Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 107,791 (2006)	15-Sep-2005

Q(β^-)=−3.21×10^3 *3*; S(n)=8165.9 *18*; S(p)=6699.9 *9*; Q(α)=2252.8 *16* 2012Wa38
Note: Current evaluation has used the following Q record −3.21E+03 308165.0 *186695*.8 82257.9 *15* 2003Au03.
Isotope shifts: 2000Bo03, 1999Le11, 1994BoZR, 1994An14, 1994An09, 1992Ri04, 1992Be07, 1992An17, 1987Au07, 1970Ca10.
Giant dipole resonance: 1994Zi04, 1994Ji07, 1994Ca11, 1993Br09.

^{176}Hf Levels

Cross Reference (XREF) Flags

A	^{176}Ta ε decay	G	^{176}Hf(n,n′γ)	M	^{178}Hf(p,t):^{178}Hf(31 y)
B	^{176}Lu β^- decay	H	^{181}Ta(π^-,5nγ)	N	^{176}Hf(γ,γ')
C	^{176}Lu β^- decay (3.664 h)	I	^{176}Lu(p,nγ)	O	^{186}W(n,2p9nγ)
D	^{174}Yb(α,2nγ)	J	^{178}Hf(p,t)	P	^{130}Te(^{48}Ca,2nγ)
E	^{176}Yb(α,4nγ)	K	^{175}Lu(α,t), (^{3}He,d),		
F	Coulomb excitation	L	^{177}Hf(d,t)		

E(level)†	Jπ‡	$T_{1/2}$	XREF	Comments
0.0[f]	0+	stable	ABCDEFGHIJ L NO	Jπ: L=0 in (p,t). Δ<r²>(^{176}Hf)=−0.084 *2* fm² (1999Le11), charge radii normalized to Δ<r²>(^{178}Hf,^{180}Hf)=0.098 fm² (1994Zi04), a 10% systematic normalization error is not included. Other: 2002Ca47.
88.349[f] *24*	2+	1.43 ns *4*	ABCDEFGHIJ L NO	μ=+0.539 *41*; Q=−2.10 *2* $T_{1/2}$: weighted average of 1.39 ns *4* from β^- ce(t) (1963Fo02) and 1.47 ns *4* Coul. ex. Jπ: 88.3γ E2 to 0+ state. μ: Coul. ex. (1968Be04,1989Ra17). μ: μ=+0.63 *6*, integral perturbed angular correlations (1996Al20). Q: Meson hfs (1984Ta10,1989Ra17).
290.18[f] *3*	4+		ABCDEFGHIJ L NO	μ=1.34 *15* Jπ: 201.8γ E2 to 2+ state. μ: Integral perturbed angular correlations (1996Al20).
596.82[f] *5*	6+		B DE GHIJ L NO	Jπ: 306.8γ E2 to 4+ state.
997.73[f] *6*	8+		B DE GH O	Jπ: 401.0γ E2 to 6+ state.
1149.94[g] *6*	0+		A CD G J	Jπ: 1150γ E0 to 0+ state. L=0 in (p,t).
1226.63[g] *5*	2+	0.8 ps *1*	A CD FG J	$T_{1/2}$: from Coulomb excitation. Jπ: 1138γ E0+E2 to 2+ state.
1247.70[h] *4*	2−#	4.66 ns *17*	A CD G L	$T_{1/2}$: from ^{176}Ta ε decay. Jπ: 1247γ M2 to 0+ state.
1293.12[j] *8*	0+		A CD G J	Jπ: 1293γ E0 to 0+ state. L=0 in (p,t).
1313.31[h] *4*	3−#		A D FG J	Jπ: 1023γ E1 to 4+ state, 1225γ E1 to 2+ state.
1333.07[p] *7*	6+ab	9.6 μs *3*	DE G I KL N	Jπ: 1043γ E2 to 4+ state. $T_{1/2}$: weighted average of 9.5 μs *2* from (α,2nγ) (1973Kh02), and 10.5 μs *7* from (γ,n) (1964Br27). Other value: 13.0 μs *5* from (p,nγ) (1967Bo08).
1341.31[i] *4*	2+	0.29 ps *3*	A D FG J N	$T_{1/2}$: from Coulomb excitation. Jπ: 1341γ E2 to 0+ state.
1362 *10*			J	
1379.38[j] *5*	2+		A D G J	XREF: J(1387). Jπ: 1291γ (E2+E0) to 2+ state.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{176}Hf Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
1390.19[g] *14*	4^+		D G	Jπ: 1100γ E0+E2(+M1) to 4^+ state.
1404.56[h] *4*	$4^{-\#}$		A D G	Jπ: 157γ E2 to 2^- state, 1115γ E1 to 4^+ state.
1412.93 *8*			A	
1445.79[i] *5*	3^+		A D G	Jπ: 1155.5γ M1 to 4^+ state, 1357.5 M1+E2 to 2^+ state.
1481.06[f] *8*	10^+		DE H O	Jπ: 483.3γ E2 to 8^+ state.
1505.81[p] *8*	7^{+a}		DE KL	Jπ: 172.7γ (M1+E2) to 6^+ state. 53.5γ (E1) from 8^- state.
1508.61[h] *7*	$5^{-\#}$		D G J	Jπ: 912γ E1 to 6^+ state.
1532.6 *5*			D	
1540.3[i] *4*	(4^+)		D G J	Jπ: 1250γ (M1+E2) to 4^+ state.
1559.31[q] *9*	8^{-b}	9.9 μs *2*	DE I K	Jπ: 226.2γ M2 to 6^+ state. $T_{1/2}$: weighted average of 9.8 μs *2* from (α,2nγ) (1973Kh02), and 10.3 μs *5* from (γ,n) (1967Bo08).
1577.61[k] *5*	$(3^+)^@$		A D G L	
1591.51[j] *5*	(4^+)		A D G	Jπ: 1301.1γ (E2) to 4^+ state.
1609.3			D J	
1628.55[g] *14*	6^+		D	Jπ: 1031.7γ E0+E2(+M1) to 6^+ state.
1643.43[l] *5*	1^-		A D G N	Jπ: 1555γ E1 to 2^+ state, 1643γ E1 to 0^+ state.
1653.11[h] *6*	$(6)^{-\#}$		D	Jπ: 248.6γ E2 to $(4)^-$ state, 1056γ to 6^+ state.
1672.34[m] *4*	$(1)^+$		A G	Jπ: 1584γ M1+E2 to 2^+ state.
1675.96[k] *16*	(4^+)		D G J L	Jπ: 1385.7γ (E2) to 4^+ state. Band assignment.
1692.0 *10*	$(2^+)^e$		N	
1699.92 *8*	(8^+)		D	Jπ: 194γ (M1) to (7^+) state.
1704.60[m] *6*	(2^+)		A D G L N	Jπ: 1616γ (M1) to 2^+ state, 1705γ (E2) to 0^+ state.
1710.44[l] *5*	(3^-)		A D G	Jπ: 1420γ (E1) to 4^+ state.
1722.05 *5*	1^-		A G L N	Jπ: 1722γ E1 to 0^+ state.
1727.80[i] *19*	(5^+)		D L	Jπ: Band assignment.
1732.46 *10*	$(5^+,6^+,7^+)$		D	Jπ: 399.4γ (M1) to 6^+ state.
1749 *10*	0^+		J	Jπ: L=0 in (p,t).
1761.47[s] *10*	$(6^+)^a$		D K	Jπ: 428γ (M1) to 6^+ state. Band assignment.
1766.89 *21*	$(3,4,5)^+$		D L	Jπ: 1476.7γ M1+E2 to 4^+ state.
1767.52 *7*	$2^-,3^-$		A	Jπ: 679γ E1 to 2^+ state, 362.7γ to $(4)^-$ state.
1783.79[h] *9*	$(7)^{-\#}$		D	Jπ: 1188γ E1 to 6^+ state, 787γ E1 to 8^+ state.
1785.09[q] *12*	9^-		DE K	XREF: D(1785.15). Jπ: L=4,5 in (^{3}He,d), 226γ (M1) to 8^- state.
1786.11 *9*			A J	
1793.61 *5*			A J	
1797.99[t] *9*	$(7)^-$		D	XREF: D(1798.05). Jπ: 464.9γ (E1) to 6^+ state. Band assignment.
1798.5[k] *6*	$(5^+)^@$		D L	XREF: D(1798.4).
1815.2 *5*			D	
1818.92[l] *6*	$(0)^-$		A	Jπ: 175.5γ M1 to 1^- state.
1830.4	5		D L	XREF: L(1828).
1853.96 *7*	$(3^+,4^+,5^+)$		A D J L	Jπ: 1563γ (M1+E2) to 4^+ state.
1856.99[l] *5*	$(2)^-$		A J	Jπ: 213γ M1(+E2) to 1^- state, 146.7γ M1(+E2) to (3^-) state.
1860.08[r] *11*	$(8)^-$		DE K	XREF: K(1860). Jπ: 300.8γ (M1) to 8^- state.
1862.0[i] *5*	(6^+)		D	Jπ: 1571.6γ (E2) to 4^+ state. Band assignment.
1862.80[n] *4*	1^+		A JK	XREF: K(1860). Jπ: 1862.7γ M1(+E2) to 0^+ state, 1774.6γ M1(+E2) to 2^+ state.
1866.6 *5*			D J	
1878? *1*	$(5^+,6^+,7^+)$		D	Jπ: 1281γ (M1+E2) to 6^+ state.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{176}Hf Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	XREF	Comments
1886 *3*		L	
1902.28 *9*	(3$^-$,4$^-$,5$^-$)	D	J$^{\pi}$: 1614.2γ (E1) to 4$^+$ state.
1912.02[n] *4*	2$^+$	A	J$^{\pi}$: 239.6γ M1 to (1)$^+$ state, 1823.7γ M1 to 2$^+$ state.
1914.13 *9*	(9$^+$)	D	J$^{\pi}$: 214γ (M1+E2) to (8$^+$) state.
1924.56 *5*	(2,3)$^-$	A D L	J$^{\pi}$: 611γ M1 to 3$^-$ state, 1836γ (E1) to 2$^+$ state.
1926.68[s] *11*	(7$^+$)[a]	D K	J$^{\pi}$: 421γ (M1) to (7$^+$) state. Band assignment.
1930.78[t] *9*	(8$^-$)	D	J$^{\pi}$: 425γ (E1) to (7$^+$) state. Band assignment.
1932.7[g] *3*	(8)$^+$	D	J$^{\pi}$: 934.8γ E0+E2(+M1) to 8$^+$ state.
1944.48[k] *16*	(6$^+$)	D L	XREF: L(1938). J$^{\pi}$: 1347.4γ (M1+E2) to 6$^+$ state. Band assignment.
1949.71 *5*		A J	
1958.18 *5*	2$^-$	A J L	J$^{\pi}$: 236γ M1(+E2) to 1$^-$ state, 644.9γ M1 to 3$^-$ state. Possible member of a K^{π}=2− band.
1964.2 *3*	(5,6,7)$^-$	D J L	J$^{\pi}$: 311γ M1 to (6)$^-$ state.
1977.0? *6*		D	
1978.0 *10*	(1)[e]	N	
1984 *3*	(6$^+$)	L	J$^{\pi}$: From theoretical and experimental cross section comparison and rotational structure in (d,t).
1992.70[h] *10*	(8)$^-$[#]	D	J$^{\pi}$: 339.6γ E2 to (6)$^-$ state.
2014.27[r] *13*	(9)$^-$	DE K	J$^{\pi}$: 229γ (M1) to (9)$^-$ state.
2023.92 *21*	(+)	D L	XREF: L(2018). J$^{\pi}$: 1427γ (M1+E2) to 6$^+$ state.
2031.05[q] *12*	10$^-$	DE	J$^{\pi}$: 246γ (M1) to (9)$^-$ state.
2034.66[f] *13*	(12$^+$)	DE H O	J$^{\pi}$: Band assignment.
2044.78 *6*	(1$^+$)	A J N	J$^{\pi}$: 1956.5γ (M1,E2) to 2$^+$ state, 2045γ (M1,E2) to 0$^+$ state.
2048.48 *8*	(2,3,4$^-$)	D J	J$^{\pi}$: 337γ (M1+E2) to (3$^-$) state.
2066.25 *7*	(1,2,3)$^+$	A J	XREF: J(2069). J$^{\pi}$: 1978γ (M1,E2) to 2$^+$ state.
2085.68[t] *10*	(9$^-$)	D	J$^{\pi}$: Band assignment.
2085.83 *20*	(5,6,7)$^+$	D J	XREF: D(2086.01)J(2089). J$^{\pi}$: 1489γ M1+E2 to 6$^+$ state.
2096.8 *5*	(5,6,7)$^+$	D J L	XREF: J(2089). J$^{\pi}$: 1500γ (M1) to 6$^+$ state.
2106.5[i] *5*	(7)$^+$	D L	J$^{\pi}$: Band assignment.
2112.89[s] *20*	(8$^+$)[a]	D	J$^{\pi}$: Band assignment.
2116.8[k] *3*	(7$^+$)	D	J$^{\pi}$: Band assignment.
2136.42[h] *24*	(9)$^-$[#]	D J l	XREF: l(2142). J$^{\pi}$: 1139.4γ E1 to 8$^+$ state, 655.3γ to (10)$^+$ state.
2147.62 *11*	(10$^+$)	D l	XREF: l(2142). J$^{\pi}$: 233.5γ (M1+E2) to (9$^+$) state.
2160.5 *6*		D	
2172.9? *6*		D	
2173.8 *8*	(7$^+$)	D l	XREF: l(2175). J$^{\pi}$: From theoretical and experimental cross section comparison and rotational structure in (d,t).
2194.02[r] *20*	(10$^-$)	DE K	J$^{\pi}$: 409γ (M1) to (9)$^-$ state.
2258.7 *5*	(6$^-$,7$^-$,8$^-$)	D	J$^{\pi}$: 460.7γ to (7)$^-$ state.
2261.55[t] *12*	(10$^-$)	D	J$^{\pi}$: 330γ (E2) to (8$^-$) state. Band assignment.
2265.27 *5*	(2)$^-$	A D	J$^{\pi}$: 924γ E1 to 2$^+$ state, 543γ to 1$^-$, 861γ to (4)$^-$ state.
2280.83 *10*	(2)[e]	A J L N	XREF: J(2286).
2284.8[i] *5*	(8$^+$)	D	J$^{\pi}$: Band assignment.
2293.85[q] *14*	11$^-$	DE	J$^{\pi}$: 263γ (M1) to 10$^-$ state. Band assignment.
2294.8[g] *3*	(10)$^+$	D	XREF: D(2295.0).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{176}Hf Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$	XREF	Comments
				J^π: 813.8γ E0+E2(+M1) to $(10)^+$ state.
2304.7[k] 8	(8^+)		D	Band assignment.
2307.76 6			A J	XREF: J(2304).
2308.34 5	$1^-,2^-,3^-$		A	J^π: 350γ M1(+E2) to 2^- state.
2318.7[s] 5	(9^+)[a]		D	J^π: Band assignment.
2361.0 10	(1)[e]		D J N	XREF: J(2348).
2389 10			J	E(level): possible doublet in (p,t).
2398.97 13	(11^+)		D	XREF: D(2399.03).
2399.01[r] 19	(11^-)		DE	XREF: D(2399.06).
2405.35 7	1[e]		A N	
2415 10			J	
2432.34 7	–		A D	J^π: 508γ M1 to $(2,3)^-$ state.
2446.9 6			D j	XREF: j(2448).
2452.47 10			A j	XREF: j(2448).
2470.84 5	2^-		A	J^π: 1223γ E2+M1+E0 to 2^- state.
2482.87 6	(1)[e]		A N	XREF: N(2484).
2514.0 7	$1^{(+)}$[e]		N	
2530.0 7	1[e]		N	
2540.9?[s] 5	(10^+)[a]		D	J^π: Band assignment.
2548.0 7	1[e]		N	
2563.54[q] 22	12^-		DE	XREF: D(2563.60).
				J^π: Band assignment.
2568.45 22			D	
2602.16 9			A	
2638.1[r] 5	(12^-)		DE	J^π: Band assignment.
2646.6[f] 4	(14^+)		DE H	J^π: Band assignment.
2690.0 7	1[e]		N	
2722.0 7	$1^{(+)}$[e]		N	
2762.51 8			A	
2791.62 7			A	
2817.55 5	$(2)^+$		A	J^π: 1476γ E2 to 2^+ state, log *ft*=6.4 from ^{176}Ta (J^π=1^-).
2827.0[q] 5	13^-		DE	J^π: Band assignment.
2831.0 10	1[e]		N	
2865.8[u] 7	14^-[c]	401 μs 6	E P	J^π: Band assignment. 38.7γ (M1) to 13^- state.
				$T_{1/2}$: from (α,4nγ) (1975Kh04).
2878.21 7			A	
2885.52 7	$1^{(+)}$[e]		A N	
2905.67 7			A	
2912.26[o] 6	$(0)^-$&		A	J^π: 1190γ M1 to 1^- state.
2920.26[o] 7	1^-&		A	J^π: 2920γ E1 to 0^+ state.
2921.03 8	$1^+,2^+$		A	J^π: 1580γ M1+E2 to 2^+ state, log *ft*=5.9 from ^{176}Ta (J^π=1^-).
2940.0 7	$1^{(+)}$[e]		N	
2944.17 5	2^-		A	J^π: 1630γ M1 to 3^- state, 1696γ M1 to 2^- state. log *ft*≤6.2 from ^{176}Ta (J^π=1^-) ε decay. Possible member of a K^π=2^- band.
2969.07[o] 6	(2^-)&		A	
2994.0 7	$1^{(+)}$[e]		N	
3044.0 7	$1^{(-)}$[e]		N	
3059.0 10	1[e]		N	
3080.2 12	15^+	0.20 ns +12−8	E P	$T_{1/2}$: Measured in (α,2nγ) (1982Ko08).
				J^π: 214γ E1 to 14^-. Level energy agrees with predicted

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{176}Hf Levels (continued)

E(level)†	Jπ‡	XREF	Comments
			value of 3190 keV for $K^{\pi}=15^{+}$, configuration=((π 7/2[404])(π 9/2[514]) (ν 9/2[624])(ν 5/2[512])) (1976Kh03).
3098.0 *10*	(1)[e]	N	
3107.0 *7*	1(+)[e]	N	
3115.0 *7*	1(−)[e]	N	
3159.0 *7*	1(+)[e]	N	
3160.5[u] *10*	15−[c]	E N P	Jπ: Band assignment. 294.7γ (M1+E2) to 14− state.
3200.0 *10*	1[e]	N	
3218.0 *10*	1[e]	N	
3222.0 *7*	1(+)[e]	N	
3232.0 *7*	1(+)[e]	N	
3261.0 *7*	1(+)[e]	N	
3266.2[v] *14*	16+[d]	E M P	Jπ: L=0 in ^{178}Hf(31 y, $J^{\pi}=16^{+}$)(p,t). 186.0γ M1 to (15^{+}) state in (α,4nγ).
3306.0 *10*	(1)[e]	N	
3307.7[f] *11*	(16+)	E	Jπ: 661γ E2 to (14^{+}) state. Band assignment.
3322.0 *10*	1[e]	N	
3343.0 *7*	1[e]	N	
3361.0 *7*	1(−)[e]	N	
3372.0 *7*	1(−)[e]	N	
3385.0 *7*	1[e]	N	
3406.0 *10*	(1)[e]	N	
3438.0 *10*	1[e]	N	
3454.0 *10*	1[e]	N	
3467.4[u] *10*	16−[c]	E N P	Jπ: Band assignment.
3485.0 *7*	1[e]	N	
3490.0 *10*	1[e]	N	
3519.0 *10*	(1)[e]	N	
3540.1[v] *16*	17+[d]	E N P	Jπ: 274γ M1+E2 to 16^{+} state.
3550.0 *7*	1(+)[e]	N	
3580.0 *10*	(1)[e]	N	
3602.0 *7*	1[e]	N	
3608.0 *10*	1[e]	N	
3627.0 *7*	1(+)[e]	N	
3662.0 *7*	1(+)[e]	N	
3671.0 *7*	1(+)[e]	N	
3689.0 *10*	(1)[e]	N	
3695.0 *10*	(2)[e]	N	
3722.0 *10*	(1)[e]	N	
3746.0 *7*	1[e]	N	
3767.0 *7*	1(+)[e]	N	
3774.0 *10*	1[e]	N	
3787.1[u] *12*	17−[c]	E N P	Jπ: Band assignment. 319.7γ (M1+E2) to 16− state.
3805.0 *7*	1(+)[e]	N	
3816.0 *7*	1(+)[e]	N	
3824.0 *10*	(1)[e]	N	
3838.0 *7*	1(−)[e]	N	
3844.0 *10*	(1)[e]	N	
3847.4[v] *16*	18+[d]	E N P	Jπ: Band assignment. 307.2γ (M1+E2) to 17^{+} state.
3856.0 *10*	(1)[e]	N	
3916.0 *10*	(1)[e]	N	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{176}Hf Levels (continued)

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	XREF		Comments
4010.5[f] *15*	(18$^+$)		E		J$^\pi$: 702.8γ E2 to (16$^+$) state. Band assignment.
4120.3[u] *14*	18$^-$[c]		E	P	J$^\pi$: Band assignment. 333.2γ (M1+E2) to 17$^-$ state.
4179.3[v] *17*	19$^+$[d]		E	P	J$^\pi$: 331.8γ (M1+E2) to 18$^+$ state. Band assignment.
4376.6 *16*	(19)$^+$	34 ns	E	P	$T_{1/2}$: From (α,4nγ) (1976Kh03). E(level): K^π=19$^+$ in (^{48}Ca,2nγ) [2001Ch89]. J$^\pi$: 529.1γ (M1) to (18)$^+$ state. $T_{1/2}$=34 ns suggests K forbiddenness. Possible K^π=19$^+$ six-quasiparticle configuration=((π 7/2[404])(π 9/2[514]) (ν 7/2[514])(ν 9/2[624])(ν 5/2[512])(ν 1/2[521])) is predicted at ≈4600 keV (1976Kh03).
4466.6[u] *16*	(19$^-$)[c]		E	P	J$^\pi$: Band assignment.
4532.2[v] *20*	20$^+$[d]		E	P	J$^\pi$: Band assignment.
4766.4 *16*	(20)$^-$		E	P	E(level): K^π=20$^-$ in (^{48}Ca,2nγ) [2001Ch89]. J$^\pi$: 389.8γ E1 decay through 4376.7 (J^π=K^π=(19)$^+$) level, instead of through the energetically favored 4179.4 (J^π=(19)$^+$, K^π=16$^+$) level, is consistent with a K^π=(20)$^-$ assignment. A possible K^π=20$^-$ six-quasiparticle configuration=((π 7/2[404])(π 9/2[514])(ν 7/2[514]) (ν 9/2[624])(ν 7/2[633])(ν 1/2[521])) is predicted at ≈5000 keV (1976Kh03).
4826.4[u] *15*	(20$^-$)[c]		E	P	J$^\pi$: Band assignment.
4863.5 *16*	(22)$^-$	43 μs	E	P	$T_{1/2}$: from (α,4nγ) (1976Kh03). E(level): K^π=22$^-$ in (^{48}Ca,2nγ) [2001Ch89]. J$^\pi$: 97.1γ E2 to (20)$^-$. Possible K^π=22$^-$ six-quasiparticle configuration=((π 7/2[404])(π 9/2[514]) (ν 7/2[514])(ν 9/2[624])(ν 7/2[633])(ν 5/2[512])). $T_{1/2}$=43 μs may be explained in terms of the 97-keV ν 5/2[512] to ν 1/2[521] single-particle E2 transition, which has been observed to be slow in neighboring odd-A hafnium nuclei.

[†] Deduced by evaluator from a least-squares fit to adopted γ-ray energies.

[‡] J, K, and π assignments are mostly based on rotational band structure, and on γ-ray multipolarities and decay patterns. This includes comparisons of experimental branching ratios with theoretical values predicted by Alaga rules. Specific arguments, as well as quasiparticle configuration assignments, are given with individual levels.

[#] Member of a K^π=2$^-$ octupole-vibrational band. Assignment was based on a comparison between experimental and theoretical B(E1) values for the transitions to the g.s. (K^π=0$^+$) rotational band (1973Kh03).

[@] Assignment based on a comparison between experimental and theoretical cross sections in ^{177}Hf(d,t).

[&] Assignment agrees with Alaga rules for log *ft* values from ^{176}Ta ε decay to the J^π=0, 1, and 2 members of this band.

[a] Intraband transitions between the bands built on 1333 keV and 1761 keV suggest configuration mixing. The following admixtures were deduced from particle transfer reactions and γ-ray decay rates: 61% proton configuration and 39% neutron configuration for the band built on 1333 keV; 39% proton configuration and 61% neutron configuration for the band built on 1761 keV.

[b] J^π=6$^+$ and 8$^-$ for the 1333- and 1559-keV levels, respectively, are based on (^{3}He,d) transfers of L=2 for the 1333-keV level, and L=5,(4) for the 1559-keV level, and on the 226γ M2 between these levels.

[c] Deduced intrinsic g-factor of 0.57 *4* agrees with configuration assignment (1976Kh03).

[d] Deduced intrinsic g-factor of 0.54 *5* agrees with configuration assignment (1976Kh03). Members of this band up to J=20 become yrast.

[e] From angular distribution in ^{176}Hf(γ,γ').

[f] Band(A): K$^\pi$=0$^+$ g.s. rotational band. Rotational parameters: A=14.4, B=−8.7. Spin members of the band used in the fit: 0 to 14.

[g] Band(B): K$^\pi$=0$^+$ β-vibrational band. Rotational parameters: A=11.8, B=−13.5. Spin members of the band used in the fit: 0 to 10.

[h] Band(C): K$^\pi$=2$^-$ octupole-vibrational band.

[i] Band(D): K$^\pi$=2$^+$ mixed γ-vibrational band.

[j] Band(E): K$^\pi$=0$^+$ band. Rotational parameters: A=14.1, B=40.7. Spin members of the band used in the fit: 0 to 4.

[k] Band(F): K$^\pi$=(3$^+$) band. Rotational parameters: A=12.5, B=−4.6. Spin members of the band used in the fit: 3 to 8.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{176}Hf Levels (continued)

[l] Band(G): $K^{\pi}=(0^-)$ band: Possible configuration=ν7/2[633]-ν7/2[514] 93% wave function (2005Gr21).
[m] Band(H): $K^{\pi}=1^+$ band.
[n] Band(I): $K^{\pi}=(1^+)$ band.
[o] Band(J): $K^{\pi}=(0^-)$ band: Possible Configuration=(π7/2[404]-ν5/2[512])- (π9/2[514]-ν7/2[514]) (2005Gr21).
[p] Band(K): $K^{\pi}=6^+$ band. configuration=61%((p,7/2[404])(p,5/2[402])+39%(n,7/2[514])(n,5/2[512])). Rotational parameters: A=12.9, B=−6.3. Spin members of the band used in the fit: 6 to 11.
[q] Band(L): $K^{\pi}=8^-$ Coriolis-mixed band. configuration=98-38%((p,7/2[404])(p,9/2[514])+ 2−62%(n,7/2[514])(n,9/2[624])). Rotational parameters: A=15.1, B=−13.8. Spin members of the band used in the fit: 8 to 13.
[r] Band(M): $K^{\pi}=7^-,8^-$ Coriolis-mixed band. Configuration=((π 7/2[404])(π 9/2[514])+ (ν 7/2[514]) (ν 7/2[633])+(ν 7/2[514])(ν 9/2[624])). 20-50% mixture of the $K^{\pi}=7^-$ mixture to $K^{\pi}=8^-$. Rotational parameters: A=6.8, B=10.7. Spin members of the band used in the fit: 8 to 12.
[s] Band(N): $K^{\pi}=6^+$ band. configuration=39%((p,7/2[404])(p,5/2[402])+61%(n,7/2[514])(n,5/2[512])). Rotational parameters: A=12.4, B=−5.8. Spin members of the band used in the fit: 6 to 9.
[t] Band(O): $K^{\pi}=6^-,7^-$ band. Configuration=((ν 7/2[633])(ν 5/2[512])+(ν 9/2[624])(ν 5/2[512])). Rotational parameters: A=7.1, B=9.5. Spin members of the band used in the fit: 7 to 9.
[u] Band(P): $K^{\pi}=(14^-)$ band. Configuration=((π 7/2[404])(π 9/2[514])(ν 7/2[514])(ν 5/2[512])).
[v] Band(Q): $K^{\pi}=(16^+)$ band. Configuration=((π 7/2[404])(π 9/2[514])(ν 7/2[514])(ν 9/2[624])).

Adopted Levels, Gammas (continued)

γ(^{176}Hf)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	δ[k]	α[i]	$I_{(\gamma+ce)}$	Comments
88.349	2+	88.34[‡] *3*	100	0.0	0+	E2[f]		5.86		B(E2)(W.u.)=183 *7*
290.18	4+	201.83[‡] *3*	100	88.349	2+	E2[f]		0.282		
596.82	6+	306.78[‡] *4*	100	290.18	4+	E2[g]		0.0747		
997.73	8+	400.99[‡] *4*	100	596.82	6+	E2[g]		0.0347		
1149.94	0+	1061.61[‡] *9*	100	88.349	2+	E2[f]				
		1150.00[‡] *10*		0.0	0+	E0[f]			0.9 *2*	I_γ: not reported.
1226.63	2+	936.41[‡] *8*	82 *7*	290.18	4+	E2[f]				B(E2)(W.u.)=5.7 *10*
		1138.26[‡] *8*	100 *8*	88.349	2+	E0+E2[f]		≈0.037		α: experimental value from ^{176}Ta ε decay.
		1226.89[‡] *24*	54 *7*	0.0	0+	(E2)[g]				B(E2)(W.u.)=0.98 *19*
1247.70	2−	957.40[‡] *8*	2.31 *18*	290.18	4+	M2+E3[f]	≥1.87	0.0115 *16*		B(M2)(W.u.)<0.0014; B(E3)(W.u.)>2.9 δ: from 1972Lo03. Additional information 1.
		1159.28[‡] *9*	100 *8*	88.349	2+	E1+M2+E3[f]		0.0034		B(E1)(W.u.)=2.01×10^{-8} *16*; B(M2)(W.u.)=0.0088 *19*; B(E3)(W.u.)=9.6 *20* α: experimental value from ^{176}Ta ε decay. Mult.: δ(M2/E1)=0.36 *5*, δ(E3/E1)=0.53 *7* (1972Lo03).
		1247.68[‡] *15*	1.86 *20*	0.0	0+	M2[f]		0.0119		B(M2)(W.u.)=0.00124 *17* ΔJ=0,1 transitions from members of the octupole band (K^π=2−) to those of the g.s. rotational band (K^π=0+) are expected to have a significant E3 multipolarity component (1972Lo03).
1293.12	0+	1204.85[‡] *10*	100 *8*	88.349	2+					
		1292.9[‡] *3*		0.0	0+	E0[f]			30 *5*	I_γ: not reported.
1313.31	3−	1023.05[‡] *7*	47 *4*	290.18	4+	E1[f]				
		1224.93[‡] *7*	100 *8*	88.349	2+	E1[f]				
1333.07	6+	736.20[&] *7*	100[&]	596.82	6+	E2[g]				B(E2)(W.u.)=2.82×10^{-6} *9*
		1043.0[&] *1*	64[&]	290.18	4+	E2[g]				B(E2)(W.u.)=3.16×10^{-7} *10*
1341.31	2+	1051.03[‡] *11*	3.2 *3*	290.18	4+					
		1252.87[‡] *10*	93 *7*	88.349	2+	M1+E2[f]				I_γ: From (γ,γ′), 95 in ε decay.
		1341.33[‡] *10*	100 *8*	0.0	0+	E2[f]				B(E2)(W.u.)=3.9 *6* Mult.: ce data allow some M1 admixture, but level scheme requires pure E2.
1379.38	2+	1089.06 *10*	14.8 *12*	290.18	4+					
		1290.97[‡] *9*	100 *8*	88.349	2+	(E2+E0)[f]		0.022		α: experimental value from ^{176}Ta ε decay.
		1379.29 *15*	4.0 *12*	0.0	0+					
1390.19	4+	793.5[&] *3*	36[&]	596.82	6+					

$^{176}_{72}Hf_{104}$-8

Adopted Levels, Gammas (continued)

γ(^{176}Hf) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[i]	Comments
1390.19	4$^+$	1099.9[&] *3*	100[&]	290.18	4$^+$	E0+E2(+M1)[g]	≈0.03	α: experimental value from ^{174}Yb(α,2nγ).
		1301.8 *3*	81	88.349	2$^+$	(E2)[g]		
1404.56	4$^-$	91.19[‡] *25*	17 *1*	1313.31	3$^-$	E2(+M1)[f]	5.27 *11*	
		156.83[‡] *3*	100 *8*	1247.70	2$^-$	E2[f]	0.671	
		1114.2[m‡] *1*	85[m] *7*	290.18	4$^+$	E1[g]		I_γ: from ^{174}Yb(α,2nγ). Doublet in ^{176}Ta ε decay.
1412.93		1122.80 *9*	100 *16*	290.18	4$^+$			
		1412.84[l] *11*	≤111[l]	0.0	0$^+$			
1445.79	3$^+$	198.07 *12*	1.9 *4*	1247.70	2$^-$			
		1155.52[‡] *18*	32 *4*	290.18	4$^+$	M1[g]		
		1357.52[‡] *10*	100 *8*	88.349	2$^+$	M1+E2[g]		
1481.06	10$^+$	483.33[@] *5*	100	997.73	8$^+$	E2[g]	0.0212	
1505.81	7$^+$	172.73[@] *4*	100	1333.07	6$^+$	(M1+E2)[g]	0.67 *20*	
1508.61	5$^-$	196.0[&] *5*	≈4[&]	1313.31	3$^-$			
		911.8[&] *3*	36[&]	596.82	6$^+$	E1[g]		
		1218.4[&] *1*	100[&]	290.18	4$^+$			
1532.6		935.8[@] *5*	100	596.82	6$^+$			
1540.3	(4$^+$)	1250.1[@] *4*	100	290.18	4$^+$	(M1+E2)[g]		
1559.31	8$^-$	53.49[&] *7*	100[&]	1505.81	7$^+$	(E1)[g]		B(E1)(W.u.)=6.2×10^{-8} *5*
		226.25[&] *6*	31[&] *6*	1333.07	6$^+$	M2[g]	1.99	B(M2)(W.u.)=0.023 *5*
1577.61	(3$^+$)	173.00 *7*	2.1 *3*	1404.56	4$^-$			
		264.08[‡] *24*	10.4 *8*	1313.31	3$^-$			
		1287.38[m] *12*	13[me] *1*	290.18	4$^+$			
		1489.30[‡] *10*	100 *8*	88.349	2$^+$	(E2)[f]		
1591.51	(4$^+$)	1301.2[‡] *5*	100	290.18	4$^+$	(E2)[g]		
1609.3		611.4[@n] *4*	100	997.73	8$^+$			
1628.55	6$^+$	238.36[&] *7*	18[&]	1390.19	4$^+$			
		630.7[&] *3*	11.1[&]	997.73	8$^+$			
		1031.7[&] *3*	78[&]	596.82	6$^+$	E0+E2(+M1)[g]	0.04	α: experimental value from ^{174}Yb(α,2nγ).
		1338.6[&] *4*	100[&]	290.18	4$^+$	(E2)[g]		
1643.43	1$^-$	1555.08[‡] *13*	100 *8*	88.349	2$^+$	E1[f]		
		1643.43[‡] *10*	59 *5*	0.0	0$^+$	E1[f]		I_γ: 68.6 in (γ,γ') deduced from R_{exp}.
1653.11	(6)$^-$	144.45[&] *7*	4.5[&]	1508.61	5$^-$			
		248.58[&] *4*	100[&]	1404.56	4$^-$	E2[g]	0.143	
		1055.8[&] *5*	8.1[&]	596.82	6$^+$			

$^{176}_{72}Hf_{104}$-9

Adopted Levels, Gammas (continued)

γ(^{176}Hf) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[i]	Comments
1672.34	$(1)^+$	292.88 *10*	0.75 *7*	1379.38	2^+			
		424.48 *15*	0.94 *10*	1247.70	2^-			
		445.52[l] *8*	≤1.0[l]	1226.63	2^+			
		1584.02 *10*	100 *8*	88.349	2^+	M1+E2[f]		
		1672.32 *12*	22.5 *18*	0.0	0^+			
1675.96	(4^+)	271.8[&] *3*	4.3[&]	1404.56	4^-			
		1385.7[&] *3*	100[&]	290.18	4^+	(E2)[g]		Mult.: measured (E1,E2) multipolarity. Level scheme requires (E2).
		1588.3[&] *5*	28[&]	88.349	2^+			
1692.0	(2^+)	1692[#]	100	0.0	0^+			
1699.92	(8^+)	194.09[&] *4*	100[&]	1505.81	7^+	(M1)[g]	0.629	
		366.87[&] *5*	50[&]	1333.07	6^+			
1704.60	(2^+)	1616.18 *10*	92 *7*	88.349	2^+	(M1)[f]		
		1704.70 *12*	100 *8*	0.0	0^+	(E2)[f]		
1710.44	(3^-)	118.93 *2*	2.6 *5*	1591.51	(4^+)			
		1420.04 *10*	100 *8*	290.18	4^+	(E1)[g]		
		1621.87[m] *10*	80[m] *21*	88.349	2^+			
1722.05	1^-	428.85 *20*	0.44 *7*	1293.12	0^+			
		1633.74 *10*	89.6 *7*	88.349	2^+	E1[f]		
		1722.04 *13*	100 *8*	0.0	0^+	E1[f]		
1727.80	(5^+)	1130.4[&] *5*	31[&]	596.82	6^+			
		1437.7[&] *2*	100[&]	290.18	4^+	(M1+E2)[g]		Mult.: Reported as (E2) from conversion electron measurement in ^{174}Yb(α,2nγ), level scheme requires (M1+E2). M.
1732.46	$(5^+,6^+,7^+)$	226.9[&] *5*	13[&]	1505.81	7^+			
		399.38[&] *7*	100[&]	1333.07	6^+	(M1)[g]	0.089	
1761.47	(6^+)	428.40[@] *7*	100	1333.07	6^+	(M1)[g]	0.0740	
1766.89	$(3,4,5)^+$	1476.7[@] *2*	100	290.18	4^+	M1+E2[g]		
1767.52	$2^-,3^-$	362.7 *3*	1.7 *4*	1404.56	4^-			
		388.06 *20*	2.55 *22*	1379.38	2^+			
		1679.18 *11*	100 *8*	88.349	2^+	E1[f]		
1783.79	$(7)^-$	276.4[&] *3*	3.5[&]	1508.61	5^-			
		787.14[&] *15*	25[&]	997.73	8^+	E1,E2[g]		Mult.: level scheme requires E1.
		1188.1[&] *2*	100[&]	596.82	6^+	E1[g]		
1785.09	9^-	225.74[@] *10*	100	1559.31	8^-	(M1)[g]	0.414	
1786.11		1495.85 *15*	58 *5*	290.18	4^+			

$^{176}_{72}Hf_{104}$-10

Adopted Levels, Gammas (continued)

γ(^{176}Hf) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	δ[k]	α[i]	Comments
1786.11		1697.8 *2*	100 *3*	88.349	2^+				
1793.61		216.00 *7*	100 *8*	1577.61	(3^+)				
		414.34 *15*	64 *5*	1379.38	2^+				
		452.18[l] *10*	<20.5[l]	1341.31	2^+				
		1503.7	≤91	290.18	4^+				
		≈1705.4	≤136	88.349	2^+				
1797.99	$(7)^-$	464.92[@] *7*	100	1333.07	6^+	(E1)[g]			
1798.5	(5^+)	289.6[&n]	5.5[&]	1508.61	5^-				
		1201.8[&] *7*	20[&]	596.82	6^+				
		1508[&] *1*	100[&]	290.18	4^+				
1815.2		1218.4[&] *8*	100[&]	596.82	6^+				
		1525.0[&] *5*	80[&]	290.18	4^+				
1818.92	$(0)^-$	175.50 *7*	100 *8*	1643.43	1^-	M1[f]		0.833	Measured M1(+E2) multipolarity. Level scheme requires M1.
		571.30 *9*	63 *5*	1247.70	2^-				
1830.4	5	1540.2[@n] *5*	100	290.18	4^+				E_γ: from (α,2nγ).
1853.96	$(3^+,4^+,5^+)$	474.64[l] *8*	<18.2[l]	1379.38	2^+				
		1563.53 *13*	41 *7*	290.18	4^+	(M1+E2)[g]			
		1765.75 *15*	100 *8*	88.349	2^+				
1856.99	$(2)^-$	146.74 *5*	50 *4*	1710.44	(3^-)	M1(+E2)[f]	0.74	1.19	
		213.50 *6*	100 *19*	1643.43	1^-	M1(+E2)[f]	0.87	0.376	
		452.18[l] *10*	<5.8[l]	1404.56	4^-				
		609.25 *9*	18 *3*	1247.70	2^-				
1860.08	$(8)^-$	300.78[@] *6*	100	1559.31	8^-	(M1)[g]		0.189	
1862.0	(6^+)	1265.2[&] *5*	75[&]	596.82	6^+				
		1571.6[&] *8*	100[&]	290.18	4^+	(E2)[g]			
1862.80	1^+	158.19 *7*	5.7 *4*	1704.60	(2^+)	M1[f]		1.12	
		190.36 *7*	10.3 *8*	1672.34	$(1)^+$	M1+E2[f]	0.72	0.554	
		483.28 *9*	0.68 *8*	1379.38	2^+				
		521.6 *1*	≈61	1341.31	2^+				
		569.77 *11*	2.8 *4*	1293.12	0^+				
		615.22 *9*	2.6 *4*	1247.70	2^-				
		1774.56 *15*	39 *3*	88.349	2^+	M1(+E2)[f]			
		1862.74 *15*	100 *8*	0.0	0^+	M1[f]			Measured M1(+E2) multipolarity. Level scheme requires M1.
1866.6		462.0[@] *5*	100	1404.56	4^-				
1878?	$(5^+,6^+,7^+)$	1281[@n] *1*	100	596.82	6^+	(M1+E2)[g]			
1902.28	$(3^-,4^-,5^-)$	1306.8[&] *2*	100[&]	596.82	6^+	E1,E2[g]			

$^{176}_{72}Hf_{104}$-11

Adopted Levels, Gammas (continued)

γ(^{176}Hf) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[i]
1902.28	(3⁻,4⁻,5⁻)	1614.2[&n] *3*	77[&]	290.18	4⁺	(E1)[g]	
1912.02	2⁺	125.4 *10*	≤4.8	1786.11			
		207.5	≤1.8	1704.60	(2⁺)		
		239.62 *6*	12.0 *10*	1672.34	(1)⁺	M1[f]	0.352
		466.16 *7*	24.7 *20*	1445.79	3⁺	M1[f]	0.0593
		532.54 *11*	5.4 *8*	1379.38	2⁺		
		570.76[l] *10*	<10[l]	1341.31	2⁺		
		598.6 *2*	0.55 *10*	1313.31	3⁻		
		685.55 *8*	2.64 *21*	1226.63	2⁺	M1[f]	0.0221
		1621.87[m] *10*	5[m] *2*	290.18	4⁺		
		1823.70 *15*	100 *8*	88.349	2⁺	M1[f]	
		1911.6 *3*	0.29 *6*	0.0	0⁺		
1914.13	(9⁺)	214.22[&] *4*	83[&]	1699.92	(8⁺)	(M1+E2)[g]	0.35 *13*
		408.3[&] *2*	100[&]	1505.81	7⁺		
1924.56	(2,3)⁻	131.0[l] *15*	<1.7[l]	1793.61			
		346.9 *2*	8.9 *7*	1577.61	(3⁺)		
		519.7 *2*	26 *2*	1404.56	4⁻		
		583.5 *2*	1.03 *17*	1341.31	2⁺		
		611.16 *8*	100 *8*	1313.31	3⁻	M1[f]	0.0296
		677.09[l] *8*	<25.2[l]	1247.70	2⁻		
		1836.34 *16*	17.1 *13*	88.349	2⁺	(E1)[f]	
1926.68	(7⁺)	420.86[&] *8*	100[&]	1505.81	7⁺	(M1)[g]	0.0775
		594[&] *1*	23[&]	1333.07	6⁺		
1930.78	(8⁻)	132.80[&] *7*	11.4[&]	1797.99	(7)⁻		
		424.96[&] *6*	100[&]	1505.81	7⁺	(E1)[g]	
1932.7	(8)⁺	934.8[&] *5*	55[&]	997.73	8⁺	E0+E2(+M1)[g]	*j*
		1335.9[&] *4*	100[&]	596.82	6⁺	(E2)[g]	
1944.48	(6⁺)	268.61[&] *12*	15[&]	1675.96	(4⁺)		
		1347.4[&] *2*	100[&]	596.82	6⁺	(M1+E2)[g]	
1949.71		131.0[l] *15*	<8.3[l]	1818.92	(0)⁻		
		636.6[l] *1*	<19.8[l]	1313.31	3⁻		
		701.96 *9*	27.1 *22*	1247.70	2⁻		
		723.10 *8*	50 *4*	1226.63	2⁺		
		1861.15 *25*	100 *25*	88.349	2⁺		
		1949.80 *17*	50 *10*	0.0	0⁺		

$^{176}_{72}Hf_{104}$-12

Adopted Levels, Gammas (continued)

γ(^{176}Hf) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	δ[k]	α[i]	Comments
1958.18	2⁻	236.19 *7*	1.5 *1*	1722.05	1⁻	M1(+E2)[f]	0.87	0.281	
		380.48 *20*	2.4 *2*	1577.61	(3⁺)	E1(+M2)[f]		0.18 *18*	
		512.3 *2*	7.4 *7*	1445.79	3⁺				
		553.5 *2*	0.40 *6*	1404.56	4⁻				
		579.08 *15*	1.10 *9*	1379.38	2⁺				
		616.79 *8*	19 *2*	1341.31	2⁺	E1[f]			
		644.86 *8*	18 *1*	1313.31	3⁻	M1[f]		0.0258	
		710.50 *8*	100 *8*	1247.70	2⁻	M1[f]		0.0202	
		1869.78 *16*	1.5 *1*	88.349	2⁺				
1964.2	(5,6,7)⁻	311.1[@] *3*	100	1653.11	(6)⁻	M1[g]		0.173	
1977.0?		191.6[@n] *5*	100	1785.09	9⁻				
1978.0	(1)	1978[#]	100	0.0	0⁺				
1992.70	(8)⁻	339.59[@] *8*	100	1653.11	(6)⁻	E2[g]		0.0554	
2014.27	(9)⁻	155.0[l&] *5*	<14[l&]	1860.08	(8)⁻				
		229.15[&] *7*	100[&]	1785.09	9⁻	(M1)[g]		0.397	
		455.1[&] *2*	60[&]	1559.31	8⁻				
2023.92	(⁺)	1427.1[@] *2*	100	596.82	6⁺	(M1+E2)[g]			
2031.05	10⁻	245.97[&] *4*	100[&]	1785.09	9⁻	(M1)[g]		0.327	
		471.6[&] *2*	13[&]	1559.31	8⁻				
2034.66	(12⁺)	553.6[&] *1*	100[&]	1481.06	10⁺				
2044.78	(1⁺)	401.44 *20*	1.44 *16*	1643.43	1⁻				
		1956.48 *15*	64 *4*	88.349	2⁺	(M1,E2)[f]			I_γ: 58 *7* in (γ,γ′) deduced from R_{exp}.
		2044.87 *15*	100 *8*	0.0	0⁺	(M1,E2)[f]			
2048.48	(2,3,4⁻)	146.28[&] *5*	39[&]	1902.28	(3⁻,4⁻,5⁻)				
		265.15[&] *7*	65[&]	1783.79	(7)⁻				
		337.23[&] *8*	100[&]	1710.44	(3⁻)	(M1+E2)[g]		0.10 *5*	
2066.25	(1,2,3)⁺	361.76 *20*	3.9 *6*	1704.60	(2⁺)				
		474.64[l] *8*	10.0[l] *6*	1591.51	(4⁺)				
		1977.85 *15*	100 *6*	88.349	2⁺	(M1,E2)[f]			
		2066.28 *16*	≤8.1	0.0	0⁺				
2085.68	(9⁻)	155.0[l&] *5*	≤91[l&]	1930.78	(8⁻)				
		287.69[&] *2*	≤182[&]	1797.99	(7)⁻				
		386.3[&] *6*	100[&]	1699.92	(8⁺)				
2085.83	(5,6,7)⁺	1088.1[&] *2*	45[&]	997.73	8⁺				

$^{176}_{72}Hf_{104}$-13

Adopted Levels, Gammas (continued)

γ(^{176}Hf) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[i]	Comments
2085.83	(5,6,7)$^+$	1489.0[&] *5*	100[&]	596.82	6$^+$	M1+E2[g]		
2096.8	(5,6,7)$^+$	1100[&] *1*	30[&]	997.73	8$^+$			
		1499.8[&] *5*	100[&]	596.82	6$^+$	(M1)[g]		
2106.5	(7)$^+$	1108.7[&] *5*	42[&]	997.73	8$^+$	[g]		Mult.: E1,E2 in (α,2nγ). Level scheme requires (M1+E2).
		1509.7[&] *8*	100[&]	596.82	6$^+$	(M1+E2)[g]		
2112.89	(8$^+$)	412.9[&] *2*	100[&]	1699.92	(8$^+$)			
		607.5[&] *5*	87[&]	1505.81	7$^+$			
2116.8	(7$^+$)	1520.0[@] *3*	100	596.82	6$^+$			Mult.: E1 deduced in (α,2nγ) is not consistent with J^π=(7$^+$) for 2116.8 level.
2136.42	(9)$^-$	352.4[&] *3*	≈18[&]	1783.79	(7)$^-$			
		655.3[&] *5*	≈14[&]	1481.06	10$^+$			
		1139.4[&] *5*	100[&] *20*	997.73	8$^+$	E1[g]		
2147.62	(10$^+$)	233.54[&] *10*	40[&]	1914.13	(9$^+$)	(M1+E2)[g]	0.28 *11*	
		447.66[&] *9*	100[&]	1699.92	(8$^+$)	(E2)[g]	0.0258	
2160.5		196.3[@] *5*	100	1964.2	(5,6,7)$^-$			
2172.9?		667.1[n] *5*	100	1505.81	7$^+$			
2173.8	(7$^+$)	1577.0[@] *8*	100	596.82	6$^+$			
2194.02	(10$^-$)	163.0[&] *2*	20[&]	2031.05	10$^-$	(M1+E2)[g]	0.81 *22*	
		180[&] *1*	12.0[&]	2014.27	(9)$^-$			
		334.3[&] *5*	20[&]	1860.08	(8)$^-$			
		408.7[&] *3*	100[&]	1785.09	9$^-$	(M1)[g]	0.084	
2258.7	(6$^-$,7$^-$,8$^-$)	460.7[@] *5*	100	1797.99	(7)$^-$	(M1)[g]	0.0612	
2261.55	(10$^-$)	330.77[@] *8*	100	1930.78	(8$^-$)	(E2)[g]	0.0598	
2265.27	(2)$^-$	315.50 *15*	10.7 *14*	1949.71				
		467.4[@n] *3*		1797.99	(7)$^-$			
		479.14 *10*	3.9 *5*	1786.11				
		543.18 *11*	10.7 *7*	1722.05	1$^-$			
		555.2 *2*	1.9 *4*	1710.44	(3$^-$)			
		819.49 *10*	34 *3*	1445.79	3$^+$			
		861[l] *1*	≤5.4[l]	1404.56	4$^-$			
		923.94 *8*	100 *7*	1341.31	2$^+$	E1[f]		
		951.86 *10*	9.3 *14*	1313.31	3$^-$			
		1017.58 *11*	15.7 *21*	1247.70	2$^-$			
2280.83	(2)	2192.33 *20*	100 *8*	88.349	2$^+$			I_γ: 69 *25* in (γ,γ') deduced from R_{exp}.
		2280.6 *2*	79 *6*	0.0	0$^+$			

Adopted Levels, Gammas (continued)

γ(^{176}Hf) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	δ[k]	α[i]	Comments
2284.8	(8$^+$)	1287.1[m@] 5	100[me]	997.73	8$^+$				
2293.85	11$^-$	100[a]	0.9[a]	2194.02	(10$^-$)				
		262.78[&] 6	100[&]	2031.05	10$^-$	(M1)[g]		0.273	
		508.9[&] 5	39[&]	1785.09	9$^-$				
2294.8	(10)$^+$	361.9[&] 8	20[&]	1932.7	(8)$^+$				
		813.8[&] 3	60[&]	1481.06	10$^+$	E0+E2(+M1)[g]		[j]	
		1297.2[&] 8	100[&]	997.73	8$^+$				
2304.7	(8$^+$)	1307.0[@] 8	100	997.73	8$^+$	[g]			Mult.: Reported (E1,E2) in (α,2nγ). Level scheme requires (E2).
2307.76		450.94 13	5.7 9	1856.99	(2)$^-$				
		540.27 13	20 4	1767.52	2$^-$,3$^-$				
		994.46[l] 12	≤18.5[l]	1313.31	3$^-$				
		2219.49 20	100 8	88.349	2$^+$				
		2307.7 2	69 6	0.0	0$^+$				
2308.34	1$^-$,2$^-$,3$^-$	350.18 20	63 5	1958.18	2$^-$	M1(+E2)[f]	0.56	0.108	
		358.72 20	75 6	1949.71					
		383.6 2	40 4	1924.56	(2,3)$^-$				
		445.52[l] 8	<42[l]	1862.80	1$^+$				
		665.01 12	46 13	1643.43	1$^-$				
		730.7 1	25 3	1577.61	(3$^+$)				
		967.06 9	100 13	1341.31	2$^+$				
2318.7	(9$^+$)	404.7[&] 6	80[&]	1914.13	(9$^+$)				
		618.5[&] 8	100[&]	1699.92	(8$^+$)				
2361.0	(1)	2361[#@]	100	0.0	0$^+$				
2398.97	(11$^+$)	251.36[&] 10	53[&]	2147.62	(10$^+$)				
		484.8[&] 2	100[&]	1914.13	(9$^+$)				
2399.01	(11$^-$)	105.0[&] 2	25[&]	2293.85	11$^-$				
		368.1[&] 2	100[&]	2031.05	10$^-$				
		385.1[a]	9.9[a]	2014.27	(9)$^-$				
2405.35	1	480.83 9	5.9 8	1924.56	(2,3)$^-$				
		551.4 2	3.8 7	1853.96	(3$^+$,4$^+$,5$^+$)				
		1178.5 2	7.7 13	1226.63	2$^+$				
		2317.0 2	51 4	88.349	2$^+$				
		2405.2 2	100 8	0.0	0$^+$				
2432.34	$^-$	507.79 15	100 8	1924.56	(2,3)$^-$	M1[f]		0.0477	
		638.83 8	13.9 11	1793.61					

Adopted Levels, Gammas (continued)

γ(^{176}Hf) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[i]	Comments
2432.34	–	647.0[@ n] *8*		1785.09	9^-			
		1052.7 *2*	3.7 *4*	1379.38	2^+			
		1090.94 *13*	5.2 *7*	1341.31	2^+			
		1184.55 *13*	7.5 *11*	1247.70	2^-			
2446.9		1448.0[@ n] *6*	100	997.73	8^+			
2452.47		861.0[l] *1*	<104[l]	1591.51	(4^+)			
		2162.1 *2*	100 *11*	290.18	4^+			
2470.84	2^-	521.3 *1*	8 *4*	1949.71				
		546.53 *10*	15.6 *13*	1924.56	$(2,3)^-$	(M1)[f]	0.0395	
		677.09[l] *8*	<9.4[l]	1793.61				
		760.4 *2*	0.49 *8*	1710.44	(3^-)			
		798.5 *2*	1.38 *24*	1672.34	$(1)^+$			
		893.3 *2*	0.76 *19*	1577.61	(3^+)			
		1066.20 *9*	18.9 *15*	1404.56	4^-			
		1157.41 *10*	100 *8*	1313.31	3^-	M1[f]		
		1222.95 *10*	59 *5*	1247.70	2^-	E2+M1+E0[f]	0.042	α: experimental value from ^{176}Ta ε decay.
2482.87	(1)	533.23 *16*	52 *17*	1949.71				
		570.76[l] *10*	<370[l]	1912.02	2^+			
		626.1 *2*	13 *2*	1856.99	$(2)^-$			
		664.07 *10*	70 *9*	1818.92	$(0)^-$			
		1333.1 *2*	30 *8*	1149.94	0^+			
		2394.6 *2*	100 *8*	88.349	2^+			
		2482.8 *2*	70 *6*	0.0	0^+			
2514.0	$1^{(+)}$	2425.6[c]	33[c] *8*	88.349	2^+			
		2514[c]	100[c]	0.0	0^+			
2530.0	1	2441.6[c]	84[c] *19*	88.349	2^+			
		2530[c]	100[c]	0.0	0^+			
2540.9?	(10^+)	626.8[@] *5*	100	1914.13	(9^+)			I_γ: complex.
2548.0	1	2459.6[c]	100[c] *24*	88.349	2^+			
		2548[c]	88[c]	0.0	0^+			
2563.54	12^-	164.3[a]	16[a]	2399.01	(11^-)			
		269.64[&] *18*	100[&]	2293.85	11^-			
		369.9[a]	8.5[a]	2194.02	(10^-)			
		533.1[&] *7*	91[&]	2031.05	10^-			
2568.45		537.4[&] *2*	100[&]	2031.05	10^-			
		554.3[&] *5*	100[&]	2014.27	$(9)^-$			
		783[&] *1*	57[&]	1785.09	9^-			
2602.16		196.82 *14*	3.7 *10*	2405.35	1			

$^{176}_{72}Hf_{104}$-16

Adopted Levels, Gammas (continued)

γ(^{176}Hf) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[i]	Comments
2602.16		2513.82 *20*	100 *8*	88.349	2^+			
		2602.15 *20*	52 *6*	0.0	0^+			
2638.1	(12^-)	238.8[a]	5.3[a]	2399.01	(11^-)			
		344.3[@] *5*	100	2293.85	11^-			
		444.4[a]	14.9[a]	2194.02	(10^-)			
		607.1[a]	18.4[a]	2031.05	10^-			
2646.6	(14^+)	611.9[@] *3*	100	2034.66	(12^+)			
2690.0	1	2601.6[c]	94[c] *14*	88.349	2^+			
		2690[c]	100[c]	0.0	0^+			
2722.0	$1^{(+)}$	2633.6[c]	41[c] *5*	88.349	2^+			
		2722[c]	100[c]	0.0	0^+			
2762.51		454.63 *9*	9.4 *15*	2307.76				
		1612.63 *12*	94 *8*	1149.94	0^+			
		2674.2 *2*	100 *8*	88.349	2^+			
		2762.8 *2*	26 *4*	0.0	0^+			
2791.62		386.1 *2*	6.7 *7*	2405.35	1			
		833.5[l] *1*	<20.9[l]	1958.18	2^-			
		841.5 *2*	12 *3*	1949.71				
		1148.3 *2*	12.7 *22*	1643.43	1^-			
		1346.08 *25*	19 *4*	1445.79	3^+			
		1450.4 *1*	100 *8*	1341.31	2^+			
		1543.73 *15*	70 *6*	1247.70	2^-			
2817.55	$(2)^+$	960.77 *12*	10.0 *14*	1856.99	$(2)^-$			
		1112.9 *2*	6.7 *7*	1704.60	(2^+)			
		1174.17 *10*	27.1 *22*	1643.43	1^-			
		1239.86[l] *12*	<15.0[l]	1577.61	(3^+)			
		1371.75 *12*	20.0 *16*	1445.79	3^+			
		1412.84[l] *11*	<15.0[l]	1404.56	4^-			
		1438.1 *3*	3.9 *9*	1379.38	2^+			
		1476.18 *10*	63 *5*	1341.31	2^+	E2[f]		
		1504.24 *10*	100 *14*	1313.31	3^-			
2827.0	13^-	189.0[a] *calc*	18.2[a]	2638.1	(12^-)			
		263.4[a] *calc*	7.2[a]	2563.54	12^-			
		427.7[a] *calc*	33[a]	2399.01	(11^-)			
		533.1[a] *7*	100[a]	2293.85	11^-			
2831.0	1	2831[#]		0.0	0^+			
2865.8	14^-	38.7[a]	11.4[a]	2827.0	13^-	(M1)[h]		B(M1)(W.u.)=6.1×10^{-8} *6*
		227.9[a]	22.2[a]	2638.1	(12^-)	(E2)[h]	0.189	B(E2)(W.u.)=4.97×10^{-6} *18*

$^{176}_{72}Hf_{104}$-17

Adopted Levels, Gammas (continued)

γ(^{176}Hf) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[i]	Comments
2865.8	14⁻	302.2[a]	100[a]	2563.54	12⁻	(E2)[h]	0.0781	B(E2)(W.u.)=5.33×10^{-7} *17*
2878.21		833.5[l] *1*	≤18.4[l]	2044.78	(1⁺)			
		1021.0 *5*	9 *4*	1856.99	(2)⁻			
		1432.56 *11*	21.1 *17*	1445.79	3⁺			
		1536.62 *11*	93 *8*	1341.31	2⁺			
		1564.95 *11*	100 *8*	1313.31	3⁻			
2885.52	1(+)	577.3 *1*	31 *3*	2308.34	1⁻,2⁻,3⁻			
		604.6[l] *1*	≤17.8[l]	2280.83	(2)			
		1213.20 *11*	100 *8*	1672.34	(1)⁺			
		1637.60 *18*	56 *11*	1247.70	2⁻			
		2797.14 *20*	44 *4*	88.349	2⁺			I_γ: 72 *13* in (γ,γ′) deduced from R_{exp}.
		2885.55 *22*	74 *6*	0.0	0⁺			
2905.67		303.55 *15*	32 *3*	2602.16				
		434.85 *10*	68 *7*	2470.84	2⁻			
		839.25 *11*	100 *15*	2066.25	(1,2,3)⁺			
		861.0[l] *1*	<58[l]	2044.78	(1⁺)			
		981.0 *3*	71 *27*	1924.56	(2,3)⁻			
		2817.0 *4*	65 *9*	88.349	2⁺			
		2905.7 *4*	31 *5*	0.0	0⁺			
2912.26	(0)⁻	604.6[l] *1*	<0.57[l]	2307.76				
		867.4 *1*	0.75 *10*	2044.78	(1⁺)			
		962.74[l] *14*	<1.19[l]	1949.71				
		1190.22 *10*	100 *8*	1722.05	1⁻	M1[f]		
		1239.86[l] *12*	<2.50[l]	1672.34	(1)⁺			
		1268.78 *10*	29.3 *23*	1643.43	1⁻	M1[f]		Measured E2+M1 multipolarity. Level scheme requires M1.
		2823.6 *4*	1.19 *24*	88.349	2⁺			
2920.26	1⁻	1198.15 *11*	1.49 *25*	1722.05	1⁻			
		1540.82 *11*	8.1 *6*	1379.38	2⁺			
		1693.7 *2*	11.9 *9*	1226.63	2⁺			
		2832.0 *2*	100 *8*	88.349	2⁺	E1[f]		
		2920.41 *20*	50 *4*	0.0	0⁺	E1[f]		
2921.03	1⁺,2⁺	318.8 *3*	2.5 *5*	2602.16				
		962.74[l] *14*	≤12.0[l]	1958.18	2⁻			
		1064.03 *12*	19.3 *24*	1856.99	(2)⁻			
		1579.9 *2*	63 *6*	1341.31	2⁺	M1+E2[f]		
		1673.40 *16*	100 *24*	1247.70	2⁻			
2940.0	1(+)	2851.6[c]	37[c] *6*	88.349	2⁺			
		2940[c]	100[c]	0.0	0⁺			

$^{176}_{72}Hf_{104}$-18

Adopted Levels, Gammas (continued)

γ(^{176}Hf) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[i]	Comments
2944.17	2⁻	461.41 *8*	1.28 *23*	2482.87	(1)			
		473.21 *7*	5.9 *5*	2470.84	2⁻			
		636.6[l] *1*	<1.10[l]	2307.76				
		678.85 *8*	4.4 *4*	2265.27	(2)⁻	M1[f]	0.0226	
		994.46[l] *12*	<1.17[l]	1949.71				
		1366.49 *11*	4.7 *4*	1577.61	(3⁺)			
		1630.83 *10*	38 *3*	1313.31	3⁻	M1[f]		
		1696.55 *13*	100 *8*	1247.70	2⁻	M1[f]		
		2856.1 *5*	0.26 *10*	88.349	2⁺			
2969.07	(2⁻)	660.67 *8*	33 *3*	2308.34	1⁻,2⁻,3⁻			
		1011.1 *3*	9 *3*	1958.18	2⁻			
		1115.0[m] *9*	<137[m]	1853.96	(3⁺,4⁺,5⁺)			I_γ: deduced by evaluator from Iγ(1115γ)/Iγ(156.8γ)=0.85 from the 1404 level in ^{174}Yb(α,2nγ), and Iγ(1115γ)=9.2 *7* for the doublet in ^{176}Ta ε decay.
		1201.48 *10*	100 *7*	1767.52	2⁻,3⁻			
		1258.75 *11*	52 *7*	1710.44	(3⁻)			
		1325.67 *13*	22 *3*	1643.43	1⁻			
		1721.3		1247.70	2⁻			
2994.0	1(+)	2905.6[c]	62[c] *11*	88.349	2⁺			
		2994[c]	100[c]	0.0	0⁺			
3044.0	1(−)	2955.6[c]	100[c] *15*	88.349	2⁺			
		3044[c]	46[c]	0.0	0⁺			
3059.0	1	3059[#]	100	0.0	0⁺			
3080.2	15⁺	214.4[b]	100	2865.8	14⁻	E1[h]	0.0496	B(E1)(W.u.)=0.00010 +*5*−*7*
3098.0	(1)	3098[#]	100	0.0	0⁺			
3107.0	1(+)	3018.6[c]	49[c] *8*	88.349	2⁺			
		3107[c]	100[c]	0.0	0⁺			
3115.0	1(−)	3026.6[c]	100[c] *12*	88.349	2⁺			
		3115[c]	56[c]	0.0	0⁺			
3159.0	1(+)	3070.6[c]	51[c] *8*	88.349	2⁺			
		3159[c]	100[c]	0.0	0⁺			
3160.5	15⁻	294.7[b]	100	2865.8	14⁻	(M1+E2)[h]	0.14 *6*	
3200.0	1	3200[#]	100	0.0	0⁺			
3218.0	1	3218[#]	100	0.0	0⁺			
3222.0	1(+)	3133.6[c]	61[c] *17*	88.349	2⁺			
		3222[c]	100[c]	0.0	0⁺			
3232.0	1(+)	3143.6[c]	59[c] *16*	88.349	2⁺			

$^{176}_{72}Hf_{104}$-19

Adopted Levels, Gammas (continued)

γ(^{176}Hf) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[i]
3232.0	1(+)	3232[c]	100[c]	0.0	0+		
3261.0	1(+)	3172.6[c]	71[c] 8	88.349	2+		
		3261[c]	100[c]	0.0	0+		
3266.2	16+	186.0[b]	100	3080.2	15+	M1[h]	0.708
3306.0	(1)	3306[#]	100	0.0	0+		
3307.7	(16+)	661.1[b]	100	2646.6	(14+)	E2[h]	0.0100
3322.0	1	3322[#]	100	0.0	0+		
3343.0	1	3254.6[c]	100[c] 20	88.349	2+		
		3343[c]	98[c]	0.0	0+		
3361.0	1(−)	3272.6[c]	100[c] 16	88.349	2+		
		3361[c]	54[c]	0.0	0+		
3372.0	1(−)	3283.6[c]	100[c] 21	88.349	2+		
		3372[c]	61[c]	0.0	0+		
3385.0	1	3296.6[c]	74[c] 18	88.349	2+		
		3385[c]	100[c]	0.0	0+		
3406.0	(1)	3406[#]	100	0.0	0+		
3438.0	1	3438[#]	100	0.0	0+		
3454.0	1	3454[#]	100	0.0	0+		
3467.4	16−	307.0[b]		3160.5	15−		
		601.6[b]		2865.8	14−		
3485.0	1	3396.6[c]	100[c] 22	88.349	2+		
		3485[c]	77[c]	0.0	0+		
3490.0	1	3490[#]	100	0.0	0+		
3519.0	(1)	3519[#]	100	0.0	0+		
3540.1	17+	274.0[b]	100	3266.2	16+	M1+E2[h]	0.17 7
3550.0	1(+)	3461.6[c]	44[c] 7	88.349	2+		
		3550[c]	100[c]	0.0	0+		
3580.0	(1)	3580[#]	100	0.0	0+		
3602.0	1	3513.6[c]	71[c] 18	88.349	2+		
		3602[c]	100[c]	0.0	0+		
3608.0	1	3608[#]	100	0.0	0+		
3627.0	1(+)	3538.6[c]	57[c] 14	88.349	2+		
		3627[c]	100[c]	0.0	0+		
3662.0	1(+)	3573.6[c]	30[c] 6	88.349	2+		
		3662[c]	100[c]	0.0	0+		
3671.0	1(+)	3582.6[c]	41[c] 9	88.349	2+		

$^{176}_{72}Hf_{104}$-20

Adopted Levels, Gammas (continued)

γ(^{176}Hf) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[i]
3671.0	$1^{(+)}$	3671[c]	100[c]	0.0	0^+		
3689.0	(1)	3689[#]	100	0.0	0^+		
3695.0	(2)	3695[#]		0.0	0^+		
3722.0	(1)	3722[#]	100	0.0	0^+		
3746.0	1	3657.6[c]	78[c] *21*	88.349	2^+		
		3746[c]	100[c]	0.0	0^+		
3767.0	$1^{(+)}$	3678.6[c]	55[c] *9*	88.349	2^+		
		3767[c]	100[c]	0.0	0^+		
3774.0	1	3774[#]	100	0.0	0^+		
3787.1	17^-	319.7[b]		3467.4	16^-	(M1+E2)[h]	0.11 *5*
		626.6[b]		3160.5	15^-		
3805.0	$1^{(+)}$	3716.6[c]	48[c] *11*	88.349	2^+		
		3805[c]	100[c]	0.0	0^+		
3816.0	$1^{(+)}$	3727.6[c]	36[c] *7*	88.349	2^+		
		3816[c]	100[c]	0.0	0^+		
3824.0	(1)	3824[#]	100	0.0	0^+		
3838.0	$1^{(-)}$	3749.6[c]	100[c] *21*	88.349	2^+		
		3838[c]	66.6[c]	0.0	0^+		
3844.0	(1)	3844[#]	100	0.0	0^+		
3847.4	18^+	307.2[b]		3540.1	17^+	(M1+E2)[h]	0.13 *6*
		581.2[b]		3266.2	16^+		
3856.0	(1)	3856[#]	100	0.0	0^+		
3916.0	(1)	3916[#]	100	0.0	0^+		
4010.5	(18^+)	702.8[b]	100	3307.7	(16^+)	E2[h]	
4120.3	18^-	333.2[b]		3787.1	17^-	(M1+E2)[h]	0.10 *5*
		653.0[bn]		3467.4	16^-		
4179.3	19^+	331.8[b]		3847.4	18^+	(M1+E2)[h]	0.10 *5*
		639.2[b]		3540.1	17^+		
4376.6	$(19)^+$	529.1[b]		3847.4	18^+	(M1)[h]	0.0429
		836.5[b]		3540.1	17^+		
4466.6	(19^-)	346.4[b]		4120.3	18^-		
		679.7[bn]		3787.1	17^-		
4532.2	20^+	352.9[b]	100	4179.3	19^+		
4766.4	$(20)^-$	389.8[b]	100	4376.6	$(19)^+$	E1[h]	0.0115

$^{176}_{72}Hf_{104}$-21

Adopted Levels, Gammas (continued)

γ(^{176}Hf) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[i]	Comments
4826.4	(20$^-$)	360.0[b]	100	4466.6	(19$^-$)			
		706[d]		4120.3	18$^-$			I_γ: not reported.
4863.5	(22)$^-$	37[d]	100	4826.4	(20$^-$)	[E2]		B(E2)(W.u.)=1.44 *20* I_γ: From (^{48}Ca,2nγ) [2001Ch89].
		97.1[b]	25	4766.4	(20)$^-$	E2[h]	4.02	B(E2)(W.u.)=0.00289 *17* I_γ: From (^{48}Ca,2nγ) [2001Ch89].

† From ^{176}Ta ε decay, except otherwise noted.
‡ Weighted averages from ^{176}Ta ε decay and ^{174}Yb(α,2nγ).
# From ^{176}Hf(γ,γ′).
@ From ^{174}Yb(α,2nγ).
& From ^{174}Yb(α,2nγ).
[a] From ^{176}Yb(α,4nγ).
[b] From ^{176}Yb(α,4nγ).
[c] From ^{176}Hf(γ,γ′), Iγ deduced from R_{exp}.
[d] From ^{130}Te(^{48}Ca,2nγ).
[e] Doublet in ^{174}Yb(α,2nγ). Iγ from ^{176}Ta ε decay suggests that most of the intensity deexcites the 1577 level.
[f] From conversion electron data measured in ^{176}Ta ε decay.
[g] From conversion electron data measured in ^{174}Yb(α,2nγ).
[h] From directly measured conversion electron data, conversion coefficients deduced from transition intensity balances, and γ(θ) in ^{176}Yb(α,4nγ).
[i] Conversion coefficients for γ-rays with mixed multipolarities and no δ given are average values for the individual multipolarities, unless otherwise specified.
[j] Experimental value from ^{174}Yb(α,2nγ).
[k] Estimated by evaluator from the deduced α(K)exp in ^{176}Ta ε decay.
[l] Multiply placed with undivided intensity.
[m] Multiply placed with intensity suitably divided.
[n] Placement of transition in the level scheme is uncertain.

$^{176}_{72}Hf_{104}$-22

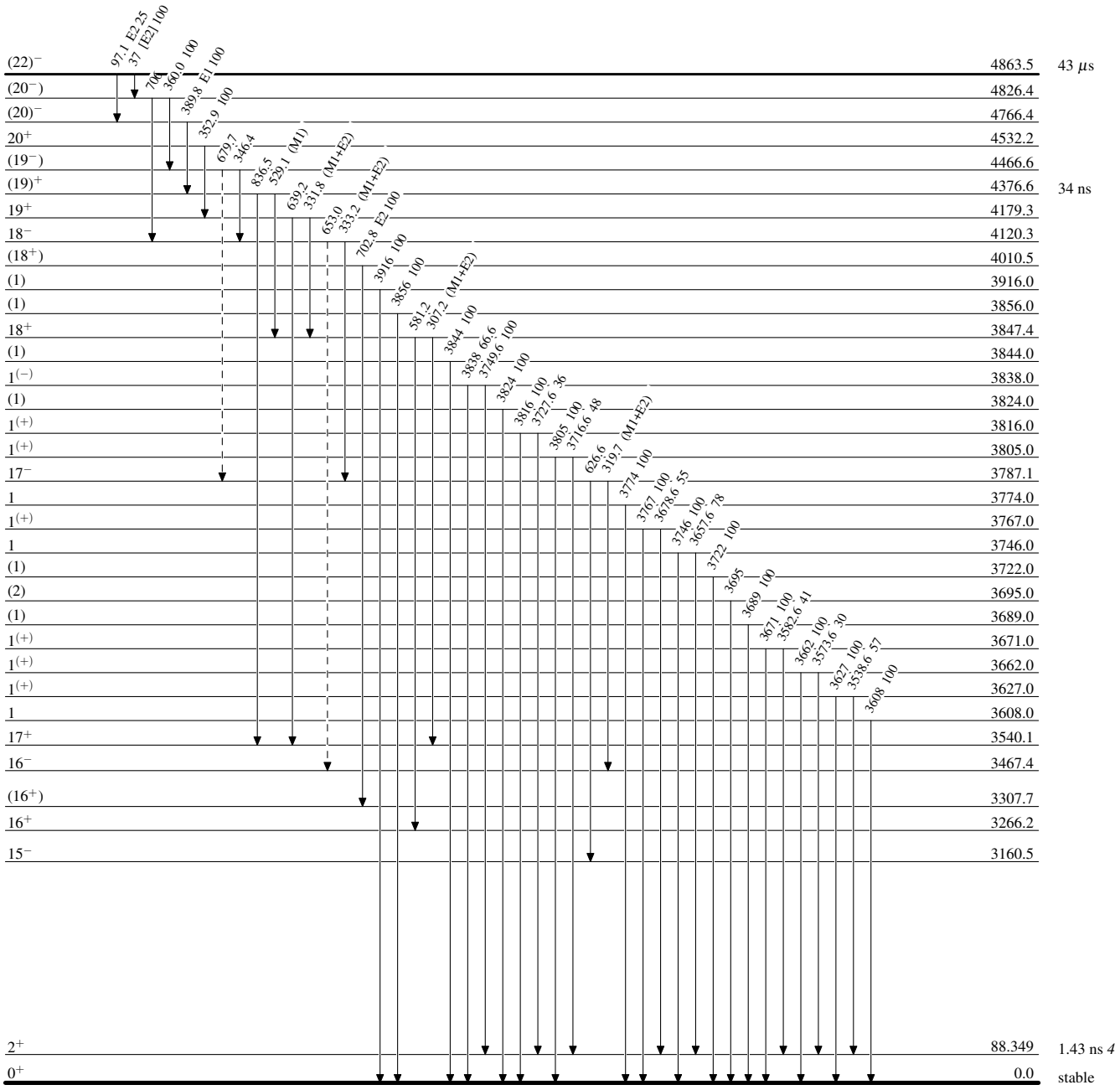
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)

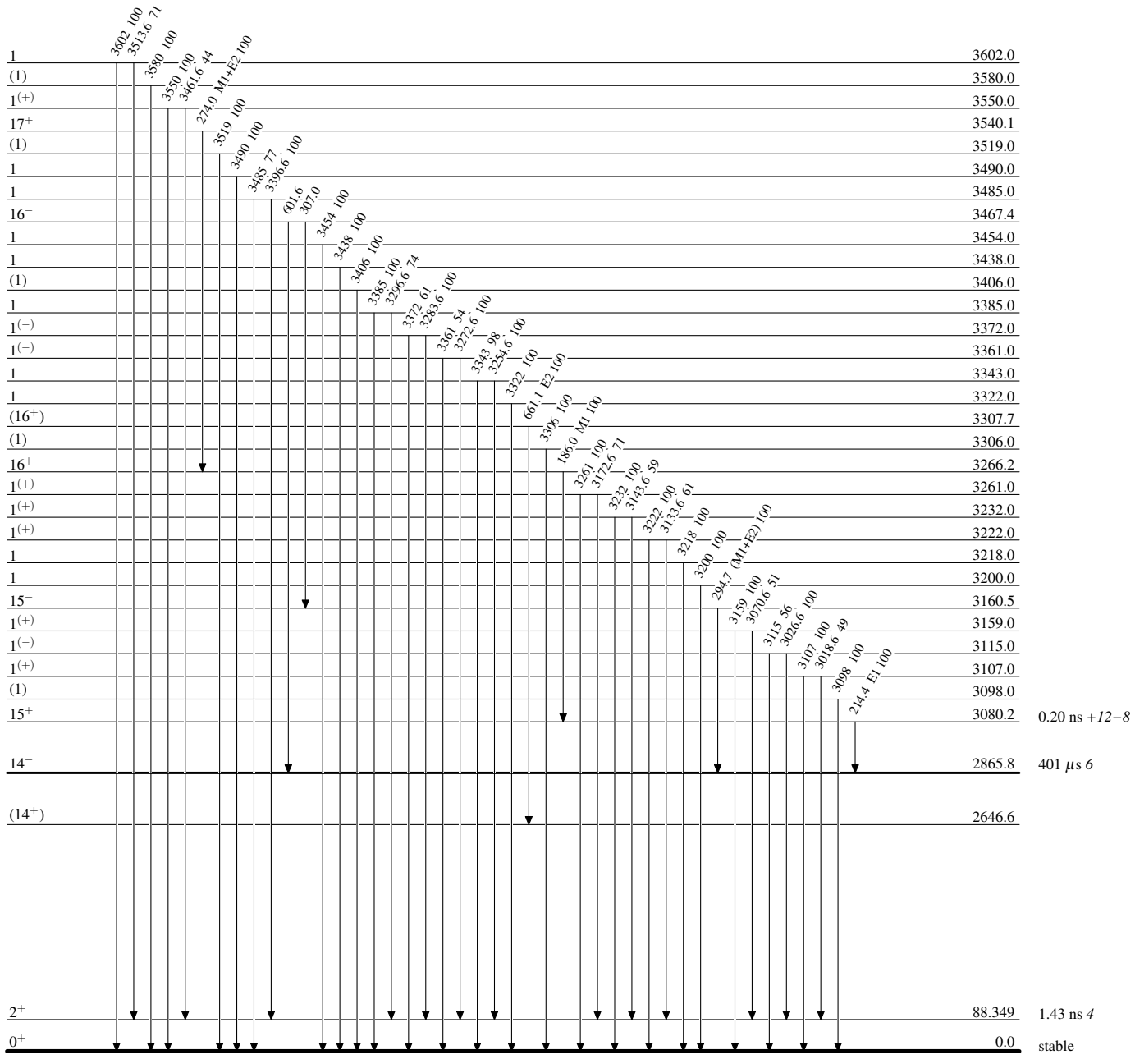


$^{176}_{72}Hf_{104}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

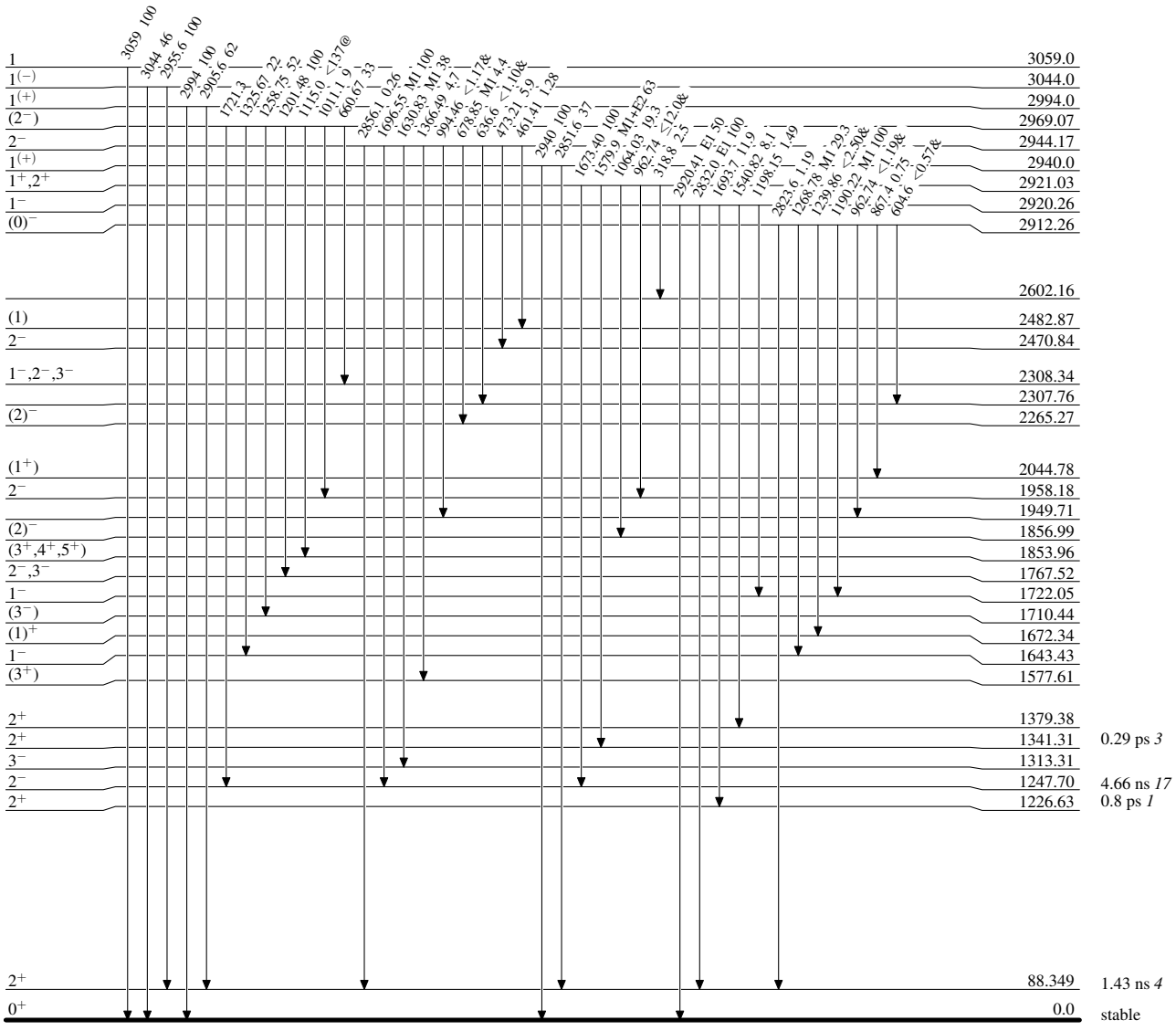


$^{176}_{72}Hf_{104}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

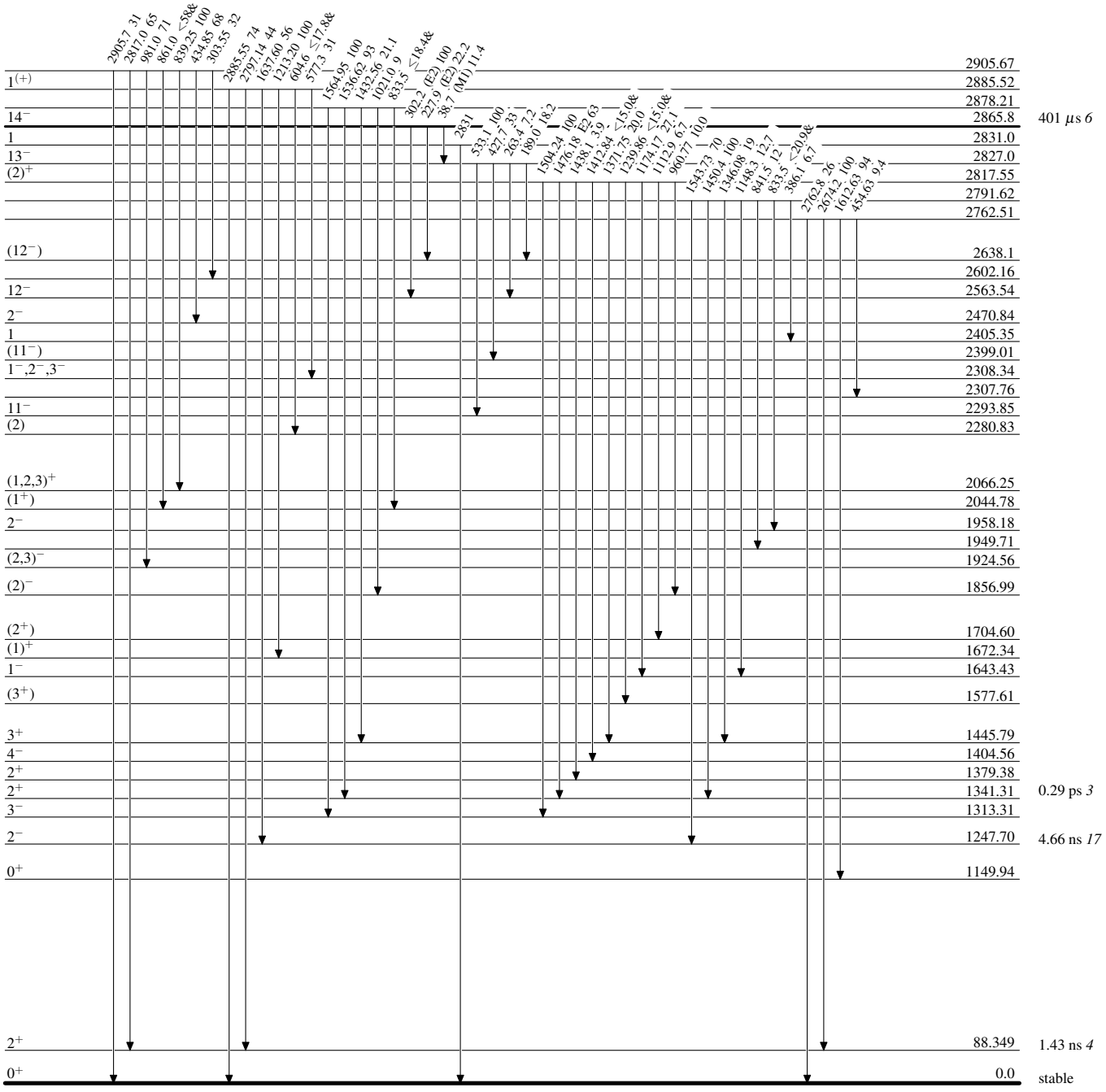


$^{176}_{72}Hf_{104}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

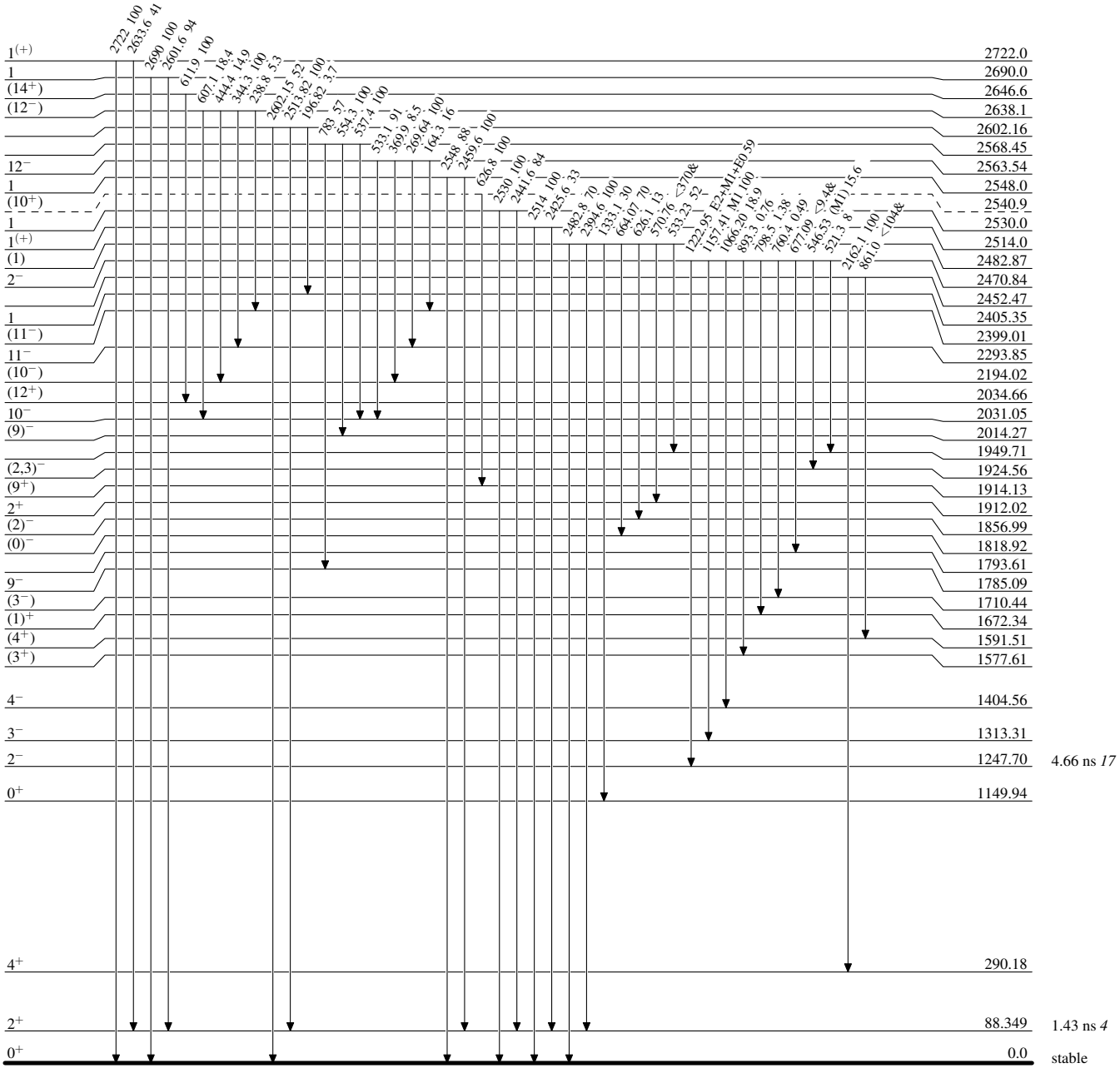


$^{176}_{72}Hf_{104}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided



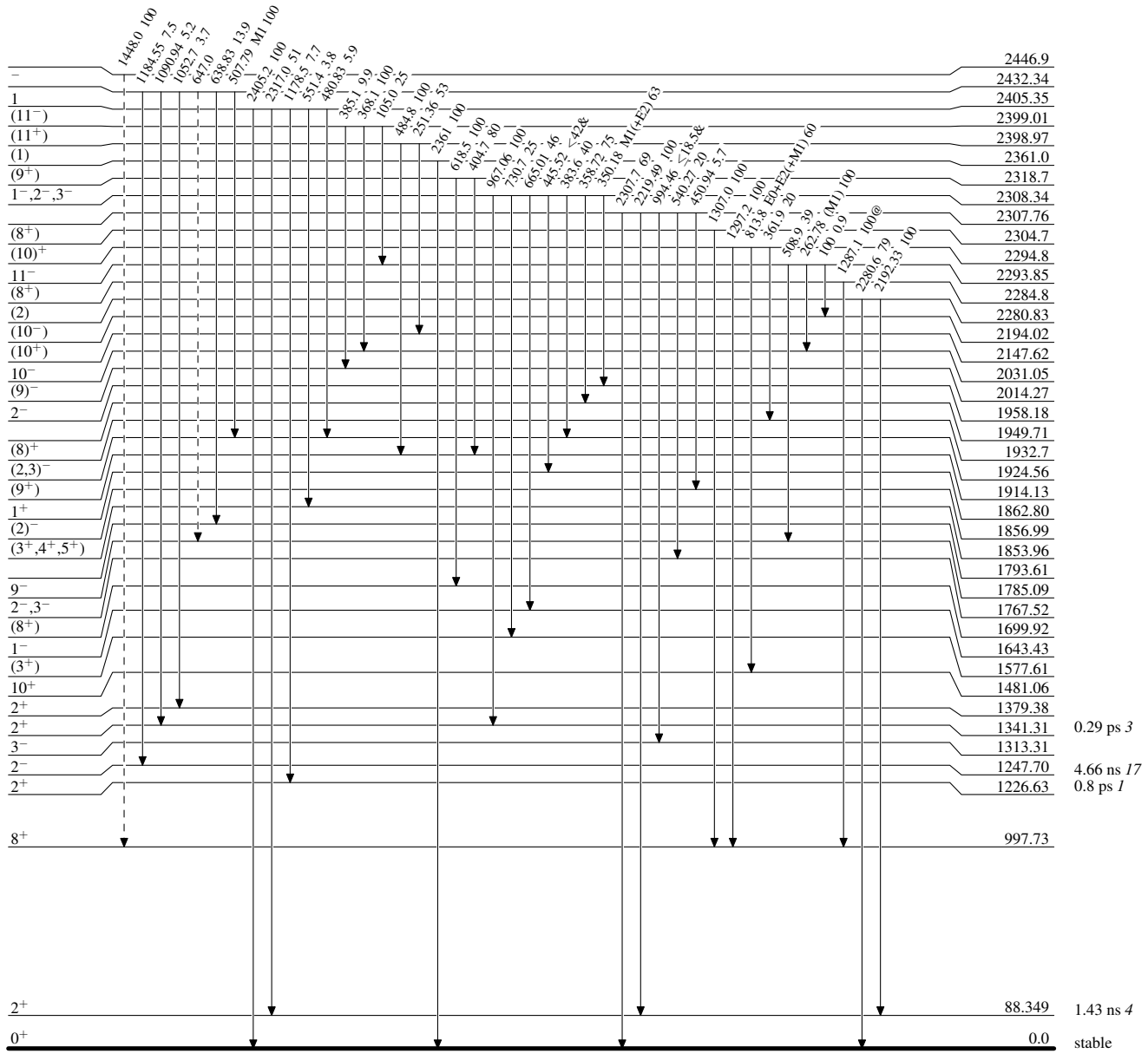
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend

- - - - - - ► γ Decay (Uncertain)



$^{176}_{72}Hf_{104}$

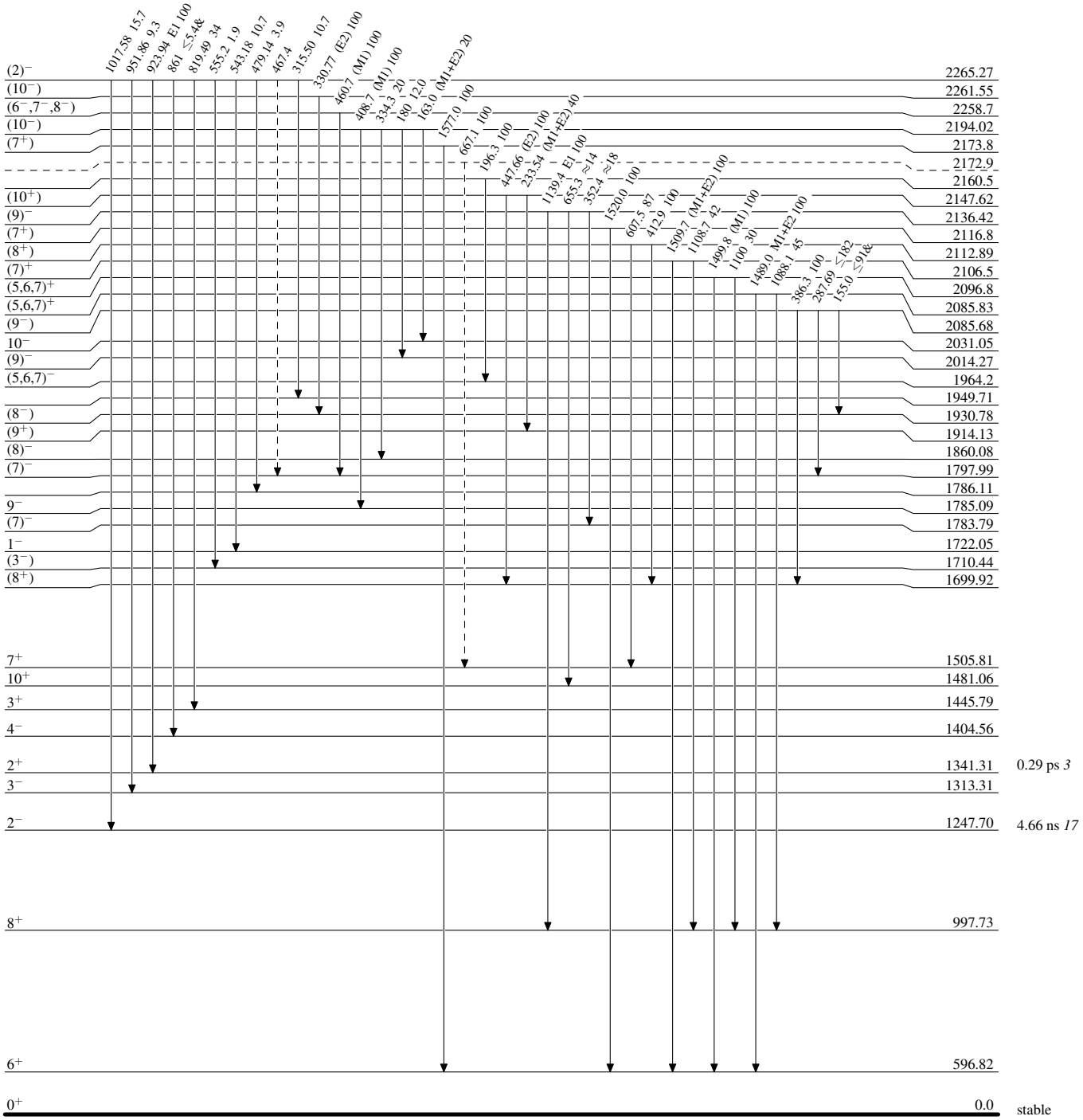
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend

- - - - - - ► γ Decay (Uncertain)



$^{176}_{72}Hf_{104}$

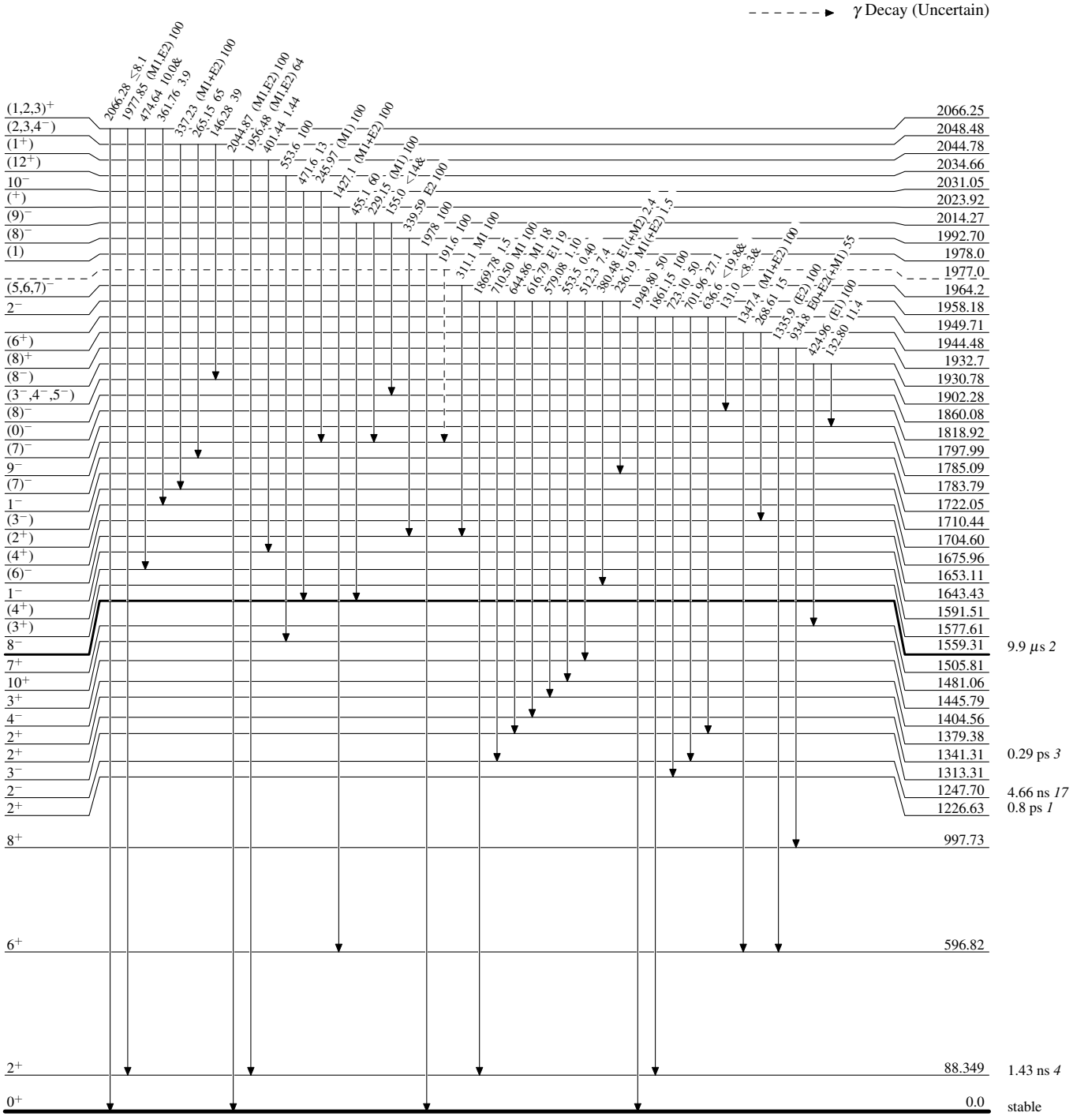
Adopted Levels, Gammas

Level Scheme (continued)

Legend

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

γ Decay (Uncertain)



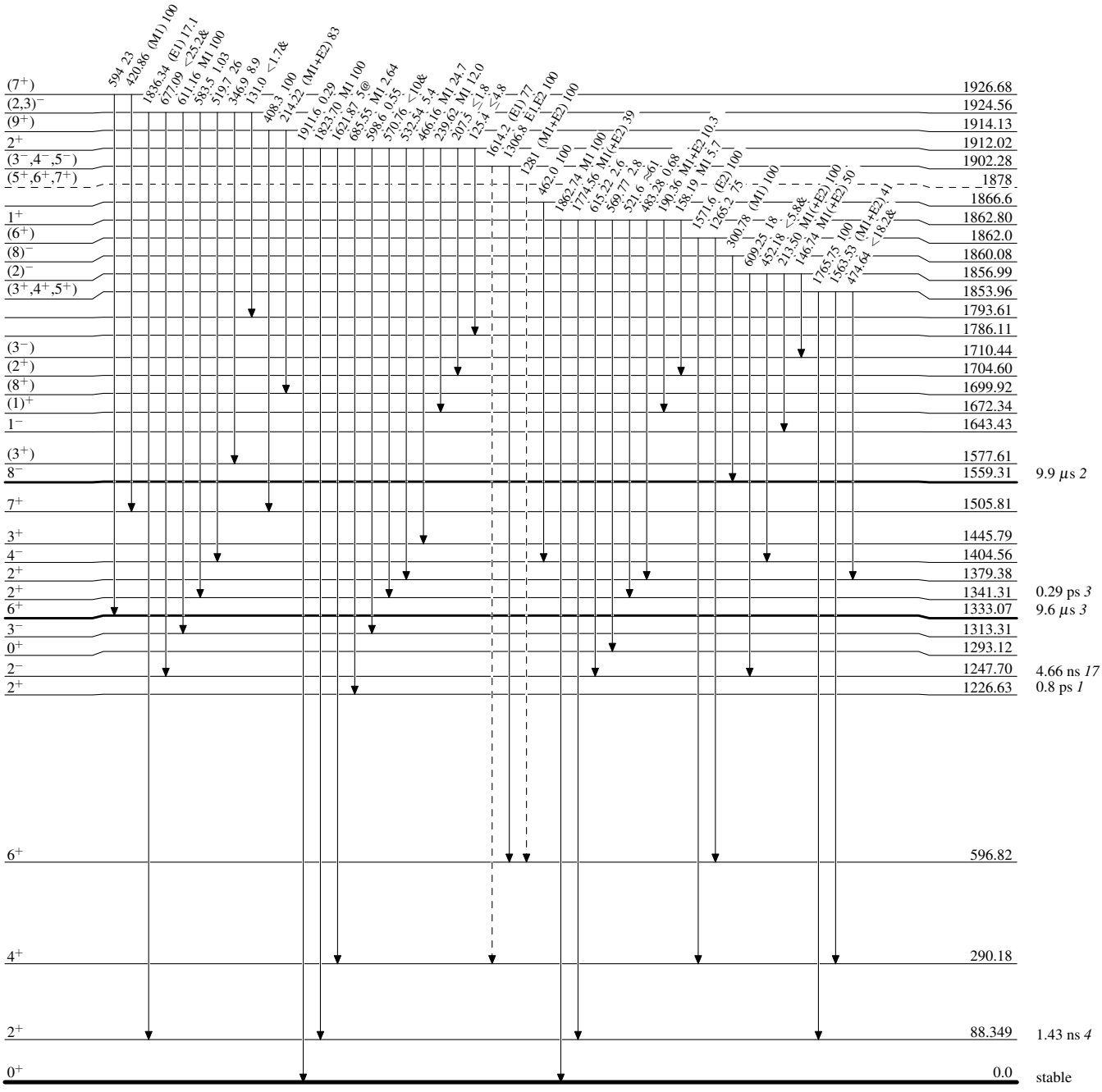
$^{176}_{72}Hf_{104}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend
γ Decay (Uncertain)



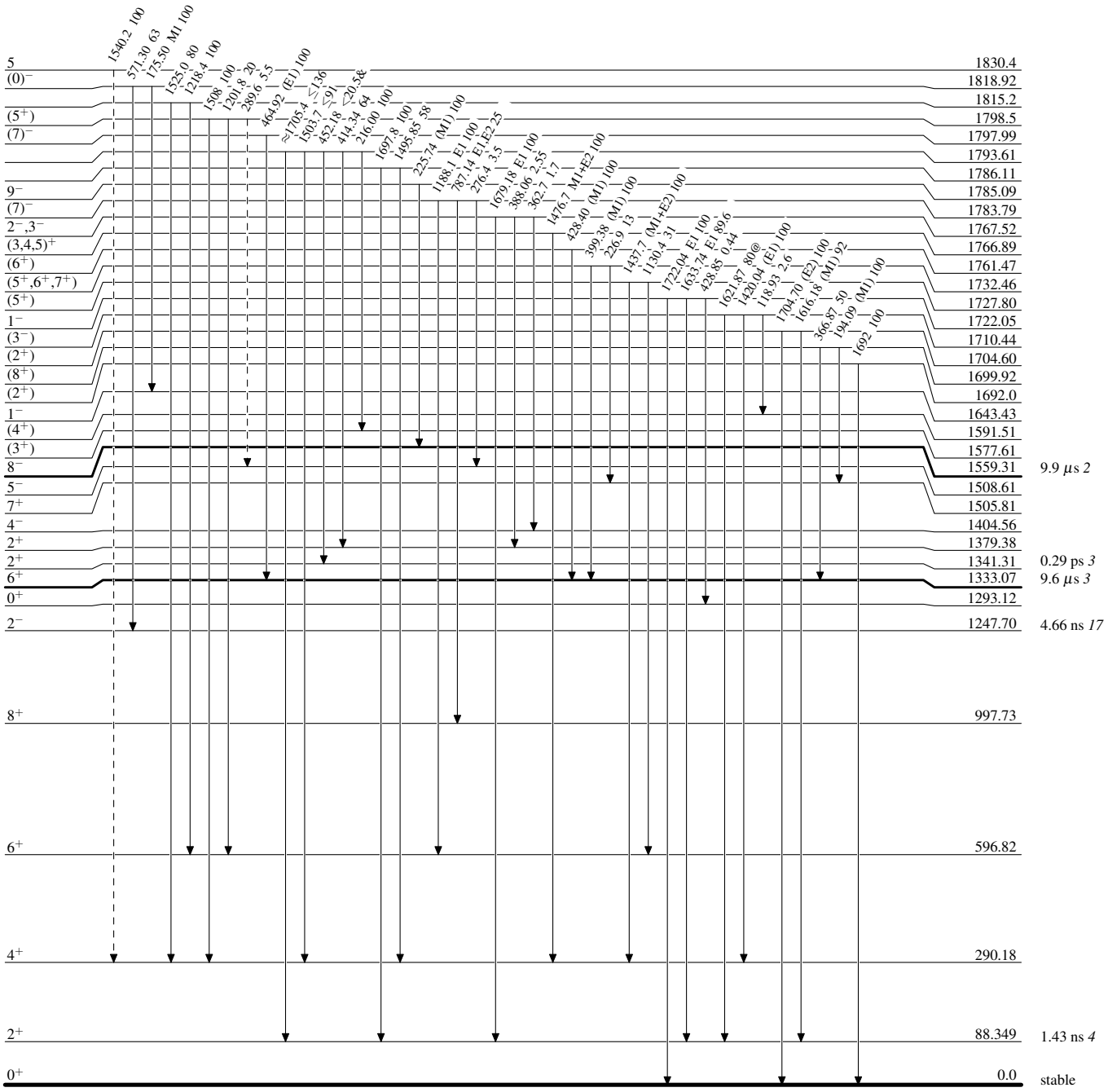
$^{176}_{72}Hf_{104}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend
- - - - - - ► γ Decay (Uncertain)



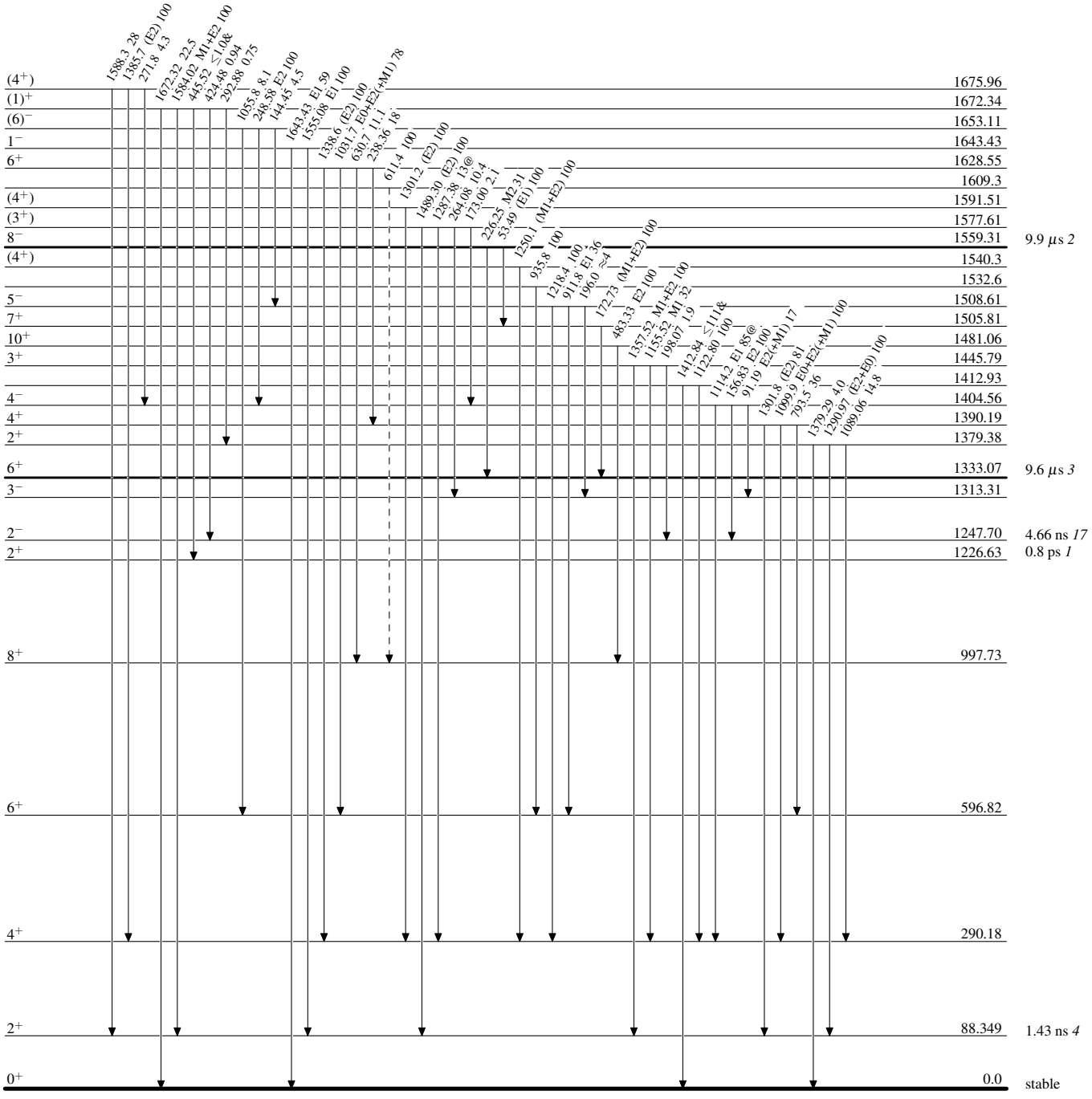
$^{176}_{72}Hf_{104}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend: ------► γ Decay (Uncertain)

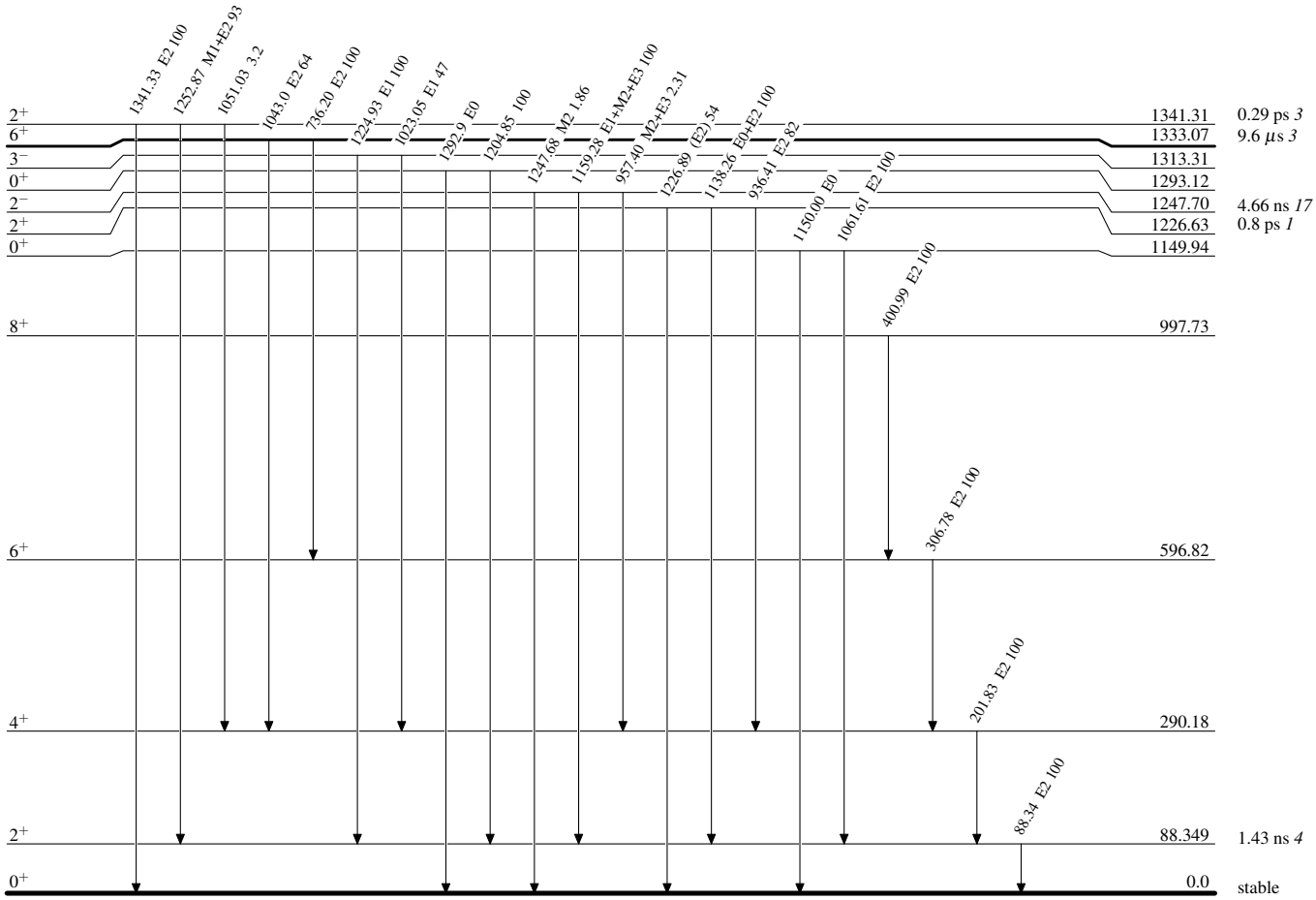


$^{176}_{72}Hf_{104}$

Adopted Levels, Gammas

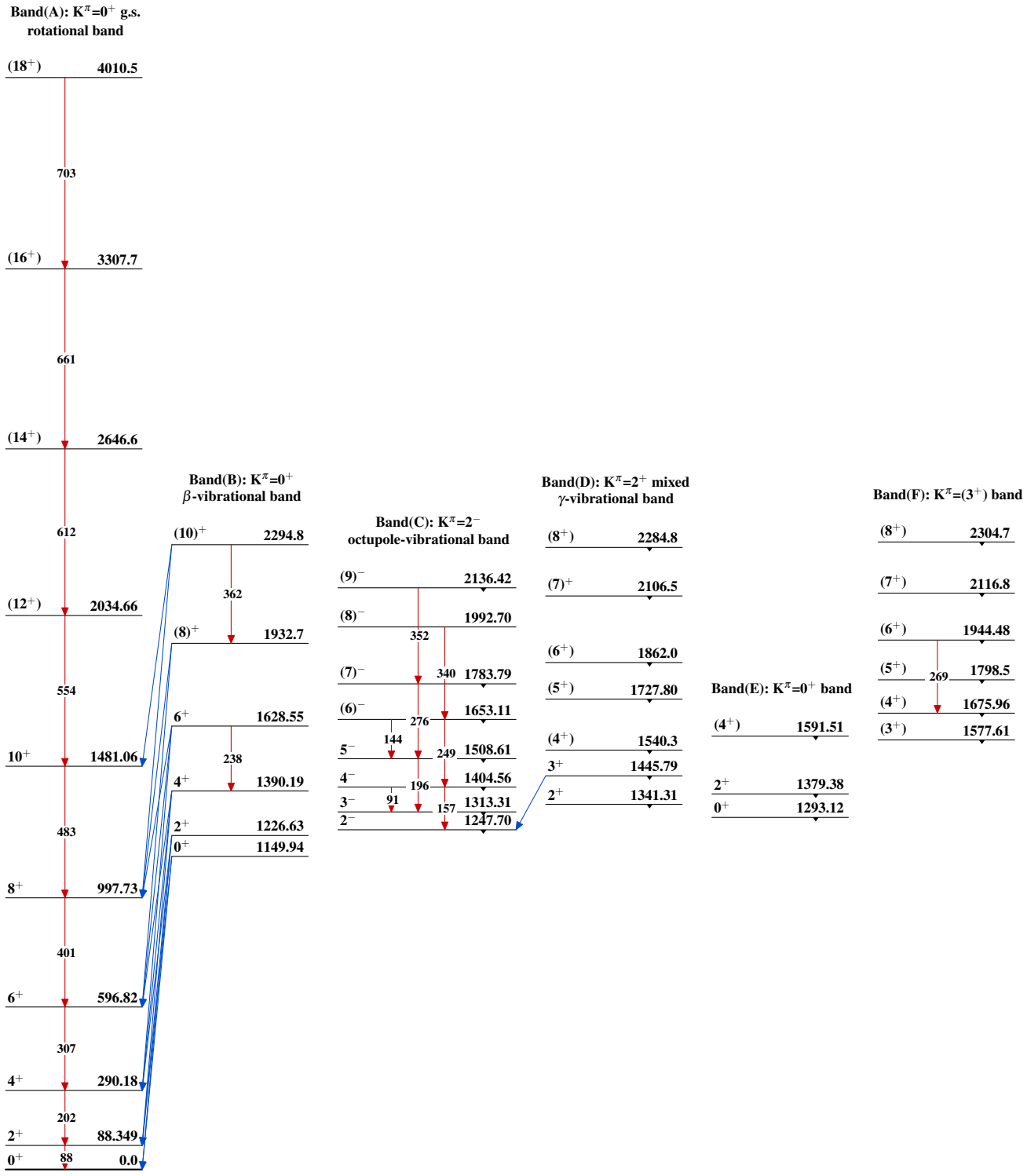
Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided



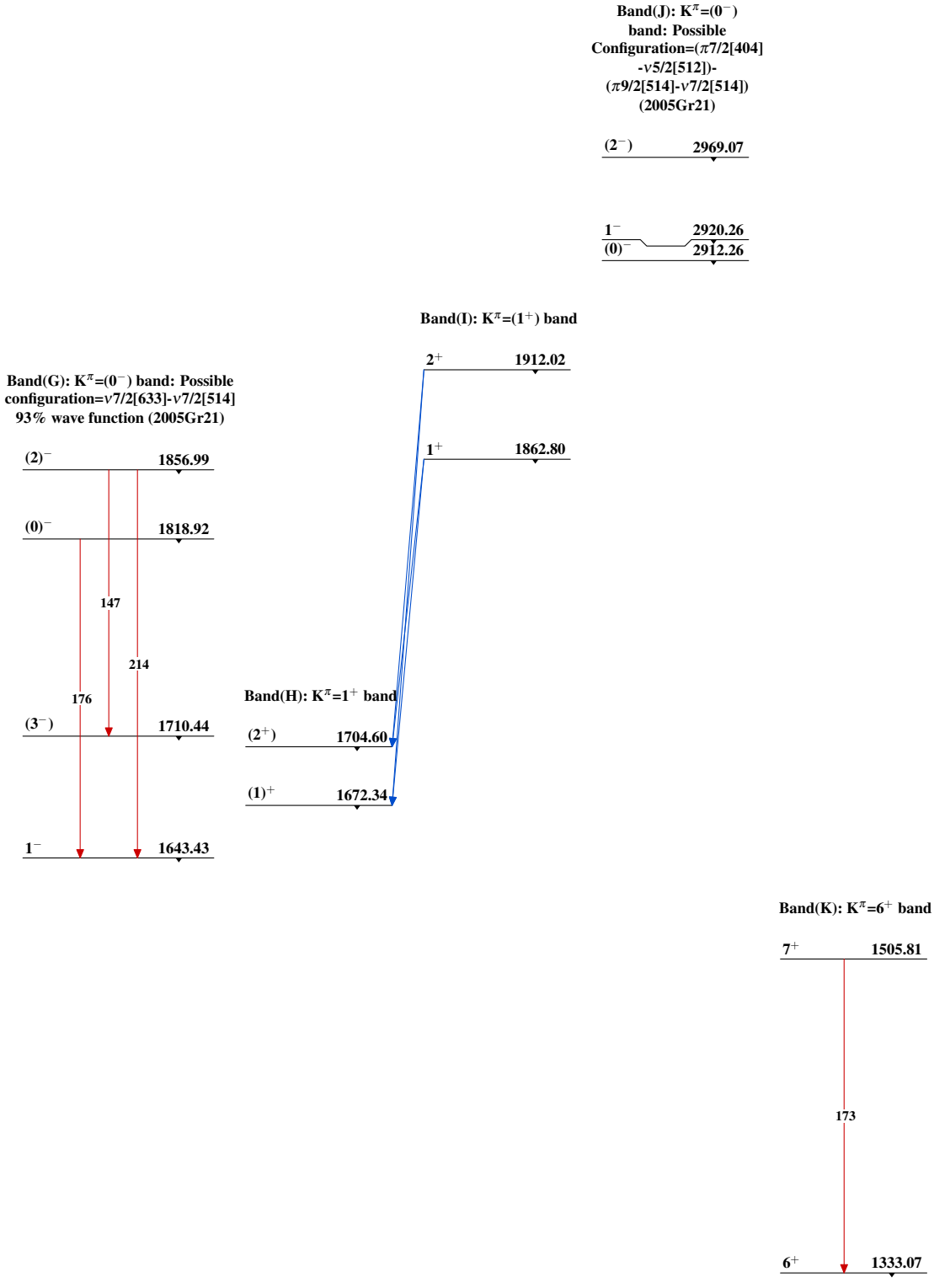
$^{176}_{72}Hf_{104}$

Adopted Levels, Gammas

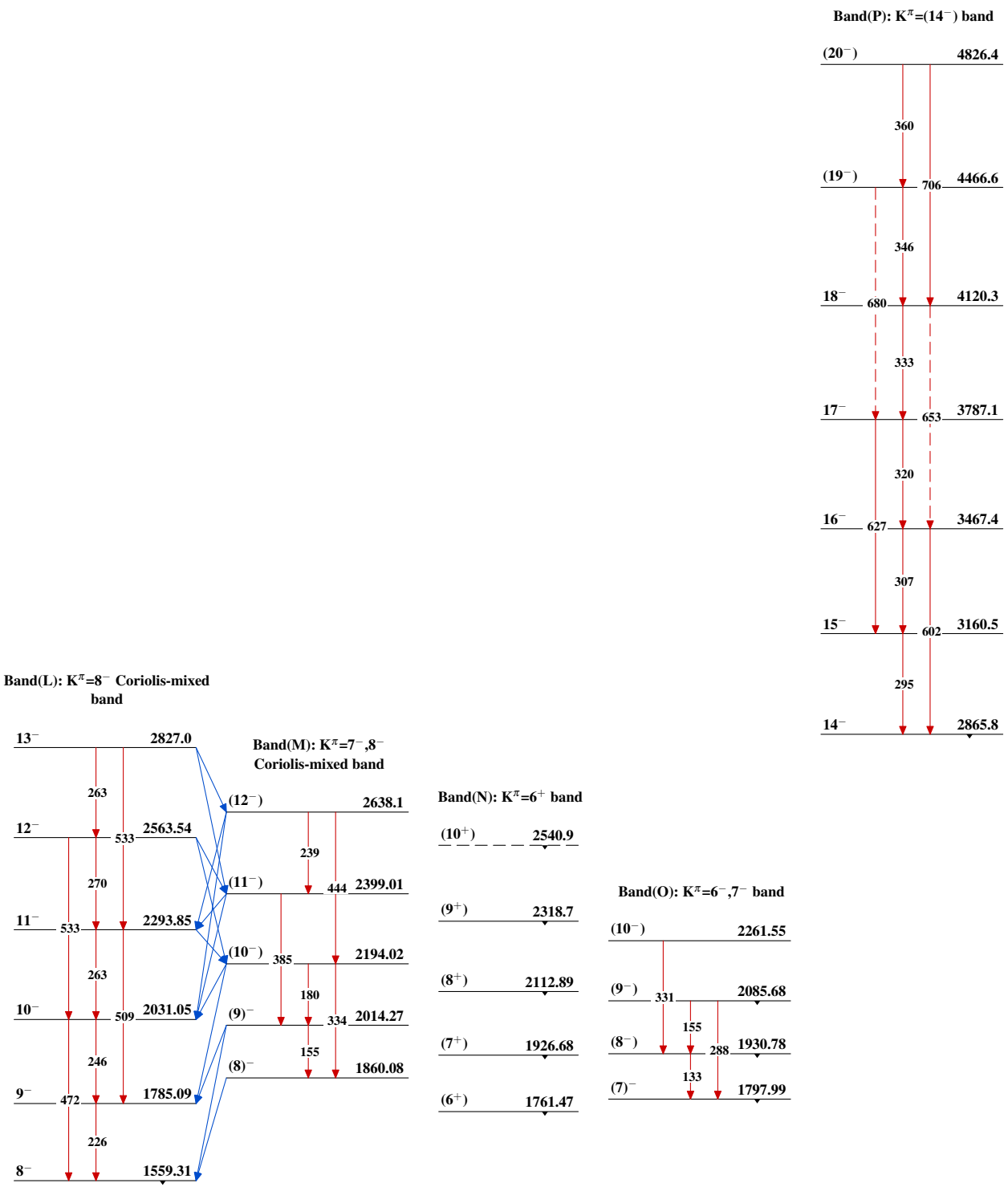


$^{176}_{72}Hf_{104}$

Adopted Levels, Gammas (continued)

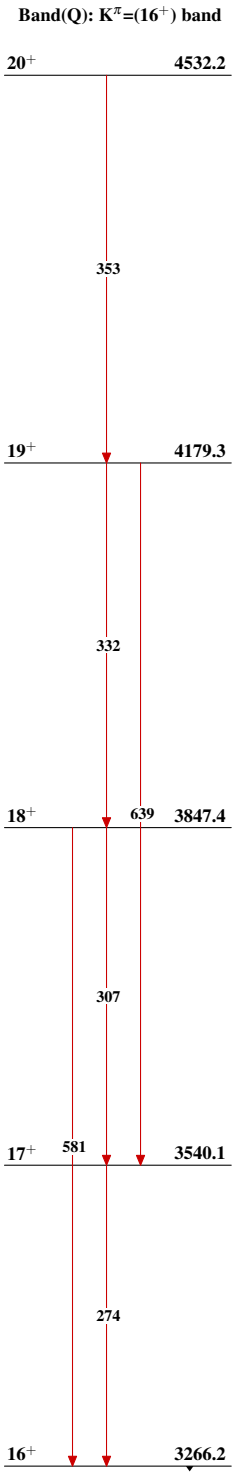


Adopted Levels, Gammas (continued)



$^{176}_{72}Hf_{104}$

Adopted Levels, Gammas (continued)



$^{176}_{72}Hf_{104}$