Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 154, 1 (2018)	20-Nov-2018

Q(β^-)=−2758 *27*; S(n)=8785 *28*; S(p)=3490 *40*; Q(α)=702 *27* 2017Wa10

Other experimental papers: 2011Ti05 (production σ for ^{nat}W and ^{181}Ta targets irradiated with 0.04-2.6 GeV protons) 1995Ve08, 1995VeZX (β-decay energy).

Above the 8^- isomer, the levels schemes proposed in (HI,xnγ) and (^{19}F,5nγ) are discrepant, of which the E(level)′s and γ-rays placements of (^{19}F,5nγ) are preferred.

^{140}Pm Levels

Cross Reference (XREF) Flags

- A ^{140}Sm ε decay
- B ^{126}Te(^{19}F,5nγ)
- C (HI,xnγ)

E(level)	J^π[†]	$T_{1/2}$	XREF	Comments
0.0	1^+[‡]	9.2 s *2*	A	%ε+%β^+=100 $T_{1/2}$: from 1968Bl14. Others: 9.2 s *5* (1973VaYZ), 9.1 s *5* (1975Ke09).
139.95 *7*	$(2)^-$		A	J^π: γ to 1^+ is E1, the lowest J for negative parity shell-model state in Z=61, N=79 nuclei is two-particle configuration=((ν $h_{11/2}$)(π $g_{7/2}$)) (1993De40).
225.47 *6*	$0^+,1^+,2^+$		A	J^π: γ to 1^+ is M1.
260.64 *8*	$(1,2,3)^+$		A	J^π: γ to $(2)^-$ is E1.
335.35 *9*	$^+$		A	J^π: γ to $0^+,1^+,2^+$ is M1.
339.88 *7*	$(1,2)^+$		A	J^π: γ to $(2)^-$ is E1, γ from $(1)^+$ is M1.
344.94 *8*	$^+$		A	J^π: γ to $1^+,2^+,3^+$ is M1.
415.15 *11*	1^+		A	J^π: J=1 from log *ft* ≈ 6.3 *via* 0^+ parent; π=+ from M1 γ to $(1,2)^+$.
0.0+x	8^-	5.95 min *5*	ABC	%ε+%β^+=100 Additional information 1. E(level): x=431 *28* (difference in mass excesses for 9.2-s g.s. and 5.95-min isomer of ^{140}Pm, 2017Au03 and references therein). $T_{1/2}$: from 1975Ke09. Others: 6 min *1* (1966At04), 5.80 min *5* (1967Bl27), 5.8 min *3* (1973VaYZ), 5.9 min *6* (1974FiZF), 5.6 min *2* (1975Za10). J^π: 8^- assignment based on 1993De40, which removed 7^- (1987Pe07): log *ft*=5.2 to 7^- (ν h11/2)(ν d3/2) daughter state and deduced (π d5/2)(ν h11/2) parent configuration (the only allowed transition is π d5/2 to ν d3/2 GT), of which only the 8^- coupling can feed mainly the 7^- daughter. The 7^- coupling of the parent state should proceed predominantly to 6^- (ν h11/2)(ν d3/2) daughter state and the 7^- daughter state should receive much weaker population, which removes 7^-. The 7^- was previously assigned based on log *ft*=7.3 to 6^+ whose weak population (I(ε+β^+)=0.5%) could more likely arise from preferably E1 transitions from unobserved higher-lying 7^- states.
481.18 *9*	$^+$		A	J^π: M1 γ′s to + levels (344.94 and 335.35).
503.39 *11*	$0^+,1^+,2^+$		A	J^π: γ to 1^+ is M1.
534.03 *15*	$(^+)$		A	J^π: γ to 1^+ is (E2).
565.46 *8*	$(1^+,2^+)$		A	J^π: $(0^+,1^+,2^+)$ from (M1) γ to 1^+; 0^+ less likely from γ to $(2)^-$.
572.11 *11*	$(1^+,2^+)$		A	J^π: $(0^+,1^+,2^+)$ from (M1) γ to 1^+; 0^+ less likely from γ to $(2)^-$.
576.27 *14*	$(0^-,1^-,2^-)$		A	J^π: γ to 1^+ is (E1).
652.36 *10*			A	
670.17 *16*	$(^+)$		A	J^π: γ to 260, + is (M1).
761.35 *13*	$(^+)$		A	J^π: γ to 1^+ is (E2).
386.23+x *10*	8^+	1.0 ns *+10−5*	BC	J^π: E1, ΔJ=0 γ to 8^-.

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Adopted Levels, Gammas (continued)

^{140}Pm Levels (continued)

E(level)	J^{π}[†]	XREF	Comments
			$T_{1/2}$: from (HI,xnγ).
808.16 *21*		A	
407.28+x[b] *16*	9^+	BC	J^{π}: E1 γ to 8^-.
844.62 *11*	$0^+,1^+,2^+$	A	J^{π}: M1 γ from 1670, 1^+.
855.81 *11*		A	
874.29 *15*		A	
926.33 *15*		A	
532.15+x[b] *17*	10^+	BC	J^{π}: M1+E2 γ to 9^+.
951.30 *16*		A	
1065.80 *16*	$(^+)$	A	J^{π}: M1 γ to + level (339.88).
1088.99 *20*		A	
1173.91 *16*		A	
806.15+x[d] *16*	$9^{(-)}$	BC	J^{π}: D γ to 8^+ and estimated configuration.
1278.8 *5*		A	
934.29+x[b] *20*	11^+	BC	J^{π}: M1(+E2) γ to 10^+.
1594.6 *3*		A	
1618.2 *4*		A	
1619.25 *11*	1^+[‡]	A	
1623.09 *15*	1^+[‡]	A	
1670.11 *10*	1^+[‡]	A	
1301.5+x[d] *8*	$11^{(-)}$	B	J^{π}: E2 γ to $9^{(-)}$.
1308.41+x[b] *21*	12^+	BC	J^{π}: E2 γ to 10^+.
1601.65+x? *19*	$11^{(-)}$	C	E(level): level resulting from inverted order of trasitions from 2097+x: 495γ-795γ in (HI,xnγ) (1993De40) with this intermediary level, or 795γ-495γ in (^{19}F,5nγ) (2010Wa37), which was adopted by evaluator. J^{π}: E2 γ to $9^{(-)}$.
2017.4 *5*		A	
1690.2+x[#] *4*	$12^{(+)}$	BC	J^{π}: (M1+E2) γ to 11^+.
1873.4+x[b] *3*	13^+	BC	J^{π}: E2 γ to 11^+.
1948.3+x[#] *11*	$12^{(+)}$	B	J^{π}: (M1+E2) γ to 11^+.
2097.0+x[d] *3*	$13^{(-)}$	BC	J^{π}: E2 γ to $11^{(-)}$.
2209.2+x[#] *4*	$12^{(+)}$	BC	J^{π}: (M1+E2) γ to 11^+.
2266.2+x[#] *11*	$13^{(+)}$	B	J^{π}: (M1+E2) γ to $12^{(+)}$.
2332.1+x[b] *8*	14^+	B	J^{π}: E2 γ to 12^+.
2354.2+x[#] *11*	14^+	B	J^{π}: E2 γ to 12^+.
2444.1+x[#] *8*	$12^{(+)}$	B	J^{π}: (M1+E2) γ to 11^+.
2557.1+x[#] *3*	14^+	BC	J^{π}: E2 γ to 12^+.
2570.7+x[#] *3*	14^+	BC	J^{π}: E2 γ to 12^+.
2595.5+x[#] *5*	$13^{(+)}$	BC	J^{π}: (M1+E2) γ to $12^{(+)}$.
2625.2+x[e] *4*	$14^{(-)}$	BC	J^{π}: (M1+E2) γ to 13^-.
2664.7+x[#] *5*	$13^{(+)}$	BC	J^{π}: (M1+E2) γ to $12^{(+)}$.
2747.8+x[c] *4*	$15^{(-)}$	BC	J^{π}: D γ to 14^+, $\Delta\pi$=yes E1 based on proposed configuration in (^{19}F,5nγ) (2010Wa37).
2776.7+x[#] *4*	$13^{(+)}$	BC	J^{π}: (M1+E2) γ to 12^+.
2830.0+x[d] *9*	$15^{(-)}$	B	J^{π}: E2 γ to $13^{(-)}$.
2905.7+x[#] *4*	$14^{(+)}$	BC	J^{π}: (M1+E2) γ to $13^{(+)}$.
2988.5+x[a] *8*	(14^+)	B	J^{π}: band head assumed (14^+) (2010Wa37); two γ's to 13^+ and $13^{(+)}$.
2992.5+x[c] *4*	$16^{(-)}$	BC	J^{π}: (M1+E2) γ to $15^{(-)}$.
3132.6+x[&] *5*	$15^{(+)}$	BC	J^{π}: (M1+E2) γ to $14^{(+)}$.
3285.9+x[a] *13*	(15^+)	B	J^{π}: (M1+E2) γ to (14^+).

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Adopted Levels, Gammas (continued)

^{140}Pm Levels (continued)

E(level)	J^{π}[†]	XREF	Comments
3372.8+x[e] *4*	$16^{(-)}$	BC	J^{π}: E2 γ to $14^{(-)}$.
3386.6+x[&] *5*	$16^{(+)}$	BC	J^{π}: (M1+E2) γ to $15^{(+)}$.
3498.4+x[c] *8*	$17^{(-)}$	BC	J^{π}: E2 γ to $15^{(-)}$.
3519.0+x[d] *10*	$17^{(-)}$	B	J^{π}: E2 γ to $15^{(-)}$.
3593.5+x[@] *9*	(16^{-})	B	J^{π}: assigned by 2010Wa37 In (^{19}F,5nγ) dataset from E2 535γ from $18^{(-)}$ and 221γ to $16^{(-)}$. As 2010Wa37 do not show proof of the E2 character other possible values are not excluded.
3610.0+x[a] *16*	(16^{+})	B	J^{π}: γ to (15^{+}) and member In M1+E2 band.
3652.3+x[&] *8*	$17^{(+)}$	BC	J^{π}: E2 γ to $15^{(+)}$.
3887.2+x[c] *9*	$18^{(-)}$	B	J^{π}: E2 γ to $16^{(-)}$.
3935.2+x[@] *12*	$18^{(-)}$	B	J^{π}: (M1+E2) γ to $17^{(-)}$.
4002.8+x[a] *19*	(17^{+})	B	J^{π}: γ to (16^{+}) and member In M1+E2 band.
4043.0+x[&] *9*	$18^{(+)}$	BC	J^{π}: M1+E2 γ to $17^{(+)}$.
4128.2+x[e] *9*	$18^{(-)}$	BC	J^{π}: E2 γ to $16^{(-)}$.
4393.0+x? *8*	$19^{(-)}$	C	E(level): level not confirmed In (^{19}F,5nγ) dataset; 895γ decaying from this level In (HI,xnγ) might have been replaced At 3887 level In (^{19}F,5nγ) dataset. J^{π}: E2 γ to $17^{(-)}$.
4484.4+x[c] *10*	$19^{(-)}$	B	J^{π}: (M1+E2) γ to $18^{(-)}$.
4486.0+x[@] *11*	$18^{(-)}$	B	J^{π}: (M1+E2) γ to $17^{(-)}$.
4508.0+x[&] *10*	$19^{(+)}$	BC	J^{π}: (M1+E2) γ to $18^{(+)}$.
4721.2+x[@] *12*	$20^{(-)}$	B	J^{π}: E2 γ to $18^{(-)}$.
4864.5+x[@] *14*	$19^{(-)}$	B	J^{π}: (M1+E2) γ to $18^{(-)}$.
4956.4+x[@] *14*	$19^{(-)}$	B	J^{π}: (M1+E2) γ to $18^{(-)}$.
5012.4+x[&] *11*	$20^{(+)}$	B	J^{π}: (M1+E2) γ to $19^{(+)}$.
5019.8+x[e] *14*	$20^{(-)}$	BC	J^{π}: E2 γ to $18^{(-)}$.
5356.4+x[&] *12*	$21^{(+)}$	B	J^{π}: (M1+E2) γ to $20^{(+)}$.
5525.2+x[@] *17*	$21^{(-)}$	B	J^{π}: (M1+E2) γ to $20^{(-)}$.
5786.2+x[@] *17*	(21^{-})	B	J^{π}: assigned by 2010Wa37 In (^{19}F,5nγ) dataset from E2 922γ to $19^{(-)}$. As 2010Wa37 do not show proof of the E2 character other possible values are not excluded.
5941.4+x[&] *16*	(22^{+})	B	J^{π}: assigned by 2010Wa37 In (^{19}F,5nγ) dataset based on band structure.
6391.5+x[@] *20*	$23^{(-)}$	B	J^{π}: E2 γ to $21^{(-)}$.

[†] J≥8 from $\gamma(\theta)$ and DCO, linear pol of γ, excit. based on $J^{\pi}=8^{-}$ for 5.95-min ^{140}Pm (1993De40).

[‡] log *ft*≤5.7 via 0^{+} parent.

[#] Possible member of a 4-qp configuration.

[@] Possible member of a 6-qp configuration.

[&] Band(A): Band based on $15^{(+)}$. Possible 4-qp band, configuration=$\pi h_{11/2}\otimes\nu(f_{7/2},h^2_{11/2})$.

[a] Band(B): Band based on (14^{+}). Possible 4-qp band, configuration=$\pi h_{11/2}\otimes\nu h^3_{11/2}$.

[b] Band(C): Probable $\pi h_{11/2}\otimes\nu h_{11/2}$ band. Assignment in 2010Wa37 based on systematics of other nuclei in this mass region.

[c] Band(D): Band based on $15^{(-)}$. Possible 4-qp configuration=$\pi 11/2[505]\otimes\nu(1/2[400],h^2_{11/2})$.

[d] Band(E): Possible $\pi h_{11/2}\otimes\nu 1/2[411]$.

[e] Band(F): Band based on $14^{(-)}$. Possible 4-qp band.

Adopted Levels, Gammas (continued)

γ(^{140}Pm)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[a]	Comments
139.95	(2)$^-$	140.0 *1*	100	0.0	1$^+$	E1	0.1068	α(K)=0.0907 *13*; α(L)=0.01273 *18*; α(M)=0.00270 *4* α(N)=0.000601 *9*; α(O)=8.71×10^{-5} *13*; α(P)=4.66×10^{-6} *7*
225.47	0$^+$,1$^+$,2$^+$	225.4 *1*	100	0.0	1$^+$	M1	0.1599	α(K)=0.1360 *20*; α(L)=0.0188 *3*; α(M)=0.00401 *6* α(N)=0.000905 *13*; α(O)=0.0001367 *20*; α(P)=8.70×10^{-6} *13*
260.64	(1,2,3)$^+$	35.2 *2*	2.7 *9*	225.47	0$^+$,1$^+$,2$^+$	(M1+E2)	80 *75*	α(L)=62 *59*; α(M)=14 *14* α(N)=3.1 *29*; α(O)=0.38 *36*; α(P)=0.00110 *68*
		120.8 *1*	100	139.95	(2)$^-$	E1	0.1597	α(K)=0.1353 *20*; α(L)=0.0192 *3*; α(M)=0.00409 *6* α(N)=0.000908 *13*; α(O)=0.0001307 *19*; α(P)=6.82×10^{-6} *10*
		260.6 *2*	9.4	0.0	1$^+$			
335.35	+	109.9 *2*	100	225.47	0$^+$,1$^+$,2$^+$	M1	1.182	α(K)=1.003 *15*; α(L)=0.1408 *21*; α(M)=0.0301 *5* α(N)=0.00678 *11*; α(O)=0.001022 *16*; α(P)=6.45×10^{-5} *10*
		195.4 *2*	20.4	139.95	(2)$^-$			
		335.5 *2*	10.2	0.0	1$^+$			
339.88	(1,2)$^+$	114.6 *2*	53.3	225.47	0$^+$,1$^+$,2$^+$	M1	1.049	α(K)=0.891 *14*; α(L)=0.1249 *19*; α(M)=0.0267 *4* α(N)=0.00601 *9*; α(O)=0.000907 *14*; α(P)=5.73×10^{-5} *9*
		199.9 *2*	38.9	139.95	(2)$^-$	E1	0.0408	α(K)=0.0347 *5*; α(L)=0.00477 *7*; α(M)=0.001012 *15* α(N)=0.000226 *4*; α(O)=3.31×10^{-5} *5*; α(P)=1.86×10^{-6} *3*
		339.8 *1*	100	0.0	1$^+$	E2	0.0370	α(K)=0.0295 *5*; α(L)=0.00588 *9*; α(M)=0.001294 *19* α(N)=0.000287 *4*; α(O)=4.03×10^{-5} *6*; α(P)=1.636×10^{-6} *23*
344.94	+	84.4 *1*	100	260.64	(1,2,3)$^+$	M1	2.52	α(K)=2.14 *3*; α(L)=0.301 *5*; α(M)=0.0643 *10* α(N)=0.01449 *21*; α(O)=0.00218 *4*; α(P)=0.0001376 *20*
		119.5 *2*	20.8	225.47	0$^+$,1$^+$,2$^+$	M1,E2	1.06 *14*	α(K)=0.75 *4*; α(L)=0.24 *14*; α(M)=0.054 *31* α(N)=0.0120 *67*; α(O)=0.00160 *80*; α(P)=4.1×10^{-5} *10*
		204.9 *2*	7.7	139.95	(2)$^-$			
		344.9 *2*	73.9	0.0	1$^+$	(E2)	0.0354	α(K)=0.0283 *4*; α(L)=0.00559 *8*; α(M)=0.001229 *18* α(N)=0.000273 *4*; α(O)=3.83×10^{-5} *6*; α(P)=1.570×10^{-6} *23*
415.15	1$^+$	75.3 *2*	100	339.88	(1,2)$^+$	M1	3.50 *6*	α(K)=2.97 *5*; α(L)=0.419 *7*; α(M)=0.0895 *15* α(N)=0.0202 *4*; α(O)=0.00304 *5*; α(P)=0.000191 *3*
		189.6 *2*	10.3	225.47	0$^+$,1$^+$,2$^+$			
		415.3 *2*	38.5	0.0	1$^+$			
481.18	+	136.4 *2*	45	344.94	+	M1	0.641	α(K)=0.544 *8*; α(L)=0.0762 *12*; α(M)=0.01626 *24* α(N)=0.00366 *6*; α(O)=0.000553 *8*; α(P)=3.50×10^{-5} *6*
		141.3 *2*	37.5	339.88	(1,2)$^+$	[M1,E2]	0.62 *5*	α(K)=0.46 *3*; α(L)=0.125 *56*; α(M)=0.028 *14* α(N)=0.0061 *29*; α(O)=8.4×10^{-4} *34*; α(P)=2.6×10^{-5} *6*
		145.7 *2*	32.5	335.35	+	M1	0.533	α(K)=0.453 *7*; α(L)=0.0632 *10*; α(M)=0.01350 *20* α(N)=0.00304 *5*; α(O)=0.000459 *7*; α(P)=2.91×10^{-5} *5*
		220.7 *1*	100	260.64	(1,2,3)$^+$	(M1)	0.1693	α(K)=0.1440 *21*; α(L)=0.0199 *3*; α(M)=0.00425 *6* α(N)=0.000959 *14*; α(O)=0.0001448 *21*; α(P)=9.21×10^{-6} *13*
		255.6 *2*	22.5	225.47	0$^+$,1$^+$,2$^+$	(M1)	0.1139	α(K)=0.0970 *14*; α(L)=0.01337 *19*; α(M)=0.00285 *4* α(N)=0.000643 *9*; α(O)=9.71×10^{-5} *14*; α(P)=6.19×10^{-6} *9*
		481.1 *2*	12.5	0.0	1$^+$			

$^{140}_{61}Pm_{79}$-4

Adopted Levels, Gammas (continued)

γ(^{140}Pm) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult. ‡	α [a]	Comments
503.39	0⁺,1⁺,2⁺	158.5 *2*	100	344.94	⁺	(M1)	0.421	α(K)=0.358 *6*; α(L)=0.0499 *8*; α(M)=0.01065 *16* α(N)=0.00240 *4*; α(O)=0.000362 *6*; α(P)=2.30×10^{-5} *4*
		163.6 *2*	14.3	339.88	(1,2)⁺	(M1)	0.386	α(K)=0.328 *5*; α(L)=0.0457 *7*; α(M)=0.00975 *14* α(N)=0.00220 *4*; α(O)=0.000332 *5*; α(P)=2.10×10^{-5} *3*
		503.3 *2*	90.5	0.0	1⁺	M1	0.0195	α(K)=0.01668 *24*; α(L)=0.00225 *4*; α(M)=0.000478 *7* α(N)=0.0001078 *16*; α(O)=1.633×10^{-5} *23*; α(P)=1.053×10^{-6} *15*
534.03	(⁺)	308.7 *2*	60	225.47	0⁺,1⁺,2⁺	(M1)	0.0689	α(K)=0.0587 *9*; α(L)=0.00805 *12*; α(M)=0.001715 *25* α(N)=0.000387 *6*; α(O)=5.85×10^{-5} *9*; α(P)=3.74×10^{-6} *6*
		533.9 *2*	100	0.0	1⁺	(E2)	0.01033	α(K)=0.00855 *12*; α(L)=0.001397 *20*; α(M)=0.000302 *5* α(N)=6.75×10^{-5} *10*; α(O)=9.80×10^{-6} *14*; α(P)=4.99×10^{-7} *7*
565.46	(1⁺,2⁺)	150.4 *2*	20	415.15	1⁺	(M1)	0.487	α(K)=0.414 *6*; α(L)=0.0578 *9*; α(M)=0.01234 *18* α(N)=0.00278 *4*; α(O)=0.000420 *6*; α(P)=2.66×10^{-5} *4*
		220.6 *1*	100	344.94	⁺	(M1)	0.1695	α(K)=0.1442 *21*; α(L)=0.0200 *3*; α(M)=0.00426 *6* α(N)=0.000960 *14*; α(O)=0.0001450 *21*; α(P)=9.22×10^{-6} *13*
		339.8 *1*	20	225.47	0⁺,1⁺,2⁺	(E2)	0.0370	α(K)=0.0295 *5*; α(L)=0.00588 *9*; α(M)=0.001294 *19* α(N)=0.000287 *4*; α(O)=4.03×10^{-5} *6*; α(P)=1.636×10^{-6} *23*
		425.6 *2*	22	139.95	(2)⁻			
		565.6 *2*	66	0.0	1⁺	(M1)	0.01457	α(K)=0.01245 *18*; α(L)=0.001672 *24*; α(M)=0.000356 *5* α(N)=8.02×10^{-5} *12*; α(O)=1.215×10^{-5} *17*; α(P)=7.84×10^{-7} *11*
572.11	(1⁺,2⁺)	237.0 *2*	33	335.35	⁺	(M1)	0.1396	α(K)=0.1188 *17*; α(L)=0.01641 *24*; α(M)=0.00350 *5* α(N)=0.000789 *12*; α(O)=0.0001192 *17*; α(P)=7.59×10^{-6} *11*
		311.4 *2*	83	260.64	(1,2,3)⁺	(M1)	0.0674	α(K)=0.0574 *8*; α(L)=0.00786 *11*; α(M)=0.001676 *24* α(N)=0.000378 *6*; α(O)=5.71×10^{-5} *8*; α(P)=3.65×10^{-6} *6*
		431.9 *2*	20	139.95	(2)⁻			
		572.2 *2*	100	0.0	1⁺	(M1)	0.01416	α(K)=0.01210 *17*; α(L)=0.001624 *23*; α(M)=0.000345 *5* α(N)=7.79×10^{-5} *11*; α(O)=1.180×10^{-5} *17*; α(P)=7.62×10^{-7} *11*
576.27	(0⁻,1⁻,2⁻)	436.3 *2*	15	139.95	(2)⁻			
		576.3 *2*	100	0.0	1⁺	(E1)	0.00300	α(K)=0.00258 *4*; α(L)=0.000336 *5*; α(M)=7.12×10^{-5} *10* α(N)=1.599×10^{-5} *23*; α(O)=2.40×10^{-6} *4*; α(P)=1.488×10^{-7} *21*
652.36		312.4 *2*	100	339.88	(1,2)⁺			
		427.0 *2*	59	225.47	0⁺,1⁺,2⁺			
		652.5 *2*	100	0.0	1⁺			
670.17	(⁺)	409.5 *2*	100	260.64	(1,2,3)⁺	(M1)	0.0330	α(K)=0.0282 *4*; α(L)=0.00383 *6*; α(M)=0.000814 *12* α(N)=0.000184 *3*; α(O)=2.78×10^{-5} *4*; α(P)=1.78×10^{-6} *3*
761.35	(⁺)	421.6 *2*		339.88	(1,2)⁺			
		761.5 *2*	100	0.0	1⁺	(E2)	0.00431	α(K)=0.00363 *5*; α(L)=0.000535 *8*; α(M)=0.0001147 *16* α(N)=2.57×10^{-5} *4*; α(O)=3.80×10^{-6} *6*; α(P)=2.16×10^{-7} *3*
386.23+x	8⁺	386.2 *1*	100	0.0+x	8⁻	E1	0.00755	B(E1)(W.u.)=4.3×10^{-6} *+43−22* α(K)=0.00647 *9*; α(L)=0.000859 *12*; α(M)=0.000182 *3* α(N)=4.08×10^{-5} *6*; α(O)=6.08×10^{-6} *9*; α(P)=3.66×10^{-7} *6*
808.16		468.5 *3*	36 *6*	339.88	(1,2)⁺			
		668.2 *2*	100	139.95	(2)⁻			

$^{140}_{61}Pm_{79}$-5

Adopted Levels, Gammas (continued)

γ(^{140}Pm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[&b]	α[a]	Comments
808.16		808.3[d]	18	0.0	1^+				
407.28+x	9^+	(21.3)		386.23+x	8^+				
		407.5 *2*	100	0.0+x	8^-	E1		0.00664	α(K)=0.00569 *8*; α(L)=0.000754 *11*; α(M)=0.0001597 *23* α(N)=3.58×10^{-5} *5*; α(O)=5.34×10^{-6} *8*; α(P)=3.23×10^{-7} *5*
844.62	$0^+,1^+,2^+$	279.0 *2*	23	565.46	$(1^+,2^+)$	(M1)		0.0902	α(K)=0.0768 *11*; α(L)=0.01055 *15*; α(M)=0.00225 *4* α(N)=0.000507 *8*; α(O)=7.67×10^{-5} *11*; α(P)=4.89×10^{-6} *7*
		341.3 *2*	100	503.39	$0^+,1^+,2^+$				
		844.8 *2*	30	0.0	1^+				
855.81		520.5 *2*	100	335.35	$^+$				
		630.5 *2*	40	225.47	$0^+,1^+,2^+$				
		855.8 *2*	67	0.0	1^+				
874.29		648.9 *2*	52	225.47	$0^+,1^+,2^+$				
		874.2 *2*	100	0.0	1^+				
926.33		586.3 *2*	61	339.88	$(1,2)^+$				
		701.0 *2*	100	225.47	$0^+,1^+,2^+$				
		926.3[d] *2*	32	0.0	1^+				
532.15+x	10^+	124.8 *1*	100	407.28+x	9^+	M1+E2		0.93 *11*	α(K)=0.66 *4*; α(L)=0.20 *11*; α(M)=0.046 *25* α(N)=0.0100 *54*; α(O)=0.00135 *64*; α(P)=3.7×10^{-5} *9*
951.30		951.1 *2*	100	0.0	1^+				
1065.80	$(^+)$	725.8 *2*	100	339.88	$(1,2)^+$	(M1)		0.00788	α(K)=0.00674 *10*; α(L)=0.000898 *13*; α(M)=0.000191 *3* α(N)=4.30×10^{-5} *6*; α(O)=6.52×10^{-6} *10*; α(P)=4.23×10^{-7} *6*
		1065.5[d] *5*	13	0.0	1^+				
1088.99		863.5 *2*	46	225.47	$0^+,1^+,2^+$				
		1089.1 *5*	100	0.0	1^+				
1173.91		608.3 *2*	100	565.46	$(1^+,2^+)$				
806.15+x	$9^{(-)}$	273.7 *2*	76[#] *3*	532.15+x	10^+	D[@]			
		399.4 *2*	31[#] *5*	407.28+x	9^+				
		419.8 *2*	100[#] *11*	386.23+x	8^+	D			
		805.7 *4*	55[#] *8*	0.0+x	8^-				
1278.8		1018.2 *5*	100	260.64	$(1,2,3)^+$				
		1053.5[d] *5*	60	225.47	$0^+,1^+,2^+$				
934.29+x	11^+	402.1 *1*	100	532.15+x	10^+	(M1+E2)	+0.07 *4*	0.0346	α(K)=0.0295 *5*; α(L)=0.00401 *6*; α(M)=0.000853 *12* α(N)=0.000192 *3*; α(O)=2.91×10^{-5} *5*; α(P)=1.87×10^{-6} *3*
1594.6		1022.6 *5*	55	572.11	$(1^+,2^+)$				
		1249.5 *5*	100	344.94	$^+$				
		1254.7 *5*	62	339.88	$(1,2)^+$				
		1594.7[d] *5*	12	0.0	1^+				
1618.2		1278.1 *5*	100	339.88	$(1,2)^+$				
		1283.0 *5*	95	335.35	$^+$				
1619.25	1^+	445.2 *2*	7.8	1173.91					

$^{140}_{61}Pm_{79}$-6

Adopted Levels, Gammas (continued)

γ(^{140}Pm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[&b]	α[a]	Comments
1619.25	1+	774.7 *2*	22.8	844.62	0+,1+,2+				
		858.0 *5*	2.2	761.35	(+)				
		967.0 *2*	10	652.36					
		1046.9 *5*	10	572.11	(1+,2+)				
		1116.0 *5*	12.8	503.39	0+,1+,2+				
		1138.1 *3*	100	481.18	+				
		1274.2 *3*	88.9	344.94	+				
		1393.5 *3*	66.7	225.47	0+,1+,2+				
		1479.9 *5*	6.1	139.95	(2)−				
		1619.1[d] *5*	3.3	0.0	1+				
1623.09	1+	671.6 *2*	7.1	951.30					
		862.0 *2*	36	761.35	(+)				
		1119.6 *5*	43	503.39	0+,1+,2+				
		1278.1 *5*	100	344.94	+				
		1283.0 *5*	95	339.88	(1,2)+				
		1397.5 *5*	27	225.47	0+,1+,2+				
		1623.0[d] *5*	5.4	0.0	1+				
1670.11	1+	604.2 *2*	16.9	1065.80	(+)				
		814.5 *2*	23.9	855.81					
		825.5 *2*	57.7	844.62	0+,1+,2+	M1		0.00577	α(K)=0.00494 *7*; α(L)=0.000655 *10*; α(M)=0.0001390 *20* α(N)=3.14×10^{-5} *5*; α(O)=4.76×10^{-6} *7*; α(P)=3.09×10^{-7} *5*
		999.9 *2*	9.2	670.17	(+)				
		1017.8 *2*	11.5	652.36					
		1093.9 *5*	9.2	576.27	(0−,1−,2−)				
		1098.0 *5*	40	572.11	(1+,2+)				
		1166.7 *5*	53	503.39	0+,1+,2+				
		1188.9 *5*	10.8	481.18	+				
		1324.9 *5*	33.9	344.94	+				
		1330.0 *5*	23.9	339.88	(1,2)+				
		1444.4 *5*	10.8	225.47	0+,1+,2+				
		1530.2 *3*	100	139.95	(2)−				
		1670.0 *5*	33.9	0.0	1+				
1301.5+x	11(−)	495.1[#]	100[#]	806.15+x	9(−)	E2[@]		0.01262	α(K)=0.01040 *15*; α(L)=0.001745 *25*; α(M)=0.000379 *6* α(N)=8.45×10^{-5} *12*; α(O)=1.221×10^{-5} *17*; α(P)=6.03×10^{-7} *9*
1308.41+x	12+	374.1 *1*	100 *3*	934.29+x	11+	M1(+E2)	+0.08 *10*	0.0416 *7*	α(K)=0.0355 *6*; α(L)=0.00484 *7*; α(M)=0.001031 *15* α(N)=0.000232 *4*; α(O)=3.51×10^{-5} *6*; α(P)=2.25×10^{-6} *4*
		776.4 *2*	8.5 *21*	532.15+x	10+	E2[@]		0.00412	α(K)=0.00348 *5*; α(L)=0.000509 *8*; α(M)=0.0001092 *16* α(N)=2.45×10^{-5} *4*; α(O)=3.62×10^{-6} *5*; α(P)=2.07×10^{-7} *3*
1601.65+x?	11(−)	795.5 *1*	100	806.15+x	9(−)	E2		0.00390	α(K)=0.00329 *5*; α(L)=0.000480 *7*; α(M)=0.0001028 *15* α(N)=2.30×10^{-5} *4*; α(O)=3.41×10^{-6} *5*; α(P)=1.96×10^{-7} *3*
2017.4		1677.5 *5*	100	339.88	(1,2)+				

$^{140}_{61}Pm_{79}$-7

Adopted Levels, Gammas (continued)

γ(^{140}Pm) (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [†]	E_f	J_f^π	Mult. [‡]	δ [&b]	α [a]	Comments
1690.2+x	$12^{(+)}$	755.9 *3*	100	934.29+x	11^+	(M1+E2) [@]		0.0058 *14*	α(K)=0.0049 *12*; α(L)=0.00068 *14*; α(M)=0.00014 *3* α(N)=3.3×10^{-5} *7*; α(O)=4.9×10^{-6} *11*; α(P)=3.01×10^{-7} *82*
1873.4+x	13^+	565.0 *2*	100 [#] *5*	1308.41+x	12^+	M1+E2 [@]	+0.13 *6*	0.01452 *23*	α(K)=0.01240 *20*; α(L)=0.00167 *3*; α(M)=0.000355 *6* α(N)=8.00×10^{-5} *12*; α(O)=1.211×10^{-5} *19*; α(P)=7.81×10^{-7} *13*
		938.7 [#]	12 [#] *3*	934.29+x	11^+	E2 [@]		0.00270	α(K)=0.00229 *4*; α(L)=0.000323 *5*; α(M)=6.90×10^{-5} *10* α(N)=1.548×10^{-5} *22*; α(O)=2.31×10^{-6} *4*; α(P)=1.374×10^{-7} *20*
1948.3+x	$12^{(+)}$	1014.0 [#]	100 [#]	934.29+x	11^+	(M1+E2) [@]		0.0029 *7*	α(K)=0.0025 *6*; α(L)=0.00033 *7*; α(M)=7.1×10^{-5} *14* α(N)=1.6×10^{-5} *3*; α(O)=2.4×10^{-6} *5*; α(P)=1.5×10^{-7} *4*
2097.0+x	$13^{(-)}$	495.4 [d] *2*		1601.65+x?	$11^{(-)}$	E2		0.01260	α(K)=0.01038 *15*; α(L)=0.001742 *25*; α(M)=0.000378 *6* α(N)=8.43×10^{-5} *12*; α(O)=1.218×10^{-5} *18*; α(P)=6.02×10^{-7} *9* γ ray placed here by in (HI,xnγ) (1993De40) but at 1301+x in (^{19}F,5nγ) (2010Wa37), which was adopted by evaluator.
		795.2 [#]		1301.5+x	$11^{(-)}$	E2 [@]		0.00391	α(K)=0.00330 *5*; α(L)=0.000480 *7*; α(M)=0.0001028 *15* α(N)=2.31×10^{-5} *4*; α(O)=3.42×10^{-6} *5*; α(P)=1.97×10^{-7} *3*
2209.2+x	$12^{(+)}$	1274.8 *3*	100	934.29+x	11^+	(M1+E2) [@]		0.0018 *4*	α(K)=0.0015 *3*; α(L)=0.00020 *4*; α(M)=4.2×10^{-5} *8* α(N)=9.5×10^{-6} *17*; α(O)=1.4×10^{-6} *3*; α(P)=9.2×10^{-8} *19*; α(IPF)=1.67×10^{-5} *5*
2266.2+x	$13^{(+)}$	576.0 [#]	100 [#]	1690.2+x	$12^{(+)}$	(M1+E2) [@]		0.011 *3*	α(K)=0.0095 *25*; α(L)=0.00136 *24*; α(M)=0.00029 *5* α(N)=6.5×10^{-5} *12*; α(O)=9.8×10^{-6} *19*; α(P)=5.8×10^{-7} *17*
2332.1+x	14^+	458.9 [#]	100 [#] *9*	1873.4+x	13^+	(M1+E2) [@]		0.020 *5*	α(K)=0.017 *5*; α(L)=0.0025 *4*; α(M)=0.00054 *7* α(N)=0.000122 *16*; α(O)=1.8×10^{-5} *3*; α(P)=1.03×10^{-6} *30*
		1023.6 [#]	50 [#] *23*	1308.41+x	12^+	E2 [@]		0.00225	α(K)=0.00191 *3*; α(L)=0.000265 *4*; α(M)=5.65×10^{-5} *8* α(N)=1.270×10^{-5} *18*; α(O)=1.90×10^{-6} *3*; α(P)=1.147×10^{-7} *16*
2354.2+x	14^+	1045.8 [#]	100 [#]	1308.41+x	12^+	E2 [@]		0.00215	α(K)=0.00183 *3*; α(L)=0.000253 *4*; α(M)=5.38×10^{-5} *8* α(N)=1.210×10^{-5} *17*; α(O)=1.81×10^{-6} *3*; α(P)=1.097×10^{-7} *16*
2444.1+x	$12^{(+)}$	1509.5 [#]	100 [#]	934.29+x	11^+	(M1+E2) [@]		0.00130 *20*	α(K)=0.00105 *17*; α(L)=0.000137 *21*; α(M)=2.9×10^{-5} *5* α(N)=6.5×10^{-6} *10*; α(O)=9.9×10^{-7} *16*; α(P)=6.4×10^{-8} *11*; α(IPF)=8.2×10^{-5} *3*

$^{140}_{61}Pm_{79}$-8

Adopted Levels, Gammas (continued)

γ(^{140}Pm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[a]	Comments
2557.1+x	14$^+$	1248.6 *2*	100	1308.41+x	12$^+$	E2[@]	1.51×10^{-3}	α(K)=0.001277 *18*; α(L)=0.0001721 *25*; α(M)=3.66×10^{-5} *6* α(N)=8.23×10^{-6} *12*; α(O)=1.236×10^{-6} *18*; α(P)=7.68×10^{-8} *11*; α(IPF)=1.218×10^{-5} *18*
2570.7+x	14$^+$	697.4 *2*	100[#] *7*	1873.4+x	13$^+$	(M1+E2)[@]	0.0070 *17*	α(K)=0.0059 *15*; α(L)=0.00083 *17*; α(M)=0.00018 *4* α(N)=4.0×10^{-5} *8*; α(O)=6.0×10^{-6} *13*; α(P)=3.7×10^{-7} *11*
		1262.5 *7*	60[#] *8*	1308.41+x	12$^+$	E2[@]	1.48×10^{-3}	α(K)=0.001249 *18*; α(L)=0.0001681 *24*; α(M)=3.57×10^{-5} *5* α(N)=8.04×10^{-6} *12*; α(O)=1.207×10^{-6} *17*; α(P)=7.51×10^{-8} *11*; α(IPF)=1.430×10^{-5} *23*
2595.5+x	13$^{(+)}$	386.0[#]	71[#] *14*	2209.2+x	12$^{(+)}$	D+Q		
		905.1[#]	100[#] *14*	1690.2+x	12$^{(+)}$	(M1+E2)[@]	0.0038 *9*	α(K)=0.0032 *8*; α(L)=0.00044 *9*; α(M)=9.3×10^{-5} *18* α(N)=2.1×10^{-5} *5*; α(O)=3.2×10^{-6} *7*; α(P)=1.98×10^{-7} *50*
2625.2+x	14$^{(-)}$	528.2 *2*	100	2097.0+x	13$^{(-)}$	(M1+E2)[@]	0.014 *4*	α(K)=0.0118 *30*; α(L)=0.0017 *3*; α(M)=0.00037 *6* α(N)=8.3×10^{-5} *13*; α(O)=1.23×10^{-5} *22*; α(P)=7.2×10^{-7} *21*
2664.7+x	13$^{(+)}$	220.2[#]	20[#] *4*	2444.1+x	12$^{(+)}$			
		455.2[#]	41[#] *6*	2209.2+x	12$^{(+)}$	(M1+E2)[@]	0.021 *5*	α(K)=0.017 *5*; α(L)=0.0026 *4*; α(M)=0.00055 *7* α(N)=0.000124 *16*; α(O)=1.8×10^{-5} *3*; α(P)=1.05×10^{-6} *31*
		974.3[#]	100[#] *14*	1690.2+x	12$^{(+)}$	(M1+E2)[@]	0.0032 *7*	α(K)=0.0027 *6*; α(L)=0.00037 *8*; α(M)=7.8×10^{-5} *15* α(N)=1.8×10^{-5} *4*; α(O)=2.7×10^{-6} *6*; α(P)=1.7×10^{-7} *4*
2747.8+x	15$^{(-)}$	177.1 *3*	100[#] *7*	2570.7+x	14$^+$	[E1][@]	0.0565	α(K)=0.0480 *7*; α(L)=0.00664 *10*; α(M)=0.001409 *21* α(N)=0.000314 *5*; α(O)=4.59×10^{-5} *7*; α(P)=2.54×10^{-6} *4* Mult.: relatively pure stretched D, Δπ=yes E1 based on proposed configuration in (^{19}F,5nγ) (2010Wa37).
		190.6 *3*	24[#] *2*	2557.1+x	14$^+$	[E1][@]	0.0463	α(K)=0.0395 *6*; α(L)=0.00543 *8*; α(M)=0.001152 *17* α(N)=0.000257 *4*; α(O)=3.76×10^{-5} *6*; α(P)=2.10×10^{-6} *3* Mult.: relatively pure stretched D, Δπ=yes E1 based on proposed configuration in (^{19}F,5nγ) (2010Wa37).
2776.7+x	13$^{(+)}$	1468.4 *3*	100	1308.41+x	12$^+$	(M1+E2)[@]	0.00136 *21*	α(K)=0.00111 *18*; α(L)=0.000145 *23*; α(M)=3.1×10^{-5} *5* α(N)=6.9×10^{-6} *11*; α(O)=1.05×10^{-6} *17*; α(P)=6.8×10^{-8} *12*; α(IPF)=6.75×10^{-5} *25*
2830.0+x	15$^{(-)}$	732.8[#]	100[#]	2097.0+x	13$^{(-)}$	E2[@]	0.00472	α(K)=0.00397 *6*; α(L)=0.000589 *9*; α(M)=0.0001265 *18* α(N)=2.83×10^{-5} *4*; α(O)=4.18×10^{-6} *6*; α(P)=2.36×10^{-7} *4*
2905.7+x	14$^{(+)}$	129.1 *3*	40 *10*	2776.7+x	13$^{(+)}$	D+Q		
		240.9 *3*	80 *20*	2664.7+x	13$^{(+)}$	(M1+E2)[@]	0.121 *13*	α(K)=0.098 *16*; α(L)=0.0181 *25*; α(M)=0.0040 *7* α(N)=0.00088 *13*; α(O)=0.000126 *13*; α(P)=5.8×10^{-6} *15*
		310.1 *3*	100 *30*	2595.5+x	13$^{(+)}$	(M1+E2)[@]	0.059 *10*	α(K)=0.048 *10*; α(L)=0.00803 *14*; α(M)=0.00174 *6* α(N)=0.000389 *9*; α(O)=5.65×10^{-5} *15*; α(P)=2.90×10^{-6} *80*
2988.5+x	(14$^+$)	324.0[#]	<7[#]	2664.7+x	13$^{(+)}$			
		1115.0[#]	100[#] *21*	1873.4+x	13$^+$			

$^{140}_{61}Pm_{79}$-9

Adopted Levels, Gammas (continued)

γ(^{140}Pm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[a]	Comments
2992.5+x	16(−)	244.8 *2*	100	2747.8+x	15(−)	(M1+E2)[@]	0.116 *13*	α(K)=0.094 *15*; α(L)=0.0172 *22*; α(M)=0.0038 *6* α(N)=0.00084 *12*; α(O)=0.000120 *11*; α(P)=5.5×10^{-6} *15*
3132.6+x	15(+)	226.9 *2*	100	2905.7+x	14(+)	(M1+E2)[@]	0.145 *13*	α(K)=0.117 *17*; α(L)=0.022 *4*; α(M)=0.0049 *10* α(N)=0.00108 *20*; α(O)=0.000154 *20*; α(P)=6.8×10^{-6} *17*
3285.9+x	(15+)	297.4[#]	100[#]	2988.5+x	(14+)	(M1+E2)[@]	0.066 *11*	α(K)=0.054 *11*; α(L)=0.0092 *3*; α(M)=0.00199 *10* α(N)=0.000444 *18*; α(O)=6.43×10^{-5} *10*; α(P)=3.25×10^{-6} *88*
3372.8+x	16(−)	747.6 *2*	100	2625.2+x	14(−)	E2[@]	0.00450	α(K)=0.00379 *6*; α(L)=0.000560 *8*; α(M)=0.0001202 *17* α(N)=2.69×10^{-5} *4*; α(O)=3.98×10^{-6} *6*; α(P)=2.26×10^{-7} *4*
3386.6+x	16(+)	254.0 *2*	100	3132.6+x	15(+)	(M1+E2)[@]	0.104 *12*	α(K)=0.085 *15*; α(L)=0.0152 *17*; α(M)=0.0033 *5* α(N)=0.00074 *9*; α(O)=0.000106 *8*; α(P)=5.0×10^{-6} *13*
3498.4+x	17(−)	505.9[#]	100[#] *8*	2992.5+x	16(−)	(M1+E2)[@]	0.016 *4*	α(K)=0.0131 *34*; α(L)=0.0019 *3*; α(M)=0.00041 *6* α(N)=9.3×10^{-5} *14*; α(O)=1.38×10^{-5} *24*; α(P)=8.1×10^{-7} *24*
		750.6[#]	11[#] *4*	2747.8+x	15(−)			
3519.0+x	17(−)	688.8[#]	100[#]	2830.0+x	15(−)	E2[@]	0.00546	α(K)=0.00458 *7*; α(L)=0.000691 *10*; α(M)=0.0001486 *21* α(N)=3.33×10^{-5} *5*; α(O)=4.90×10^{-6} *7*; α(P)=2.72×10^{-7} *4*
3593.5+x	(16−)	220.8[#]	100[#]	3372.8+x	16(−)			
3610.0+x	(16+)	324.1[#]	100[#]	3285.9+x	(15+)			
3652.3+x	17(+)	265.8[#]	100[#] *4*	3386.6+x	16(+)	(M1+E2)[@]	0.091 *12*	α(K)=0.074 *13*; α(L)=0.0131 *11*; α(M)=0.0029 *3* α(N)=0.00064 *6*; α(O)=9.2×10^{-5} *5*; α(P)=4.4×10^{-6} *12*
		519.7[#]	6[#] *1*	3132.6+x	15(+)	E2[@]	0.01109	α(K)=0.00917 *13*; α(L)=0.001511 *22*; α(M)=0.000327 *5* α(N)=7.31×10^{-5} *11*; α(O)=1.059×10^{-5} *15*; α(P)=5.34×10^{-7} *8*
3887.2+x	18(−)	388.8[#]	100[#] *10*	3498.4+x	17(−)			
		894.7[#]	67[#] *10*	2992.5+x	16(−)	E2[@]	0.00300	α(K)=0.00254 *4*; α(L)=0.000361 *5*; α(M)=7.72×10^{-5} *11* α(N)=1.733×10^{-5} *25*; α(O)=2.58×10^{-6} *4*; α(P)=1.522×10^{-7} *22*
3935.2+x	18(−)	416.2[#]	100[#]	3519.0+x	17(−)	(M1+E2)[@]	0.026 *6*	α(K)=0.022 *6*; α(L)=0.0033 *4*; α(M)=0.00072 *7* α(N)=0.000161 *16*; α(O)=2.4×10^{-5} *3*; α(P)=1.33×10^{-6} *39*
4002.8+x	(17+)	392.8[#]	100[#]	3610.0+x	(16+)			
4043.0+x	18(+)	390.7[#]	100[#] *5*	3652.3+x	17(+)	(M1+E2)[@]	0.031 *7*	α(K)=0.026 *6*; α(L)=0.0040 *4*; α(M)=0.00086 *6* α(N)=0.000193 *15*; α(O)=2.8×10^{-5} *3*; α(P)=1.57×10^{-6} *45*
		656.5[#]	2.3[#] *6*	3386.6+x	16(+)			
4128.2+x	18(−)	534.6[#]	9.2[#] *25*	3593.5+x	(16−)			
		755.4[c#]	100[c#] *9*	3372.8+x	16(−)	E2[@]	0.00439	α(K)=0.00370 *6*; α(L)=0.000546 *8*; α(M)=0.0001170 *17* α(N)=2.62×10^{-5} *4*; α(O)=3.88×10^{-6} *6*; α(P)=2.20×10^{-7} *3*
4393.0+x?	19(−)	894.6 *3*	100	3498.4+x	17(−)	E2	0.00300	α(K)=0.00254 *4*; α(L)=0.000361 *5*; α(M)=7.72×10^{-5} *11* α(N)=1.733×10^{-5} *25*; α(O)=2.58×10^{-6} *4*; α(P)=1.522×10^{-7} *22*
4484.4+x	19(−)	597.2[#]	100[#] *13*	3887.2+x	18(−)	(M1+E2)[@]	0.0102 *25*	α(K)=0.0087 *23*; α(L)=0.00124 *23*; α(M)=0.00026 *5* α(N)=5.9×10^{-5} *11*; α(O)=8.9×10^{-6} *18*; α(P)=5.3×10^{-7} *16*

$^{140}_{61}Pm_{79}$-10

Adopted Levels, Gammas (continued)

$\gamma(^{140}Pm)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[a]	Comments
4484.4+x	$19^{(-)}$	986.0[#]	13[#] *8*	3498.4+x	$17^{(-)}$			
4486.0+x	$18^{(-)}$	892.5[#]	20[#] *8*	3593.5+x	(16^-)	E2	0.00302	α(K)=0.00256 *4*; α(L)=0.000363 *5*; α(M)=7.77×10^{-5} *11* α(N)=1.743×10^{-5} *25*; α(O)=2.59×10^{-6} *4*; α(P)=1.530×10^{-7} *22*
		966.9[#]	100[#] *25*	3519.0+x	$17^{(-)}$	(M1+E2)[@]	0.0032 *8*	α(K)=0.0028 *7*; α(L)=0.00037 *8*; α(M)=8.0×10^{-5} *16* α(N)=1.8×10^{-5} *4*; α(O)=2.7×10^{-6} *6*; α(P)=1.7×10^{-7} *5*
4508.0+x	$19^{(+)}$	465.0[#]	100[#] *6*	4043.0+x	$18^{(+)}$	(M1+E2)[@]	0.019 *5*	α(K)=0.016 *4*; α(L)=0.0024 *4*; α(M)=0.00052 *7* α(N)=0.000117 *15*; α(O)=1.7×10^{-5} *3*; α(P)=1.00×10^{-6} *29*
		855.7[#]	7.0[#] *12*	3652.3+x	$17^{(+)}$			
4721.2+x	$20^{(-)}$	593.1[#]	<5.3[#]	4128.2+x	$18^{(-)}$			
		785.9[#]	100[#] *21*	3935.2+x	$18^{(-)}$	E2[@]	0.00401	α(K)=0.00338 *5*; α(L)=0.000494 *7*; α(M)=0.0001059 *15* α(N)=2.37×10^{-5} *4*; α(O)=3.52×10^{-6} *5*; α(P)=2.02×10^{-7} *3*
4864.5+x	$19^{(-)}$	736.3[#]	100[#]	4128.2+x	$18^{(-)}$	(M1+E2)[@]	0.0061 *15*	α(K)=0.0052 *13*; α(L)=0.00072 *15*; α(M)=0.00015 *3* α(N)=3.5×10^{-5} *7*; α(O)=5.2×10^{-6} *11*; α(P)=3.21×10^{-7} *88*
4956.4+x	$19^{(-)}$	828.2[#]	100[#]	4128.2+x	$18^{(-)}$	(M1+E2)[@]	0.0046 *11*	α(K)=0.0040 *10*; α(L)=0.00054 *11*; α(M)=0.000115 *23* α(N)=2.6×10^{-5} *6*; α(O)=3.9×10^{-6} *9*; α(P)=2.43×10^{-7} *64*
5012.4+x	$20^{(+)}$	504.4[#]	100[#] *8*	4508.0+x	$19^{(+)}$	(M1+E2)[@]	0.016 *4*	α(K)=0.0132 *34*; α(L)=0.0019 *3*; α(M)=0.00042 *6* α(N)=9.4×10^{-5} *14*; α(O)=1.39×10^{-5} *24*; α(P)=8.1×10^{-7} *24*
		969.4[#]	15[#] *7*	4043.0+x	$18^{(+)}$			
5019.8+x	$20^{(-)}$	891.6[#]	100[#]	4128.2+x	$18^{(-)}$	E2[@]	0.00302	α(K)=0.00256 *4*; α(L)=0.000364 *5*; α(M)=7.79×10^{-5} *11* α(N)=1.747×10^{-5} *25*; α(O)=2.60×10^{-6} *4*; α(P)=1.533×10^{-7} *22*
5356.4+x	$21^{(+)}$	344.0[#]	100[#] *13*	5012.4+x	$20^{(+)}$	(M1+E2)[@]	0.044 *9*	α(K)=0.036 *8*; α(L)=0.00584 *22*; α(M)=0.00126 *3* α(N)=0.000283 *9*; α(O)=4.1×10^{-5} *3*; α(P)=2.20×10^{-6} *62*
		848.4[#]	<4.4[#]	4508.0+x	$19^{(+)}$			
5525.2+x	$21^{(-)}$	505.4[#]	100[#]	5019.8+x	$20^{(-)}$	(M1+E2)[@]	0.016 *4*	α(K)=0.0132 *34*; α(L)=0.0019 *3*; α(M)=0.00041 *6* α(N)=9.3×10^{-5} *14*; α(O)=1.38×10^{-5} *24*; α(P)=8.1×10^{-7} *24*
5786.2+x	(21^-)	921.7[#]	100[#]	4864.5+x	$19^{(-)}$			
5941.4+x	(22^+)	585.0[#]	100[#]	5356.4+x	$21^{(+)}$			
6391.5+x	$23^{(-)}$	866.3[#]	100[#]	5525.2+x	$21^{(-)}$	E2[@]	0.00322	α(K)=0.00273 *4*; α(L)=0.000390 *6*; α(M)=8.34×10^{-5} *12* α(N)=1.87×10^{-5} *3*; α(O)=2.78×10^{-6} *4*; α(P)=1.631×10^{-7} *23*

[†] From (HI,xnγ) for γ's from levels that decay to the 0.0+x keV, 8$^-$ isomer, unless noted otherwise; from ^{140}Sm ε for the other γ's.
[‡] From (HI,xnγ) for γ's from levels that decay to the 0.0+x keV, 8$^-$ isomer by $\gamma(\theta)$, DCO except where noted; from ^{140}Sm ε for the other γ's by α(K)exp.
[#] From ^{126}Te(^{19}F,5nγ).
[@] From ^{126}Te(^{19}F,5nγ) based on measurements of DCO ratios (2010Wa37), $\gamma(\theta)$, and linear pol ((1981PoZV, 1982PoZX) , from in ^{126}Te(^{19}F,5nγ). When linear pol is not available Q transitions are most likely E2 based on heavy ion reaction type, deformation, and rotational character of the bands; and admixed

$^{140}_{61}Pm_{79}$-11

Adopted Levels, Gammas (continued)

$\gamma(^{140}Pm)$ (continued)

D+Q transitions are tentatively M1+E2 (combined with level scheme arguments). Few pure D transitions were adopted as E1 (also combined with level scheme arguments).

& From $^{126}Te(^{19}F,5n\gamma)$.

[a] Additional information 2.

[b] If No value given it was assumed δ=1.00 for E2/M1, δ=1.00 for E3/M2 and δ=0.10 for the other multipolarities.

[c] Multiply placed with intensity suitably divided.

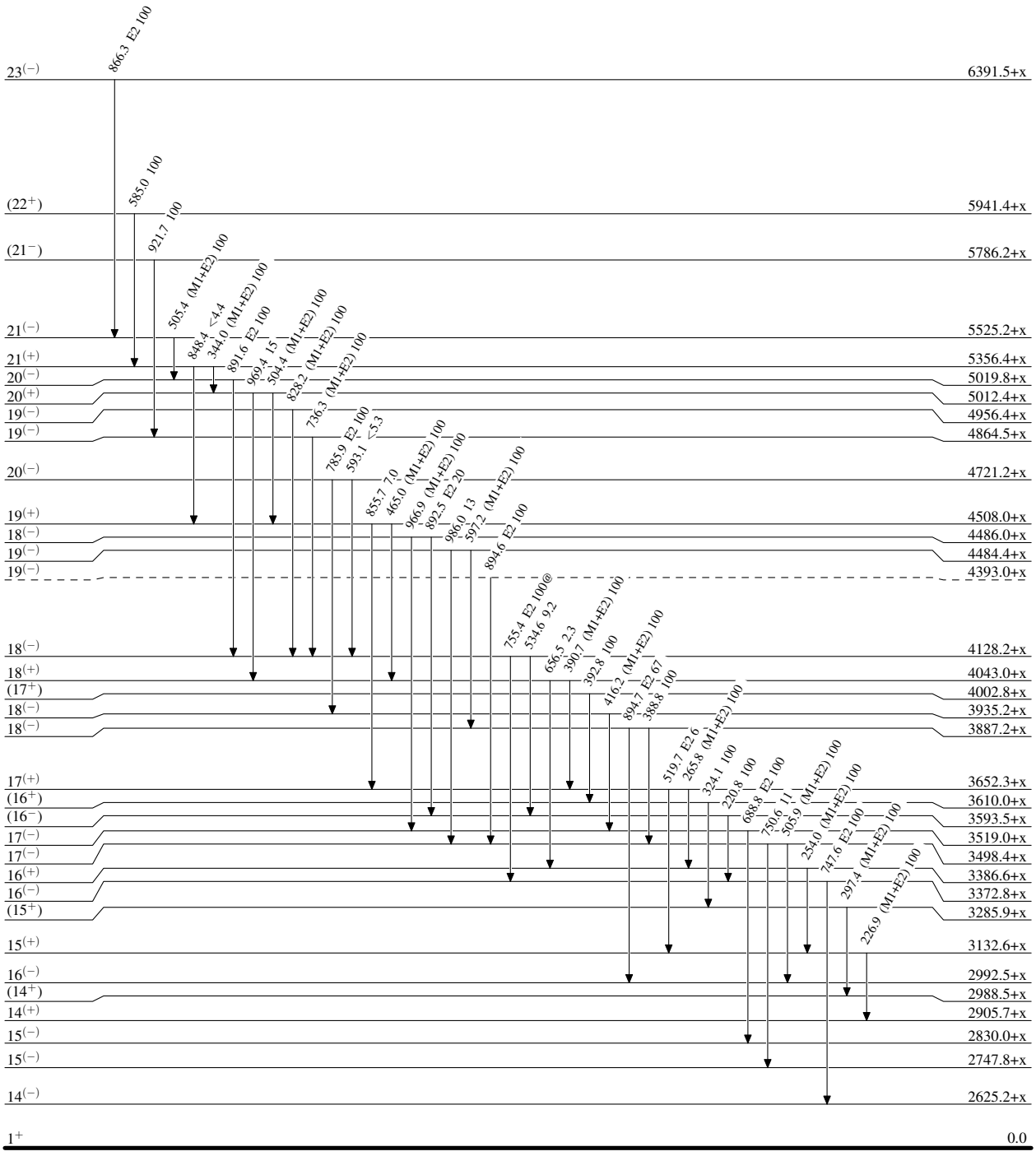
[d] Placement of transition in the level scheme is uncertain.

$^{140}_{61}Pm_{79}$-12

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided



$^{140}_{61}Pm_{79}$

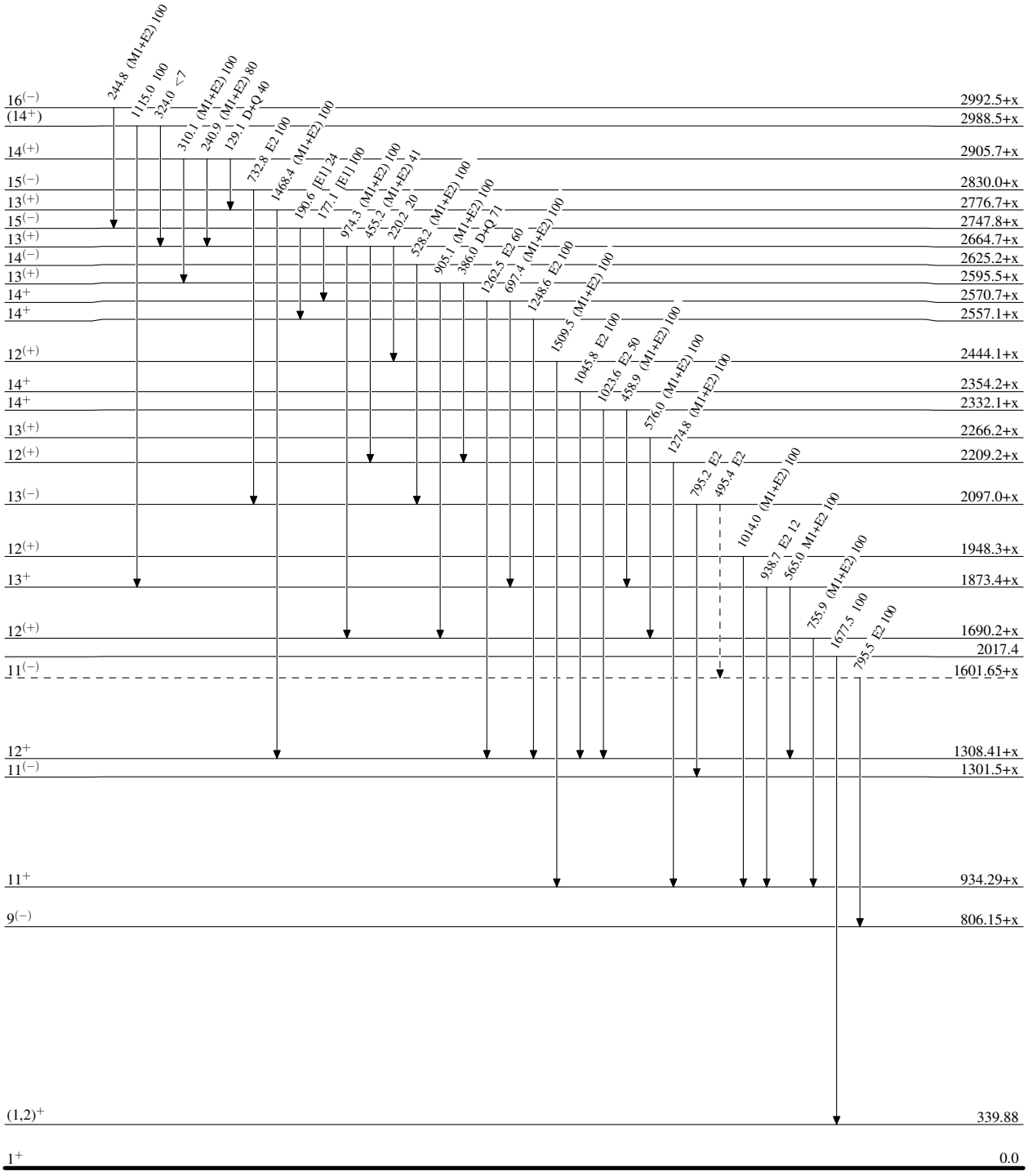
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided

- - - - - - ► γ Decay (Uncertain)



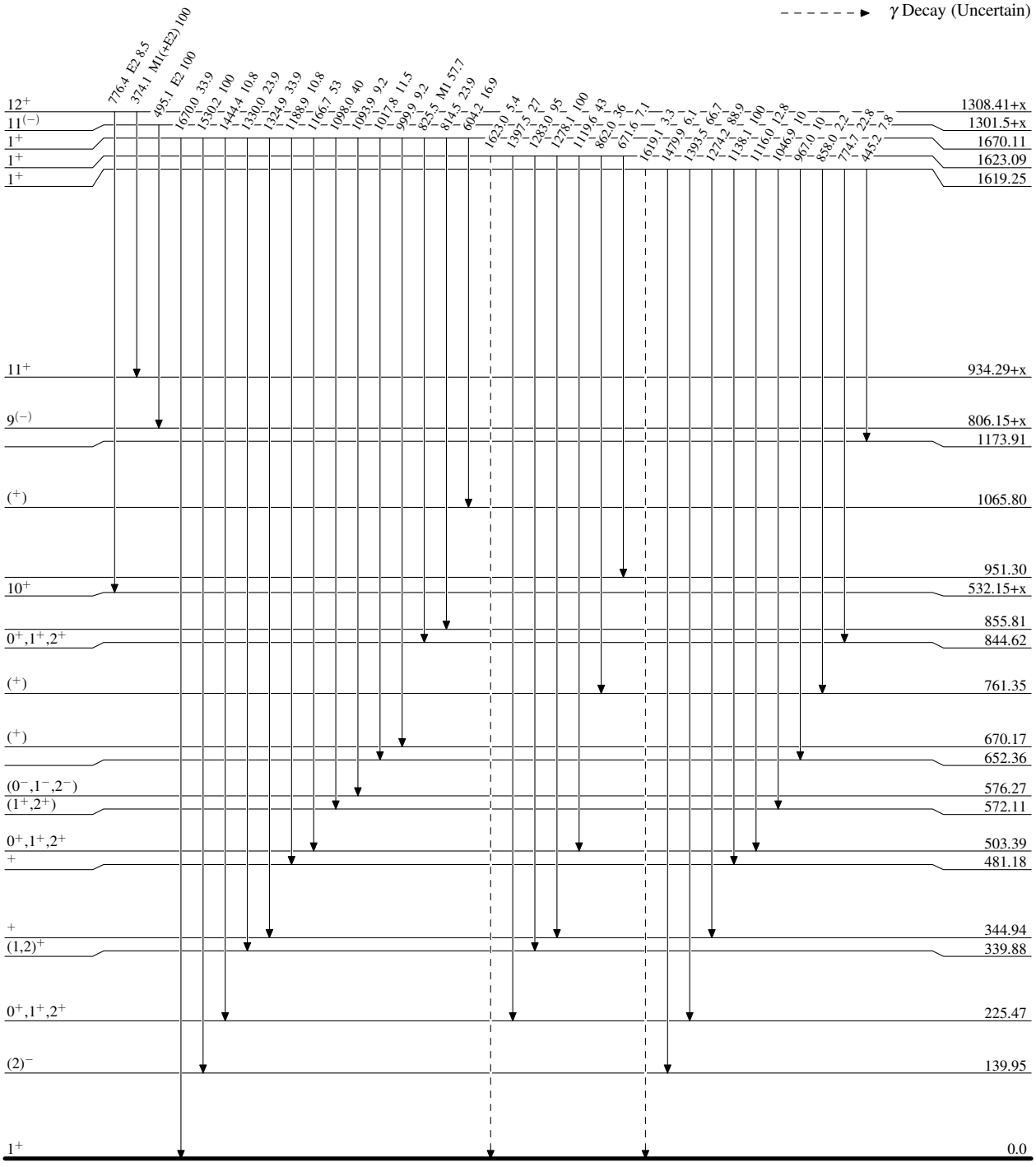
$^{140}_{61}Pm_{79}$

Adopted Levels, Gammas

Level Scheme (continued)

Legend

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided



$^{140}_{61}Pm_{79}$

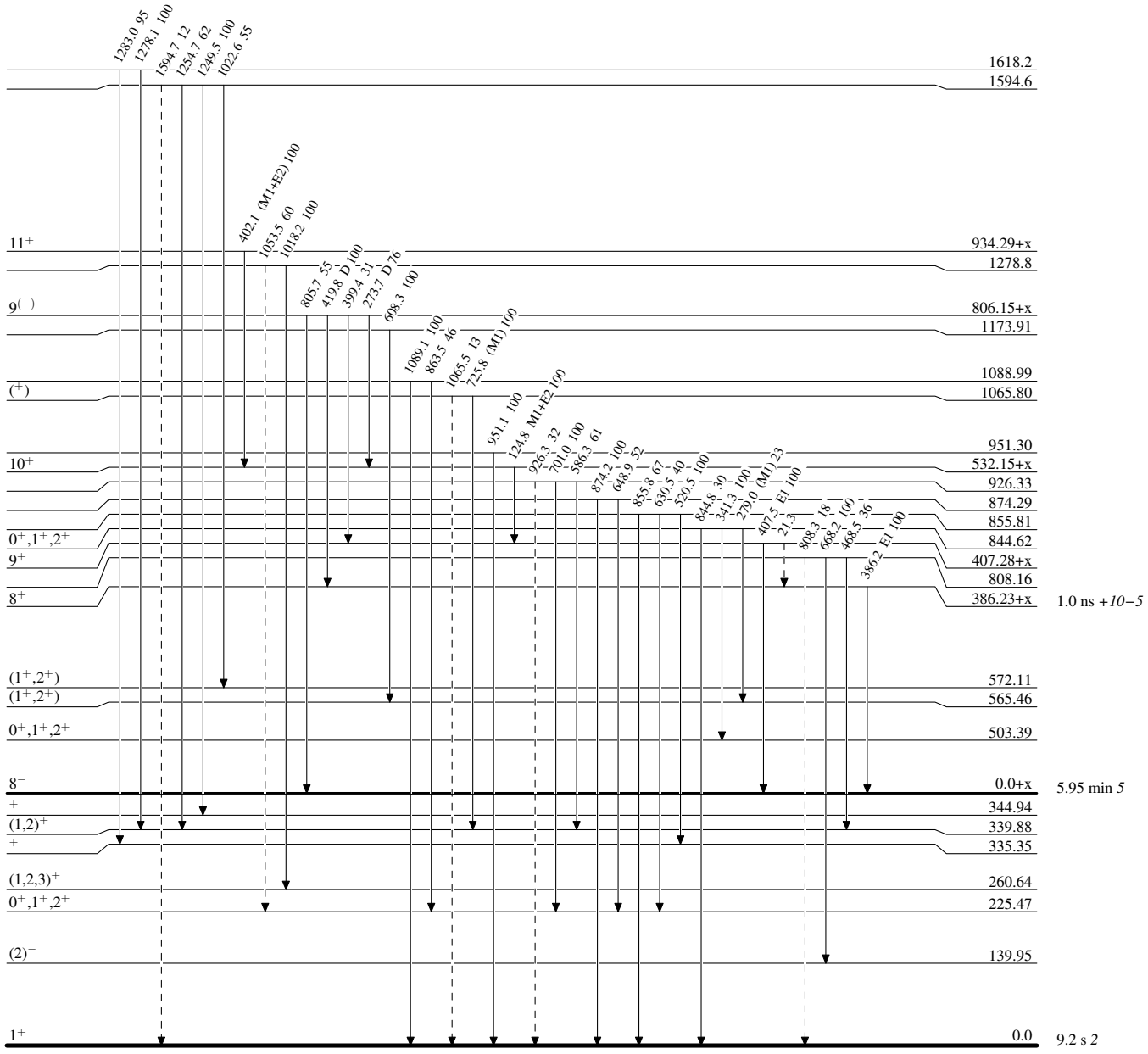
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided

- - - - - - ► γ Decay (Uncertain)

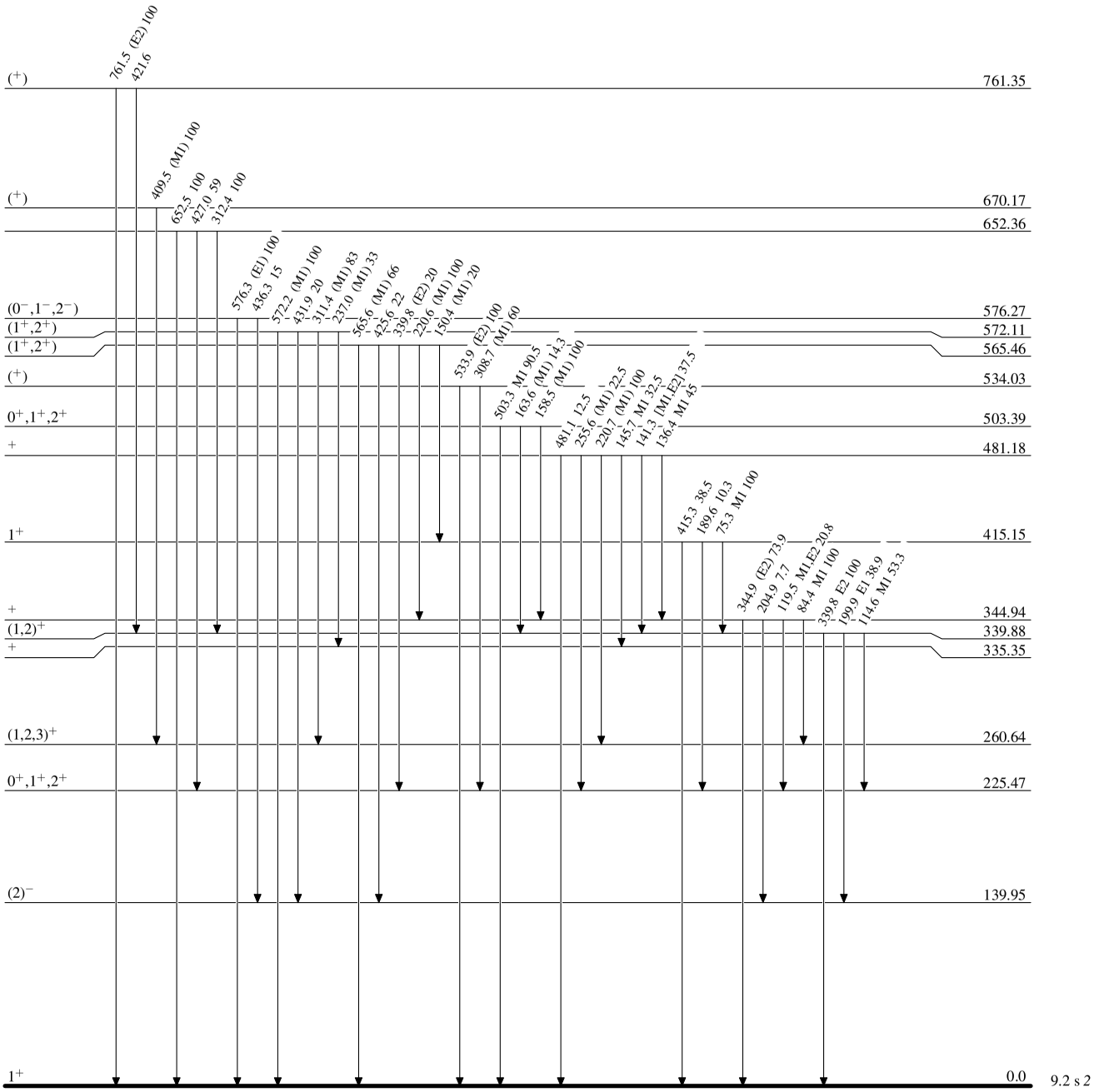


$^{140}_{61}Pm_{79}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided

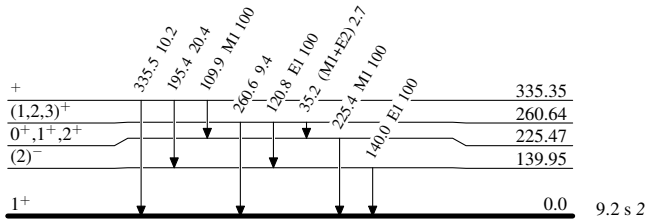


$^{140}_{61}Pm_{79}$

Adopted Levels, Gammas

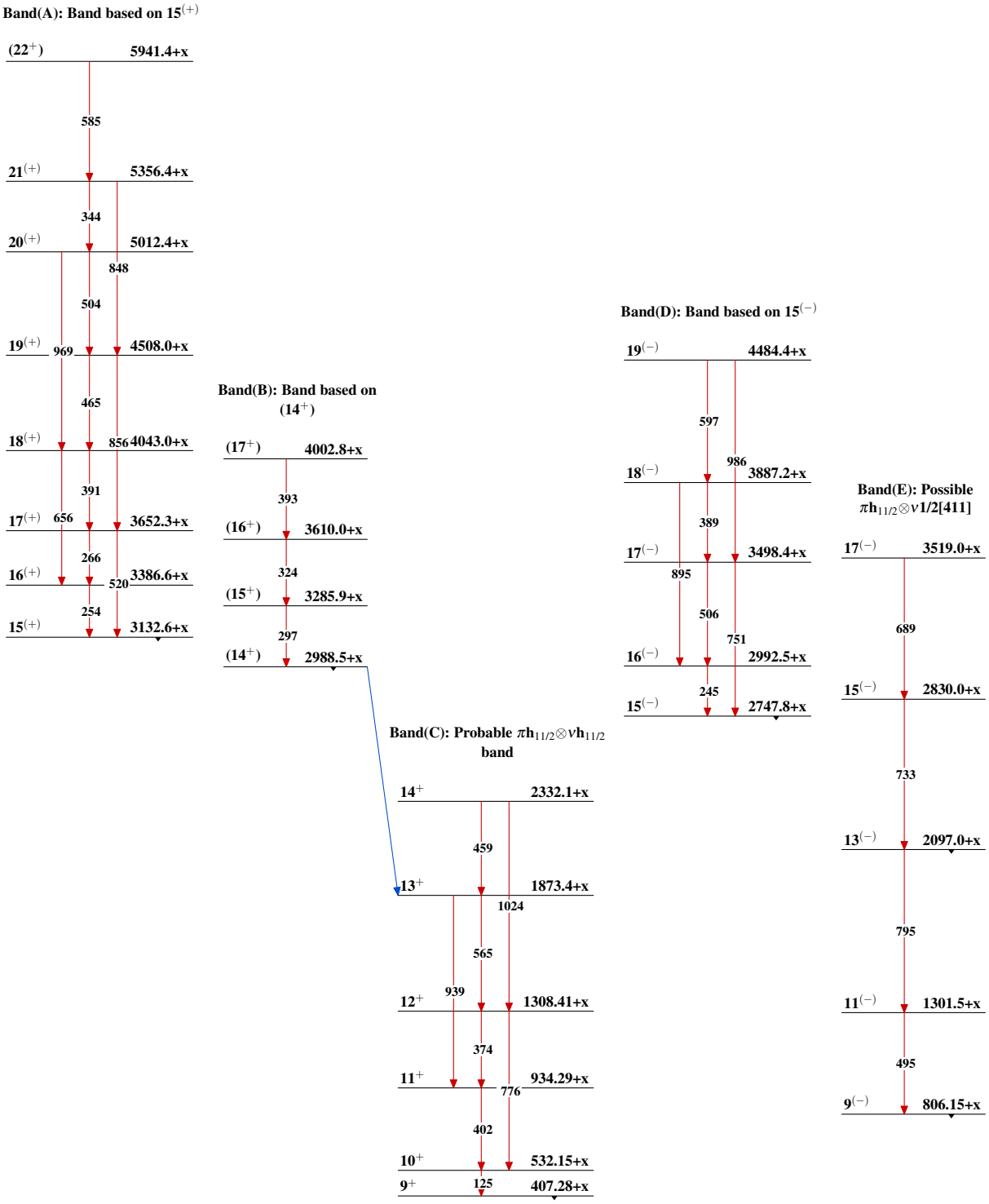
Level Scheme (continued)

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided



$^{140}_{61}Pm_{79}$

Adopted Levels, Gammas



$^{140}_{61}Pm_{79}$

Adopted Levels, Gammas (continued)

$^{140}_{61}Pm_{79}$