^{163}Tb β^- decay (19.5 min) 1971Ka22

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. W. Reich, Balraj Singh	NDS 111, 1211 (2010)	12-Apr-2010

Parent: ^{163}Tb: E=0.0; $J^\pi=3/2^+$; $T_{1/2}$=19.5 min *3*; Q(β^-)=1785 *4*; %β^- decay=100.0

^{163}Tb-J^π,$T_{1/2}$,Q(β^-): From the ^{163}Tb Adopted Levels.

^{163}Tb-Configuration=π3/2[411].

Additional information 1.

1971Ka22 (also 1972Ka12): measured Eγ, Iγ, γ(t), $\gamma\gamma$-coin, Eβ's, Iβ's, β(t), $\beta\gamma$ coin.

Others:

1966Fu08: measured Eγ, Iγ, γ(t), $\gamma\gamma$ coin, Eβ's, β(t), $\beta\gamma$ coin.

1964Ma16: measured $T_{1/2}$, γ.

1951Bu25: measured $T_{1/2}$.

^{163}Dy Levels

See Adopted Levels for band assignments.

E(level)	J^π†	E(level)	J^π†	E(level)	J^π†	E(level)	J^π†
0.0	$5/2^-$	389.79 *10*	$3/2^-$	737.49 *13*	$1/2^+$	935.11 *11*	$(3/2)^+$
73.40 *10*	$7/2^-$	421.88 *10*	$(3/2)^-$	766.20 *13*	$(3/2)^+$	949.34 *13*	$(5/2)^+$
167.37 *12*	$9/2^-$	427.62 *11*	$(5/2)^-$	781.02 *17*	$5/2^+$	1058.81 *15*	$1/2^+$
250.80 *10*	$5/2^+$	475.34 *13*	$(5/2)^-$	859.12 *14*	$(3/2)^+$	1084.27 *14*	$(3/2)^+$
285.58 *11*	$7/2^+$	514.61 *14*	$7/2^-$	884.24‡ *12*	$1/2^+$	1147.09 *17*	$3/2^+$
351.23 *11*	$(1/2)^-$	553.06 *16*	$7/2^-$	915.67 *22*	$5/2^+$		

† From Adopted Levels.

‡ Probable bandhead of the $K^\pi=2^-$ octupole vibration built on the 5/2[523] g.s. orbital. The low log *ft* value indicates that it is populated via a ν5/2[523]→π7/2[523], *au*, β^- transition, implying that the dominant configuration is ν5/2[523]-π7/2[523]+π3/2[411]. This situation is presumably similar to that In ^{162}Dy, where the $K^\pi=2^-$ octupole vibration occurs relatively low In the level scheme (1148.2 keV) and has these two proton orbitals As the dominant configuration, which is what is expected for the $K^\pi=2^-$ octupole phonon In this mass region.

β^- radiations

Eβ= 1400 *100* (1966Fu08) to 250.9 level is not reported by 1971Ka22 who suggest a possible contamination from ^{162}Tb β^- in 1966Fu08.

E(decay)	E(level)	Iβ^-†	Log *ft*	Comments
(638 *4*)	1147.09	0.25 *15*	6.7 *3*	av Eβ=199.9 *15*
(701 *4*)	1084.27	1.6 *3*	6.08 *9*	av Eβ=222.9 *15*
(726 *4*)	1058.81	1.4 *3*	6.19 *10*	av Eβ=232.4 *15*
(836 *4*)	949.34	4.5 *5*	5.90 *5*	av Eβ=273.8 *16*
(850 *4*)	935.11	15.4 *14*	5.39 *4*	av Eβ=279.3 *16*
(869 *4*)	915.67	1.6 *3*	6.41 *9*	av Eβ=286.8 *16*
(901 *4*)	884.24	34.8 *24*	5.12 *4*	av Eβ=299.0 *16* E(decay): measured values: 800 (1966Fu08,($\beta\gamma$)), 820 (1971Ka22,$\beta\gamma$).
(926 *4*)	859.12	4.5 *5*	6.05 *5*	av Eβ=308.8 *16* E(decay): 940 *100* (1971Ka22,$\beta\gamma$).
(1004 *4*)	781.02	0.33 *19*	7.3 *3*	av Eβ=339.6 *16*
(1019 *4*)	766.20	11.5 *11*	5.80 *5*	av Eβ=345.5 *16*

Continued on next page (footnotes at end of table)

^{163}Tb β^- decay (19.5 min) 1971Ka22 (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
				E(decay): 940 *100* (1971Ka22,$\beta\gamma$).
(1048 *4*)	737.49	11.4 *11*	5.85 *5*	av Eβ=357.0 *16*
				E(decay): 940 *100* (1971Ka22,$\beta\gamma$).
(1232[‡] *4*)	553.06	0.3 *2*	8.4[1u] *3*	av Eβ=435.2 *16*
(1270[‡] *4*)	514.61	<0.5	>8.2[1u]	av Eβ=450.4 *16*
(1310 *4*)	475.34	3.9 *6*	6.7 *1*	av Eβ=464.1 *17*
(1357[‡] *4*)	427.62	<1.5	>7.1	av Eβ=484.0 *17*
(1363 *4*)	421.88	9.1 *15*	6.4 *1*	av Eβ=486.4 *17*
				E(decay): measured value: 1270 60, weighted average of 1240 *100* (1971Ka22,$\beta\gamma$), 1300 *100* (1971Ka22,singles), 1280 *100* (1966Fu08,$\beta\gamma$).

[†] Absolute intensity per 100 decays.
[‡] Existence of this branch is questionable.

$\gamma(^{163}Dy)$

Iγ normalization: ΣI(γ+ce)(to g.s.)=100. The β^- and βγ coin measurements show no β^- branch to g.s.

E_γ	I_γ[@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[†]	α[&]	Comments
37.8[b] 5	0.02 1	427.62	(5/2)$^-$	389.79	3/2$^-$	[M1]		6.5 3	α(L)=5.10 22; α(M)=1.12 5; α(N+..)=0.299 13 α(N)=0.259 11; α(O)=0.0378 16; α(P)=0.00215 10 Mult.: E2 is less likely from RUL.
38.6 5	0.13 6	389.79	3/2$^-$	351.23	(1/2)$^-$	[M1]		6.1 3	α(L)=4.79 20; α(M)=1.05 5; α(N+..)=0.281 12 α(N)=0.243 11; α(O)=0.0355 15; α(P)=0.00202 9 Mult.: E2 is less likely from RUL.
[x]68.8[#] 5	0.30 15								
70.7 5	0.35 17	421.88	(3/2)$^-$	351.23	(1/2)$^-$	E2		10.3 4	α(K)=2.27 4; α(L)=6.19 23; α(M)=1.49 6; α(N+..)=0.372 14 α(N)=0.333 13; α(O)=0.0394 15; α(P)=0.0001018 21
73.4 2	9 2	73.40	7/2$^-$	0.0	5/2$^-$	E2+M1	1.98 10	8.27 16	α(K)=2.71 7; α(L)=4.27 12; α(M)=1.02 3; α(N+..)=0.257 7 α(N)=0.229 6; α(O)=0.0274 7; α(P)=0.000137 5
76.5 5	0.35 17	427.62	(5/2)$^-$	351.23	(1/2)$^-$	E2		7.55 23	α(K)=2.01 4; α(L)=4.26 15; α(M)=1.02 4; α(N+..)=0.256 9 α(N)=0.229 8; α(O)=0.0272 10; α(P)=8.61×10^{-5} 18
77.6 5	0.14 7	553.06	7/2$^-$	475.34	(5/2)$^-$	M1(+E2)	0.23 +12−23	5.08 18	α(K)=4.07 17; α(L)=0.79 20; α(M)=0.18 5; α(N+..)=0.046 12 α(N)=0.041 11; α(O)=0.0056 13; α(P)=0.000252 12
93.9 2	0.5 2	167.37	9/2$^-$	73.40	7/2$^-$	E2+M1	−1.9 3	3.31 7	α(K)=1.55 8; α(L)=1.36 9; α(M)=0.323 21; α(N+..)=0.082 6 α(N)=0.073 5; α(O)=0.0088 6; α(P)=7.5×10^{-5} 7
118.2 2	0.40 15	285.58	7/2$^+$	167.37	9/2$^-$	[E1]		0.197	α(K)=0.1653 25; α(L)=0.0251 4; α(M)=0.00550 9; α(N+..)=0.001431 22 α(N)=0.001251 19; α(O)=0.000172 3; α(P)=7.81×10^{-6} 12 Mult.: not M2 from α(exp)≤7.7 from intensity balance (α(M2)≈12).
[x]123.6[#] 5	0.25 12								
124.8 2	0.6 2	514.61	7/2$^-$	389.79	3/2$^-$	E2		1.208	α(K)=0.625 10; α(L)=0.449 7; α(M)=0.1070 17; α(N+..)=0.0270 5 α(N)=0.0240 4; α(O)=0.00293 5; α(P)=2.67×10^{-5} 4
146.7 2	0.90 25	884.24	1/2$^+$	737.49	1/2$^+$	M1		0.805	α(K)=0.678 10; α(L)=0.0993 15; α(M)=0.0218 4; α(N+..)=0.00582 9 α(N)=0.00504 8; α(O)=0.000738 11; α(P)=4.22×10^{-5} 7
154.0 2	1.2 3	935.11	(3/2)$^+$	781.02	5/2$^+$	[M1,E2]		0.64 7	α(K)=0.47 13; α(L)=0.13 5; α(M)=0.031 12; α(N+..)=0.008 3 α(N)=0.007 3; α(O)=0.0009 3; α(P)=2.6×10^{-5} 11
167.3 2	2.5 5	167.37	9/2$^-$	0.0	5/2$^-$	E2		0.432	α(K)=0.269 4; α(L)=0.1258 19; α(M)=0.0297 5; α(N+..)=0.00754 12 α(N)=0.00669 10; α(O)=0.000833 13; α(P)=1.230×10^{-5} 18
177.4 2	2.9 6	250.80	5/2$^+$	73.40	7/2$^-$	E1		0.0667	α(K)=0.0562 8; α(L)=0.00822 12; α(M)=0.00180 3; α(N+..)=0.000471 7 α(N)=0.000411 6; α(O)=5.76×10^{-5} 9; α(P)=2.80×10^{-6} 4
212.2 2	3.0 6	285.58	7/2$^+$	73.40	7/2$^-$	E1		0.0417	α(K)=0.0352 5; α(L)=0.00508 8; α(M)=0.001110 16;

From ENSDF

^{163}Tb β^- decay (19.5 min) 1971Ka22 (continued)

$\gamma(^{163}Dy)$ (continued)

E_γ	I_γ[@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[&]	Comments
								α(N+..)=0.000292 *5* α(N)=0.000254 *4*; α(O)=3.58×10^{-5} *5*; α(P)=1.79×10^{-6} *3*
250.8 *2*	29.9 *30*	250.80	5/2$^+$	0.0	5/2$^-$	E1	0.0270	α(K)=0.0229 *4*; α(L)=0.00327 *5*; α(M)=0.000714 *11*; α(N+..)=0.000188 *3* α(N)=0.0001635 *24*; α(O)=2.32×10^{-5} *4*; α(P)=1.186×10^{-6} *17*
260.1 *2*	2.7 *5*	427.62	(5/2)$^-$	167.37	9/2$^-$	E2	0.1006	α(K)=0.0730 *11*; α(L)=0.0213 *3*; α(M)=0.00494 *7*; α(N+..)=0.001270 *19* α(N)=0.001121 *16*; α(O)=0.0001453 *21*; α(P)=3.70×10^{-6} *6*
266.3 *2*	0.90 *25*	781.02	5/2$^+$	514.61	7/2$^-$	E1	0.0232	α(K)=0.0196 *3*; α(L)=0.00280 *4*; α(M)=0.000610 *9*; α(N+..)=0.0001609 *23* α(N)=0.0001400 *20*; α(O)=1.99×10^{-5} *3*; α(P)=1.024×10^{-6} *15*
285.6 *2*	3.7 *7*	285.58	7/2$^+$	0.0	5/2$^-$	E1	0.0194	α(K)=0.01647 *24*; α(L)=0.00234 *4*; α(M)=0.000510 *8*; α(N+..)=0.0001345 *19* α(N)=0.0001169 *17*; α(O)=1.666×10^{-5} *24*; α(P)=8.64×10^{-7} *13*
316.4 *2*	37.0 *37*	389.79	3/2$^-$	73.40	7/2$^-$	E2	0.0549	α(K)=0.0415 *6*; α(L)=0.01036 *15*; α(M)=0.00238 *4*; α(N+..)=0.000614 *9* α(N)=0.000541 *8*; α(O)=7.15×10^{-5} *11*; α(P)=2.19×10^{-6} *3*
321.5 *2*	0.5[‡] *3*	1058.81	1/2$^+$	737.49	1/2$^+$	M1	0.0939	α(K)=0.0793 *12*; α(L)=0.01140 *16*; α(M)=0.00250 *4*; α(N+..)=0.000668 *10* α(N)=0.000578 *9*; α(O)=8.48×10^{-5} *12*; α(P)=4.89×10^{-6} *7*
338.5 *2*	20.1 *20*	766.20	(3/2)$^+$	427.62	(5/2)$^-$	E1	0.01277	α(K)=0.01083 *16*; α(L)=0.001521 *22*; α(M)=0.000332 *5*; α(N+..)=8.77×10^{-5} *13* α(N)=7.62×10^{-5} *11*; α(O)=1.091×10^{-5} *16*; α(P)=5.77×10^{-7} *9*
344.3 *2*	2.0 *5*	766.20	(3/2)$^+$	421.88	(3/2)$^-$	[E1]	0.01226	α(K)=0.01040 *15*; α(L)=0.001458 *21*; α(M)=0.000318 *5*; α(N+..)=8.41×10^{-5} *12* α(N)=7.31×10^{-5} *11*; α(O)=1.046×10^{-5} *15*; α(P)=5.54×10^{-7} *8*
347 *1*	1.5[‡] *5*	514.61	7/2$^-$	167.37	9/2$^-$	E2,M1	0.059 *18*	α(K)=0.048 *17*; α(L)=0.0084 *10*; α(M)=0.00187 *17*; α(N+..)=0.00049 *6* α(N)=0.00043 *5*; α(O)=6.1×10^{-5} *9*; α(P)=2.9×10^{-6} *12*
347.8 *2*	27.4 *27*	737.49	1/2$^+$	389.79	3/2$^-$	E1	0.01196	α(K)=0.01015 *15*; α(L)=0.001422 *20*; α(M)=0.000310 *5*; α(N+..)=8.20×10^{-5} *12* α(N)=7.13×10^{-5} *10*; α(O)=1.021×10^{-5} *15*; α(P)=5.41×10^{-7} *8*
351.2 *2*	117 *12*	351.23	(1/2)$^-$	0.0	5/2$^-$	E2	0.0403	α(K)=0.0310 *5*; α(L)=0.00718 *11*; α(M)=0.001641 *24*; α(N+..)=0.000425 *6* α(N)=0.000374 *6*; α(O)=4.99×10^{-5} *7*; α(P)=1.660×10^{-6} *24*
354 *1*	0.5[‡] *3*	781.02	5/2$^+$	427.62	(5/2)$^-$	[E1]	0.01146 *18*	α(K)=0.00972 *16*; α(L)=0.001362 *22*; α(M)=0.000297 *5*; α(N+..)=7.85×10^{-5} *13* α(N)=6.82×10^{-5} *11*; α(O)=9.78×10^{-6} *16*; α(P)=5.19×10^{-7} *8*
354.3 *2*	20.6 *21*	427.62	(5/2)$^-$	73.40	7/2$^-$	E2	0.0392	α(K)=0.0303 *5*; α(L)=0.00697 *10*; α(M)=0.001592 *23*; α(N+..)=0.000413 *6* α(N)=0.000362 *6*; α(O)=4.85×10^{-5} *7*; α(P)=1.623×10^{-6} *23*
376.5 *2*	2.8 *6*	766.20	(3/2)$^+$	389.79	3/2$^-$	E1	0.00989	α(K)=0.00839 *12*; α(L)=0.001171 *17*; α(M)=0.000255 *4*; α(N+..)=6.75×10^{-5} *10* α(N)=5.87×10^{-5} *9*; α(O)=8.42×10^{-6} *12*; α(P)=4.50×10^{-7} *7*
384 *1*	1.0 *5*	859.12	(3/2)$^+$	475.34	(5/2)$^-$			
386 *1*	0.5[‡] *3*	553.06	7/2$^-$	167.37	9/2$^-$	M1,E2	0.044 *14*	α(K)=0.036 *13*; α(L)=0.0061 *9*; α(M)=0.00136 *18*; α(N+..)=0.00036 *6* α(N)=0.00031 *5*; α(O)=4.4×10^{-5} *8*; α(P)=2.2×10^{-6} *9*
386.3 *2*	20.1 *20*	737.49	1/2$^+$	351.23	(1/2)$^-$	E1	0.00930	α(K)=0.00790 *11*; α(L)=0.001100 *16*; α(M)=0.000240 *4*; α(N+..)=6.35×10^{-5} *9* α(N)=5.51×10^{-5} *8*; α(O)=7.92×10^{-6} *12*; α(P)=4.24×10^{-7} *6*
389.8 *2*	108 *11*	389.79	3/2$^-$	0.0	5/2$^-$	E2,M1	0.043 *14*	α(K)=0.036 *13*; α(L)=0.0059 *9*; α(M)=0.00132 *18*; α(N+..)=0.00035 *5* α(N)=0.00030 *5*; α(O)=4.3×10^{-5} *8*; α(P)=2.1×10^{-6} *9*
391 *1*	2.0 *5*	781.02	5/2$^+$	389.79	3/2$^-$	E1	0.00904 *14*	α(K)=0.00767 *12*; α(L)=0.001069 *17*; α(M)=0.000233 *4*; α(N+..)=6.17×10^{-5} *10* α(N)=5.35×10^{-5} *9*; α(O)=7.69×10^{-6} *12*; α(P)=4.13×10^{-7} *7*
396.3 *2*	2.1 *4*	949.34	(5/2)$^+$	553.06	7/2$^-$			

From ENSDF

$^{163}_{66}Dy_{97}$-4

^{163}Tb β^- decay (19.5 min) 1971Ka22 (continued)

$\gamma(^{163}Dy)$ (continued)

E_γ	I_γ [@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[&]	Comments
401.9 *2*	11.1 *11*	475.34	$(5/2)^-$	73.40	$7/2^-$	M1	0.0522	α(K)=0.0441 *7*; α(L)=0.00630 *9*; α(M)=0.001380 *20*; α(N+..)=0.000369 *6* α(N)=0.000319 *5*; α(O)=4.68×10^{-5} *7*; α(P)=2.71×10^{-6} *4*
415.0 *2*	23.9 *24*	766.20	$(3/2)^+$	351.23	$(1/2)^-$	E1	0.00786	α(K)=0.00668 *10*; α(L)=0.000927 *13*; α(M)=0.000202 *3*; α(N+..)=5.35×10^{-5} *8* α(N)=4.64×10^{-5} *7*; α(O)=6.68×10^{-6} *10*; α(P)=3.60×10^{-7} *5*
421.9 *2*	51 *5*	421.88	$(3/2)^-$	0.0	$5/2^-$	M1	0.0460	α(K)=0.0389 *6*; α(L)=0.00554 *8*; α(M)=0.001214 *17*; α(N+..)=0.000325 *5* α(N)=0.000281 *4*; α(O)=4.12×10^{-5} *6*; α(P)=2.39×10^{-6} *4*
427.6 *2*	15.6 *16*	427.62	$(5/2)^-$	0.0	$5/2^-$	E2,M1	0.034 *11*	α(K)=0.028 *10*; α(L)=0.0045 *9*; α(M)=0.00101 *17*; α(N+..)=0.00027 *5* α(N)=0.00023 *4*; α(O)=3.3×10^{-5} *7*; α(P)=1.7×10^{-6} *7*
434.8 *2*	6.3 *10*	949.34	$(5/2)^+$	514.61	$7/2^-$			
437.3 *2*	1.5 *5*	859.12	$(3/2)^+$	421.88	$(3/2)^-$			
440 *1*	1.0[‡] *5*	915.67	$5/2^+$	475.34	$(5/2)^-$			
441.2 *2*	3.0 *6*	514.61	$7/2^-$	73.40	$7/2^-$	M1,E2	0.031 *10*	α(K)=0.026 *9*; α(L)=0.0042 *8*; α(M)=0.00092 *16*; α(N+..)=0.00024 *5* α(N)=0.00021 *4*; α(O)=3.0×10^{-5} *7*; α(P)=1.5×10^{-6} *6*
459.8 *2*	5.1 *8*	935.11	$(3/2)^+$	475.34	$(5/2)^-$			
462.4 *2*	9.8 *12*	884.24	$1/2^+$	421.88	$(3/2)^-$			
475.4 *2*	13.1 *13*	475.34	$(5/2)^-$	0.0	$5/2^-$	M1	0.0338	α(K)=0.0286 *4*; α(L)=0.00406 *6*; α(M)=0.000888 *13*; α(N+..)=0.000238 *4* α(N)=0.000206 *3*; α(O)=3.02×10^{-5} *5*; α(P)=1.750×10^{-6} *25*
479.7 *2*	1.5 *4*	553.06	$7/2^-$	73.40	$7/2^-$	M1	0.0330	α(K)=0.0280 *4*; α(L)=0.00397 *6*; α(M)=0.000868 *13*; α(N+..)=0.000232 *4* α(N)=0.000201 *3*; α(O)=2.95×10^{-5} *5*; α(P)=1.710×10^{-6} *24*
486.7 *2*	4.9 *8*	737.49	$1/2^+$	250.80	$5/2^+$	[E2]	0.01626	α(K)=0.01306 *19*; α(L)=0.00249 *4*; α(M)=0.000562 *8*; α(N+..)=0.0001470 *21* α(N)=0.0001286 *18*; α(O)=1.770×10^{-5} *25*; α(P)=7.29×10^{-7} *11*
494.5 *2*	100	884.24	$1/2^+$	389.79	$3/2^-$	E1	0.00526	α(K)=0.00448 *7*; α(L)=0.000616 *9*; α(M)=0.0001341 *19*; α(N+..)=3.56×10^{-5} *5* α(N)=3.09×10^{-5} *5*; α(O)=4.46×10^{-6} *7*; α(P)=2.44×10^{-7} *4*
507.5 *2*	20.5 *21*	935.11	$(3/2)^+$	427.62	$(5/2)^-$	E1	0.00497	α(K)=0.00423 *6*; α(L)=0.000580 *9*; α(M)=0.0001264 *18*; α(N+..)=3.35×10^{-5} *5* α(N)=2.91×10^{-5} *4*; α(O)=4.20×10^{-6} *6*; α(P)=2.31×10^{-7} *4*
515[ab] *1*	1.6[a] *10*	514.61	$7/2^-$	0.0	$5/2^-$	M1	0.0275	α(K)=0.0233 *4*; α(L)=0.00330 *5*; α(M)=0.000722 *11*; α(N+..)=0.000193 *3* α(N)=0.0001671 *25*; α(O)=2.45×10^{-5} *4*; α(P)=1.425×10^{-6} *22* Placement is based on (n,γ) data. Placement from 553 level (1971Ka22).
515[ab] *1*	1.9[a] *10*	766.20	$(3/2)^+$	250.80	$5/2^+$	E2	0.01404	α(K)=0.01133 *17*; α(L)=0.00211 *4*; α(M)=0.000474 *8*; α(N+..)=0.0001240 *19* α(N)=0.0001084 *17*; α(O)=1.499×10^{-5} *23*; α(P)=6.36×10^{-7} *10* I_γ: total Iγ= 3.5 *10* divided on the basis of (n,γ) data.
527.4 *2*	1.2 *3*	949.34	$(5/2)^+$	421.88	$(3/2)^-$			
533.0 *2*	42 *4*	884.24	$1/2^+$	351.23	$(1/2)^-$	E1	0.00446	α(K)=0.00380 *6*; α(L)=0.000520 *8*; α(M)=0.0001131 *16*; α(N+..)=3.00×10^{-5} *5* α(N)=2.60×10^{-5} *4*; α(O)=3.77×10^{-6} *6*; α(P)=2.08×10^{-7} *3*
545.3 *2*	7.5 *11*	935.11	$(3/2)^+$	389.79	$3/2^-$			
553.0 *5*	0.4 *2*	553.06	$7/2^-$	0.0	$5/2^-$	M1	0.0230	α(K)=0.0195 *3*; α(L)=0.00275 *4*; α(M)=0.000601 *9*; α(N+..)=0.0001607 *23* α(N)=0.0001391 *20*; α(O)=2.04×10^{-5} *3*; α(P)=1.188×10^{-6} *17*
559.5 *2*	9.1 *12*	949.34	$(5/2)^+$	389.79	$3/2^-$			
573.5 *2*	0.7 *2*	859.12	$(3/2)^+$	285.58	$7/2^+$	[E2]	0.0107	α(K)=0.00872; α(L)=0.00154; α(M)=0.000345; α(N+..)=7.92×10^{-5} α(N)=7.92×10^{-5}; α(O)=1.10×10^{-5}; α(P)=4.9×10^{-7}
[x]578.2[#] *2*	0.80 *25*							

From ENSDF

$^{163}_{66}Dy_{97}$-5

^{163}Tb β^- decay (19.5 min) 1971Ka22 (continued)

$\gamma(^{163}Dy)$ (continued)

E_γ	I_γ[@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[&]	Comments
583.9 *2*	31.2 *31*	935.11	$(3/2)^+$	351.23	$(1/2)^-$	(E1)	0.00366	α(K)=0.00312 *5*; α(L)=0.000425 *6*; α(M)=9.24×10^{-5} *13*; α(N+..)=2.45×10^{-5} *4* α(N)=2.13×10^{-5} *3*; α(O)=3.08×10^{-6} *5*; α(P)=1.712×10^{-7} *24*
608.3 *2*	16.4 *16*	859.12	$(3/2)^+$	250.80	$5/2^+$	M1	0.0181	α(K)=0.01531 *22*; α(L)=0.00215 *3*; α(M)=0.000471 *7*; α(N+..)=0.0001259 *18* α(N)=0.0001090 *16*; α(O)=1.601×10^{-5} *23*; α(P)=9.32×10^{-7} *13*
630.1 *2*	5.0 *8*	915.67	$5/2^+$	285.58	$7/2^+$	M1	0.01653	α(K)=0.01402 *20*; α(L)=0.00197 *3*; α(M)=0.000431 *6*; α(N+..)=0.0001151 *17* α(N)=9.96×10^{-5} *14*; α(O)=1.464×10^{-5} *21*; α(P)=8.53×10^{-7} *12*
633.4 *2*	1.3 *3*	884.24	$1/2^+$	250.80	$5/2^+$			
637 *1*	0.9 *3*	1058.81	$1/2^+$	421.88	$(3/2)^-$			
649.6 *2*	0.5 *2*	935.11	$(3/2)^+$	285.58	$7/2^+$			
656.5 *5*	0.25 *15*	1084.27	$(3/2)^+$	427.62	$(5/2)^-$	(E1)	0.00286	α(K)=0.00244 *4*; α(L)=0.000330 *5*; α(M)=7.17×10^{-5} *11*; α(N+..)=1.90×10^{-5} *3* α(N)=1.652×10^{-5} *24*; α(O)=2.40×10^{-6} *4*; α(P)=1.344×10^{-7} *19*
662.5 *2*	0.9[‡] *5*	1084.27	$(3/2)^+$	421.88	$(3/2)^-$			
664 *1*	0.7[‡] *4*	949.34	$(5/2)^+$	285.58	$7/2^+$			
665 *1*	1.0[‡] *5*	915.67	$5/2^+$	250.80	$5/2^+$	(M1,E2)	0.011 *4*	α(K)=0.009 *3*; α(L)=0.0014 *4*; α(M)=0.00030 *8*; α(N+..)=8.0×10^{-5} *20* α(N)=7.0×10^{-5} *18*; α(O)=1.0×10^{-5} *3*; α(P)=5.5×10^{-7} *20*
668.9 *2*	2.7 *7*	1058.81	$1/2^+$	389.79	$3/2^-$			
684.3 *2*	1.3 *6*	935.11	$(3/2)^+$	250.80	$5/2^+$			
694.5 *5*	0.25 *15*	1084.27	$(3/2)^+$	389.79	$3/2^-$			
698.5 *5*	0.4 *2*	949.34	$(5/2)^+$	250.80	$5/2^+$			
707.5 *2*	1.4 *6*	1058.81	$1/2^+$	351.23	$(1/2)^-$	E1	0.00245	α(K)=0.00209 *3*; α(L)=0.000282 *4*; α(M)=6.13×10^{-5} *9*; α(N+..)=1.628×10^{-5} *23* α(N)=1.411×10^{-5} *20*; α(O)=2.05×10^{-6} *3*; α(P)=1.156×10^{-7} *17*
[x]722.4[#] *5*	0.4 *2*							
725.1[b] *2*	0.7 *3*	1147.09	$3/2^+$	421.88	$(3/2)^-$	E1	0.00233	α(K)=0.00199 *3*; α(L)=0.000268 *4*; α(M)=5.82×10^{-5} *9*; α(N+..)=1.547×10^{-5} *22* α(N)=1.341×10^{-5} *19*; α(O)=1.95×10^{-6} *3*; α(P)=1.101×10^{-7} *16* Tentative placement from (n,γ).
733.0 *2*	1.1 *5*	1084.27	$(3/2)^+$	351.23	$(1/2)^-$			
808 *1*	0.8[‡] *4*	1058.81	$1/2^+$	250.80	$5/2^+$			I_γ: 3.4 *10* from branching in adopted gammas.
833.4 *2*	4.5 *8*	1084.27	$(3/2)^+$	250.80	$5/2^+$	M1	0.00827	α(K)=0.00702 *10*; α(L)=0.000977 *14*; α(M)=0.000213 *3*; α(N+..)=5.71×10^{-5} *8* α(N)=4.94×10^{-5} *7*; α(O)=7.26×10^{-6} *11*; α(P)=4.25×10^{-7} *6*
[x]844.2[#] *2*	0.50 *25*							
896.4 *2*	0.6 *3*	1147.09	$3/2^+$	250.80	$5/2^+$	M1	0.00692	α(K)=0.00588 *9*; α(L)=0.000816 *12*; α(M)=0.0001782 *25*; α(N+..)=4.76×10^{-5} *7* α(N)=4.12×10^{-5} *6*; α(O)=6.06×10^{-6} *9*; α(P)=3.55×10^{-7} *5*

[†] From adopted gammas.
[‡] From $\gamma\gamma$.
[#] Assignment to ^{163}Tb decay is uncertain.
[@] For absolute intensity per 100 decays, multiply by 0.225 *14*.
[&] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies,

From ENSDF

$\gamma(^{163}Dy)$ (continued)

assigned multipolarities, and mixing ratios, unless otherwise specified.

[a] Multiply placed with intensity suitably divided.

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

[x] γ ray not placed in level scheme.

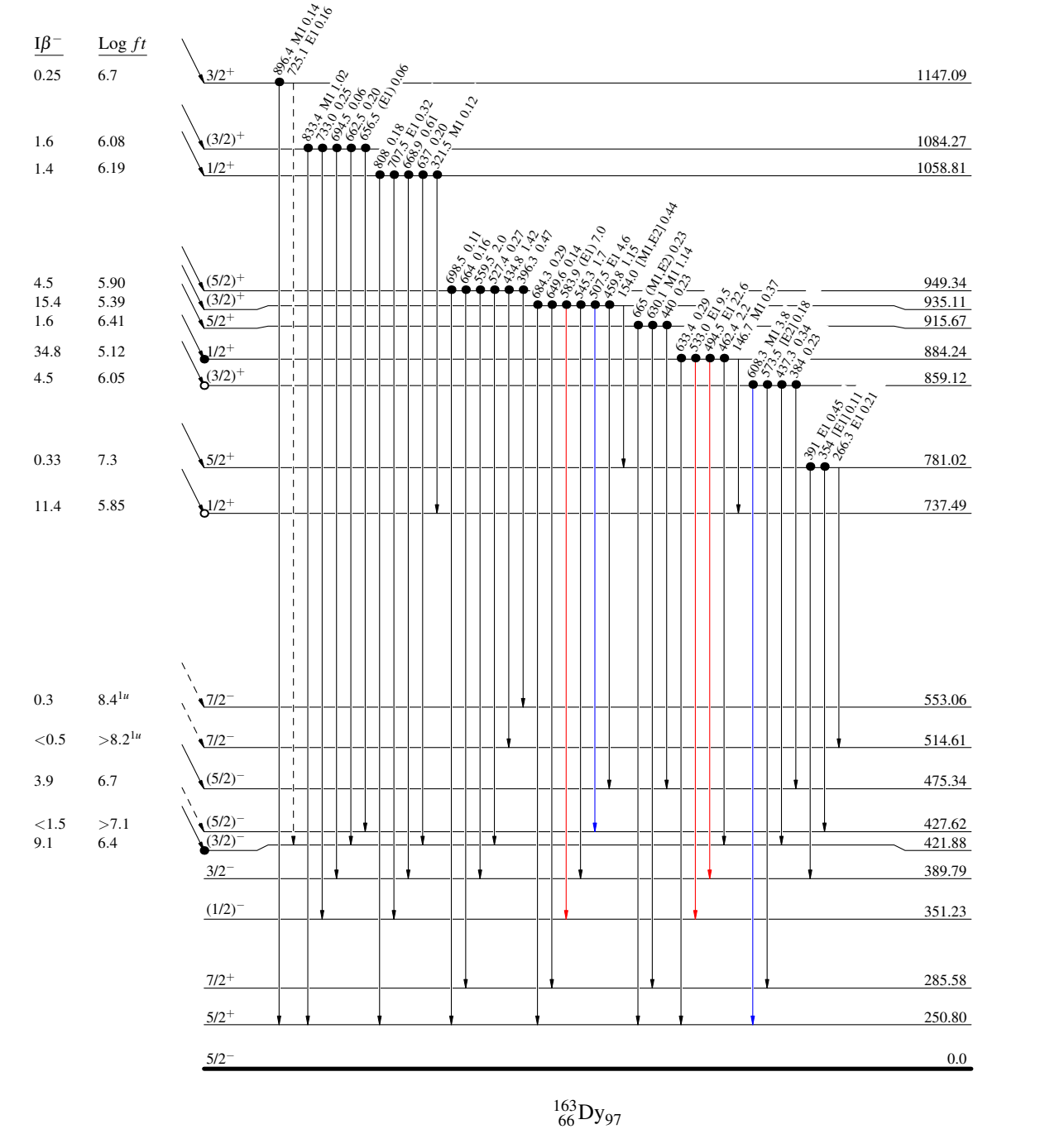
^{163}Tb β^- decay (19.5 min) 1971Ka22

Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)
- Coincidence

$3/2^+$ 0.0 19.5 min 3
Q_{β^-}=1785 4 $\%\beta^-$=100
$^{163}_{65}Tb_{98}$

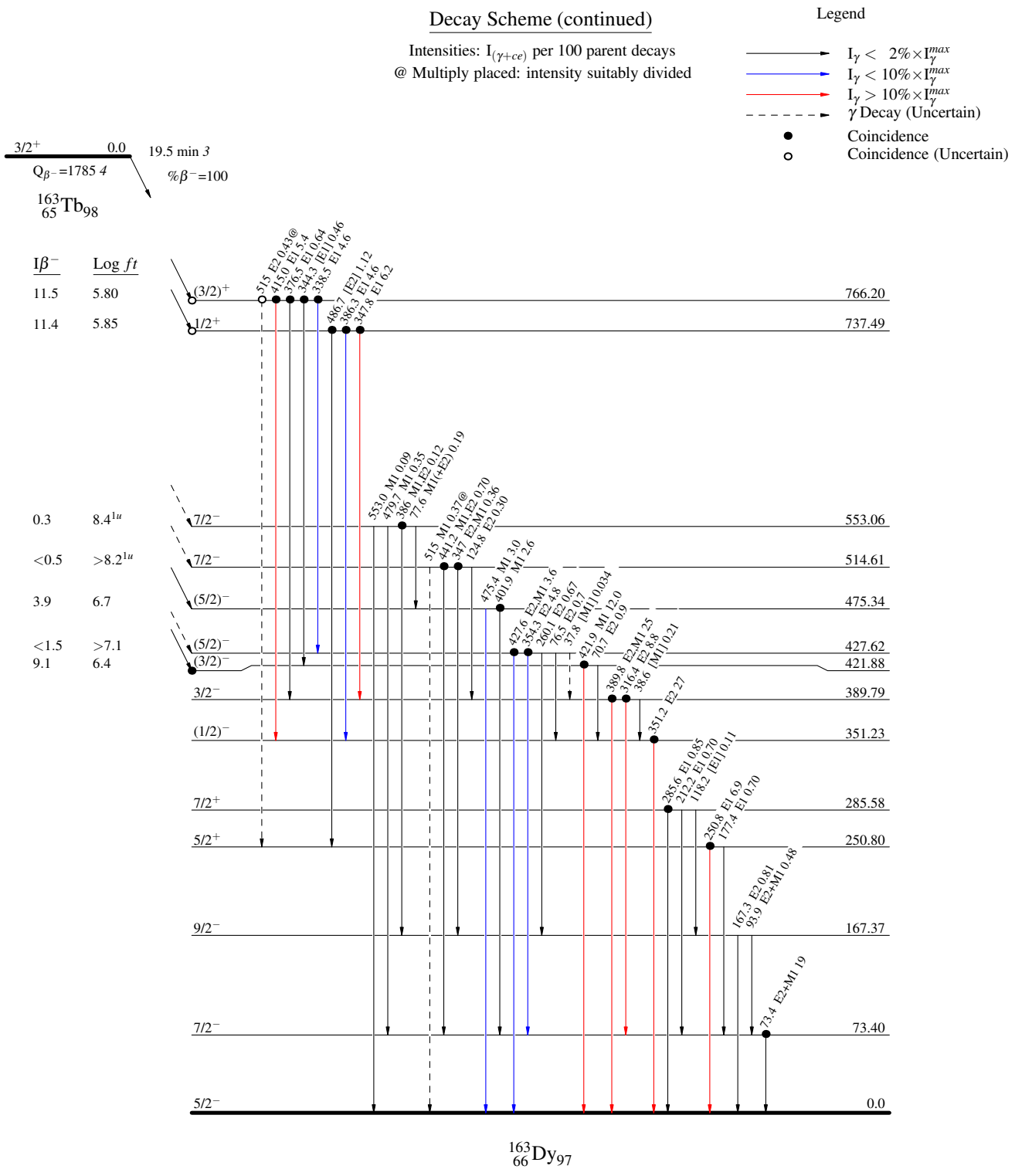


$^{163}_{66}Dy_{97}$

^{163}Tb β^- decay (19.5 min) 1971Ka22

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
@ Multiply placed: intensity suitably divided



$^{163}_{66}Dy_{97}$