^{101}Zr β^- decay 1991Oh03,1987Gr18,1990PaZY

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	ENSDF	1-Jul-2006

Parent: ^{101}Zr: E=0.0; J$^\pi$=(3/2$^+$); $T_{1/2}$=2.3 s *1*; Q(β^-)=5485 *25*; %β^- decay=100.0

1980ScZZ on-line separation fission products LOHENGRIN, measured γ, $\gamma\gamma$.

1987Gr18 on-line separation fission products LOHENGRIN, measured $\beta\gamma$.

1991Oh03 on-line separation fission products JOSEF, measured γ, $\beta\gamma$(t); other: 1990PaZY, preliminary data of 1991Oh03.

^{101}Nb Levels

E(level)	J$^\pi$	$T_{1/2}$†	Comments
0.0‡	(5/2$^+$)	7.1 s *3*	$T_{1/2}$: from Adopted Levels.
119.36‡ *7*	(7/2$^+$)	84 ps *4*	
205.60@ *7*	(3/2$^-$)	1.83 ns *3*	
208.40# *8*	(5/2$^-$)	0.80 ns *5*	
255.16‡ *10*	(9/2$^+$)	35 ps *5*	
346.20@ *8*	(5/2$^-$)	24 ps *5*	
374.01 *10*	(7/2$^-$)	19 ps *11*	
532.23 *12*	(7/2$^-$)	13 ps *10*	
593.32 *12*			
597.71 *14*			
672.93 *10*			
702.86 *19*			
722.13 *14*		25 ps *5*	
778.10 *19*			
781.57 *16*			
878.93 *15*			
899.55 *15*			
912.08 *12*			
921.55 *19*			
952.95 *22*			
1061.30 *15*			
1109.53 *19*			
1119.57 *12*			
1126.42 *18*			
1180.25 *19*			
1294.2 *6*			
1620.1 *4*			
1844.3 *3*			
1878.10 *12*			
1925.01 *17*			
1929.47 *21*			
1957.84 *13*			
2009.63 *13*			
2030.65 *20*			
2096.2 *3*			
2118.7 *4*			

† From 1991Oh03, unless otherwise noted.
‡ Band(A): [422] 5/2.
# Band(B): [303] 5/2.
@ Band(C): [301] 3/2.

^{101}Zr β^- decay 1991Oh03,1987Gr18,1990PaZY (continued)

β^- radiations

E(decay)†	E(level)	Iβ^-‡	Log *ft*	Comments
(3.37×10^3 *3*)	2118.7	0.5 *2*	6.04 *19*	av Eβ=1437 *12*
(3.39×10^3 *3*)	2096.2	0.2 *2*	6.5 *5*	av Eβ=1447 *12*
(3.45×10^3 *3*)	2030.65	1.3 *5*	5.67 *18*	av Eβ=1478 *12*
(3.48×10^3 *3*)	2009.63	5.0 *14*	5.10 *14*	av Eβ=1488 *12*
(3.53×10^3 *3*)	1957.84	5.4 *14*	5.09 *13*	av Eβ=1513 *12* E(decay): Eβ= 3540 *50*.
(3.56×10^3 *3*)	1929.47	2.0 *6*	5.54 *15*	av Eβ=1527 *12* E(decay): Eβ= 3590 *85*.
(3.56×10^3 *3*)	1925.01	2.7 *8*	5.41 *15*	av Eβ=1529 *12*
(3.61×10^3 *3*)	1878.10	3.2 *9*	5.36 *14*	av Eβ=1551 *12*
(3.64×10^3 *3*)	1844.3	0.18 *18*	6.6 *5*	av Eβ=1567 *12*
(3.86×10^3 *3*)	1620.1	0.12 *12*	6.9 *5*	av Eβ=1674 *12*
(4.19×10^3 *3*)	1294.2	0.12 *12*	7.1 *5*	av Eβ=1830 *12*
(4.30×10^3 *3*)	1180.25	2.0 *6*	5.90 *15*	av Eβ=1884 *12*
(4.36×10^3 *3*)	1126.42	0.2 *2*	6.9 *5*	av Eβ=1910 *12*
(4.37×10^3 *3*)	1119.57	1.5 *5*	6.06 *16*	av Eβ=1913 *12*
(4.38×10^3 *3*)	1109.53	0.2 *2*	6.9 *5*	av Eβ=1918 *12*
(4.53×10^3 *3*)	952.95	0.5 *2*	6.60 *19*	av Eβ=1993 *12*
(4.56×10^3 *3*)	921.55	0.2 *2*	7.0 *5*	av Eβ=2008 *12*
(4.57×10^3 *3*)	912.08	3.1 *8*	5.83 *13*	av Eβ=2013 *12*
(4.59×10^3 *3*)	899.55	0.4 *3*	6.7 *4*	av Eβ=2019 *12*
(4.61×10^3 *3*)	878.93	2.1 *6*	6.01 *14*	av Eβ=2029 *12*
(4.70×10^3 *3*)	781.57	0.6 *6*	6.6 *5*	av Eβ=2075 *12*
(4.71×10^3 *3*)	778.10	0.2 *2*	7.1 *5*	av Eβ=2077 *12*
(4.76×10^3 *3*)	722.13	1.0 *4*	6.40 *19*	av Eβ=2104 *12* E(decay): Eβ= 4544 *415*.
(4.78×10^3 *3*)	702.86	0.6 *2*	6.63 *16*	av Eβ=2113 *12*
(4.81×10^3 *3*)	672.93	1.3 *5*	6.31 *18*	av Eβ=2128 *12*
(4.89×10^3 *3*)	597.71	1.3 *5*	6.34 *18*	av Eβ=2164 *12* E(decay): Eβ= 4870 *150*.
(4.89×10^3 *3*)	593.32	1.0 *4*	6.45 *19*	av Eβ=2166 *12*
(4.95×10^3 *3*)	532.23	0.3 *3*	7.0 *5*	av Eβ=2195 *12*
(5.11×10^3 *3*)	374.01	0.9 *3*	6.58 *16*	av Eβ=2271 *12*
(5.14×10^3 *3*)	346.20	1.4 *4*	6.47 *16*	av Eβ=2284 *12*
(5.23×10^3 *3*)	255.16	0.5 *2*	7.1 *3*	av Eβ=2328 *12*
(5.28×10^3 *3*)	208.40	0.4 *4*	7.0 *5*	av Eβ=2351 *12*
(5.28×10^3 *3*)	205.60	0.5 *5*	6.9 *5*	av Eβ=2352 *12*
(5.37×10^3 *3*)	119.36	2.9 *17*	6.2 *3*	av Eβ=2393 *12* E(decay): Eβ= 5310 *70*.
(5485 *25*)	0.0	56 *11*	4.92 *11*	av Eβ=2451 *12*

† From 1987Gr18.
‡ Absolute intensity per 100 decays.

γ(^{101}Nb)

Iγ normalization: from Iγ(205.7)=6.1% 15 (1991Oh03).

Continued on next page (footnotes at end of table)

^{101}Zr β^- decay 1991Oh03,1987Gr18,1990PaZY (continued)

γ(^{101}Nb) (continued)

E_γ[†]	I_γ[†‡]	E_i(level)	J^π_i	E_f	J^π_f	Mult.	δ	α[#]	Comments
108.3 *2*	2 *1*	781.57		672.93		M1,E2		0.5 *4*	α(K)=0.4 *3*; α(L)=0.07 *6*; α(M)=0.013 *10*; α(N+..)=0.0018 *14* α(N)=0.0018 *13*; α(O)=6.E−5 *4* α(K)exp=0.57 *47* (1991Oh03)
119.3 *1*	180 *20*	119.36	(7/2$^+$)	0.0	(5/2$^+$)	M1(+E2)	<0.33	0.162 *24*	α(K)exp=0.14 *2* (1993Oh03) B(M1)(W.u.)>0.11; B(E2)(W.u.)<8.9×10^2
124.4 *2*	5 *1*	722.13		597.71					
135.8 *1*	17.3 *13*	255.16	(9/2$^+$)	119.36	(7/2$^+$)	M1(+E2)	<1.05	0.17 *7*	α(K)=0.15 *7*; α(L)=0.021 *11*; α(M)=0.0036 *19*; α(N+..)=0.0005 *3* α(N)=0.0005 *3*; α(O)=2.3×10^{-5} *9* α(K)exp=0.13 *8* (1991Oh03) B(M1)(W.u.)>0.071; B(E2)(W.u.)<5.9×10^3
137.9 *2*	2 *1*	346.20	(5/2$^-$)	208.40	(5/2$^-$)				
140.6 *1*	31 *2*	346.20	(5/2$^-$)	205.60	(3/2$^-$)	M1+E2	<0.25	0.096 *7*	α(K)=0.084 *7*; α(L)=0.0101 *11*; α(M)=0.00178 *19*; α(N+..)=0.00027 *3* α(N)=0.00026 *3*; α(O)=1.41×10^{-5} *9* α(K)exp=0.06 *3* (1991Oh03) B(M1)(W.u.)>0.18; B(E2)(W.u.)<8.4×10^2 Mult.: α(K)exp consistent with E1, but placement requires $\Delta\pi$=no.
165.7 *1*	5 *2*	374.01	(7/2$^-$)	208.40	(5/2$^-$)				
183.6 *4*	3 *1*	781.57		597.71					
186.0 *1*	5.0 *10*	532.23	(7/2$^-$)	346.20	(5/2$^-$)	M1,E2		0.08 *4*	α(K)exp=0.10 *19* (1991Oh03) Mult.: α(K)exp consistent with E1, but placement requires $\Delta\pi$=no.
205.7 *1*	100 *5*	205.60	(3/2$^-$)	0.0	(5/2$^+$)	E1,M1		0.024 *9*	α(K)=0.021 *8*; α(L)=0.0024 *9*; α(M)=0.00042 *16*; α(N+..)=6.4×10^{-5} *25* α(N)=6.1×10^{-5} *24*; α(O)=3.4×10^{-6} *14* α(K)exp=0.04 *3* (1991Oh03)
208.5 *1*	45 *2*	208.40	(5/2$^-$)	0.0	(5/2$^+$)				
226.8 *1*	1 *1*	346.20	(5/2$^-$)	119.36	(7/2$^+$)				
254.4 *2*	3 *1*	374.01	(7/2$^-$)	119.36	(7/2$^+$)				
255.2 *3*	2.9 *8*	255.16	(9/2$^+$)	0.0	(5/2$^+$)				
327.1 *5*	1.1 *4*	532.23	(7/2$^-$)	205.60	(3/2$^-$)				
338.2 *1*	8 *1*	593.32		255.16	(9/2$^+$)				
346.2 *2*	4 *1*	346.20	(5/2$^-$)	0.0	(5/2$^+$)				
373.9 *2*	6 *1*	374.01	(7/2$^-$)	0.0	(5/2$^+$)				
417.5 *2*	2 *1*	672.93		255.16	(9/2$^+$)				
473.9 *2*	11 *1*	593.32		119.36	(7/2$^+$)				
494.3 *4*	1 *1*	702.86		208.40	(5/2$^-$)				
497.3 *2*	8 *1*	702.86		205.60	(3/2$^-$)				
553.3 *2*	5 *1*	899.55		346.20	(5/2$^-$)				
553.6 *1*	26 *2*	672.93		119.36	(7/2$^+$)				
569.7 *4*	1 *1*	778.10		208.40	(5/2$^-$)				
572.5 *2*	3 *1*	778.10		205.60	(3/2$^-$)				
^{x}581.4 *2*	6 *1*								E_γ: could be deexciting a possible 787 level not adopted by the authors.

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$^{101}Zr\ \beta^-$ decay 1991Oh03,1987Gr18,1990PaZY (continued)

$\gamma(^{101}Nb)$ (continued)

E_γ [†]	I_γ [†‡]	E_i(level)	J_i^π	E_f	J_f^π
587.2[@] 3	2[@] 1	1119.57		532.23	(7/2−)
587.2[@] 3	13[@] 3	1180.25		593.32	
593.5 5	11 4	593.32		0.0	(5/2+)
597.8 2	47 3	597.71		0.0	(5/2+)
673.0 3	4 2	672.93		0.0	(5/2+)
693.9 2	6 1	899.55		205.60	(3/2−)
706.3 2	3 1	912.08		205.60	(3/2−)
722.2 2	29 2	722.13		0.0	(5/2+)
744.9 3	2 1	952.95		208.40	(5/2−)
747.0 3	6 1	952.95		205.60	(3/2−)
751.4 3	7 1	1878.10		1126.42	
759.6 2	20 2	878.93		119.36	(7/2+)
773.5 2	5 1	1119.57		346.20	(5/2−)
781.6 3	33 5	781.57		0.0	(5/2+)
802.4 2	7 1	921.55		119.36	(7/2+)
806.4 3	3 1	1061.30		255.16	(9/2+)
816.1 3	3 1	1925.01		1109.53	
878.9 2	15 2	878.93		0.0	(5/2+)
896.5 2	6 2	1957.84		1061.30	
904.2 2	5 1	1109.53		205.60	(3/2−)
911.2 2	3 1	1119.57		208.40	(5/2−)
912.2 2	58 4	912.08		0.0	(5/2+)
914.1 2	6 1	1119.57		205.60	(3/2−)
920.7 2	11 1	1126.42		205.60	(3/2−)
941.8 2	1 1	1061.30		119.36	(7/2+)
966.0 1	11 2	1878.10		912.08	
971.5 4	2 1	1180.25		208.40	(5/2−)
1037.1 4	3 1	1957.84		921.55	
1060.9 3	7 2	1180.25		119.36	(7/2+)
1085.8 6	2 1	1294.2		208.40	(5/2−)
1095.8 4	8 3	1878.10		781.57	
1119.0 3	9 4	1119.57		0.0	(5/2+)
1131.0 2	5 1	2030.65		899.55	
1143.0 3	12 3	1925.01		781.57	
1156.0 2	17 3	1878.10		722.13	
1180.0 5	10 2	1180.25		0.0	(5/2+)
1249.0 4	8 5	2030.65		781.57	
1280.6 4	7 2	1878.10		597.71	
1327.6 3	10 2	1925.01		597.71	
1337.1 3	8 2	2009.63		672.93	
1364.9 3	2 1	1620.1		255.16	(9/2+)
1635.9 3	3 1	1844.3		208.40	(5/2−)
1673.1 3	3 1	1878.10		205.60	(3/2−)
1750.0 3	3 1	2096.2		346.20	(5/2−)
1801.1 2	14 2	2009.63		208.40	(5/2−)
1810.1 2	33 4	1929.47		119.36	(7/2+)
1825.5 4	8 1	2030.65		205.60	(3/2−)
1838.5 2	25 3	1957.84		119.36	(7/2+)
1890.6 6	3 1	2009.63		119.36	(7/2+)
1910.3 4	4 1	2118.7		208.40	(5/2−)
1924.5 3	19 3	1925.01		0.0	(5/2+)
1957.6 2	54 6	1957.84		0.0	(5/2+)
1999.3 5	4 1	2118.7		119.36	(7/2+)
2009.5 2	57 7	2009.63		0.0	(5/2+)

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^{101}Zr β^- decay 1991Oh03,1987Gr18,1990PaZY (continued)

γ(^{101}Nb) (continued)

† From 1991Oh03.

‡ For absolute intensity per 100 decays, multiply by 0.061 *15*.

Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

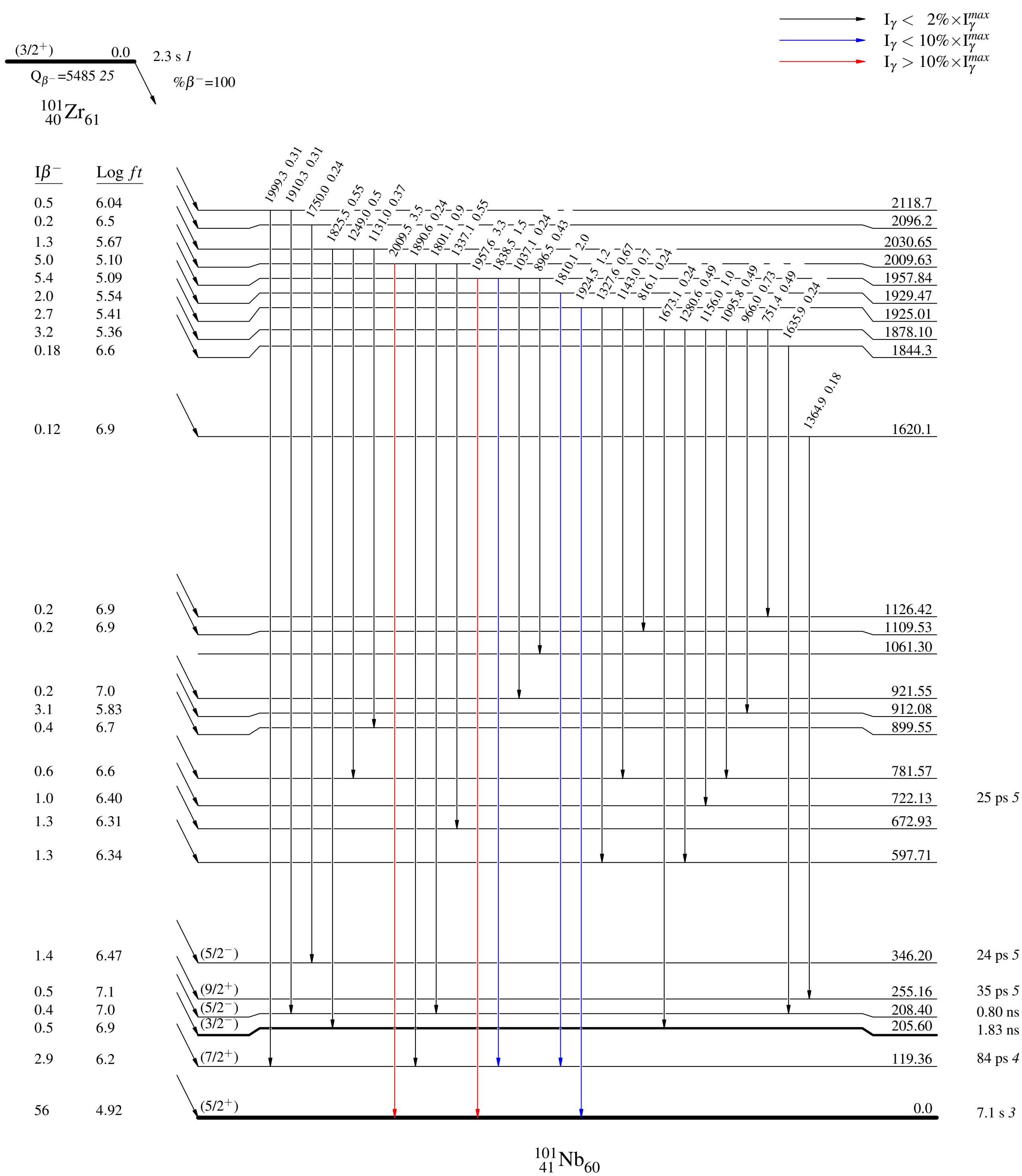
@ Multiply placed with intensity suitably divided.

^{x} γ ray not placed in level scheme.

^{101}Zr β^- decay 1991Oh03,1987Gr18,1990PaZY

Decay Scheme

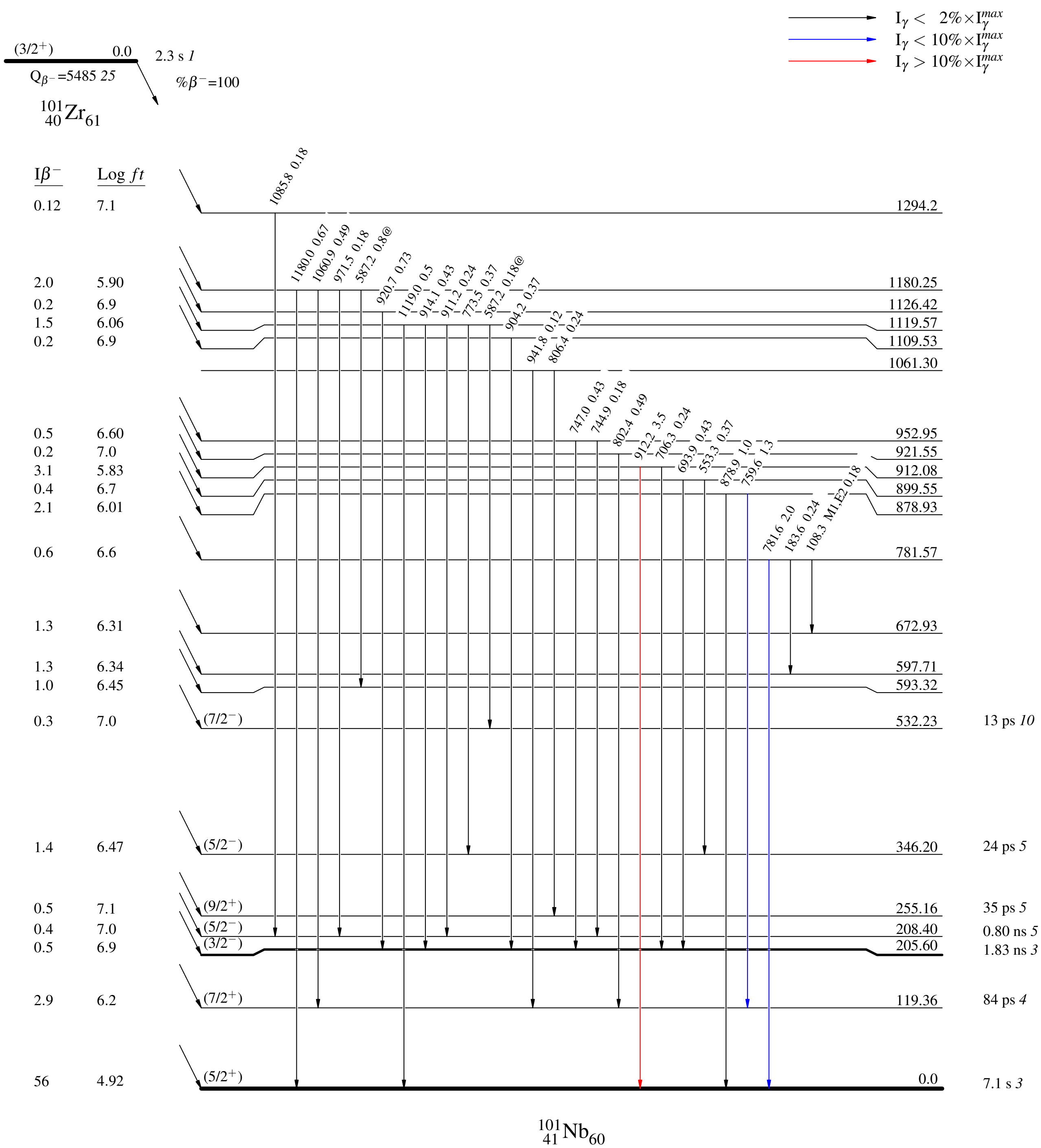
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{101}Zr β^- decay 1991Oh03,1987Gr18,1990PaZY

Decay Scheme (continued)

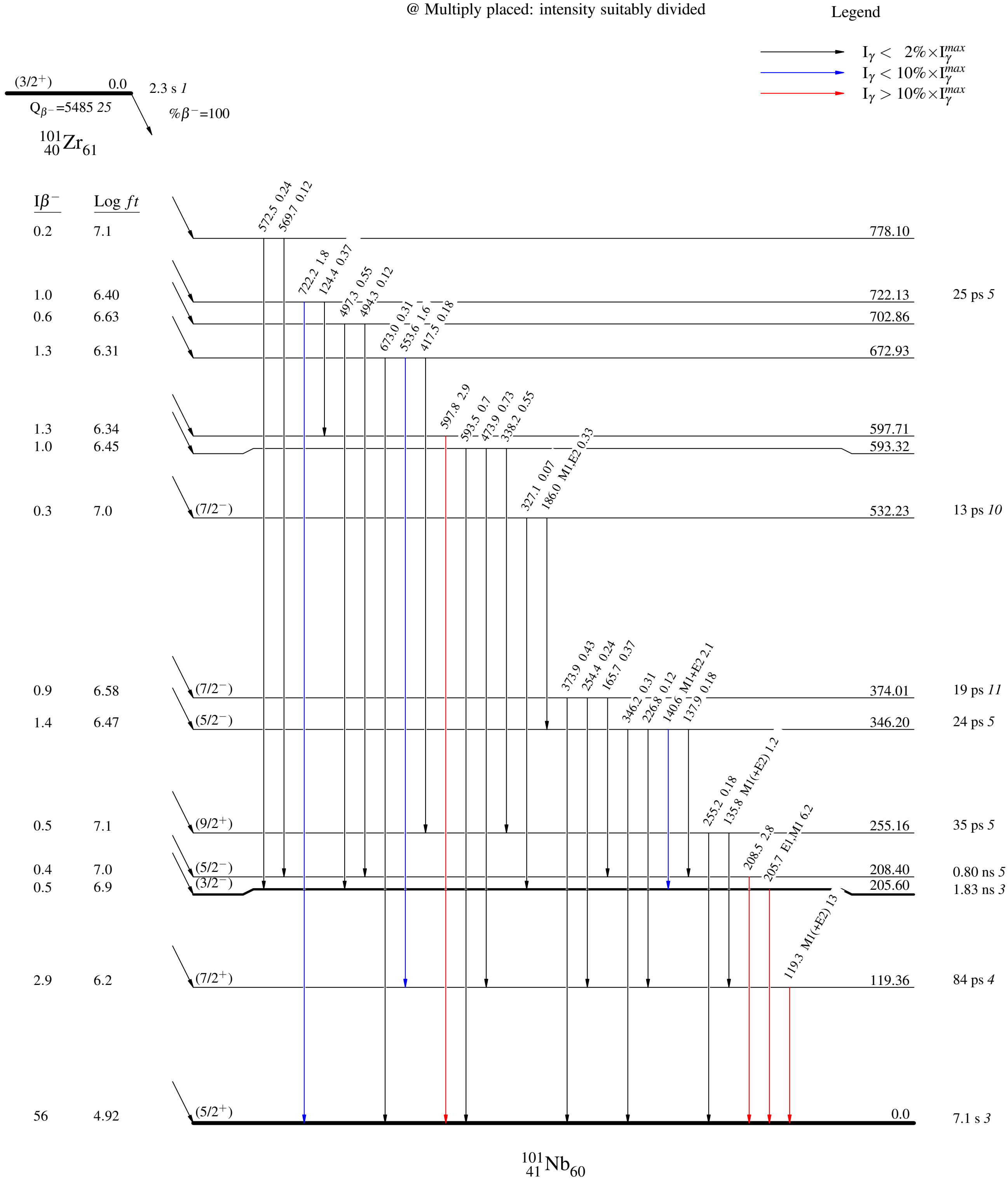
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
@ Multiply placed: intensity suitably divided



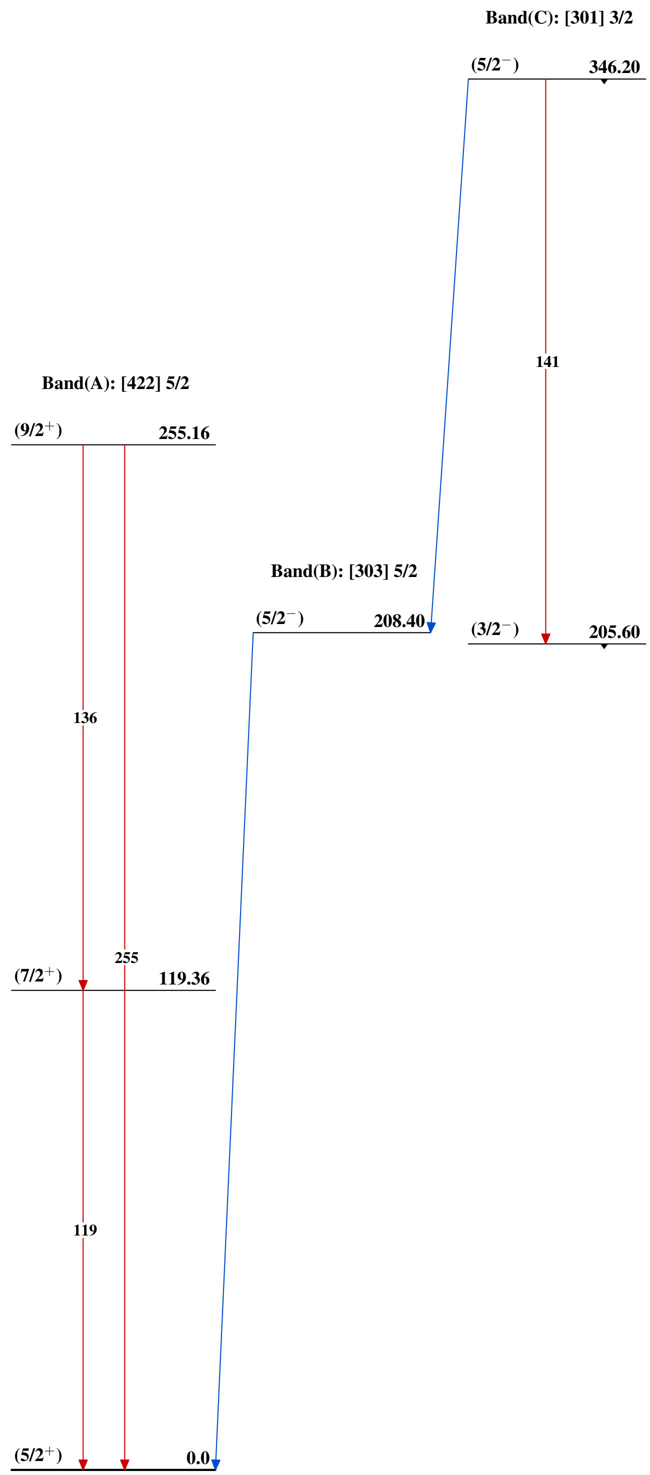
^{101}Zr β^- decay 1991Oh03,1987Gr18,1990PaZY

Decay Scheme (continued)

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



^{101}Zr β^- decay 1991Oh03,1987Gr18,1990PaZY



$^{101}_{41}Nb_{60}$