Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 170, 1 (2020)	16-Aug-2020

Q(β^-)=3318 *9*; S(n)=5252 *25*; S(p)=10861 *19*; Q(α)=−3085 *11* 2017Wa10

Nuclide identified from ^{252}Cf spontaneous fission with mass separation (1987Gr12) and identified as parent of ^{153}Pm (1996Ya12) as well as $\gamma\gamma\gamma$ and $\gamma\gamma$X coincidences with ^{252}Cf source in Ge detector array (1996Ba34,1997Hw02).

^{153}Nd Levels

Cross Reference (XREF) Flags

A ^{153}Pr β^- decay
B ^{252}Cf SF decay

E(level)†	J$^\pi$‡	$T_{1/2}$	XREF	Comments
0.0@	(3/2)$^-$	31.6 s *10*	AB	%β^-=100 J$^\pi$: 3/2$^-$,5/2$^-$,7/2$^-$ from log *ft*=5.4 allowed β- to 5/2$^-$ g.s. of ^{153}Pm; 5/2$^-$,7/2$^-$ excluded by systematics of 3/2$^-$ g.s. and 5/2$^+$ excited state bandheads for N=92 isotones (2010Si03, ^{252}Cf SF dataset). $T_{1/2}$: From weighted average of 32.3 s *2* (1996Ta26), 28.9 s *4* (1987Gr12, 1988GrZY, 1990An31), and 32 s *4* (1979PiZP); these values are not consistent with a reduced-χ^2=29 for this average. In computing this average, the evaluator has already increased the uncertainty of 0.1 given in 1996Ta26 to 0.2 in order to reduce its relative weight.
49.94# *19*	(5/2)$^-$		AB	J$^\pi$: E1 γ from (5/2)$^+$.
120.19@ *16*	(7/2$^-$)		B	
191.71a *16*	(5/2)$^+$	1.10 μs *5*	AB	J$^\pi$: E1 γ to (3/2)$^-$ g.s.; assignment changed from (5/2$^-$) (1996Ya12, β^- decay) by 2010Si03 (^{252}Cf SF decay). $T_{1/2}$: weighted average of 1.06 μs *5* (1996Ya12, ^{153}Pr β^- decay) and 1.17 μs *7* (2010Si03, ^{252}Cf SF decay).
208.42# *20*	(9/2$^-$)		B	
252.24& *23*	(7/2$^+$)		B	
317.89@ *22*	(11/2$^-$)		B	
330.08a *23*	(9/2$^+$)		B	
427.9& *3*	(11/2$^+$)		B	
441.24# *24*	(13/2$^-$)		B	
539.0a *3*	(13/2$^+$)		B	
588.33@ *25*	(15/2$^-$)		B	
677.3& *3*	(15/2$^+$)		B	
743.6# *3*	(17/2$^-$)		B	
817.4a *3*	(17/2$^+$)		B	
928.0@ *3*	(19/2$^-$)		B	
1001.5& *4*	(19/2$^+$)		B	
1111.3# *3*	(21/2$^-$)		B	
1164.7a *4*	(21/2$^+$)		B	
1331.5@ *4*	(23/2$^-$)		B	
1399.9& *4*	(23/2$^+$)		B	
1539.7# *4*	(25/2$^-$)		B	
1578.9a *4*	(25/2$^+$)		B	
1794.8@ *4*	(27/2$^-$)		B	

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Adopted Levels, Gammas (continued)

^{153}Nd Levels (continued)

E(level)†	Jπ‡	XREF	E(level)†	Jπ‡	XREF	E(level)†	Jπ‡	XREF
1869.4[&] 4	(27/2+)	B	2314.8[@] 5	(31/2−)	B	2595.3[a] 5	(33/2+)	B
2025.2[#] 4	(29/2−)	B	2407.4[&] 4	(31/2+)	B	3009.4[&] 5	(35/2+)	B
2057.1[a] 4	(29/2+)	B	2564.2[#] 5	(33/2−)	B	3190.1[a] 5	(37/2+)	B

† From least-squares fit to Eγ′s.

‡ Values from 2010Si03 (^{252}Cf SF decay) are adopted here as follows. For negative parity bands (A and a), J^π values up to $(17/2^-)$ are adopted based on $(3/2)^-$ for g.s. and on systematics of N=90 isotones (1997Hw02). For positive parity bands (B and b), J^π value for the bandhead of band b is established by E1 linking transitions to negative parity bands. Higher J^π values are deduced based on the lower adopted values and the well-established rotational character of the bands. The critical assignments are commented more specifically in the table.

Band(A): ν5/2[642], α=+1/2. Dominant configuration from QPRM calculations (2010Si03).

@ Band(a): ν5/2[642], α=−1/2.

& Band(B): ν3/2[521], α=−1/2. Dominat configurations from QPRM calculations (2010Si03).

a Band(b): ν3/2[521], α=+1/2.

γ(^{153}Nd)

For unplaced γ′s see ^{153}Pr β^- decay dataset.

E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.‡	α#	Comments
49.94	$(5/2)^-$	50.0	100	0.0	$(3/2)^-$			
120.19	$(7/2^-)$	70.2 2	100 32	49.94	$(5/2)^-$			
		120.2 2	50	0.0	$(3/2)^-$			
191.71	$(5/2)^+$	71.5 2	19 2	120.19	$(7/2^-)$	[E1]	0.645 11	α(K)=0.542 9; α(L)=0.0813 13; α(M)=0.0172 3 α(N)=0.00376 6; α(O)=0.000533 9; α(P)=2.58×10^{-5} 4 B(E1)(W.u.)=5.6×10^{-8} 7
		141.8 2	59 7	49.94	$(5/2)^-$	E1	0.0997	α(K)=0.0848 13; α(L)=0.01176 18; α(M)=0.00248 4 α(N)=0.000548 8; α(O)=8.02×10^{-5} 12; α(P)=4.43×10^{-6} 7 B(E1)(W.u.)=2.2×10^{-8} 3
		191.7 2	100	0.0	$(3/2)^-$	E1	0.0440	α(K)=0.0375 6; α(L)=0.00510 8; α(M)=0.001076 16 α(N)=0.000239 4; α(O)=3.52×10^{-5} 5; α(P)=2.03×10^{-6} 3 B(E1)(W.u.)=1.52×10^{-8} 10
208.42	$(9/2^-)$	88.3 2	58 10	120.19	$(7/2^-)$			
		158.5 2	100	49.94	$(5/2)^-$			
252.24	$(7/2^+)$	60.7 2	100	191.71	$(5/2)^+$			
317.89	$(11/2^-)$	109.5 2	71 14	208.42	$(9/2^-)$			
		197.6 2	100	120.19	$(7/2^-)$			
330.08	$(9/2^+)$	78.0 2	50 16	252.24	$(7/2^+)$			
		138.2 2	100	191.71	$(5/2)^+$			
427.9	$(11/2^+)$	97.9 2	76 11	330.08	$(9/2^+)$			
		175.8	100	252.24	$(7/2^+)$			
441.24	$(13/2^-)$	123.3 2	60 8	317.89	$(11/2^-)$			
		232.9 2	100	208.42	$(9/2^-)$			

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Adopted Levels, Gammas (continued)

γ(^{153}Nd) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π
539.0	(13/2$^+$)	111.1 *2*	86 *10*	427.9	(11/2$^+$)
		208.8 *2*	100	330.08	(9/2$^+$)
588.33	(15/2$^-$)	147.1 *2*	45 *6*	441.24	(13/2$^-$)
		270.4 *2*	100	317.89	(11/2$^-$)
677.3	(15/2$^+$)	138.3 *2*	63 *8*	539.0	(13/2$^+$)
		249.4 *2*	100	427.9	(11/2$^+$)
743.6	(17/2$^-$)	155.3 *2*	16 *6*	588.33	(15/2$^-$)
		302.4 *2*	100	441.24	(13/2$^-$)
817.4	(17/2$^+$)	140.1 *2*	43 *6*	677.3	(15/2$^+$)
		278.4 *2*	100	539.0	(13/2$^+$)
928.0	(19/2$^-$)	184.4 *2*	36 *7*	743.6	(17/2$^-$)
		339.6 *2*	100	588.33	(15/2$^-$)
1001.5	(19/2$^+$)	184.1 *2*	54 *8*	817.4	(17/2$^+$)
		324.2 *2*	100	677.3	(15/2$^+$)
1111.3	(21/2$^-$)	183.2 *2*	25 *8*	928.0	(19/2$^-$)
		367.7 *2*	100	743.6	(17/2$^-$)
1164.7	(21/2$^+$)	163.2 *2*	25 *5*	1001.5	(19/2$^+$)
		347.3 *2*	100	817.4	(17/2$^+$)
1331.5	(23/2$^-$)	220.2 *2*	20 *6*	1111.3	(21/2$^-$)
		403.6 *2*	100	928.0	(19/2$^-$)
1399.9	(23/2$^+$)	235.1 *2*	37 *7*	1164.7	(21/2$^+$)
		398.5 *2*	100	1001.5	(19/2$^+$)
1539.7	(25/2$^-$)	208[@]	10 *3*	1331.5	(23/2$^-$)
		428.4 *2*	100	1111.3	(21/2$^-$)
1578.9	(25/2$^+$)	179.0 *2*	10 *3*	1399.9	(23/2$^+$)
		414.2 *2*	100	1164.7	(21/2$^+$)
1794.8	(27/2$^-$)	463.3 *2*	100	1331.5	(23/2$^-$)
1869.4	(27/2$^+$)	290.5 *2*	20 *5*	1578.9	(25/2$^+$)
		469.6 *2*	100	1399.9	(23/2$^+$)
2025.2	(29/2$^-$)	485.5 *2*	100	1539.7	(25/2$^-$)
2057.1	(29/2$^+$)	187.5[@] *2*	5 *3*	1869.4	(27/2$^+$)
		478.1 *2*	100	1578.9	(25/2$^+$)
2314.8	(31/2$^-$)	520.0 *2*	100	1794.8	(27/2$^-$)
2407.4	(31/2$^+$)	350.3 *2*	10 *3*	2057.1	(29/2$^+$)
		538.0 *2*	100	1869.4	(27/2$^+$)
2564.2	(33/2$^-$)	539.0 *2*	100	2025.2	(29/2$^-$)
2595.3	(33/2$^+$)	188[@]		2407.4	(31/2$^+$)
		538.2 *2*	100	2057.1	(29/2$^+$)
3009.4	(35/2$^+$)	602.0 *2*	100	2407.4	(31/2$^+$)
3190.1	(37/2$^+$)	594.8 *2*	100	2595.3	(33/2$^+$)

[†] From 2010Si03 (^{252}Cf SF decay).
[‡] From α(K)exp (2010Si03, ^{252}Cf SF decay).
[#] Additional information 1.
[@] Placement of transition in the level scheme is uncertain.

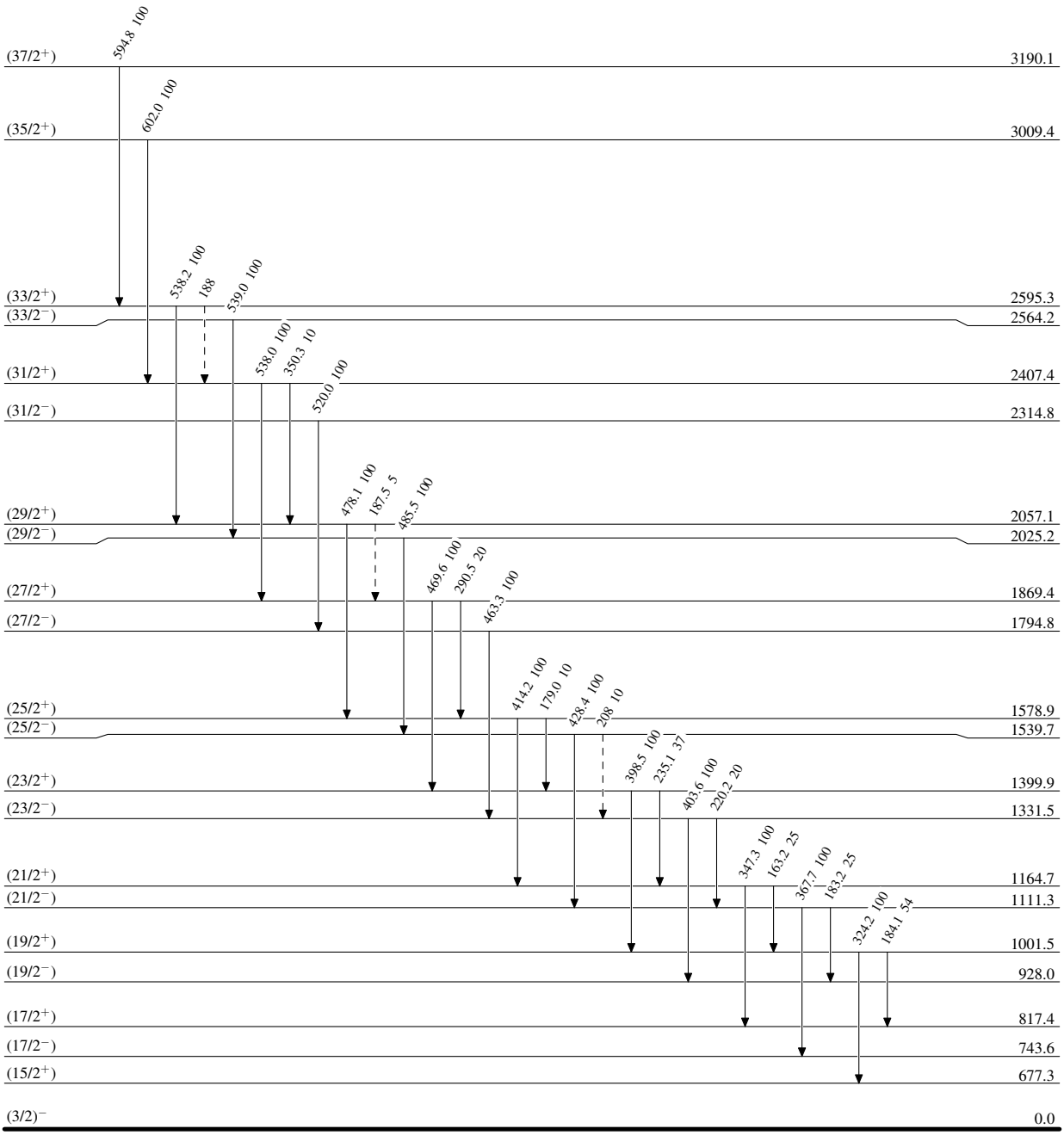
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



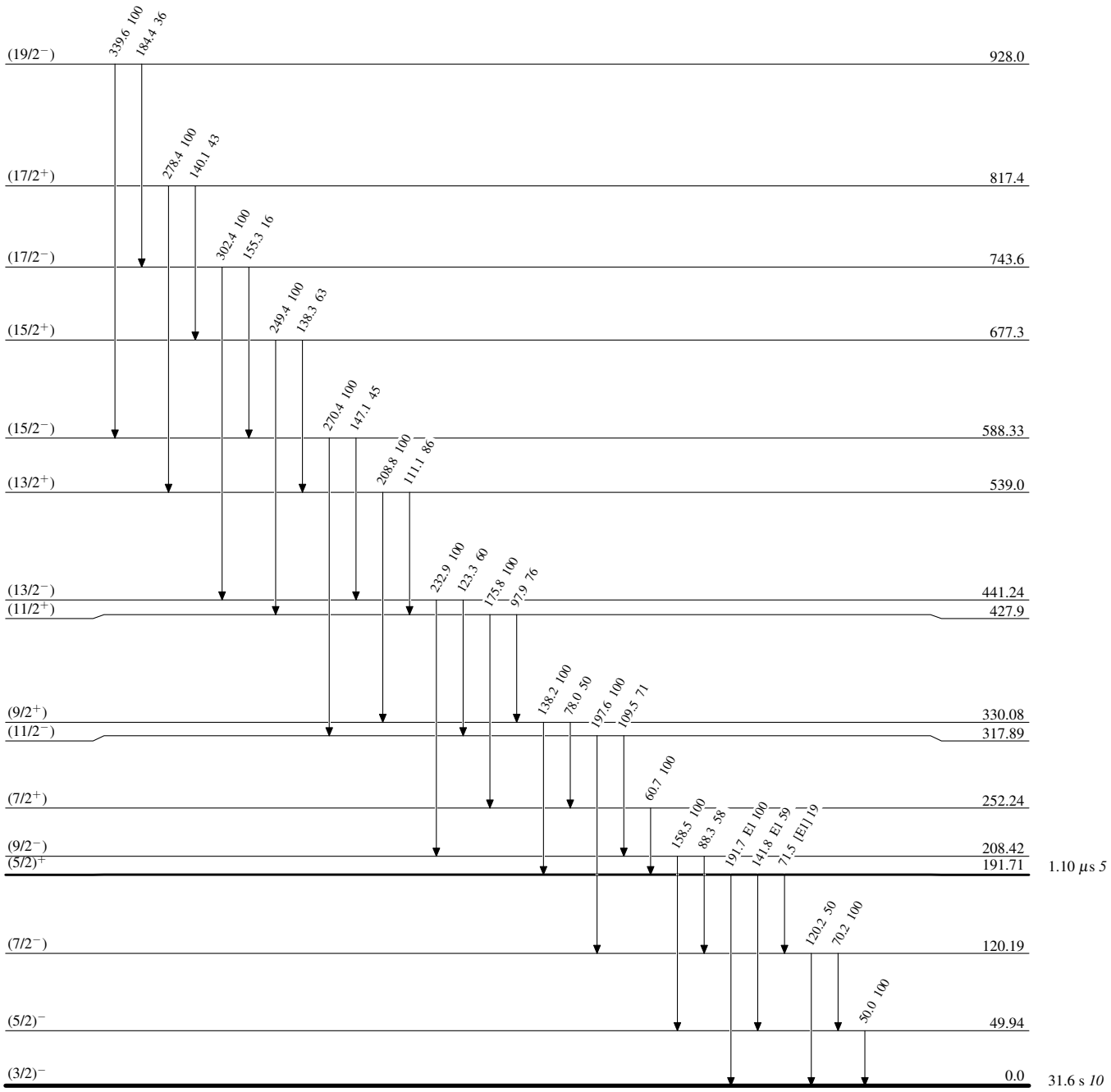
31.6 s *10*

$^{153}_{60}Nd_{93}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{153}_{60}Nd_{93}$

Adopted Levels, Gammas