Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 117, 1 (2014)	1-Oct-2013

Q(β^-)=−9860 *80*; S(n)=11728 *13*; S(p)=4400 *12*; Q(α)=1481 *29* 2012Wa38
Mass measurement (Penning trap): 2007Ra37, 2000Be42.
Gamow-Teller giant state (total absorption spectroscopy): 2004Al35.

^{148}Dy Levels

Cross Reference (XREF) Flags

A	^{148}Ho ε decay (2.2 s)	D	^{149}Er εp decay (8.9 s)
B	^{148}Ho ε decay (9.59 s)	E	^{152}Er α decay
C	^{149}Er εp decay (4 s)	F	(HI,xnγ)

E(level)[#]	J$^\pi$[†]	$T_{1/2}$	XREF	Comments
0.0	0^+	3.3 min *2*	AB EF	%ε+%β^+=100 $T_{1/2}$: unweighted average of 3.1 min *1* (1975To03) and 3.5 min *2* (1974GrYZ,1974La32,1975Gr35). rms charge radius $<r^2>^{1/2}$=5.0538 fm *2030* (2004An14); others: see 2000Ga58.
1677.3	2^+		AB F	J$^\pi$: γ to 0^+ is E2.
1687.5	3^-		B F	J$^\pi$: γ to 0^+ is E3.
2348.3	5^-		B F	J$^\pi$: E2 to 3^- and log *ft*=5.8 from $(5)^-$.
2426.7	4^+		B F	
2731.0	6^+		B F	
2738.1	7^-		B F	
2832.2	8^+	65 ns *10*	B F	$T_{1/2}$: from 1980Kl09 (HI,xnγ).
2853.9	$(5,6)^-$		B	J$^\pi$: log *ft*=5.5 from $(5)^-$ and M1 to 5^-.
2919.1	10^+	471 ns *20*	F	$T_{1/2}$: from 1981Ha17 (HI,xnγ). Other: 480 ns *30* (1978Da14) (HI,xnγ).
2969.6	$(5,6,7)^-$‡		B	
2995.2	$(4)^-$		B	
3115.4	$(6,7)^-$		B	J$^\pi$: log *ft*=6.2 from $(5)^-$ and M1 to 7^-.
3171.7	$(5,6,7)^-$‡		B	
3188.6	$(5,6,7)^-$‡		B	
3279.6	$(6)^-$		B	
3323.2	$(6)^-$		B	
3327.7	$(5)^-$		B	
3405.0	$(8)^-$		B	
3755.8	$(5,6,7)^-$‡		B	
3980.7	(11^-)		F	
4289.5	$(5,6,7)^-$‡		B	
4393.0	$(5,6,7)^-$‡		B	
4459.8	$(5,6,7)^-$‡		B	
4477.2	(12^-)		F	
4634.2	$(5,6,7)^-$‡		B	
4761.9	$(5,6,7)^-$‡		B	
4851.4	(12^+)		F	
5054.6	$(5,6,7)^-$‡		B	
5261.0	$(5,6,7)^-$‡		B	
5270.4	(13)		F	
5410.5	(14^+)		F	
5522.9	(14^-)		F	

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Adopted Levels, Gammas (continued)

^{148}Dy Levels (continued)

E(level)[#]	J$^{\pi}$[†]	XREF	E(level)[#]	J$^{\pi}$[†]	XREF	E(level)[#]	J$^{\pi}$[†]	XREF
5772.4	(15$^-$)	F	8532.0	(20)	F	10111.5	(23)	F
5985.5	(16$^-$)	F	8785.4		F	10456.4		F
6264.5	(17$^-$)	F	9017.4		F	10933.5		F
6591.8	(18)	F	9169.6		F	11816.4		F
6601?[@]		F	9289.8	(21)	F	12536.8		F
7115.7	(17$^-$)	F	9704.3		F	12651.5		F
7434.6	(18$^+$)	F	10058.0		F	13220.0		F
8198.5	(19)	F	10103.1		F	14235.0		F

[†] The values of J$^{\pi}$ are based on unpublished data on $\gamma(\theta)$ and α(K)exp (1989DrZZ,1986DiZZ), see also 1982JuZY, 1981Kl05, and 1981Ha17 (HI,xnγ); the values of J$^{\pi}$ for levels populated only in ε decay were derived from branching and log *ft* data (1989Ta11).
[‡] From log *ft* values for ε decay from (5)$^-$.
[#] Levels with E>2919.1 and J>10 are from 1989DrZZ.
[@] From 1981Ha17, not observed in 1989DrZZ.

$\gamma(^{148}$Dy)

E$_i$(level)	J$_i^{\pi}$	E$_{\gamma}$[†]	I$_{\gamma}$	E$_f$	J$_f^{\pi}$	Mult.[†]	α[#]	Comments
1677.3	2$^+$	1677.3 *1*	100	0.0	0$^+$	E2	1.24×10^{-3}	α(K)=0.000939 *14*; α(L)=0.0001291 *18*; α(M)=2.81×10^{-5} *4* α(N)=6.50×10^{-6} *9*; α(O)=9.49×10^{-7} *14*; α(P)=5.42×10^{-8} *8*; α(IPF)=0.0001398 *20*
1687.5	3$^-$	(10)	≈0.75	1677.3	2$^+$	[E1]	27.0	
		1687.5 *1*	100	0.0	0$^+$	E3	0.00213	α(K)=0.001726 *25*; α(L)=0.000258 *4*; α(M)=5.67×10^{-5} *8* α(N)=1.310×10^{-5} *19*; α(O)=1.90×10^{-6} *3*; α(P)=1.035×10^{-7} *15*; α(IPF)=7.09×10^{-5} *10*
2348.3	5$^-$	660.8 *1*	100	1687.5	3$^-$	E2[‡]	0.00759	α(K)=0.00625 *9*; α(L)=0.001047 *15*; α(M)=0.000233 *4* α(N)=5.35×10^{-5} *8*; α(O)=7.54×10^{-6} *11*; α(P)=3.57×10^{-7} *5*
2426.7	4$^+$	739.4 *1*	100 *7*	1687.5	3$^-$	E1	0.00224	α(K)=0.00191 *3*; α(L)=0.000257 *4*; α(M)=5.59×10^{-5} *8* α(N)=1.288×10^{-5} *18*; α(O)=1.87×10^{-6} *3*; α(P)=1.059×10^{-7} *15*
		749.4 *2*	50 *4*	1677.3	2$^+$	E2	0.00568	α(K)=0.00471 *7*; α(L)=0.000756 *11*; α(M)=0.0001676 *24* α(N)=3.85×10^{-5} *6*; α(O)=5.47×10^{-6} *8*; α(P)=2.70×10^{-7} *4*
2731.0	6$^+$	304.3 *1*	100	2426.7	4$^+$	E2	0.0618	α(K)=0.0464 *7*; α(L)=0.01191 *17*; α(M)=0.00274 *4* α(N)=0.000623 *9*; α(O)=8.20×10^{-5} *12*; α(P)=2.42×10^{-6} *4*
		382.7		2348.3	5$^-$	E1	0.00951	α(K)=0.00807 *12*; α(L)=0.001126 *16*; α(M)=0.000245 *4* α(N)=5.64×10^{-5} *8*; α(O)=8.10×10^{-6} *12*; α(P)=4.34×10^{-7} *6*
2738.1	7$^-$	389.8 *1*	100	2348.3	5$^-$	E2[‡]	0.0298	α(K)=0.0233 *4*; α(L)=0.00505 *7*; α(M)=0.001148

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Adopted Levels, Gammas (continued)

γ(^{148}Dy) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ	E_f	J_f^π	Mult.[†]	α[#]	Comments
								17 α(N)=0.000262 *4*; α(O)=3.53×10^{-5} *5*; α(P)=1.268×10^{-6} *18*
2832.2	8$^+$	94.1 *2*	100 *20*	2738.1	7$^-$	E1	0.363 *6*	B(E1)(W.u.)≈4.5×10^{-6} α(K)=0.303 *5*; α(L)=0.0474 *8*; α(M)=0.01039 *16* α(N)=0.00236 *4*; α(O)=0.000320 *5*; α(P)=1.384×10^{-5} *21*
		101.2 *6*	20 *4*	2731.0	6$^+$	E2	2.59 *7*	B(E2)(W.u.)=3.8 *13* α(K)=1.090 *23*; α(L)=1.16 *4*; α(M)=0.277 *9* α(N)=0.0621 *20*; α(O)=0.00747 *23*; α(P)=4.52×10^{-5} *10*
2853.9	(5,6)$^-$	504.3 *2*	100	2348.3	5$^-$	M1[‡]	0.0291	α(K)=0.0246 *4*; α(L)=0.00348 *5*; α(M)=0.000762 *11* α(N)=0.0001764 *25*; α(O)=2.59×10^{-5} *4*; α(P)=1.504×10^{-6} *22*
2919.1	10$^+$	86.9	100	2832.2	8$^+$	E2	4.60	B(E2)(W.u.)=0.93 *7* α(K)=1.561 *22*; α(L)=2.34 *4*; α(M)=0.562 *8* α(N)=0.1258 *18*; α(O)=0.01502 *21*; α(P)=6.48×10^{-5} *9*
2969.6	(5,6,7)$^-$	115.6 *3*	23 *1*	2853.9	(5,6)$^-$	M1[‡]	1.58 *3*	α(K)=1.332 *22*; α(L)=0.196 *4*; α(M)=0.0430 *7* α(N)=0.00994 *16*; α(O)=0.001454 *23*; α(P)=8.30×10^{-5} *14*
		542.0 *5*	12 *2*	2426.7	4$^+$			
		620 *1*	49 *14*	2348.3	5$^-$			
		1281.3 *2*	100 *3*	1687.5	3$^-$			
2995.2	(4)$^-$	567.3 *2*	81 *6*	2426.7	4$^+$			
		1307.2 *2*	100 *9*	1687.5	3$^-$			
3115.4	(6,7)$^-$	261.5 *5*	13 *3*	2853.9	(5,6)$^-$			
		282.2 *5*	10 *2*	2832.2	8$^+$			
		376.1 *5*	28 *4*	2738.1	7$^-$	M1[‡]	0.0621	α(K)=0.0525 *8*; α(L)=0.00751 *11*; α(M)=0.001644 *24* α(N)=0.000380 *6*; α(O)=5.58×10^{-5} *8*; α(P)=3.23×10^{-6} *5*
		765.9 *2*	100 *5*	2348.3	5$^-$			
3171.7	(5,6,7)$^-$	1483.4 *2*	100	1687.5	3$^-$			
3188.6	(5,6,7)$^-$	1500.3 *2*	100	1687.5	3$^-$			
3279.6	(6)$^-$	164.1 *3*	28 *4*	3115.4	(6,7)$^-$	M1[‡]	0.588	α(K)=0.495 *8*; α(L)=0.0724 *11*; α(M)=0.01589 *24* α(N)=0.00368 *6*; α(O)=0.000538 *8*; α(P)=3.08×10^{-5} *5*
		425.7 *4*	31 *6*	2853.9	(5,6)$^-$			
		930.0 *3*	100 *7*	2348.3	5$^-$			
3323.2	(6)$^-$	353.6 *4*	33 *5*	2969.6	(5,6,7)$^-$	M1[‡]	0.0730	α(K)=0.0617 *9*; α(L)=0.00884 *13*; α(M)=0.00194 *3* α(N)=0.000448 *7*; α(O)=6.58×10^{-5} *10*; α(P)=3.80×10^{-6} *6*
		583.7 *3*	24 *6*	2738.1	7$^-$			
		973.6 *2*	100 *3*	2348.3	5$^-$			
3327.7	(5)$^-$	1639.4 *4*	100	1687.5	3$^-$			
3405.0	(8)$^-$	665.8 *4*	100	2738.1	7$^-$			
3755.8	(5,6,7)$^-$	1328.3 *5*	28 *6*	2426.7	4$^+$			
		1405.9 *2*	100 *6*	2348.3	5$^-$			

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Adopted Levels, Gammas (continued)

γ(^{148}Dy) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ	E_f	J_f^π	Mult.[†]	α[#]	Comments
3980.7	(11$^-$)	1061.1	100	2919.1	10$^+$	E1	1.12×10^{-3}	α(K)=0.000957 *14*; α(L)=0.0001266 *18*; α(M)=2.75×10^{-5} *4* α(N)=6.34×10^{-6} *9*; α(O)=9.26×10^{-7} *13*; α(P)=5.34×10^{-8} *8*
4289.5	(5,6,7)$^-$	1101.0 *3*	63 *3*	3188.6	(5,6,7)$^-$			
		1320.0 *2*	55 *3*	2969.6	(5,6,7)$^-$			
		1861.5 *4*	26 *3*	2426.7	4$^+$			
		1939.7 *3*	100 *4*	2348.3	5$^-$			
		2600.9 *4*	16 *2*	1687.5	3$^-$			
4393.0	(5,6,7)$^-$	1397.3 *3*	100 *10*	2995.2	(4)$^-$			
		1661.5 *8*	31 *7*	2731.0	6$^+$			
		2043.4 *4*	35 *8*	2348.3	5$^-$			
4459.8	(5,6,7)$^-$	2110.2 *4*	100	2348.3	5$^-$			
4477.2	(12$^-$)	496.5	100	3980.7	(11$^-$)	M1	0.0302	α(K)=0.0256 *4*; α(L)=0.00363 *5*; α(M)=0.000794 *12* α(N)=0.000184 *3*; α(O)=2.70×10^{-5} *4*; α(P)=1.566×10^{-6} *22*
4634.2	(5,6,7)$^-$	2284.6 *4*	100 *8*	2348.3	5$^-$			
		2945.8 *10*	17 *6*	1687.5	3$^-$			
4761.9	(5,6,7)$^-$	2412.4 *4*	100 *8*	2348.3	5$^-$			
		3073.4 *6*	27 *6*	1687.5	3$^-$			
4851.4	(12$^+$)	1932.3	100	2919.1	10$^+$	E2	1.10×10^{-3}	α(K)=0.000724 *11*; α(L)=9.82×10^{-5} *14*; α(M)=2.14×10^{-5} *3* α(N)=4.93×10^{-6} *7*; α(O)=7.23×10^{-7} *11*; α(P)=4.18×10^{-8} *6*; α(IPF)=0.000253 *4*
5054.6	(5,6,7)$^-$	2705.0 *4*	100	2348.3	5$^-$			
5261.0	(5,6,7)$^-$	2291.4 *4*	100	2969.6	(5,6,7)$^-$			
5270.4	(13)	418.3		4851.4	(12$^+$)			
		794.0		4477.2	(12$^-$)	D		
5410.5	(14$^+$)	559.1	100	4851.4	(12$^+$)	E2	0.01139	α(K)=0.00927 *13*; α(L)=0.001659 *24*; α(M)=0.000372 *6* α(N)=8.52×10^{-5} *12*; α(O)=1.185×10^{-5} *17*; α(P)=5.23×10^{-7} *8*
5522.9	(14$^-$)	1045.7	100	4477.2	(12$^-$)	E2	0.00277	α(K)=0.00234 *4*; α(L)=0.000344 *5*; α(M)=7.56×10^{-5} *11* α(N)=1.742×10^{-5} *25*; α(O)=2.51×10^{-6} *4*; α(P)=1.348×10^{-7} *19*
5772.4	(15$^-$)	361.8		5410.5	(14$^+$)	E1	0.01087	α(K)=0.00923 *13*; α(L)=0.001291 *18*; α(M)=0.000281 *4* α(N)=6.47×10^{-5} *9*; α(O)=9.27×10^{-6} *13*; α(P)=4.94×10^{-7} *7*
		502.2		5270.4	(13)	Q		
5985.5	(16$^-$)	212.7		5772.4	(15$^-$)			
		462.9		5522.9	(14$^-$)	E2	0.0186	α(K)=0.01484 *21*; α(L)=0.00291 *4*; α(M)=0.000657 *10* α(N)=0.0001501 *21*; α(O)=2.06×10^{-5} *3*; α(P)=8.24×10^{-7} *12*
6264.5	(17$^-$)	279.4		5985.5	(16$^-$)	M1	0.1366	α(K)=0.1153 *17*; α(L)=0.01664 *24*; α(M)=0.00365 *6* α(N)=0.000844 *12*; α(O)=0.0001238 *18*; α(P)=7.12×10^{-6} *10*
		491.4		5772.4	(15$^-$)	E2	0.01586	α(K)=0.01274 *18*; α(L)=0.00242 *4*; α(M)=0.000546 *8*

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Adopted Levels, Gammas (continued)

$\gamma(^{148}Dy)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ	E_f	J_f^π	Mult.[†]	α[#]	Comments
								α(N)=0.0001249 *18*; α(O)=1.720×10^{-5} *24*; α(P)=7.12×10^{-7} *10*
6591.8	(18)	327.3	100	6264.5	(17$^-$)	D		
6601?		829[@]	100	5772.4	(15$^-$)			
7115.7	(17$^-$)	851.6		6264.5	(17$^-$)			
		1130.9		5985.5	(16$^-$)	(D)		
7434.6	(18$^+$)	318.4		7115.7	(17$^-$)	D		
		1170.6		6264.5	(17$^-$)	(E1)	9.49×10^{-4}	α(K)=0.000801 *12*; α(L)=0.0001056 *15*; α(M)=2.29×10^{-5} *4* α(N)=5.28×10^{-6} *8*; α(O)=7.73×10^{-7} *11*; α(P)=4.48×10^{-8} *7*; α(IPF)=1.331×10^{-5} *19*
8198.5	(19)	763.95	100	7434.6	(18$^+$)	D		
8532.0	(20)	333.5	100	8198.5	(19)	D		
8785.4		586.9	100	8198.5	(19)			
9017.4		818.9		8198.5	(19)			
9169.6		152.0		9017.4		D		
		637.9		8532.0	(20)			
		971.0		8198.5	(19)			
9289.8	(21)	757.8	100	8532.0	(20)	D		
9704.3		535.2		9169.6		D		
		1171.9		8532.0	(20)			
10058.0		353.7	100	9704.3		D		
10103.1		933.5	100	9169.6				
10111.5	(23)	407.1		9704.3				
		821.8		9289.8	(21)	Q		
10456.4		353.3		10103.1				
		398.5		10058.0				
		750.5		9704.3				
10933.5		477.4		10456.4				
		821.0[@]		10111.5	(23)			
11816.4		882.9	100	10933.5		Q		
12536.8		720.4	100	11816.4		D		
12651.5		114.7		12536.8		D		
13220.0		568.5	100	12651.5		(D)		
14235.0		1015.0	100	13220.0				

[†] Data for γ's from levels with E>2919.1 and J>10 are from 1989DrZZ. γ's with mult labeled D and Q are stretched $\Delta J=1$ and $\Delta J=2$ transitions respectively (from $\gamma(\theta)$) (1989DrZZ).
[‡] From ce data in ^{148}Ho ε decay (9.59 s).
[#] Additional information 1.
[@] Placement of transition in the level scheme is uncertain.

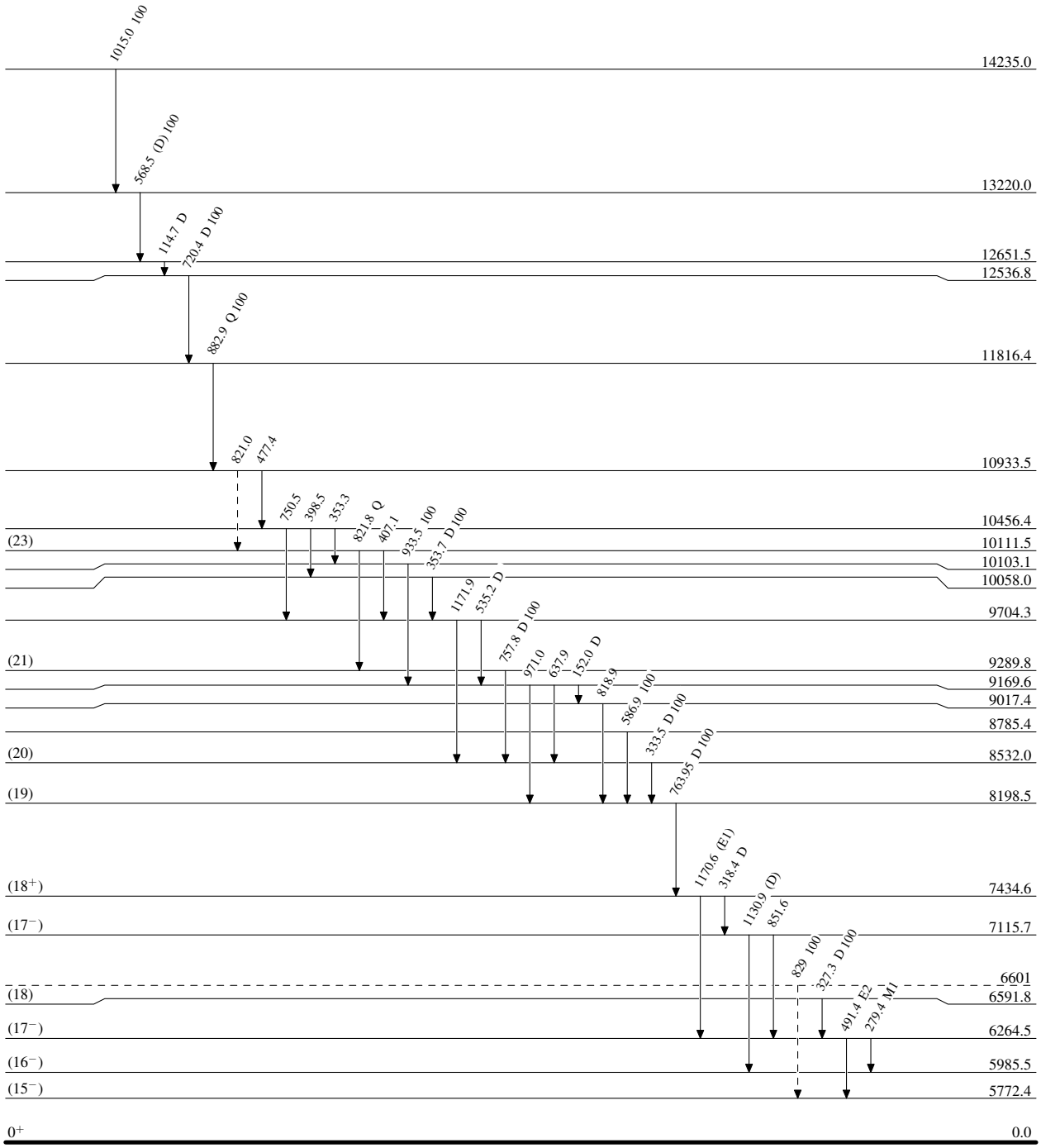
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

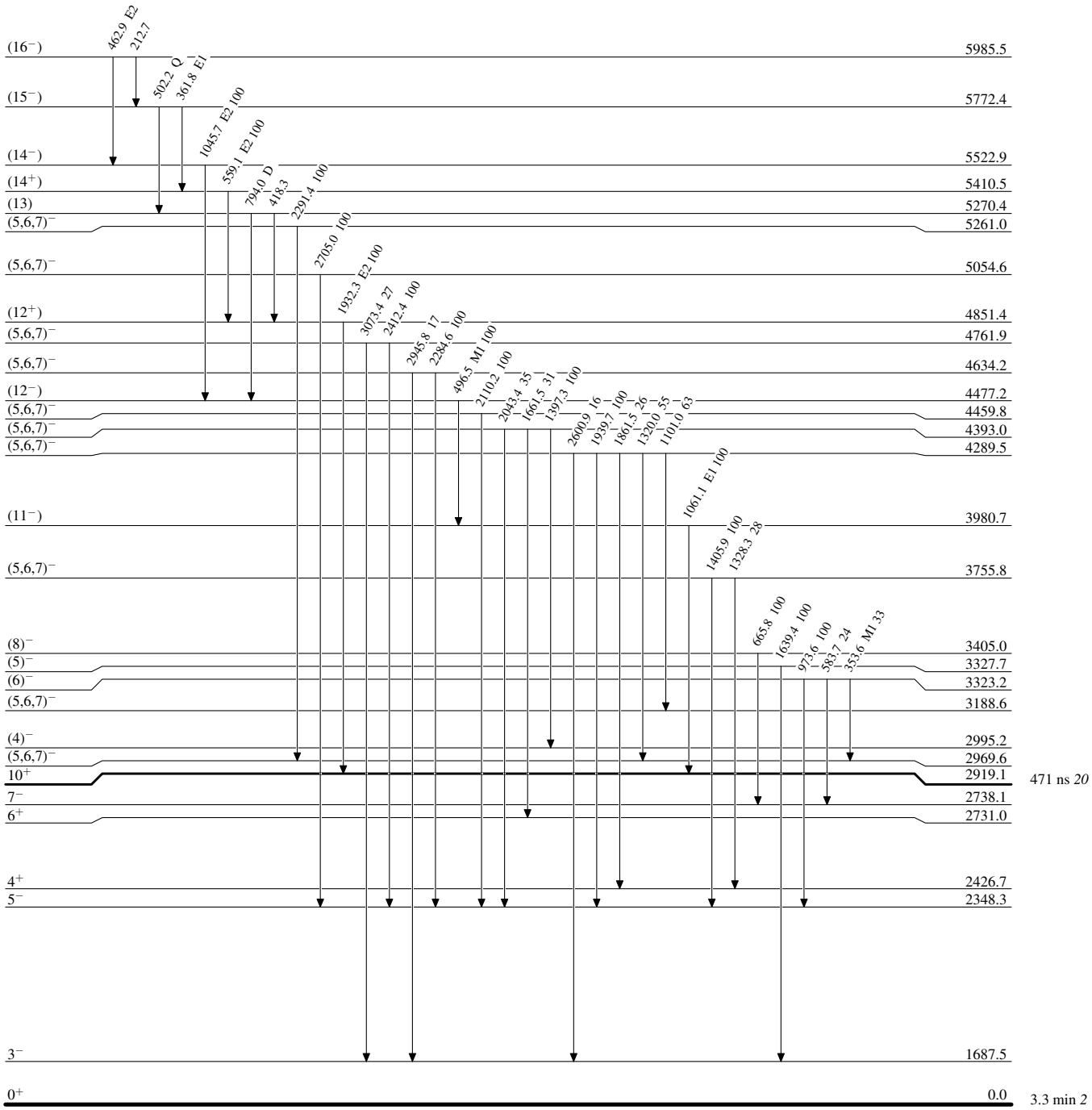


$^{148}_{66}Dy_{82}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{148}_{66}Dy_{82}$

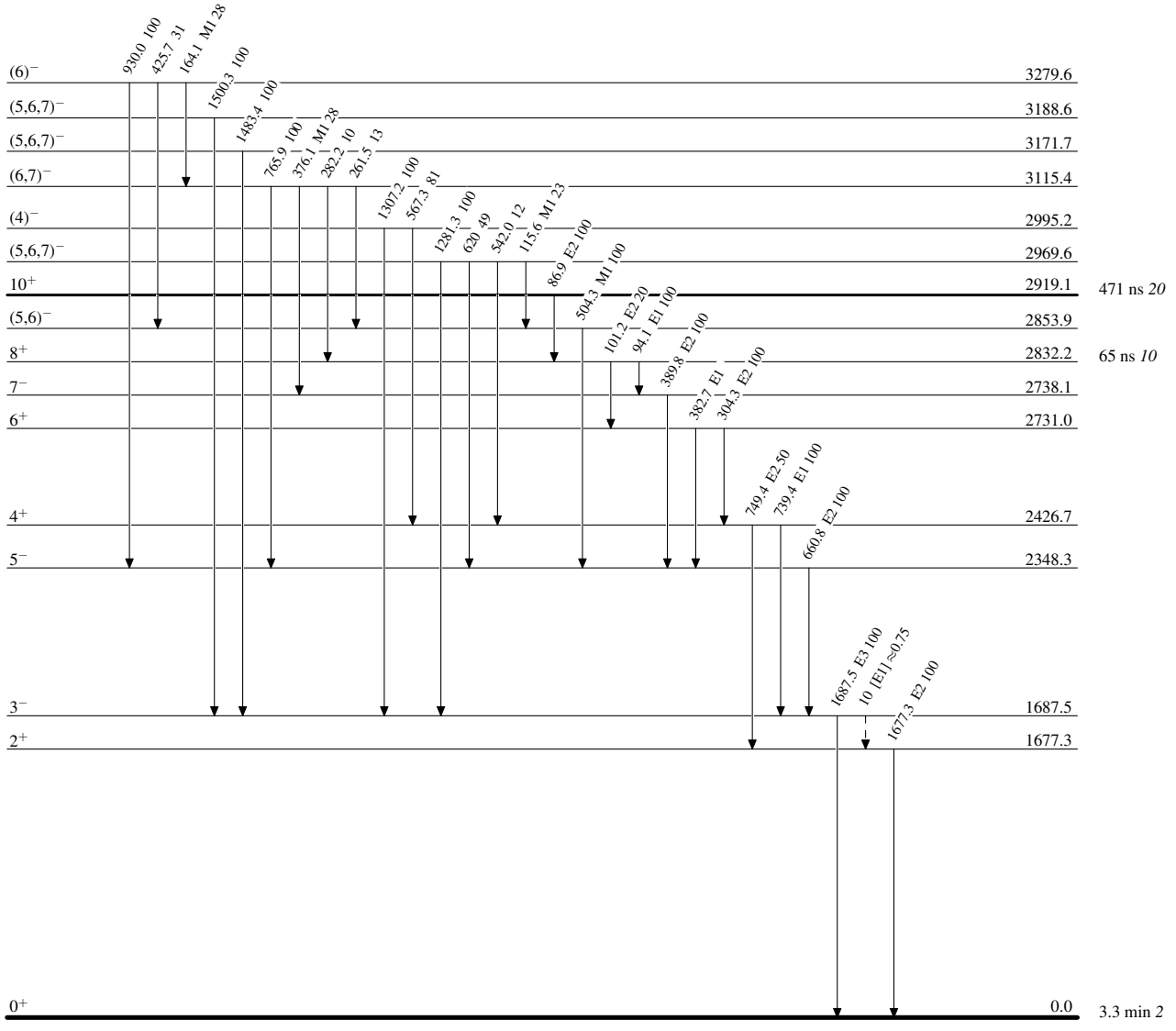
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{148}_{66}Dy_{82}$