^{173}Ta ε decay 1973Re03

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	V. S. Shirley	NDS 75,377 (1995)	1-Oct-1993

Parent: ^{173}Ta: E=0.0; J$^{\pi}$=5/2$^-$; T$_{1/2}$=3.14 h *13*; Q(ε)=2790 *SY*; %ε+%β^+ decay=100.0

The decay scheme and most data are from 1973Re03 (sources from ^{165}Ho(^{12}C,4n) (E(^{12}C)=76-83 MeV, metallic holmium targets); measured Eβ (anthracene), Eγ, Iγ (Ge(Li) with FWHM≈1.1 keV at 120 keV and 2.0 keV at 660 keV, Si(Li) with FWHM=600 eV at 67 keV, surface-barrier Si with FWHM=5 keV at 624 keV, NaI), prompt and delayed $\gamma\gamma$ and ceγ coin, $\gamma\beta$ coin). Some intensity values differ from those in 1973Re03 because of computation errors therein.

Reference citations are given with data from other sources. Others: 1960Fa03, 1960Ha18, 1963Sa14, 1971Na28, 1972An04, 1983Ed01.

^{173}Hf Levels

Band structure: see Adopted Levels.

E(level)	J$^{\pi}$	T$_{1/2}$†	E(level)	J$^{\pi}$
0.0	1/2$^-$	23.6 h *1*	811.7 *1*	5/2$^-$
69.73 *4*	3/2$^-$		927.5 *1*	3/2$^-$,5/2,7/2$^-$
81.49 *5*	5/2$^-$		942.9 *2*	7/2$^-$
107.15 *5*	5/2$^-$	180 ns *8*	958.3 *1*	3/2,5/2$^-$
197.3 *1*	7/2$^-$		1020.1 *1*	5/2$^-$,7/2$^-$
197.4 *1*	7/2$^+$	160 ns *40*	1111.5 *1*	7/2$^+$
241.9 *1*	7/2$^-$		1126.9 *1*	5/2$^-$
255.4 *1*	9/2$^+$		1192.7 *2*	3/2$^-$,5/2,7/2
262.1 *1*	9/2$^-$		1248.5 *1*	7/2$^-$
312.3 *1*	9/2$^-$		1450.2 *1*	9/2$^+$
451.6 *2*	11/2$^-$		1574.1 *2*	3/2$^-$,5/2$^-$
508.8 *1*	11/2$^-$		1655.5 *2*	5/2$^-$,7/2$^-$
635.7 *2*	5/2$^+$,7/2,9/2$^+$		1667.3 *2*	5/2$^-$,7/2$^-$
775.4 *2*	5/2$^-$,7/2		1694.5 *2*	5/2$^-$,7/2
785.2 *2*	(7/2,9/2)$^-$		2263.6? *3*	5/2$^-$,7/2

† Delayed ceγ coin (1971BoZG,1973Re03). Other: 1972An04.

ε,β^+ radiations

ε+β^+ feedings are from intensity imbalance at each level (g.s. feeding not expected (ΔJ$^{\pi}$=^{2},No). Values are approximate because of large number of unplaced transitions.

1973Re03 report Q+=3670 *200*, deduced from Eβ+=2480 *200* (172.2γ-β coin). This value, which is considerably higher than Q+=2790 (syst) adopted by 1993Au05, would result in log *ft* values ranging from 0.3 to 0.9 larger.

E(decay)	E(level)	Iε†	Log *ft*	I($\varepsilon+\beta^+$)†	Comments
(526 *SY*)	2263.6?	≈0.18	≈7.4	≈0.18	εK= 0.8; εL= 0.15; εM+= 0.049
(1095 *SY*)	1694.5	≈1.0	≈7.3	≈1.0	εK= 0.8; εL= 0.14; εM+= 0.043
(1122 *SY*)	1667.3	≈0.63	≈7.5	≈0.63	εK= 0.8; εL= 0.14; εM+= 0.043
(1134 *SY*)	1655.5	≈1.4	≈7.2	≈1.4	εK= 0.8; εL= 0.14; εM+= 0.043
(1215 *SY*)	1574.1	≈0.61	≈7.6	≈0.61	εK= 0.8; εL= 0.14; εM+= 0.043
(1339 *SY*)	1450.2	≈4.1	≈6.9	≈4.1	εK= 0.8; εL= 0.14; εM+= 0.043
(1541 *SY*)	1248.5	≈1.1	≈7.6	≈1.1	εK= 0.8; εL= 0.14; εM+= 0.042
(1597 *SY*)	1192.7	≈0.56	≈7.9	≈0.56	εK= 0.8; εL= 0.14; εM+= 0.042
(1663 *SY*)	1126.9	≈0.79	≈7.8	≈0.79	εK= 0.8; εL= 0.14; εM+= 0.042

Continued on next page (footnotes at end of table)

^{173}Ta ε decay 1973Re03 (continued)

ϵ,β^+ radiations (continued)

E(decay)	E(level)	Iβ^+ †	Iε†	Log *ft*	I($\varepsilon+\beta^+$)†	Comments
(1678 *SY*)	1111.5		≈2.2	≈7.4	≈2.2	εK= 0.8; εL= 0.14; εM+= 0.042
(1769 *SY*)	1020.1		≈1.2	≈7.7	≈1.2	εK= 0.8; εL= 0.14; εM+= 0.041
(1831 *SY*)	958.3		≈1.2	≈7.7	≈1.2	εK= 0.8; εL= 0.13; εM+= 0.041
(1847 *SY*)	942.9		≈2.1	≈7.5	≈2.1	εK= 0.8; εL= 0.13; εM+= 0.041
(1862 *SY*)	927.5	≈0.01	≈0.85	≈7.9	≈0.86	av Eβ= 390; εK= 0.8; εL= 0.13; εM+= 0.041
(1978 *SY*)	811.7	≈0.03	≈1.52	≈7.7	≈1.55	av Eβ= 440; εK= 0.8; εL= 0.13; εM+= 0.041
(2004‡ *SY*)	785.2	≈0.01	≈0.66	≈8.0	≈0.67	av Eβ= 450; εK= 0.8; εL= 0.13; εM+= 0.041
(2014 *SY*)	775.4	≈0.01	≈0.38	≈8.3	≈0.39	av Eβ= 460; εK= 0.8; εL= 0.13; εM+= 0.041
(2154 *SY*)	635.7	≈0.01	≈0.34	≈8.4	≈0.35	av Eβ= 500; εK= 0.8; εL= 0.13; εM+= 0.040
(2534 *SY*)	255.4	≈0.05	≈2.25	≈9.1^{1u}	≈2.30	av Eβ= 700; εK= 0.8; εL= 0.14; εM+= 0.042
(2548 *SY*)	241.9	≈2.3	≈27.3	≈6.6	≈29.6	av Eβ= 700; εK= 0.8; εL= 0.12; εM+= 0.038
(2592 *SY*)	197.4	≈0.3	≈3.5	≈7.5	≈3.8	av Eβ= 700; εK= 0.8; εL= 0.12; εM+= 0.037
(2592 *SY*)	197.3	≈0.03	≈0.37	≈8.5	≈0.40	av Eβ= 700; εK= 0.8; εL= 0.12; εM+= 0.037
(2682 *SY*)	107.15	≈1.1	≈9.8	≈7.1	≈10.9	av Eβ= 800; εK= 0.7; εL= 0.12; εM+= 0.037
(2720 *SY*)	69.73	≈3	≈28	≈6.7	≈31	av Eβ= 800; εK= 0.7; εL= 0.12; εM+= 0.036 I($\varepsilon+\beta^+$): combined feeding to 69.7 and 81.5 levels (I(γ+ce) for connecting 11.9γ not known).

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

γ(^{173}Hf)

Iγ normalization: from total I(γ+ce) to g.s.=100%. Iγ normalization=0.196 *9*, as deduced from the growth of 123.7γ in ^{173}Hf decay relative to the decay of 172.2γ in ^{173}Ta decay (1986Sz05), is larger than, but consistent with, the present decay-scheme value.

E_γ	I_γ[b]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[†]	δ	α[c]	Comments
11.9[&] *2*		81.49	5/2−	69.73	3/2−				Level intensity balance requires Ti(11.9γ) between 54 and 230.
20.3[&] *1*		262.1	9/2−	241.9	7/2−				
[x]22.2 *1*	0.20 *5*								
25.70 *5*	0.8 *2*	107.15	5/2−	81.49	5/2−	M1[#]		37.7	α(L)= 29.0; α(M)= 6.53
37.40 *5*	7.1 *8*	107.15	5/2−	69.73	3/2−	M1+E2[#]	0.029[#] *+8−11*	12.6	α(L)= 9.71; α(M)= 2.19
58.05 *5*	2.8 *7*	255.4	9/2+	197.4	7/2+	M1+E2	0.21 *10*	4.7 *14*	α(L)= 3.6 *8*; α(M)= 0.84 *20*; α(N+..)= 0.24 *8* δ: from α(L)exp=3.6 *7*.
69.70 *5*	34 *4*	69.73	3/2−	0.0	1/2−	M1+E2[#]	0.88[#] *20*	13.4 *5*	α(K)= 6.1 *9*; α(L)= 5.6 *8*; α(M)= 1.37 *19*; α(N+..)= 0.39 *7* %Iγ=5.95 *24*.
81.5 *1*	8.4 *9*	81.49	5/2−	0.0	1/2−	E2[#]		8.13	α(K)= 1.33; α(L)= 5.16; α(M)= 1.28; α(N+..)= 0.364
90.1 *2*	2.2 *6*	197.3	7/2−	107.15	5/2−	M1+E2	0.23 *2*	5.56	α(K)= 4.46; α(L)= 0.849; α(M)= 0.195; α(N+..)= 0.0575 Properties of analogous transitions in ^{169}Yb and ^{171}Yb were used to separate the complex 90-keV peak (Eγ=90.3 *1*, Iγ=31 *3*, α(K)exp=0.68 *12*) into an E1 component (Eγ=90.3 *1*, Iγ=28.8 *29*) and an M1+E2 component (Eγ=90.1 *2*, Iγ=2.2 *6*, δ=0.23 *2*). Eγ=90.1 *2*, as determined from ce data (1968Ha39), is attributed to the M1+E2 component, and Eγ=90.3 *1* (1973Re03), to the E1 component.
90.3 *1*	28.8 *29*	197.4	7/2+	107.15	5/2−	E1		0.472	α(K)= 0.386; α(L)= 0.0666; α(M)= 0.0150; α(N+..)= 0.00427 See comment with 90.1γ.
107.2[&] *2*		107.15	5/2−	0.0	1/2−	(E2)[#]		2.73	α(K)= 0.839; α(L)= 1.43; α(M)= 0.357; α(N+..)= 0.102 Very weak transition seen in ce spectrum only (Ice(K) (unresolved doublet)≤9, relative to Ice(K)=280 for 90.1γ+90.3γ).
115.0 *1*	2.2 *6*	312.3	9/2−	197.3	7/2−	M1+E2[#]		2.4[a] *3*	α(K)= 1.5 *8*; α(L)= 0.7 *4*; α(M)= 0.17 *9*; α(N+..)= 0.049 *25*
139.4 *3*	0.19 *10*	451.6	11/2−	312.3	9/2−	M1+E2	+0.09 *2*	1.59	α(K)= 1.32; α(L)= 0.208; α(M)= 0.0470; α(N+..)= 0.0140 Iγ,Mult.,δ: from (HI,xnγ).
160.4 *1*	28 *3*	241.9	7/2−	81.49	5/2−	M1+E2[#]	0.69[#] *+40−30*	0.93 *8*	α(K)= 0.7 *1*; α(L)= 0.17 *3*; α(M)= 0.040 *7*; α(N+..)= 0.0116 *13*

$^{173}_{72}$Hf$_{101}$-3

γ(^{173}Hf) (continued)

E_γ	I_γ[b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ	α[c]	Comments
172.2 *1*	100	241.9	7/2⁻	69.73	3/2⁻	E2[#]		0.484	α(K)= 0.255; α(L)= 0.174; α(M)= 0.0427; α(N+..)= 0.0122
180.6 *1*	12.7 *3*	262.1	9/2⁻	81.49	5/2⁻	E2		0.41	α(K)= 0.223; α(L)= 0.142; α(M)= 0.0348; α(N+..)= 0.00991 I_γ: average of 12.4 *13* (1973Re03) and 13.0 *6* (1986Sz05).
205.4 *1*	0.9 *3*	312.3	9/2⁻	107.15	5/2⁻	(E2)		0.266	α(K)= 0.157; α(L)= 0.0831; α(M)= 0.0202; α(N+..)= 0.00574 Mult.: from (HI,xnγ).
[x]214.3 *1*	0.30 *8*								
246.8 *1*	0.70 *18*	508.8	11/2⁻	262.1	9/2⁻	[M1+E2]		0.24[a] *9*	α(K)= 0.18 *9*; α(L)= 0.041 *16*; α(M)= 0.009 *4*; α(N+..)= 0.00273 *7*
254.4 *1*	0.20 *5*	451.6	11/2⁻	197.3	7/2⁻	[E2]		0.133	α(K)= 0.0866; α(L)= 0.0352; α(M)= 0.00852; α(N+..)= 0.00241
267.0 *1*	1.9 *5*	508.8	11/2⁻	241.9	7/2⁻	E2		0.114	α(K)= 0.0758; α(L)= 0.0292; α(M)= 0.00706; α(N+..)= 0.00199 Mult.: from (HI,xnγ).
[x]277.0 *1*	0.15 *4*								
[x]285.2[&] *5*	0.9[@] *2*								
[x]305.6[&] *5*									
[x]315.0[&] *6*									
[x]338.8[&] *6*									
380.3 *2*	0.30 *8*	635.7	5/2⁺,7/2,9/2⁺	255.4	9/2⁺				
[x]382.5 *2*	0.10 *3*								
[x]398.3[&] *7*									
[x]413.3 *1*	0.50 *13*								
[x]419.2[&] *7*									
[x]425.7 *2*	<0.1								
[x]427.6 *2*	<0.2								
[x]428.9 *2*	<0.1								
434.3 *1*	0.30 *8*	942.9	7/2⁻	508.8	11/2⁻				
438.3 *1*	1.7 *5*	635.7	5/2⁺,7/2,9/2⁺	197.4	7/2⁺				
463.4 *1*	0.15 *4*	775.4	5/2⁻,7/2	312.3	9/2⁻				
529.8 *2*	2.6 *7*	785.2	(7/2,9/2)⁻	255.4	9/2⁺	E1		0.00583	α(K)= 0.00489; α(L)= 0.000707
[x]530.2 *2*	1.0 *3*								
549.6 *2*	2.1 *6*	811.7	5/2⁻	262.1	9/2⁻				
[x]557.1 *2*	0.4 *1*								
[x]559.0 *2*	0.60 *15*								
[x]566.5 *2*	0.30 *8*								
569.6 *2*	0.4 *1*	811.7	5/2⁻	241.9	7/2⁻				
577.6 *2*	0.20 *5*	775.4	5/2⁻,7/2	197.3	7/2⁻				
587.8 *2*	1.2 *3*	785.2	(7/2,9/2)⁻	197.3	7/2⁻	M1+E2	1.9 *+31−7*	0.017 *4*	α(K)= 0.014 *3*; α(L)= 0.0025 *4* δ: from α(K)exp=0.014 *3*.

$^{173}_{72}Hf_{101}$-4

γ(^{173}Hf) (continued)

E_γ	I_γ[b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ	α[c]	Comments
^{x}615.3 *2*	0.9 *3*								
^{x}618.0[@] *11*	0.7[@] *2*								
^{x}631.2[&] *15*									
^{x}635.4 *2*	<0.3								
^{x}640.9 *2*	<0.3								
^{x}648.7[@] *8*	0.5[@] *1*								
660.0[e] *2*	0.20 *5*	1111.5	7/2$^+$	451.6	11/2$^-$				
^{x}662.7 *2*	1.1 *3*								
667.7 *2*	1.9 *5*	775.4	5/2$^-$,7/2	107.15	5/2$^-$				
^{x}675.1 *2*	3.2 *8*								
680.2 *2*	0.50 *13*	942.9	7/2$^-$	262.1	9/2$^-$				
685.6 *2*	0.70 *18*	927.5	3/2$^-$,5/2,7/2$^-$	241.9	7/2$^-$				
^{x}691.6 *2*	1.3 *4*								
700.6 *2*	6.6 *5*	942.9	7/2$^-$	241.9	7/2$^-$	M1+E2	1.9 +*34*−*7*	0.0114 *24*	α(K)= 0.0093 *19*; α(L)= 0.00159 *28* I_γ: average of 7.1 *8* (1973Re03) and 6.1 *4* (1986Sz05). δ: from α(K)exp=0.0093 *19*.
^{x}702.6 *2*	1.7 *5*								
707.9 *2*	0.30 *8*	1020.1	5/2$^-$,7/2$^-$	312.3	9/2$^-$				
730.6 *2*	3.4 *9*	811.7	5/2$^-$	81.49	5/2$^-$	M1		0.0188	α(K)= 0.0157; α(L)= 0.00234
739.6 *4*	≈0.6	1248.5	7/2$^-$	508.8	11/2$^-$				
742.0 *4*	≈0.6	811.7	5/2$^-$	69.73	3/2$^-$				
^{x}744.7 *4*	≈0.4								
^{x}747.1 *4*	≈0.6								
^{x}749.5 *4*	≈0.6								
^{x}754.0 *2*	0.70 *18*								
^{x}771.4 *2*	0.4 *1*								
778.2 *2*	2.9 *8*	1020.1	5/2$^-$,7/2$^-$	241.9	7/2$^-$				
^{x}783.4 *2*	0.4 *1*								
^{x}789.1 *2*	1.2 *3*								
^{x}795.2 *2*	1.2 *3*								
799.1 *2*	2.5 *7*	1111.5	7/2$^+$	312.3	9/2$^-$				
^{x}801.4 *2*	1.2 *3*								
811.7 *2*	2.3 *6*	811.7	5/2$^-$	0.0	1/2$^-$				
^{x}814.5 *2*	0.50 *13*								
822.8 *2*	1.8 *5*	1020.1	5/2$^-$,7/2$^-$	197.3	7/2$^-$				
^{x}836.2 *2*	1.4 *4*								
^{x}842.8 *2*	0.60 *15*								
846.1 *2*	2.6 *7*	927.5	3/2$^-$,5/2,7/2$^-$	81.49	5/2$^-$				
851.0 *2*	0.70 *18*	958.3	3/2,5/2$^-$	107.15	5/2$^-$				
857.6 *2*	1.6 *4*	927.5	3/2$^-$,5/2,7/2$^-$	69.73	3/2$^-$				
861.7 *2*	0.50 *13*	942.9	7/2$^-$	81.49	5/2$^-$				
864.6 *2*	1.9 *5*	1126.9	5/2$^-$	262.1	9/2$^-$				
873.0 *2*	4.0 *10*	942.9	7/2$^-$	69.73	3/2$^-$				

$^{173}_{72}$Hf$_{101}$-5

γ(^{173}Hf) (continued)

E_γ	I_γ[b]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[†]	α[c]	Comments
876.6 *2*	2.0 *5*	958.3	3/2,5/2$^-$	81.49	5/2$^-$			
^{x}883.8 *2*	1.2 *3*							
888.7 *2*	1.05 *27*	958.3	3/2,5/2$^-$	69.73	3/2$^-$			
^{x}892.6 *4*	0.10 *3*							
^{x}905.7 *2*	0.4 *1*							
914.0 *2*	1.6 *4*	1111.5	7/2$^+$	197.3	7/2$^-$			
^{x}917.4 *2*	0.20 *5*							
^{x}931.6 *2*	0.30 *8*							
^{x}935.5[@] *15*	0.8[@] *2*							
938.7 *2*	0.60 *15*	1020.1	5/2$^-$,7/2$^-$	81.49	5/2$^-$			
942.0[e] *2*	1.0 *3*	1450.2	9/2$^+$	508.8	11/2$^-$			
^{x}947.2 *2*	0.20 *5*							
950.4 *2*	1.4 *4*	1020.1	5/2$^-$,7/2$^-$	69.73	3/2$^-$			
958.6 *2*	2.9 *8*	958.3	3/2,5/2$^-$	0.0	1/2$^-$			
986.5 *2*	0.4 *1*	1248.5	7/2$^-$	262.1	9/2$^-$			
^{x}989.6 *2*	0.50 *13*							
995.4 *2*	1.5 *4*	1192.7	3/2$^-$,5/2,7/2	197.3	7/2$^-$			
1006.6 *2*	3.2 *8*	1248.5	7/2$^-$	241.9	7/2$^-$	M1	0.00848	α(K)= 0.00709; α(L)= 0.00104
^{x}1009.9 *2*	0.60 *15*							
^{x}1013.1 *2*	0.4 *1*							
1030.0 *2*	8.1 *10*	1111.5	7/2$^+$	81.49	5/2$^-$	E1	0.00156	α(K)= 0.00132; α(L)= 0.000183 I_γ: average of 9.0 *3* (1973Re03) and 7.1 *4* (1986Sz05).
1045.2 *2*	1.7 *5*	1126.9	5/2$^-$	81.49	5/2$^-$			
^{x}1052.4 *2*	0.70 *18*							
1057.3 *2*	0.30 *8*	1126.9	5/2$^-$	69.73	3/2$^-$			
^{x}1067.5 *2*	0.60 *15*							
^{x}1070.3 *2*	0.60 *15*							
1085.5 *2*	1.7 *5*	1192.7	3/2$^-$,5/2,7/2	107.15	5/2$^-$			
^{x}1088.7 *2*	0.60 *15*							
^{x}1104.8 *2*	0.4 *1*							
1127.0 *2*	0.60 *15*	1126.9	5/2$^-$	0.0	1/2$^-$			
1166.9 *2*	0.50 *13*	1248.5	7/2$^-$	81.49	5/2$^-$			
^{x}1176.1 *2*	0.8 *2*							
1178.7 *2*	1.5 *4*	1248.5	7/2$^-$	69.73	3/2$^-$			
^{x}1194.9 *2*	<0.3							
1208.2 *2*	15.3 *16*	1450.2	9/2$^+$	241.9	7/2$^-$	E1	0.00117	α(K)=0.000988; α(L)= 0.000136
^{x}1213.2[@] *12*	≈0.4[@]							
^{x}1216.2 *2*	0.70 *18*							
^{x}1220.9 *2*	<0.2							
^{x}1247.1[@] *15*	0.6[@] *2*							
1253.0 *2*	0.9 *3*	1450.2	9/2$^+$	197.3	7/2$^-$			
^{x}1277.0 *4*	≈0.3							
^{x}1279.6 *4*	≈0.4							

^{173}Ta ε decay 1973Re03 (continued)

γ(^{173}Hf) (continued)

E_γ	I_γ[b]	E_i(level)	J_i^π	E_f	J_f^π
[x]1285.6 4	‡				
[x]1301.0 4	‡				
[x]1323.5 4	‡				
[x]1327.1 4	0.4 1				
1332.4 4	0.50 13	1574.1	$3/2^-,5/2^-$	241.9	$7/2^-$
[x]1337.2 4	‡				
[x]1340.2 4	‡				
1343.2[d] 2	1.0[d] 3	1450.2	$9/2^+$	107.15	$5/2^-$
1343.2[de] 2	1.0[d] 3	1655.5	$5/2^-,7/2^-$	312.3	$9/2^-$
[x]1349.3 4	0.4 1				
[x]1350.7 4	‡				
[x]1357.6 4	‡				
1368.2 2	2.2 6	1450.2	$9/2^+$	81.49	$5/2^-$
[x]1375.3 2	1.4 4				
1380.3 2	3.1 8	1450.2	$9/2^+$	69.73	$3/2^-$
[x]1390.4 4	0.60 15				
1393.5 3	4.1 11	1655.5	$5/2^-,7/2^-$	262.1	$9/2^-$
1405.3 3	0.60 15	1667.3	$5/2^-,7/2^-$	262.1	$9/2^-$
[x]1409.2 3	0.30 8				
1413.5 3	0.70 18	1655.5	$5/2^-,7/2^-$	241.9	$7/2^-$
[x]1420.2 5	‡				
1425.2 5	0.8 2	1667.3	$5/2^-,7/2^-$	241.9	$7/2^-$
1432.2 3	3.2 8	1694.5	$5/2^-,7/2$	262.1	$9/2^-$
[x]1434.7 5	0.50 13				
[x]1445.6 3	1.1 3				
1452.7 5	‡	1694.5	$5/2^-,7/2$	241.9	$7/2^-$
[x]1467.4 5	<0.5				
[x]1481.2 5	<0.3				
[x]1486.7 3	1.0 3				
1492.5 3	0.70 18	1574.1	$3/2^-,5/2^-$	81.49	$5/2^-$
[x]1499.0 3	1.2 3				
1504.3 3	0.4 1	1574.1	$3/2^-,5/2^-$	69.73	$3/2^-$
[x]1537.7 5	‡				
[x]1547.6 3	1.7 5				
[x]1568.2 5	‡				
1574.2[de] 3	1.9[d] 5	1574.1	$3/2^-,5/2^-$	0.0	$1/2^-$
1574.2[d] 3	1.9[d] 5	1655.5	$5/2^-,7/2^-$	81.49	$5/2^-$
1585.7[d] 3	0.60[d] 15	1655.5	$5/2^-,7/2^-$	69.73	$3/2^-$
1585.7[d] 3	0.60[d] 15	1667.3	$5/2^-,7/2^-$	81.49	$5/2^-$

E_γ	I_γ[b]	E_i(level)	J_i^π	E_f	J_f^π
[x]1589.1[@] 17	≈0.4[@]				
1597.6 3	1.6 4	1667.3	$5/2^-,7/2^-$	69.73	$3/2^-$
1613.2 3	2.7 7	1694.5	$5/2^-,7/2$	81.49	$5/2^-$
[x]1622.3[@] 16	0.7[@] 2				
[x]1625.4[@] 15	0.7[@] 2				
[x]1633.9 3	0.30 8				
[x]1648.2 3	0.60 15				
[x]1691.0 3	0.4 1				
[x]1692.9 5	‡				
[x]1697.2 5	‡				
[x]1702.9 5	0.20 5				
[x]1709.7 5	0.4 1				
[x]1717.2 5	0.30 8				
[x]1757.8 5	0.4 1				
[x]1836.1 5	‡				
[x]1882.2 5	0.20 5				
[x]1892.2 5	‡				
[x]1913.3 5	0.20 5				
[x]1960.6 5	0.20 5				
2001.3 5	0.60 15	2263.6?	$5/2^-,7/2$	262.1	$9/2^-$
2022.7 6	‡	2263.6?	$5/2^-,7/2$	241.9	$7/2^-$
[x]2048.5 5	0.30 8				
[x]2066.7 5	0.20 5				
[x]2077.3 5	0.30 8				
[x]2086.9 5	0.20 5				
[x]2161.5 4	0.70 18				
2182.0 4	0.4 1	2263.6?	$5/2^-,7/2$	81.49	$5/2^-$
[x]2188.3 4	0.60 15				
[x]2199.8 4	0.60 15				
[x]2244.9 4	0.60 15				
[x]2258.1 4	0.20 5				
[x]2269.4 4	0.70 18				
[x]2281.0 5	0.20 5				
[x]2293.6 5	0.20 5				
[x]2319.9 5	0.20 5				
[x]2328.3 5	0.20 5				
[x]2360.2 5	0.30 8				
[x]2460.2 4	0.30 8				
[x]2475.0 4	0.50 13				

^{173}Ta ε decay **1973Re03 (continued)**

γ(^{173}Hf) (continued)

E_γ	I_γ[b]	E_i(level)	E_γ	I_γ[b]	E_i(level)	E_γ	I_γ[b]	E_i(level)	E_γ	I_γ[b]	E_i(level)
[x]2493.0 *5*	0.20 *5*		[x]2585.7 *5*	0.20 *5*		[x]2656.6 *5*	0.30 *8*		[x]2722.3 *5*	0.10 *3*	
[x]2526.5 *5*	0.30 *8*		[x]2595.3 *5*	0.10 *3*		[x]2674.9 *5*	0.20 *5*		[x]2736.7 *5*	0.10 *3*	
[x]2557.5 *5*	0.10 *3*		[x]2638.1 *5*	0.4 *1*		[x]2680.1 *4*	0.50 *13*		[x]2749.1 *5*	0.10 *3*	
[x]2567.8 *5*	0.20 *5*		[x]2644.1 *5*	0.70 *18*		[x]2694.1 *5*	0.10 *3*		[x]2784.6 *5*	0.04 *1*	

[†] From α(exp) except where noted. To normalize the Ice and Iγ intensity scales, Ice values were multiplied by a factor of 0.064 *5*, as deduced from a fit of α(K) and/or α(L) (theory) for 69.7γ, 81.5γ, 160.4γ, and 172.2γ. For Eγ>500, Iγ and Ice values from 1971BoZG were also considered, and a different normalization factor deduced.

[‡] Weak.

[#] From ce subshell ratios (1968Ha39).

[@] From 1971BoZG.

[&] From ce data (1968Ha39); uncertainty implied by spectrometer resolution.

[a] Brackets combined range for M1 and E2.

[b] For absolute intensity per 100 decays, multiply by 0.175 *18*.

[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] Multiply placed with undivided intensity.

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

[x] γ ray not placed in level scheme.

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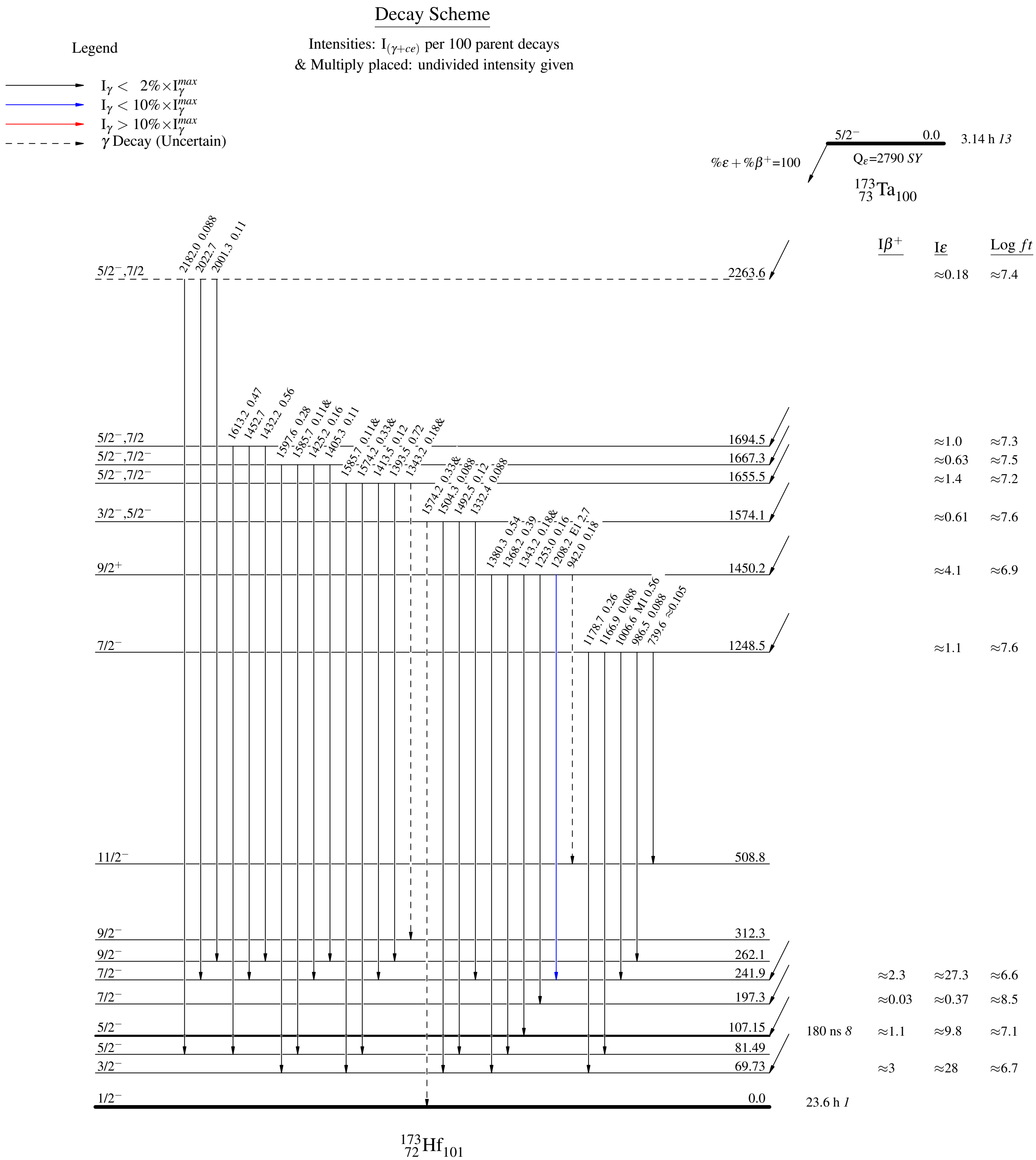

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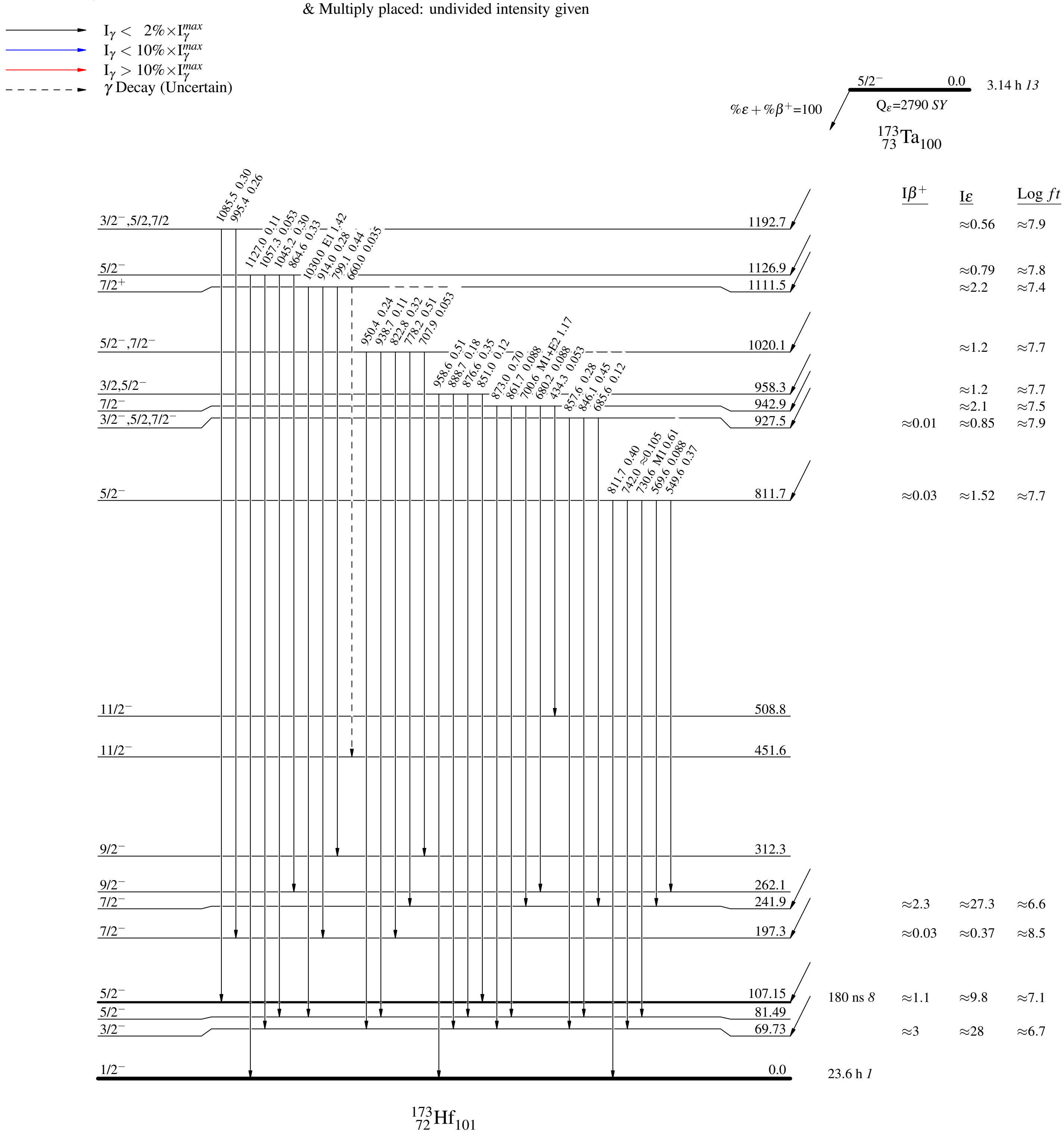
Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
& Multiply placed: undivided intensity given



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Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
& Multiply placed: undivided intensity given