^{126}Cs $\varepsilon+\beta^+$ decay 1992Ma08

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	H. Iimura, J. Katakura, S. Ohya	NDS 180,1 (2022)	1-Oct-2021

Parent: ^{126}Cs: E=0.0; $J^\pi=1^+$; $T_{1/2}$=1.643 min *17*; Q(ε)=4796 *10*; %ε+%β^+ decay=100

The decay scheme is that of 1976Pa11, extended by 1992Ma08.

1992Ma08: ^{98,100}Mo(^{32}S,xnyp)^{126}Cs E(^{32}S)=145 MeV, on-line mass separation γ, $\gamma\gamma$, ce.

1976Pa11; ^{115}In(^{16}O,5n)^{126}La ε decay, ^{133}Cs(p,8n)^{126}Ba. ^{126}Ba ε decay; semi, scin γ, $\beta\gamma$-, $\gamma\gamma$-coin.

1979Si11; ^{133}Cs(p,8n)^{126}Ba ε decay, Ge(Li)-NaI(Tl) $\gamma\gamma(\theta)$, established 925γ-388γ cascade is $0^+ - 2^+ - 0^+$.

Others: 1954Ka33, 1967DaZY, 1969Ch18, 1975We23, 1978Dr01, 1993Al03.

^{126}Xe Levels

E(level)	J^π†	$T_{1/2}$	E(level)	J^π†	E(level)	J^π†
0.0	0^+	stable	2004.83 *11*	$3^{(-)}$	2489.35 *6*	(2^+)
388.62 *3*	2^+		2064.0 *4*	$2^{(+)}$	2502.54 *6*	0^+,1,2
879.86 *3*	2^+		2086.29 *7*	2^+	2520.86 *8*	0^+,1,2
941.97 *4*	4^+		2215.18 *8*	$(1,2^+)$	2553.03 *10*	0^+
1313.86 *4*	0^+		2228.65 *8*	$(1,2^+)$	2565.15 *5*	
1317.66 *4*	3^+		2347.23 *6*	0^+,1,2	2759.44 *11*	
1678.56 *3*	2^+		2358.58 *8*	1^+	2796.41 *8*	0^+,1,2
1760.53 *11*	0^+		2419.22 *7*	$1^+,2^+$	2893.17 *7*	2^+
1903.46 *11*	5^+		2455.31 *3*	2^+	2962.09 *11*	

† From the Adopted Levels.

ε,β^+ radiations

It is likely that some high energy γ rays were not observed in 1992Ma08.

Iβ: see comment on Iγ normalization in γ(^{126}Xe) data set.

E(decay)	E(level)	Iβ^+ †	Iε†	Log *ft*	I($\varepsilon+\beta^+$)†	Comments
(1834 *10*)	2962.09	<0.00030	<0.0066	>7.3	<0.0069	av Eβ=368.3 *49*; εK=0.8166 *17*; εL=0.11047 *25*; εM+=0.03006 *7*
(1903 *10*)	2893.17	0.0052 *4*	0.088 *5*	6.196 *25*	0.093 *5*	av Eβ=398.4 *49*; εK=0.8052 *20*; εL=0.1088 *3*; εM+=0.02961 *8*
(2000 *10*)	2796.41	0.0111 *8*	0.129 *7*	6.07 *3*	0.140 *8*	av Eβ=440.9 *49*; εK=0.7860 *25*; εL=0.1060 *4*; εM+=0.02885 *10*
(2037 *10*)	2759.44	<0.00068	<0.0070	>7.4	<0.0077	av Eβ=457.1 *49*; εK=0.778 *3*; εL=0.1049 *4*; εM+=0.02853 *10*
(2231 *10*)	2565.15	0.0245 *15*	0.139 *8*	6.14 *3*	0.163 *9*	av Eβ=543.0 *49*; εK=0.726 *4*; εL=0.0976 *5*; εM+=0.02654 *13*
(2275 *10*)	2520.86	0.0088 *7*	0.044 *3*	6.65 *4*	0.053 *4*	av Eβ=562.6 *49*; εK=0.712 *4*; εL=0.0957 *5*; εM+=0.02603 *13*
(2294 *10*)	2502.54	0.050 *3*	0.240 *12*	5.924 *24*	0.290 *15*	av Eβ=570.8 *49*; εK=0.706 *4*; εL=0.0950 *5*; εM+=0.02582 *14*
(2307 *10*)	2489.35	0.0348 *21*	0.161 *9*	6.10 *3*	0.196 *11*	av Eβ=576.6 *49*; εK=0.702 *4*; εL=0.0944 *5*; εM+=0.02566 *14*
(2341 *10*)	2455.31	0.10 *1*	0.44 *2*	5.68 *3*	0.54 *3*	av Eβ=591.8 *49*; εK=0.691 *4*; εL=0.0929 *5*; εM+=0.02525 *14*
(2377 *10*)	2419.22	0.012 *1*	0.047 *3*	6.66 *3*	0.059 *4*	av Eβ=607.8 *49*; εK=0.679 *4*; εL=0.0912 *5*; εM+=0.02480 *14*
(2449 *10*)	2347.23	0.049 *3*	0.159 *8*	6.159 *25*	0.208 *11*	av Eβ=640.0 *50*; εK=0.655 *4*; εL=0.0878 *6*; εM+=0.02388 *15*

Continued on next page (footnotes at end of table)

^{126}Cs $\varepsilon+\beta^+$ decay 1992Ma08 (continued)

ϵ,β^+ radiations (continued)

E(decay)	E(level)	Iβ^+ †	Iε†	Log *ft*	I($\varepsilon+\beta^+$)†	Comments
(2567 *10*)	2228.65	0.012 *1*	0.031 *2*	6.91 *4*	0.043 *3*	av Eβ=693.1 *50*; εK=0.613 *4*; εL=0.0821 *6*; εM+=0.02231 *15*
(2581 *10*)	2215.18	<0.00800	<0.0197	>7.1	<0.0277	av Eβ=699.1 *50*; εK=0.608 *4*; εL=0.0814 *6*; εM+=0.02213 *15*
(2710 *10*)	2086.29	0.024 *1*	0.047 *3*	6.78 *3*	0.071 *4*	av Eβ=757.1 *50*; εK=0.561 *4*; εL=0.0751 *6*; εM+=0.02040 *15*
(2732 *10*)	2064.0	0.071 *4*	0.130 *7*	6.34 *3*	0.201 *11*	av Eβ=767.1 *50*; εK=0.553 *4*; εL=0.0740 *6*; εM+=0.02010 *15*
(3117 *10*)	1678.56	1.09 *6*	1.06 *6*	5.550 *24*	2.15 *11*	av Eβ=942.0 *51*; εK=0.420 *4*; εL=0.0561 *5*; εM+=0.01524 *13*
(3482 *10*)	1313.86	3.4 *2*	2.0 *1*	5.37 *3*	5.4 *3*	av Eβ=1109.1 *51*; εK=0.317 *3*; εL=0.0423 *4*; εM+=0.01148 *10*
(3916 *10*)	879.86	2.9 *4*	1.0 *1*	5.76 *6*	3.9 *5*	av Eβ=1309.9 *52*; εK=0.2267 *20*; εL=0.0301 *3*; εM+=0.00818 *7*
(4407 *10*)	388.62	24.4 *13*	5.5 *3*	5.137 *25*	29.9 *16*	av Eβ=1539.2 *52*; εK=0.1574 *13*; εL=0.02089 *17*; εM+=0.00567 *5*
(4796 *10*)	0.0	48.5 *19*	7.9 *3*	5.053 *19*	56.4 *22*	av Eβ=1722.0 *52*; εK=0.1201 *9*; εL=0.01592 *12*; εM+=0.00432 *4*

† Absolute intensity per 100 decays.

$\gamma(^{126}Xe)$

Iγ normalization: from I($\varepsilon+\beta^+$ to g.s.)=56.4% *22*; this value is estimated by the evaluators on the basis of I($\gamma^\pm$)/I(388.6γ)=4.0 *2* (1976Pa11) for ^{126}Ba-^{126}Cs equilibrium source with the assumptions that: 1) β^+ transitions in ^{126}Ba β^+ decay are negligible; 2) the I(ε)/I(β^+) ratios are those given in β^+, ε data in this data set. Relative to I(388.6γ)=100 (1992Ma08).

E_γ[‡]	I_γ[@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†#]	δ[†#]	α[&]	Comments
360.86 *5*	0.282 *2*	1678.56	2^+	1317.66	3^+				
364.70 *5*	0.54 *1*	1678.56	2^+	1313.86	0^+	E2		0.0226	α(K)=0.0189 *3*; α(L)=0.00300 *5*; α(M)=0.000618 *9* α(N)=0.0001259 *18*; α(O)=1.473×10^{-5} *21* α(K)exp=0.031 *8* (1992Ma08).
388.66 *5*	100	388.62	2^+	0.0	0^+	E2		0.0187	α(K)=0.01561 *22*; α(L)=0.00243 *4*; α(M)=0.000500 *7* α(N)=0.0001019 *15*; α(O)=1.199×10^{-5} *17* Mult.: from $\gamma\gamma(\theta)$ (1979Si11), ce(K):ce(L):ce(M)=1.00:0.175 *9*:0.044 *4* (1992Ma08).
^{x}411.82 *5*	0.15 *1*								
434.01 *5*	2.67 *5*	1313.86	0^+	879.86	2^+	E2		0.01345	α(K)=0.01131 *16*; α(L)=0.001705 *24*; α(M)=0.000350 *5* α(N)=7.14×10^{-5} *10*; α(O)=8.47×10^{-6} *12* Mult.: α(K)exp=0.0138 *6*, α(L)exp=0.00218 *16* (1992Ma08).
437.85 *5*	0.30 *1*	1317.66	3^+	879.86	2^+	M1+E2	+8 *+3−2*	0.01314	α(K)=0.01107 *16*; α(L)=0.001658 *24*; α(M)=0.000340 *5* α(N)=6.95×10^{-5} *10*; α(O)=8.26×10^{-6} *12* α(K)exp=0.012 *17* (1992Ma08).
491.27 *5*	12.4 *9*	879.86	2^+	388.62	2^+	M1+E2	+9.1 *+43−23*	0.00946 *14*	α(K)=0.00800 *12*; α(L)=0.001164 *17*; α(M)=0.000238 *4* α(N)=4.87×10^{-5} *7*; α(O)=5.84×10^{-6} *9* Mult.,δ: from $\gamma\gamma(\theta)$ in ^{126}I β^- decay (1971Ta04). α(K)exp=0.0112 *9*, α(L)exp=0.0017 *1*, α(M)exp=0.00046 *5* (1992Ma08).
^{x}526.4 *1*	0.037 *6*								
^{x}548.7 *3*	1.6 *3*								1976Pa11 lists this γ as belonging to Cs decay. However, this γ is included in Ba decay scheme in 1976Pa11.
553.38 *5*	0.67 *1*	941.97	4^+	388.62	2^+	E2		0.00680 *10*	α(K)=0.00578 *8*; α(L)=0.000818 *12*; α(M)=0.0001670 *24* α(N)=3.42×10^{-5} *5*; α(O)=4.13×10^{-6} *6* α(K)exp=0.0075 *4*, α(L)exp=0.00086 *18* (1992Ma08).
585.8 *1*	0.021 *6*	1903.46	5^+	1317.66	3^+	E2		0.00584 *9*	α(K)=0.00497 *7*; α(L)=0.000696 *10*; α(M)=0.0001418 *20* α(N)=2.91×10^{-5} *4*; α(O)=3.52×10^{-6} *5*
^{x}713.1 *5*	0.2 *1*								Observed in 1976Pa11.
736.54 *5*	0.47 *1*	1678.56	2^+	941.97	4^+	E2		0.00327 *5*	α(K)=0.00280 *4*; α(L)=0.000375 *6*; α(M)=7.63×10^{-5} *11* α(N)=1.571×10^{-5} *22*; α(O)=1.92×10^{-6} *3* α(K)exp=0.0033 *3* (1992Ma08).
776.7 *1*	0.015 *5*	2455.31	2^+	1678.56	2^+				
798.65 *5*	1.33 *2*	1678.56	2^+	879.86	2^+	M1(+E2)		0.0032 *5*	α(K)=0.0027 *4*; α(L)=0.00035 *5*; α(M)=7.0×10^{-5} *9*

$^{126}_{54}Xe_{72}$-3

γ(^{126}Xe) (continued)

$E_γ$‡	$I_γ$@	E_i(level)	$J^π_i$	E_f	$J^π_f$	Mult.†#	δ†#	α&	Comments
									α(N)=1.45×10^{-5} *18*; α(O)=1.81×10^{-6} *24* α(K)exp=0.0034 *2* (1992Ma08).
879.90 *5*	3.18 *7*	879.86	2$^+$	0.0	0$^+$	E2		0.00216 *3*	α(K)=0.00185 *3*; α(L)=0.000242 *4*; α(M)=4.90×10^{-5} *7* α(N)=1.010×10^{-5} *15*; α(O)=1.247×10^{-6} *18* α(K)exp=0.0021 *1* (1992Ma08).
925.24 *5*	11.2 *2*	1313.86	0$^+$	388.62	2$^+$	E2		0.00192 *3*	α(K)=0.001656 *24*; α(L)=0.000214 *3*; α(M)=4.34×10^{-5} *6* α(N)=8.96×10^{-6} *13*; α(O)=1.108×10^{-6} *16* Mult.: α(K)exp=0.00225 *9*, α(L)exp=0.00031 *4* (1992Ma08).
929.08 *5*	0.34 *2*	1317.66	3$^+$	388.62	2$^+$	M1+E2	+1.6 *+3−7*	0.00208 *18*	α(K)=0.00180 *16*; α(L)=0.000229 *17*; α(M)=4.6×10^{-5} *4* α(N)=9.6×10^{-6} *7*; α(O)=1.19×10^{-6} *10*
^{x}977.1 *1*	0.028 *5*								
^{x}983.9 *1*	0.012 *4*								
^{x}993.1 *1*	0.014 *4*								
^{x}1033.4 *5*	0.7 *2*								Observed in 1976Pa11.
1101.8 *1*	0.027 *3*	2419.22	1$^+$,2$^+$	1317.66	3$^+$				
1137.9 *1*	0.046 *3*	2455.31	2$^+$	1317.66	3$^+$				
1144.4 *1*	0.054 *3*	2086.29	2$^+$	941.97	4$^+$				
1184.0 *1*	0.135 *4*	2064.0	2$^{(+)}$	879.86	2$^+$	(M1+E2)			
1206.4 *1*	0.095 *3*	2086.29	2$^+$	879.86	2$^+$	D+Q	+0.9 *+5−3*		
^{x}1210.0 *1*	0.015 *2*								
1247.49 *5*	0.109 *4*	2565.15		1317.66	3$^+$				
1289.87 *5*	0.81 *2*	1678.56	2$^+$	388.62	2$^+$	M1,E2		0.00110 *13*	α(K)=0.00093 *12*; α(L)=0.000115 *13*; α(M)=2.3×10^{-5} *3* α(N)=4.8×10^{-6} *6*; α(O)=6.1×10^{-7} *8*; α(IPF)=1.95×10^{-5} *7* α(K)exp=0.0017 *8* (1992Ma08).
1348.9 *1*	0.053 *3*	2228.65	(1,2$^+$)	879.86	2$^+$				
1371.9 *1*	0.092 *4*	1760.53	0$^+$	388.62	2$^+$				
^{x}1430.2 *1*	0.011 *4*								
^{x}1467.3 *5*	0.2 *1*								Observed in 1976Pa11.
1513.6 *1*	0.076 *3*	2455.31	2$^+$	941.97	4$^+$				
1539.4 *1*	0.075 *3*	2419.22	1$^+$,2$^+$	879.86	2$^+$				
1575.6 *1*	0.206 *5*	2455.31	2$^+$	879.86	2$^+$				
1609.43 *5*	0.352 *7*	2489.35	(2$^+$)	879.86	2$^+$	D+Q			
1616.2 *1*	0.029 *3*	2004.83	3$^{(-)}$	388.62	2$^+$	(E1)			
1622.65 *5*	0.69 *1*	2502.54	0$^+$,1,2	879.86	2$^+$				
1641.1 *1*	0.030 *3*	2520.86	0$^+$,1,2	879.86	2$^+$				
1675.5 *1*	0.36 *1*	2064.0	2$^{(+)}$	388.62	2$^+$	D(+Q)	+0.00 *5*		
1678.51 *5*	1.86 *4*	1678.56	2$^+$	0.0	0$^+$				
^{x}1687.0 *1*	0.019 *2*								
^{x}1768.2 *1*	0.012 *2*								
1826.9 *1*	0.055 *3*	2215.18	(1,2$^+$)	388.62	2$^+$				

$^{126}_{54}Xe_{72}$-4

γ(^{126}Xe) (continued)

E_γ[‡]	I_γ[@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†#]	δ[†#]	Comments
1839.9 *1*	0.067 *3*	2228.65	(1,2$^+$)	388.62	2$^+$			
1916.7 *1*	0.022 *2*	2796.41	0$^+$,1,2	879.86	2$^+$			
1951.1 *1*	0.024 *2*	2893.17	2$^+$	941.97	4$^+$			
1958.59 *5*	0.51 *1*	2347.23	0$^+$,1,2	388.62	2$^+$			
1969.8 *1*	0.008 *2*	2358.58	1$^+$	388.62	2$^+$	D+Q	+0.8 *+10−5*	
2013.3 *1*	0.070 *3*	2893.17	2$^+$	879.86	2$^+$			
2020.1 *1*	0.017 *2*	2962.09		941.97	4$^+$			
2030.3 *1*	0.042 *2*	2419.22	1$^+$,2$^+$	388.62	2$^+$			
2066.8 *1*	0.83 *2*	2455.31	2$^+$	388.62	2$^+$			
2086.2 *1*	0.026 *2*	2086.29	2$^+$	0.0	0$^+$			
2100.9 *1*	0.130 *4*	2489.35	(2$^+$)	388.62	2$^+$			
2114.0 *1*	0.023 *2*	2502.54	0$^+$,1,2	388.62	2$^+$			
2132.1 *1*	0.101 *3*	2520.86	0$^+$,1,2	388.62	2$^+$			
^{x}2155 *1*	0.06 *2*							Observed in 1976Pa11.
2176.50 *5*	0.291 *6*	2565.15		388.62	2$^+$			
2214.8 *1*	0.013 *2*	2215.18	(1,2$^+$)	0.0	0$^+$			
^{x}2281.2 *1*	0.006 *1*							
^{x}2338.0 *1*	0.025 *3*							
2358.7 *1*	0.011 *2*	2358.58	1$^+$	0.0	0$^+$			
2370.8 *1*	0.019 *2*	2759.44		388.62	2$^+$			
2407.6 *1*	0.322 *6*	2796.41	0$^+$,1,2	388.62	2$^+$			
^{x}2425.3 *1*	0.011 *2*							
2455.3 *1*	0.151 *4*	2455.31	2$^+$	0.0	0$^+$			
2504.6 *1*	0.120 *4*	2893.17	2$^+$	388.62	2$^+$			
^{x}2512.3 *1*	0.012 *2*							
^{x}2524.7 *1*	0.038 *3*							
2553.0 *1*		2553.03	0$^+$	0.0	0$^+$	E0		
^{x}2566.3 *1*	0.075 *3*							
^{x}2581.3 *1*	0.041 *2*							
^{x}2644.8 *2*	0.016 *2*							
^{x}2656.8 *2*	0.015 *2*							
^{x}2876.1 *2*	0.006 *1*							
2893.1 *2*	0.014 *1*	2893.17	2$^+$	0.0	0$^+$			
^{x}2918.1 *2*	0.012 *1*							
^{x}2988.1 *2*	0.005 *1*							
^{x}3149.5 *2*	0.016 *2*							
^{x}3175.5 *2*	0.020 *2*							
^{x}3207.1 *2*	0.007 *1*							

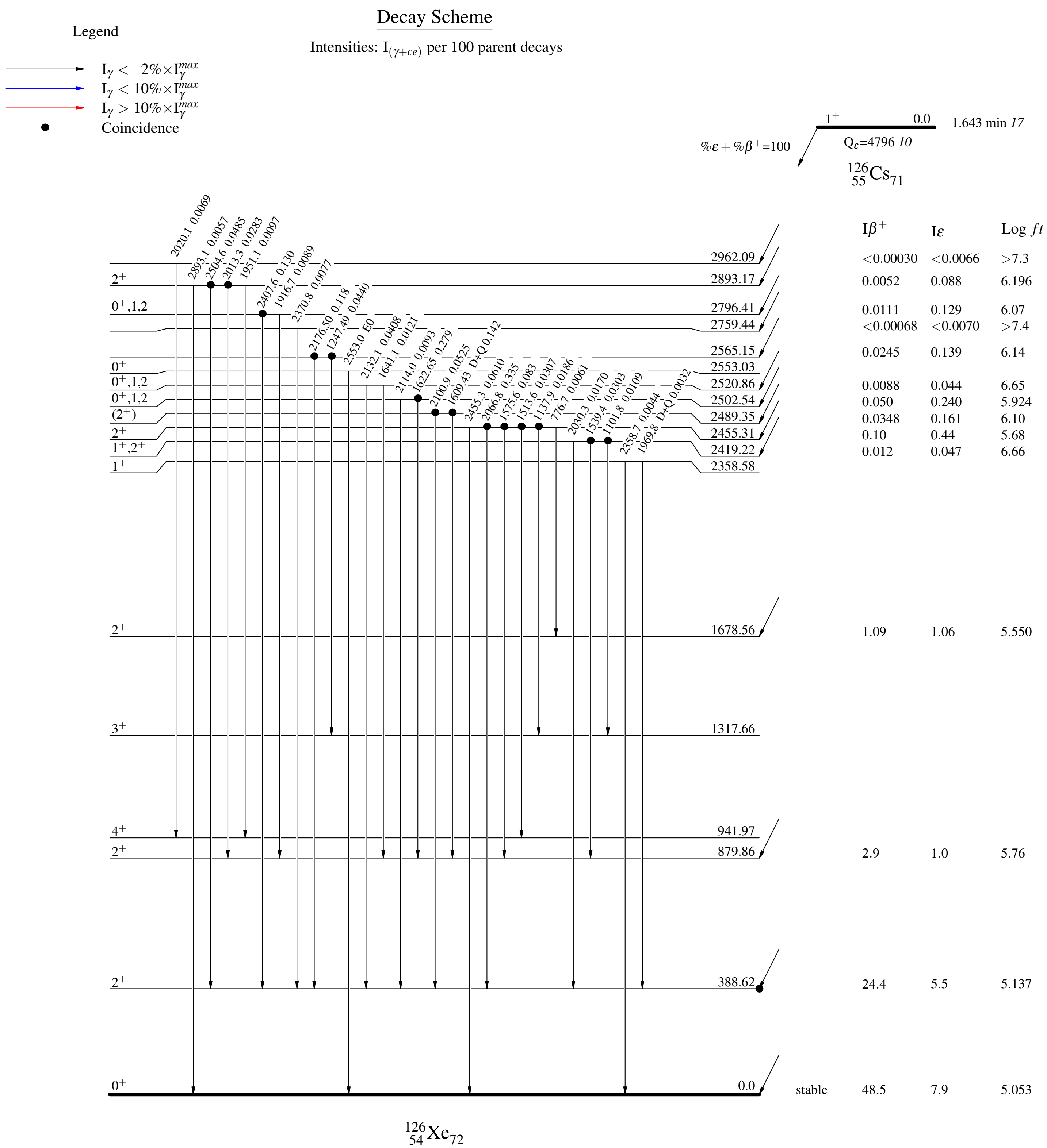
[†] α(K)exp of 1992Ma08 were measured relative to α(K)exp(388.66γ), with the theoretical value for pure E2 taken as 0.0154. Evaluators recalculated with 0.0156.

$^{126}_{54}$Xe$_{72}$-5

γ(^{126}Xe) (continued)

‡ From 1992Ma08.
# From adopted gammas except where noted otherwise.
@ For absolute intensity per 100 decays, multiply by 0.404 *20*.
& 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.
^{x} γ ray not placed in level scheme.

^{126}Cs ε decay 1992Ma08



^{126}Cs ε decay 1992Ma08

Decay Scheme (continued)

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