^{96}Y β^- decay (5.34 s) 1990Ma03,1988Ma01,1990Ma45

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	D. Abriola(a), A. A. Sonzogni	NDS 109, 2501 (2008)	1-Apr-2008

Parent: ^{96}Y: E=0.0; $J^\pi=0^-$; $T_{1/2}$=5.34 s *5*; $Q(\beta^-)$=7096 *23*; $\%\beta^-$ decay=100.0

1975Kh05: measured ce spectra, $T_{1/2}$.

1975Sa15: studied both g.s. and isomeric decay of ^{96}Y; measured Eγ, Iγ, $\gamma\gamma$ coin, Eβ, $T_{1/2}$.

1988Ma01: Eγ, Iγ, ce spectra, Iγ(t), $\gamma\gamma$ coin, γ-ce coin, and $\gamma\gamma(\theta)$.

1990Ma03: measured Eγ, Iγ, Iγ(t), $\gamma\gamma$(t) coin, ce-γ coin, $\beta\gamma$ coin, ce spectra.

Other: 1988MaYY.

1990Ma45: measured $T_{1/2}$ using $\beta\gamma$ delayed coin.

^{96}Zr Levels

E(level)[†]	J^π[‡]	$T_{1/2}$[#]
0.0	0^+	
1581.34 *21*	0^+	
1750.60 *15*	2^+	
1897.25 *15*	3^-	50 ps *7*
2225.81 *17*	2^+	<10 ps
2669.07 *20*	(2^+)	
2695.3 *3*	0^+	28 ps *7*
2925.69 *24*	0^+	20 ps *14*
3212.37 *24*	2^+	
3450.34 *24*		
3509.4 *4*	2^+	
3701.1? *10*	$(1,2^+)$	
4024.6? *8*		
4258.1 *5*	3^-	
4512.5 *7*	$(1,2^+)$	
4737.5 *8*	$(1,2^+)$	
4837.9 *3*	$(1^-,2^+)$	
4882.0? *10*		
4895.2 *7*	$(1,2^+)$	
4914.1? *10*	$(1,2^+)$	
4929.1 *9*	$(1,2^+)$	
5196.6? *10*		
5228.5 *6*	$(1,2^+)$	
5272.0 *6*	$(1,2^+)$	
5312.2 *7*		
5408.0 *7*		
5442.9 *5*	$(1,2^+)$	
5502.2? *8*	$(1,2^+)$	
5538.9 *6*	$(1,2^+)$	
5551.6 *6*	$(1,2^+)$	
5573.8 *6*	$(1,2^+)$	
5601.5 *6*	$(1,2^+)$	
5625.6 *10*		
5652.6? *10*		
5701.0 *6*		
5719.1 *8*	$(1,2^+)$	
5741.2? *10*		
5783.1 *8*	$(1,2^+)$	
5804.5 *7*	$(1,2^+)$	
5838.3 *10*	$(1,2^+)$	
5847.5 *6*	$(1,2^+)$	
5914.7? *6*	$(1,2^+)$	
5934.6 *6*	$(1,2^+)$	
6143.4? *8*	$(1,2^+)$	
6231.6 *11*	$(1,2^+)$	

[†] From a least-squares fit to Eγ data.

[‡] From Adopted Levels.

[#] From 1990Ma45.

β^- radiations

E(decay)	E(level)	$I\beta^-$[†‡]	Log *ft*	Comments
(864 *23*)	6231.6	0.0082 *17*	5.85 *10*	av Eβ=298.1 *94*
(953 *23*)	6143.4?	0.0035 *13*	6.38 *17*	av Eβ=335.1 *96*
(1161 *23*)	5934.6	0.029 *5*	5.78 *9*	av Eβ=422.6 *99*
(1181 *23*)	5914.7?	0.027 *5*	5.84 *9*	av Eβ=431 *10*
(1249 *23*)	5847.5	0.015 *3*	6.19 *10*	av Eβ=460 *10*
(1258 *23*)	5838.3	0.0063 *16*	6.58 *12*	av Eβ=464 *10*
(1292 *23*)	5804.5	0.0089 *17*	6.47 *9*	av Eβ=479 *10*
(1313 *23*)	5783.1	0.0038 *11*	6.87 *13*	av Eβ=488 *10*
(1377 *23*)	5719.1	0.024 *4*	6.15 *8*	av Eβ=516 *11*
(1395 *23*)	5701.0	0.010 *2*	6.55 *10*	av Eβ=524 *11*
(1470 *23*)	5625.6	0.0040 *13*	7.04 *15*	av Eβ=558 *11*
(1495 *23*)	5601.5	0.034 *6*	6.14 *9*	av Eβ=568 *11*
(1522 *23*)	5573.8	0.011 *2*	6.66 *9*	av Eβ=581 *11*
(1544 *23*)	5551.6	0.045 *8*	6.07 *9*	av Eβ=591 *11*
(1557 *23*)	5538.9	0.011 *2*	6.70 *9*	av Eβ=596 *11*
(1653 *23*)	5442.9	0.038 *6*	6.26 *8*	av Eβ=639 *11*

Continued on next page (footnotes at end of table)

^{96}Y β^- decay (5.34 s) 1990Ma03,1988Ma01,1990Ma45 (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^-[†‡]	Log *ft*	Comments
(1688 *23*)	5408.0	0.013 *2*	6.77 *8*	av Eβ=655 *11*
(1784 *23*)	5312.2	0.015 *2*	6.80 *7*	av Eβ=698 *11*
(1824 *23*)	5272.0	0.014 *3*	6.87 *10*	av Eβ=717 *11*
(1868 *23*)	5228.5	0.013 *3*	6.94 *11*	av Eβ=737 *11*
(2167 *23*)	4929.1	0.022 *5*	6.98 *10*	av Eβ=874 *11*
(2182 *23*)	4914.1?	0.009 *5*	7.38 *25*	av Eβ=881 *11*
(2201 *23*)	4895.2	0.031 *6*	6.86 *9*	av Eβ=890 *11*
(2258 *23*)	4837.9	0.089 *14*	6.45 *7*	av Eβ=917 *11*
(2359 *23*)	4737.5	0.011 *2*	7.43 *9*	av Eβ=963 *11*
(2584 *23*)	4512.5	0.011 *2*	7.60 *8*	av Eβ=1068 *11*
(2838 *23*)	4258.1	0.013 *3*	7.70 *11*	av Eβ=1188 *11*
(3395 *23*)	3701.1?	0.012 *3*	8.07 *11*	av Eβ=1452 *11*
(3587 *23*)	3509.4	0.002 *1*	10.48[1u] *22*	av Eβ=1541 *11*
(3646 *23*)	3450.34	0.081 *14*	7.37 *8*	av Eβ=1572 *11*
(4170 *23*)	2925.69	0.041 *8*	7.92 *9*	av Eβ=1823 *11*
(4401 *23*)	2695.3	0.17 *2*	7.41 *6*	av Eβ=1933 *11*
(4427 *23*)	2669.07	0.043 *10*	9.72[1u] *11*	av Eβ=1940 *11*
(4870 *23*)	2225.81	0.44 *5*	8.97[1u] *6*	av Eβ=2151 *11*
(5345 *23*)	1750.60	1.91 *20*	8.59[1u] *5*	av Eβ=2379 *11*
(5515 *23*)	1581.34	1.26 *10*	6.97 *4*	av Eβ=2468 *11*
(7096 *23*)	0.0	95.5 *5*	5.591 *8*	av Eβ=3230 *11* E(decay): 7067 *30* (1990Ma03), 7120 keV *50* (1980De02) and 7030 keV *70* (1978St02). Iβ^-: 95.2 *9* (1988Ma01), 95.0 *15* (1975Sa15).

† From intensity balance at each level (1990Ma03).

‡ Absolute intensity per 100 decays.

γ(^{96}Zr)

Iγ normalization: Iγ(1750.4)=2.35% *24* (1990Ma03).

E$_\gamma$[†]	I$_\gamma$[a]	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult.[&]	δ[&]	α[c]	Comments
146.653 *10*	32 *2*	1897.25	3$^-$	1750.60	2$^+$	(E1)		0.0371	α(K)=0.0327 *5*; α(L)=0.00366 *6*; α(M)=0.000632 *9*; α(N)=8.84×10^{-5} *13*; α(O)=5.80×10^{-6} *9* α(N+..)=9.42×10^{-5} *14* E$_\gamma$: from 1979Bo26.
328.7[‡] *2*	22.1 *8*	2225.81	2$^+$	1897.25	3$^-$	(E1(+M2))	−0.02 *5*	0.00381 *16*	α(K)=0.00336 *14*; α(L)=0.000372 *17*; α(M)=6.4×10^{-5} *3*; α(N)=9.1×10^{-6} *5*; α(O)=6.2×10^{-7} *3* α(N+..)=9.7×10^{-6} *5*
469.5[‡] *2*	73 *2*	2695.3	0$^+$	2225.81	2$^+$	[E2]		0.00507	α(K)=0.00444 *7*; α(L)=0.000521 *8*; α(M)=9.05×10^{-5} *13*; α(N)=1.268×10^{-5} *18*; α(O)=8.29×10^{-7} *12* α(N+..)=1.351×10^{-5} *19*
475.3[‡] *2*	80 *3*	2225.81	2$^+$	1750.60	2$^+$	M1+E2	−0.09 *+1−2*	0.00361	α(K)=0.00318 *5*; α(L)=0.000355 *5*; α(M)=6.16×10^{-5} *9*; α(N)=8.76×10^{-6} *13*; α(O)=6.19×10^{-7} *9* α(N+..)=9.38×10^{-6} *14* Mult.,δ: D+Q; −1.5 *+13−10* from $\gamma(\theta)$ (1988Ma01).
644.4[‡] *2*	30 *1*	2225.81	2$^+$	1581.34	0$^+$	E2		0.00203	α(K)=0.001781 *25*; α(L)=0.000203 *3*; α(M)=3.53×10^{-5} *5*; α(N)=4.97×10^{-6} *7*; α(O)=3.36×10^{-7} *5* α(N+..)=5.31×10^{-6} *8*
699.9 *3*	7.6 *6*	2925.69	0$^+$	2225.81	2$^+$	(E2)		1.62×10^{-3}	α(K)=0.001427 *20*; α(L)=0.0001620 *23*; α(M)=2.81×10^{-5} *4*; α(N)=3.96×10^{-6} *6*; α(O)=2.70×10^{-7} *4* α(N+..)=4.24×10^{-6} *6*
771.7[‡] *2*	6.4[#] *10*	2669.07	(2$^+$)	1897.25	3$^-$	(E1+M2)	+0.08 *+6−7*	0.00050 *4*	α(K)=0.00044 *3*; α(L)=4.8×10^{-5} *4*; α(M)=8.4×10^{-6} *6*; α(N)=1.19×10^{-6} *9*; α(O)=8.4×10^{-8} *6* α(N+..)=1.28×10^{-6} *10*
781.2[‡] *2*	20 *3*	3450.34		2669.07	(2$^+$)				
918.5[‡] *2*	32 *2*	2669.07	(2$^+$)	1750.60	2$^+$	M1,E2		8.13×10^{-4} *13*	α(K)=0.000718 *11*; α(L)=7.95×10^{-5} *16*; α(M)=1.38×10^{-5} *3*; α(N)=1.96×10^{-6} *4*; α(O)=1.378×10^{-7} *20* α(N+..)=2.09×10^{-6} *4*
1175.0[#] *3*	19[#] *2*	2925.69	0$^+$	1750.60	2$^+$	(E2)		4.73×10^{-4}	α(K)=0.000413 *6*; α(L)=4.56×10^{-5} *7*; α(M)=7.90×10^{-6} *11*; α(N)=1.121×10^{-6} *16*;

From ENSDF

$^{96}_{40}$Zr$_{56}$-3

^{96}Y β^- decay (5.34 s) 1990Ma03,1988Ma01,1990Ma45 (continued)

γ(^{96}Zr) (continued)

E_γ[†]	I_γ[a]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[&]	α[c]	$I_{(\gamma+ce)}$[b]	Comments
									α(O)=7.89×10^{-8} *11* α(N+..)=6.06×10^{-6} *9*
1225.2[#] *5*	2.4[#] *10*	3450.34		2225.81	2$^+$				
1315.0[#] *3*	3.3[#] *4*	3212.37	2$^+$	1897.25	3$^-$				
1332.4[#] *4*	5.5[#] *10*	4258.1	3$^-$	2925.69	0$^+$				
1462.0[#] *4*	2.9[#] *7*	3212.37	2$^+$	1750.60	2$^+$				
1581.6 *4*		1581.34	0$^+$	0.0	0$^+$	E0		1.41 *12*	E_γ: weighted average of 1581.4 *5* (1988Ma01) and 1581.7 *5* (1986VaZP). Mult.: no γ corresponding to ce was seen (1975Kh05). $I_{(\gamma+ce)}$: from 1990Ma03; other: 1.4% *5* (1988Ma01).
1612.1[#] *4*	0.8[#] *4*	3509.4	2$^+$	1897.25	3$^-$				
1625.8[#] *4*	10 *3*	4837.9	(1$^-$,2$^+$)	3212.37	2$^+$				
1699.6[#] *4*	12 *3*	3450.34		1750.60	2$^+$				
1750.4[‡] *2*	1000 *3*	1750.60	2$^+$	0.0	0$^+$	E2	3.98×10^{-4}		α(K)=0.000184 *3*; α(L)=2.01×10^{-5} *3*; α(M)=3.48×10^{-6} *5*; α(N)=4.94×10^{-7} *7*; α(O)=3.52×10^{-8} *5* α(N+..)=0.000190 *3* I_γ: Iγ=2.35% *24* (1990Ma03); 2.9% *9* (1988Ma01).
1897.4 *4*	6 *2*	1897.25	3$^-$	0.0	0$^+$	[E3]	4.40×10^{-4}		α(K)=0.000268 *4*; α(L)=2.96×10^{-5} *5*; α(M)=5.14×10^{-6} *8*; α(N)=7.30×10^{-7} *11*; α(O)=5.17×10^{-8} *8* α(N+..)=0.0001367 *20*
1912.1[#] *4*	3.5[#] *8*	4837.9	(1$^-$,2$^+$)	2925.69	0$^+$				
1956.3[#d] *10*	1.5[#] *5*	4882.0?		2925.69	0$^+$				
2225.6[‡] *4*	137 *8*	2225.81	2$^+$	0.0	0$^+$	E2	5.50×10^{-4}		α(K)=0.0001185 *17*; α(L)=1.283×10^{-5} *18*; α(M)=2.22×10^{-6} *4*; α(N)=3.16×10^{-7} *5*; α(O)=2.26×10^{-8} *4* α(N+..)=0.000417 *6*
2274.0[#d] *8*	2.2[#] *8*	4024.6?		1750.60	2$^+$				
2940.0[#] *4*	6.0[#] *15*	4837.9	(1$^-$,2$^+$)	1897.25	3$^-$				
3086.9[#] *7*	4.5 *7*	4837.9	(1$^-$,2$^+$)	1750.60	2$^+$				
3212.9[#] *7*	2.9 *16*	3212.37	2$^+$	0.0	0$^+$				
3257.4 *7*	3.6 *8*	4837.9	(1$^-$,2$^+$)	1581.34	0$^+$				
3615.2[#d] *10*	1.4[#] *6*	5196.6?		1581.34	0$^+$				
3701.0 *10*	5.0[@] *10*	3701.1?	(1,2$^+$)	0.0	0$^+$				
3730.8 *7*	6.2 *7*	5312.2		1581.34	0$^+$				
3826.6 *7*	5.6[@] *7*	5408.0		1581.34	0$^+$				
3861.7 *6*	12.0[@] *13*	5442.9	(1,2$^+$)	1581.34	0$^+$				
3992.2 *8*	1.9 *5*	5573.8	(1,2$^+$)	1581.34	0$^+$				
4044.2 *10*	1.7 *5*	5625.6		1581.34	0$^+$				
4071.2[#d] *10*	1.4[#] *5*	5652.6?		1581.34	0$^+$				

γ(^{96}Zr) (continued)

E_γ[†]	I_γ[a]	E_i(level)	J^π_i	E_f	J^π_f	E_γ[†]	I_γ[a]	E_i(level)	J^π_i	E_f	J^π_f
4119.6 6	4.4 5	5701.0		1581.34	0+	5502.0[d] 8	5.2 8	5502.2?	(1,2+)	0.0	0+
4159.8[d] 10	0.9 4	5741.2?		1581.34	0+	5538.7 6	4.5 7	5538.9	(1,2+)	0.0	0+
4162.9[#] 10	5.8 11	5914.7?	(1,2+)	1750.60	2+	5551.4 6	19.0 24	5551.6	(1,2+)	0.0	0+
4334.2[d] 15	1.1 3	5914.7?	(1,2+)	1581.34	0+	5573.7 8	2.6 5	5573.8	(1,2+)	0.0	0+
4512.4 7	4.7[@] 9	4512.5	(1,2+)	0.0	0+	5601.3 6	14.4 18	5601.5	(1,2+)	0.0	0+
4562.7[d] 10	0.9 4	6143.4?	(1,2+)	1581.34	0+	5718.9 8	10.3 13	5719.1	(1,2+)	0.0	0+
4737.4 8	4.5 8	4737.5	(1,2+)	0.0	0+	5782.9 8	1.6 4	5783.1	(1,2+)	0.0	0+
4839.2 8	10.1 19	4837.9	(1−,2+)	0.0	0+	5804.3 7	3.8 6	5804.5	(1,2+)	0.0	0+
4895.1 7	13.4[@] 22	4895.2	(1,2+)	0.0	0+	5838.1 10	2.7 6	5838.3	(1,2+)	0.0	0+
4914.0 10	3.9[@] 20	4914.1?	(1,2+)	0.0	0+	5847.3 6	6.3 10	5847.5	(1,2+)	0.0	0+
4929.0 9	9.4 16	4929.1	(1,2+)	0.0	0+	5914.9 8	5.6 10	5914.7?	(1,2+)	0.0	0+
5228.3 6	5.5 9	5228.5	(1,2+)	0.0	0+	5934.4 6	12.2 15	5934.6	(1,2+)	0.0	0+
5271.8 6	6.1 9	5272.0	(1,2+)	0.0	0+	6141.6 14	1.5 5	6143.4?	(1,2+)	0.0	0+
5442.5 7	4.3[@] 6	5442.9	(1,2+)	0.0	0+	6231.4 11	3.5 6	6231.6	(1,2+)	0.0	0+

[†] From 1990Ma03, except where noted otherwise.
[‡] From 1988Ma01.
[#] From $\gamma\gamma$ or ce-γ coincidence.
[@] Mixed with a first-or second-escape peak from transitions of higher energy; intensity of the impurity line was subtracted.
[&] From adopted gammas.
[a] For absolute intensity per 100 decays, multiply by 0.00235 *24*.
[b] Absolute intensity per 100 decays.
[c] 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.
[d] Placement of transition in the level scheme is uncertain.

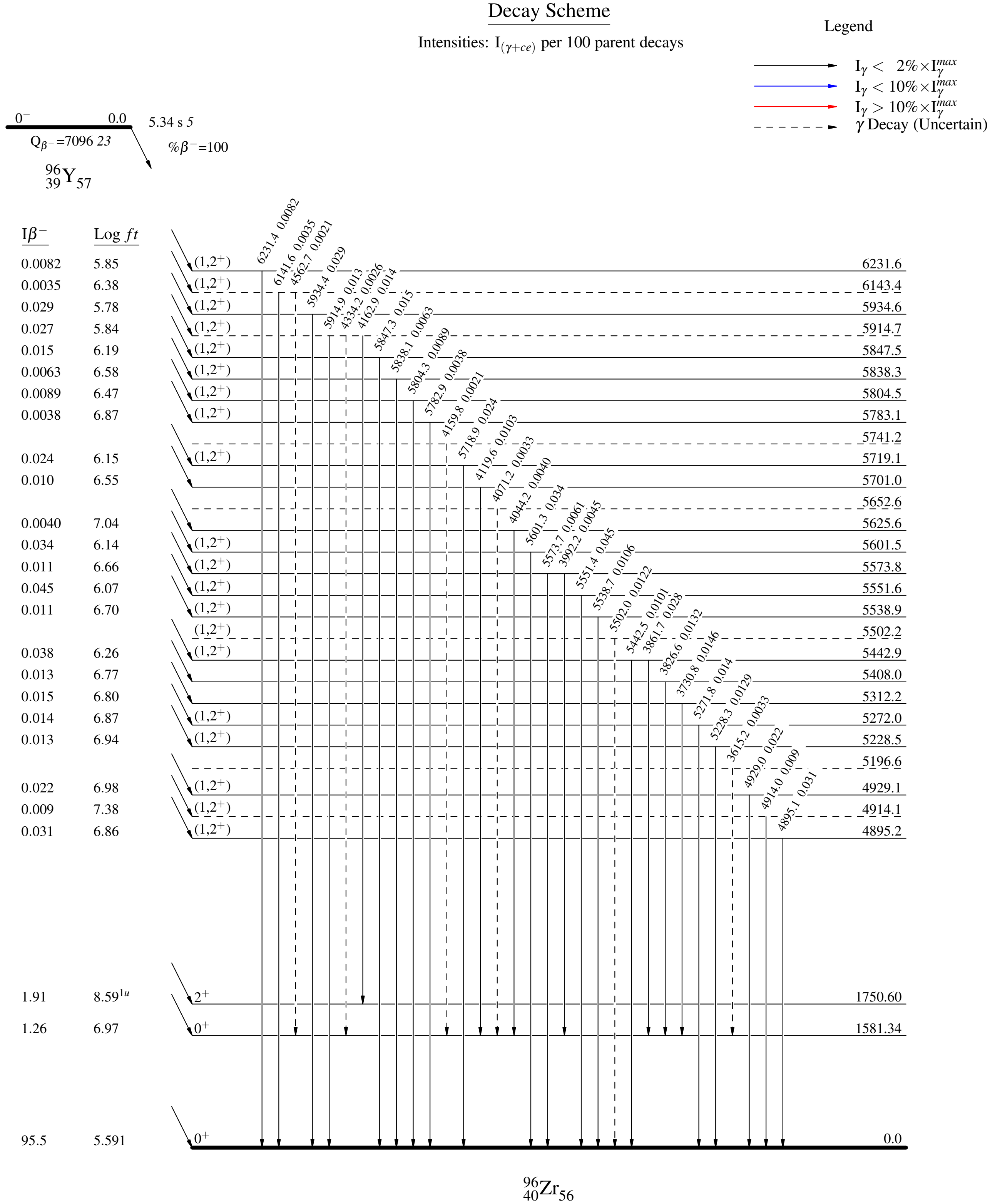
From ENSDF

$^{96}_{40}$Zr$_{56}$-5

^{96}Y β^- decay (5.34 s) 1990Ma03,1988Ma01,1990Ma45

Decay Scheme

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



$^{96}Y\ \beta^-$ decay (5.34 s) 1990Ma03,1988Ma01,1990Ma45