 3; $\alpha(\text{P})=2.2\times 10^{-6}$ 7
		497.3 3	19 7	1346.9	13/2 ⁺	E2	0.01247	$\alpha(\text{K})=0.01028$ 15; $\alpha(\text{L})=0.001722$ 25; $\alpha(\text{M})=0.000374$ 6; $\alpha(\text{N}+..)=9.60\times 10^{-5}$ 14 $\alpha(\text{N})=8.34\times 10^{-5}$ 12; $\alpha(\text{O})=1.205\times 10^{-5}$ 17; $\alpha(\text{P})=5.96\times 10^{-7}$ 9
1896.57	17/2 ⁺	247.0 2	100 13	1648.7	15/2 ⁺	M1+E2	0.113 13	$\alpha(\text{K})=0.092$ 15; $\alpha(\text{L})=0.0167$ 21; $\alpha(\text{M})=0.0036$ 6; $\alpha(\text{N}+..)=0.00093$ 12 $\alpha(\text{N})=0.00081$ 11; $\alpha(\text{O})=0.000116$ 10; $\alpha(\text{P})=5.4\times 10^{-6}$ 14
		498.7 3	13 6	1397.2	13/2 ⁺			
2013.47		168.6 3	100	1844.76	17/2 ⁺			
2026.01	19/2 ⁻	578.1 1	100	1447.91	15/2 ⁻	E2	0.00841 12	$\alpha=0.00841$ 12; $\alpha(\text{K})=0.00700$ 10; $\alpha(\text{L})=0.001112$ 16; $\alpha(\text{M})=0.000240$ 4; $\alpha(\text{N}+..)=6.19\times 10^{-5}$ 9 $\alpha(\text{N})=5.37\times 10^{-5}$ 8; $\alpha(\text{O})=7.83\times 10^{-6}$ 11; $\alpha(\text{P})=4.11\times 10^{-7}$ 6
2124.70	19/2 ⁺	279.9 2	100 13	1844.76	17/2 ⁺	M1+E2	0.078 11	$\alpha(\text{K})=0.064$ 12; $\alpha(\text{L})=0.0111$ 7; $\alpha(\text{M})=0.00242$ 19; $\alpha(\text{N}+..)=0.00062$ 4 $\alpha(\text{N})=0.00054$ 4; $\alpha(\text{O})=7.78\times 10^{-5}$ 21; $\alpha(\text{P})=3.8\times 10^{-6}$ 11
		622.2 2	75 8	1502.0	15/2 ⁺			
2441.57	21/2 ⁽⁺⁾	316.9 3	100 14	2124.70	19/2 ⁺	M1+E2	0.055 10	$\alpha(\text{K})=0.046$ 10; $\alpha(\text{L})=0.00751$ 11; $\alpha(\text{M})=0.00163$ 4; $\alpha(\text{N}+..)=0.000419$ 6 $\alpha(\text{N})=0.000364$ 6; $\alpha(\text{O})=5.29\times 10^{-5}$ 19; $\alpha(\text{P})=2.7\times 10^{-6}$ 8
		415.4 3	64 11	2026.01	19/2 ⁻			
2448.60	23/2 ⁻	422.6 1	100	2026.01	19/2 ⁻	E2	0.0195	$\alpha(\text{K})=0.01591$ 23; $\alpha(\text{L})=0.00285$ 4; $\alpha(\text{M})=0.000622$ 9; $\alpha(\text{N}+..)=0.0001591$ 23 $\alpha(\text{N})=0.0001384$ 20; $\alpha(\text{O})=1.98\times 10^{-5}$ 3; $\alpha(\text{P})=9.08\times 10^{-7}$ 13
2615.29	(21/2 ⁺)	490.6 3	100	2124.70	19/2 ⁺	M1+E2	0.017 4	$\alpha(\text{K})=0.014$ 4; $\alpha(\text{L})=0.0021$ 3; $\alpha(\text{M})=0.00045$ 6; $\alpha(\text{N}+..)=0.000117$ 17 $\alpha(\text{N})=0.000101$ 15; $\alpha(\text{O})=1.50\times 10^{-5}$ 25; $\alpha(\text{P})=9.\text{E}-7$ 3
2811.57	23/2 ⁽⁺⁾	196.3 3	67 11	2615.29	(21/2 ⁺)			
		362.9 3	92 8	2448.60	23/2 ⁻			
		369.9 3	100 11	2441.57	21/2 ⁽⁺⁾			
3052.42	27/2 ⁻	603.8 1	100	2448.60	23/2 ⁻			
3159.93	25/2 ⁽⁺⁾	348.2 3	67 27	2811.57	23/2 ⁽⁺⁾			
		544.6 3	53 27	2615.29	(21/2 ⁺)			
		711.6 3	100 7	2448.60	23/2 ⁻			
		718.3 3	67 13	2441.57	21/2 ⁽⁺⁾			

Adopted Levels, Gammas (continued)

$\gamma(^{145}\text{Pm})$ (continued)

<u>E_i(level)</u>	<u>J_i^{π}</u>	<u>E_{γ}</u>	<u>I_{γ}</u>	<u>E_f</u>	<u>J_f^{π}</u>	<u>E_i(level)</u>	<u>J_i^{π}</u>	<u>E_{γ}</u>	<u>I_{γ}</u>	<u>E_f</u>	<u>J_f^{π}</u>
3497.06	27/2 ⁽⁺⁾	337.2 2	100 18	3159.93	25/2 ⁽⁺⁾	4389.71	(29/2)	724.4 3	98 24	3665.34	(25/2)
		444.6 3	75 7	3052.42	27/2 ⁻			1337.0 3	100 17	3052.42	27/2 ⁻
3665.34	(25/2)	613.0 3	94 19	3052.42	27/2 ⁻	4701.4	(31/2)	311.7 2	100 17	4389.71	(29/2)
		853.8 3	100 13	2811.57	23/2 ⁽⁺⁾			615.3 3	25 8	4086.25	(27/2)
3760.41	29/2 ⁽⁺⁾	263.3 3	34 4	3497.06	27/2 ⁽⁺⁾	4760.3	(35/2 ⁺ ,37/2 ⁺)	397.8 3	100	4362.6	(31/2 ⁺ ,33/2 ⁺)
		600.5 3	17 3	3159.93	25/2 ⁽⁺⁾	4935.1	(33/2)	233.8 3	100 11	4701.4	(31/2)
		708.0 2	100 6	3052.42	27/2 ⁻			545.5 @ 3		4389.71	(29/2)
3850.9	(27/2)	1402.5 3	100	2448.60	23/2 ⁻			711.3 3	17 6	4223.7	(29/2)
4013.8	(31/2 ⁺)	253.4 2	100 6	3760.41	29/2 ⁽⁺⁾	5030.5		806.8 3	100	4223.7	(29/2)
		516.9 3	34 5	3497.06	27/2 ⁽⁺⁾	5482.7	(35/2 ⁺ ,37/2 ⁺)	1120.1 3	100	4362.6	(31/2 ⁺ ,33/2 ⁺)
4086.25	(27/2)	421.0 3	100 17	3665.34	(25/2)	5727.3		244.6 3	100	5482.7	(35/2 ⁺ ,37/2 ⁺)
		926.2 3	100 15	3159.93	25/2 ⁽⁺⁾	5891.7	(39/2 ⁺ ,41/2 ⁺)	164.5 3	100 29	5727.3	
		1034.0 3	13 7	3052.42	27/2 ⁻			409.0 3	29 7	5482.7	(35/2 ⁺ ,37/2 ⁺)
4223.7	(29/2)	1171.2 2	100	3052.42	27/2 ⁻			1131.4 3	56 11	4760.3	(35/2 ⁺ ,37/2 ⁺)
4362.6	(31/2 ⁺ ,33/2 ⁺)	138.7 3	33 7	4223.7	(29/2)	6130.7		239.0 3	100 33	5891.7	(39/2 ⁺ ,41/2 ⁺)
		348.8 2	100 13	4013.8	(31/2 ⁺)			403.5 3	17 8	5727.3	
4389.71	(29/2)	303.5 3	98 24	4086.25	(27/2)	6853.7		962.0 3	100	5891.7	(39/2 ⁺ ,41/2 ⁺)
		539.0 3	49 24	3850.9	(27/2)	7216.8		1086.1 3	100	6130.7	

† Additional information 1.

‡ From (HI,xn γ).

From (HI,xn γ).

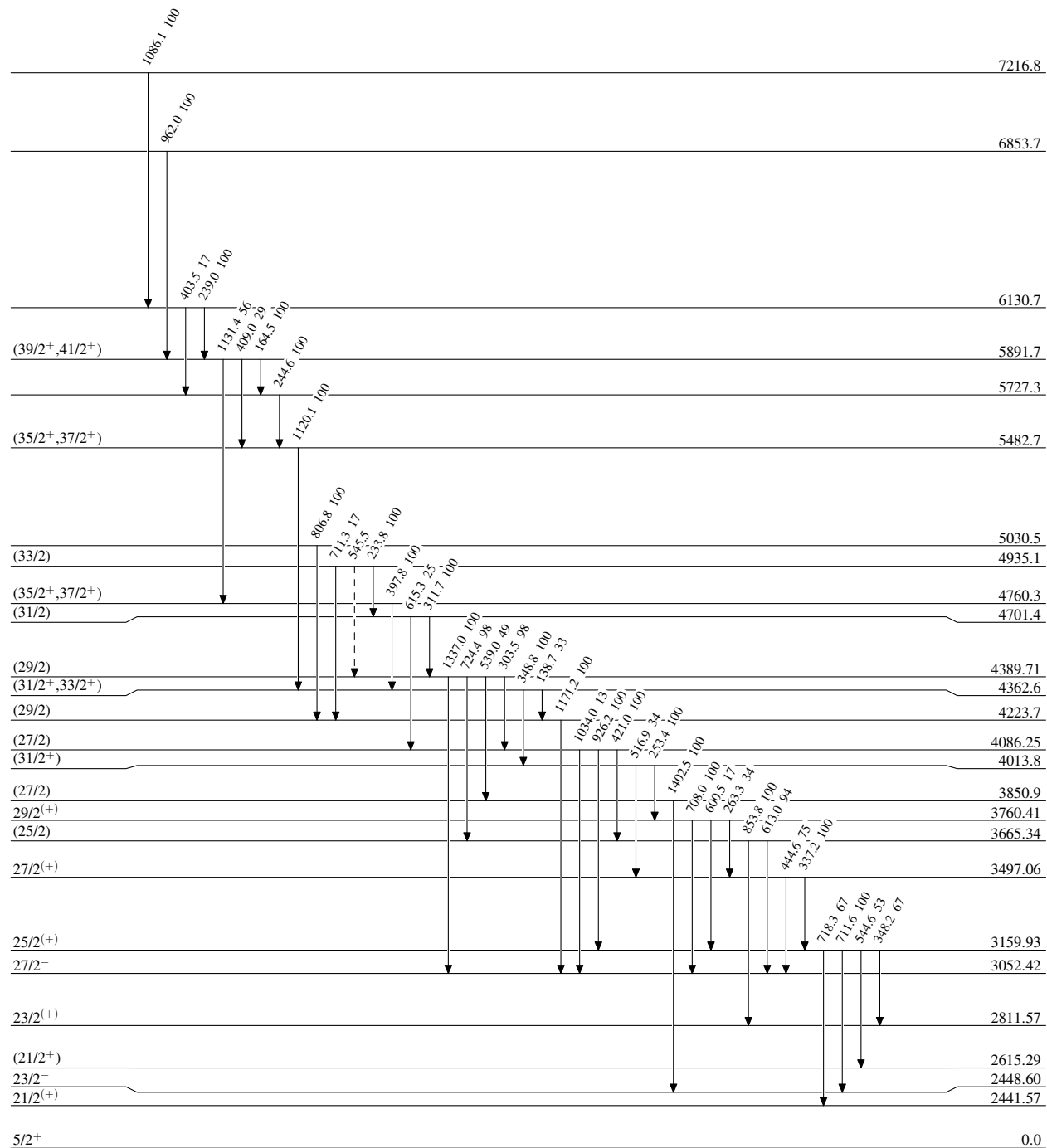
@ Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Legend

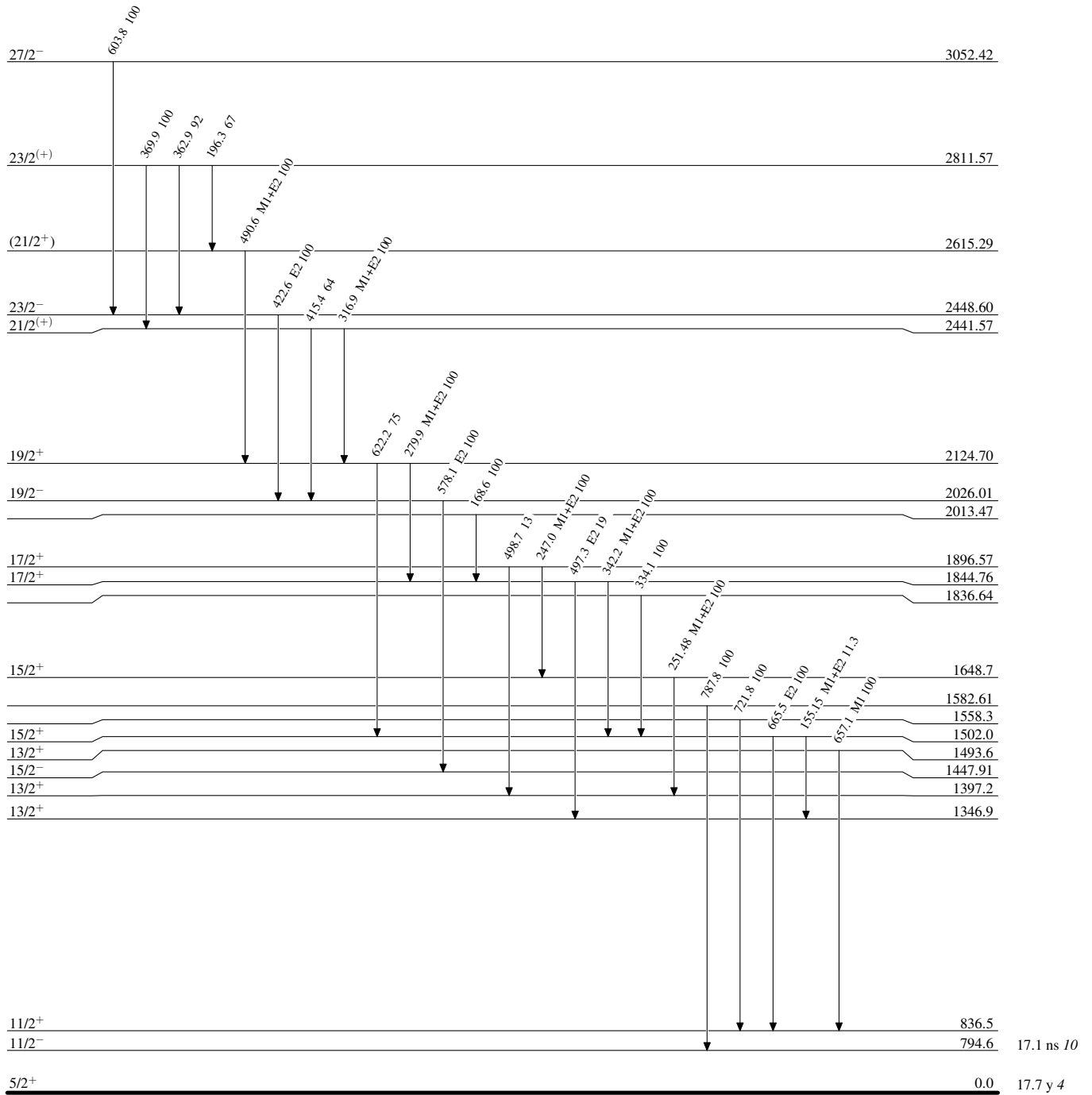
Level Scheme

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain)

Adopted Levels, GammasLevel Scheme (continued)

Intensities: Relative photon branching from each level

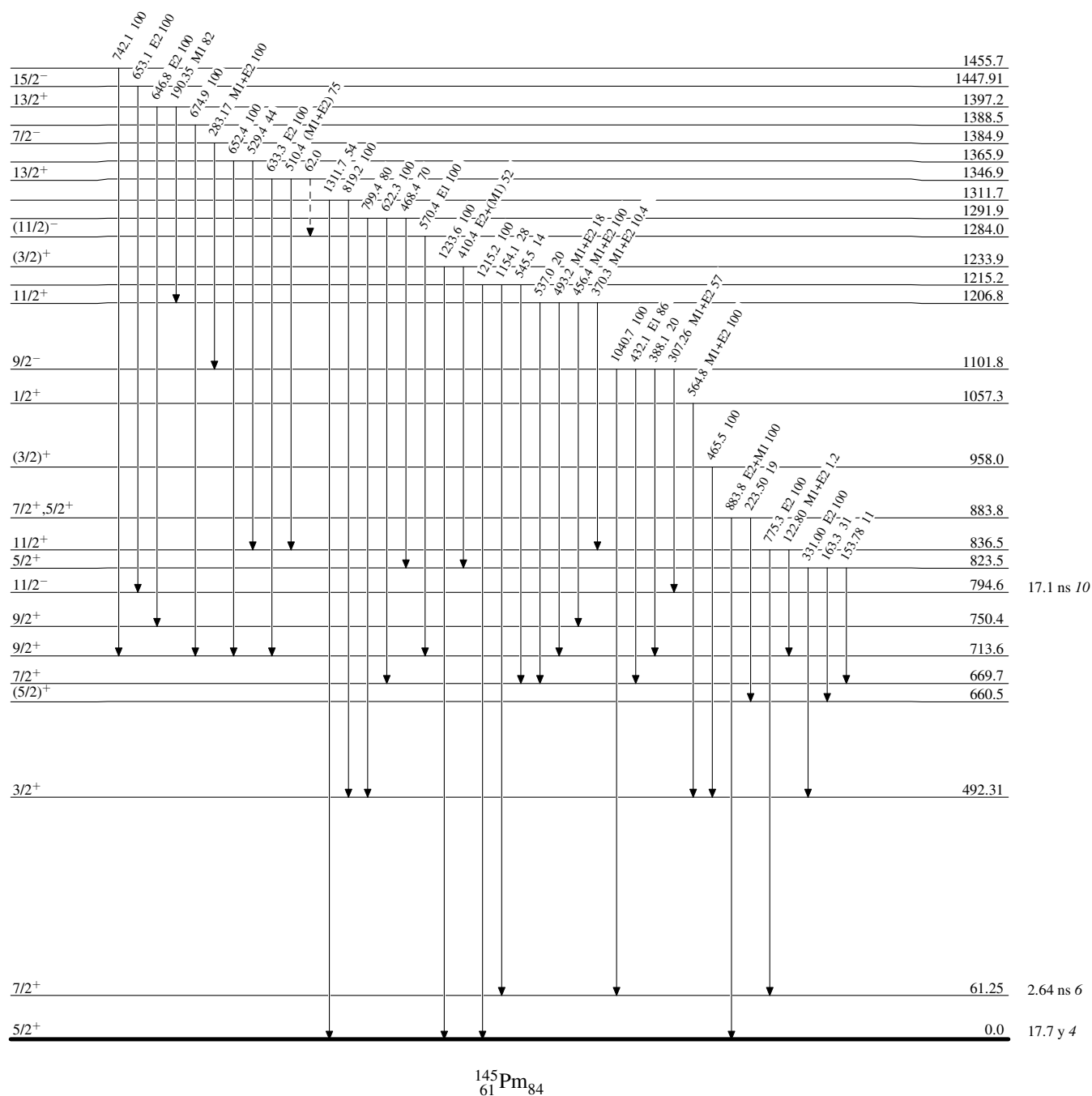


Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

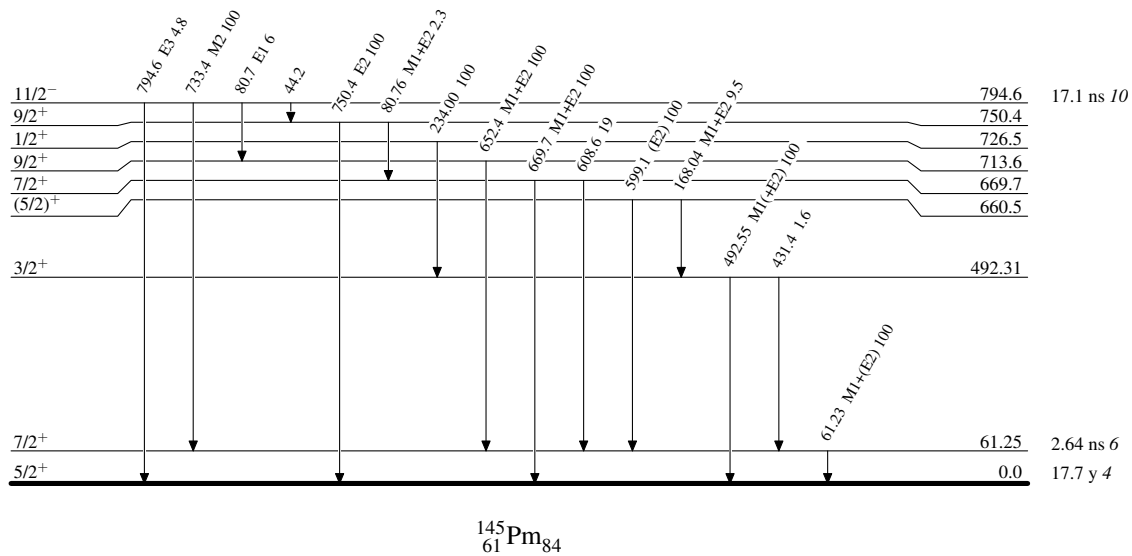
-----► γ Decay (Uncertain)


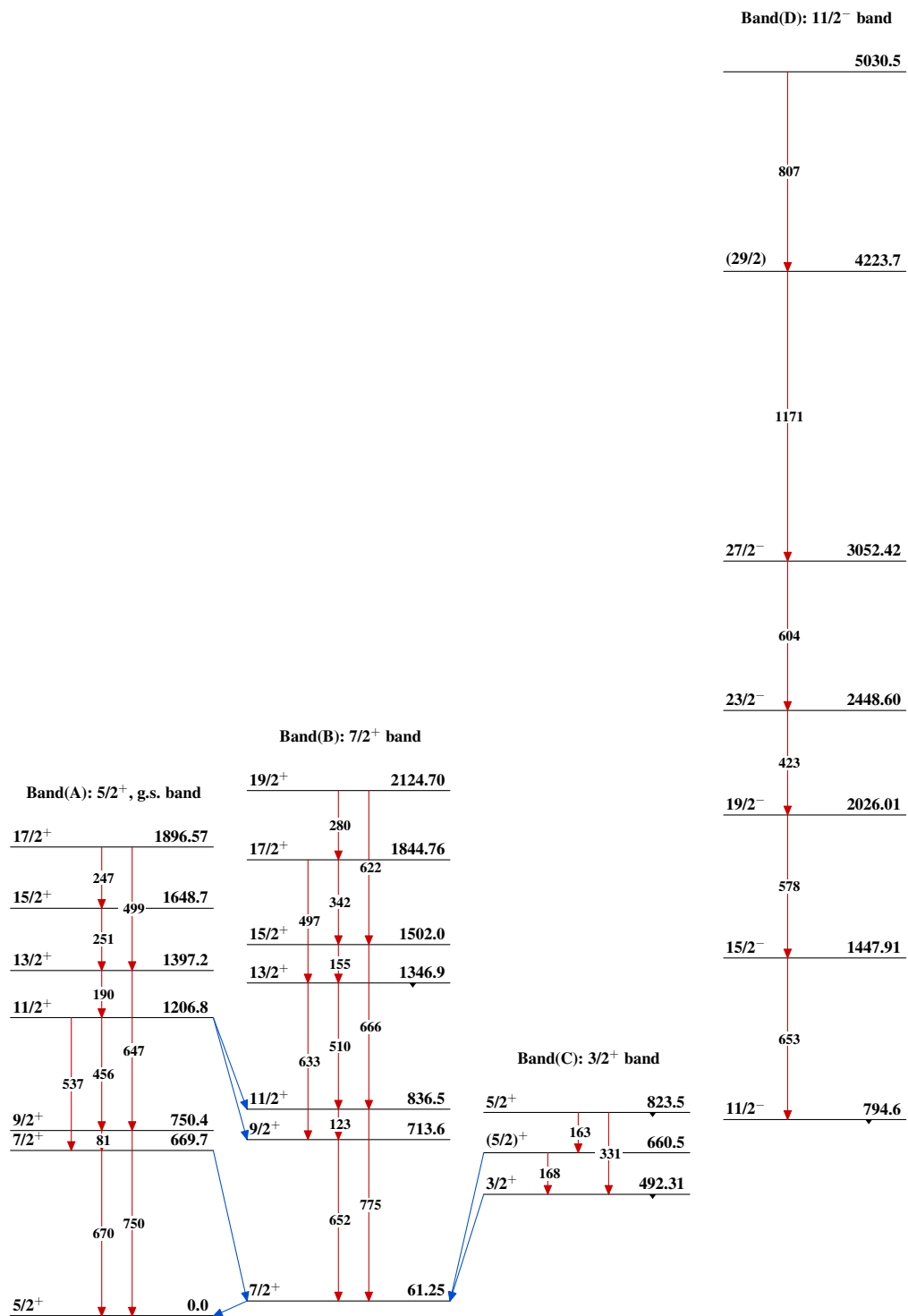
Adopted Levels, Gammas

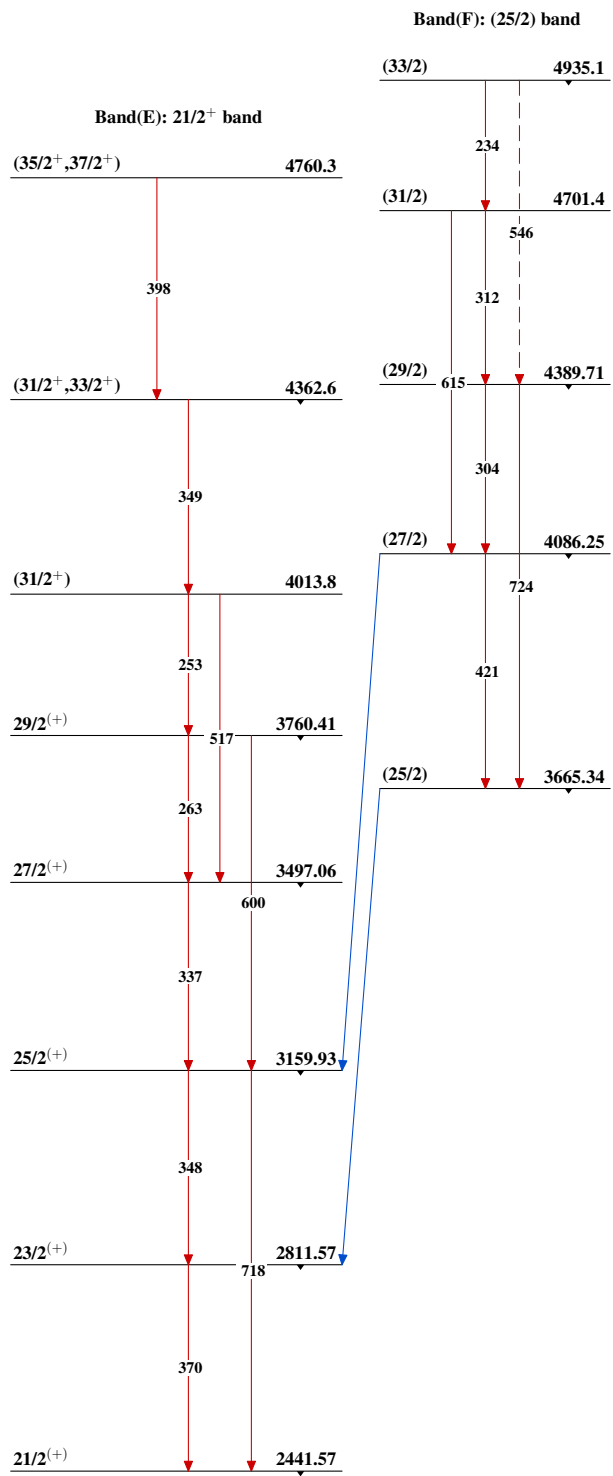
Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain) $^{145}_{61}\text{Pm}_{84}$

Adopted Levels, Gammas $^{145}_{61}\text{Pm}_{84}$

Adopted Levels, Gammas (continued) $^{145}_{61}\text{Pm}_{84}$