Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan	NDS 126, 151 (2015)	1-Feb-2015

Q(β^-)=702 *3*; S(n)=6648 *3*; S(p)=5760 *3*; Q(α)=2023 *3* 2012Wa38
S(2n)=14478 syst *52*; S(2p)=13174 *3* (2012Wa38).
Other reactions:
^{9}Be(^{208}Pb,Xγ): 2002Pf01, 2012My01.
^{154}Sm(^{40}Ar,^{14}N): 1983Va10.
^{169}Tm(^{16}O,X): 2011Ya17.
^{179}Ta(n,γ): 1999Sc26.
^{180}Hf(p,n): 1977NoZU, 1981NoZX, 1982No09, 1985BaZA, 1986Ba84, 1987Ra23, 1989LaZS, 2011Ta22.
^{180}Ta(n,n′), ^{180}Ta(n,n′γ): 1975HaYR, 1999Ka03.
^{180}Ta(p,p′), ^{180}Ta(α,α′): 1986Is04, 1997Sc18, 1998Sc36.
^{180}W(n,p): 1975Qa01, 1983Ca23.
^{181}Ta(e,e′n): 1975Ra39.
^{181}Ta(π^+,p), (π^-,p): 1977Ja10, 1977Ja15, 1977ZiZZ, 1980Do07, 1980Mc03, 1981Mc09, 1998HuZY, 1998ZhZJ.
^{181}Ta(n,2n): 1968Bo25, 1969Br01, 1972Mo15, 1973ArZI, 1977Ve07, 1975FrZW, 1975FrZT, 1974FrZG, 1978Da24, 1979Mi11, 1980Mc03, 1980Ry02, 1980Se07, 1981La09, 1982Lu07, 1983AdZY, 1985Lu07, 1985Fa09, 1987Lu05, 1989Pe04, 1989Sc20, 1996Si34, 1999ZhZY, 2007Sh15, 2009Lu09, 2011Zh26, 2011Sv02.
^{181}Ta(pol p,p), (pol p,d): 1978WiZD.
^{181}Ta(p,np): 1971DuZQ, 1973CaXK, 1984Ab05, 1988Ba83.
^{181}Ta(^{15}N,^{16}N): 1966Ar17, 1972Ar35.
^{181}Ta(^{16}O,^{17}O): 1977Vi02, 1982Ma08.
α: Additional information 1.

^{180}Ta Levels

Cross Reference (XREF) Flags

A	^{180}Hf β^- decay (5.53 h)	E	^{180}Hf(^{238}U,Xγ)	I	^{181}Ta(p,d)
B	^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ)	F	^{180}Ta(γ,γ′): target=9$^-$ isomer	J	^{181}Ta(d,t)
C	^{179}Hf(α,t),(^{3}He,d)	G	Coulomb excitation		
D	^{180}Hf(p,nγ),(d,2nγ)	H	^{181}Ta(γ,n)		

E(level)[†]	J$^\pi$	T$_{1/2}$[‡]	XREF	Comments
0.0[a]	1$^+$	8.154 h *6*	ABCD F HIJ	%β^-=15 *3*; %ε=85 *3* %β^-,%ε: deduced by evaluator from β^-/ε=0.15 *2* (1962Ga07), β^-/ε=0.221 *14* (1980Ry01), and β^-/ε=0.18 *3* (1974HeYW). J$^\pi$: J=1 from log *ft*=5.97 to 2$^+$ and log *ft*=5.71 to 0$^+$ in ε decay to ^{180}Hf. π from L(d,t)=L(p,d)=4. T$_{1/2}$: weighted average of 8.152 h *6* (1980Ry01), 8.15 h *3* (1999Be65), and 8.18 h *2* (2002Be18). Others: 8.00 h *5* (1950Wi67), 8.15 h *2* (1951Br87), 8.15 h *5* (1962Be52), 8.19 h (1962Fo10), 8.1 h *1* (1963Ra14), and 7.99 h *5* (1968Bo25). configuration=π7/2[404]ν9/2[624].
39.54[a] *5*	2$^+$		BCD HIJ	J$^\pi$: 40γ to 1$^+$, band assignment; π=+ from L(d,t)=L(p,d)=4.
77.2[a] *12*	9$^-$	>7.1×10^{15} y	ABCDEFG I	Q=+4.95 *2*; μ=4.825 *11* E(level): weighted average of 78.0 *10* from ^{181}Ta(p,d) (2002We01) and 75.5 *14* from the difference between the ^{181}Ta neutron separation energy (S(n)=7576.8 keV *13*) (2012Wa38), and the neutron thermal capture-state energy of 7652.3 keV *5* (from ^{180}Ta(>7.1×10^{15} y)(n,γ)) (1981Co17). Other values: 73 keV *2*, using S(n)=7579 keV *2* from ^{181}Ta(γ,n)

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Adopted Levels, Gammas (continued)

^{180}Ta Levels (continued)

E(level)[†]	Jπ	T1/2[‡]	XREF	Comments
				(1981Co17); 77 keV *9*, from mass doublets measurements (1980Sh06); 82 keV, from (α,t) (1983Wa01). Jπ: J=9 from high resolution collinear laser spectroscopy (2006Bi14). π consistent with population of 716 keV (J^π=15/2$^+$) and 1539 keV (J^π=21/2$^+$) levels in ^{181}Ta by (assumed E1) primary γ-rays in ^{180}Ta(>7.1×10^{15} y)(n,γ) E=thermal (1981Co17). Configuration=((π9/2[514])+(ν9/2[624])) and J^π=9$^-$ are consistent with μ=4.77 *5* (1980Bu09) and with reaction cross section ratio in (α,t) and (^{3}He,d) (1983Wa01). T1/2: from T1/2(β$^-$)>1.7×10^{16} y and T1/2(ε)>1.2×10^{16} y (2006Hu15). Other values: T1/2>1.2×10^{15} y from T1/2(β$^-$)>1.9×10^{15} y and T1/2(ε)>3.0×10^{15} y (1985Cu03), >2.8×10^{13} y (1981No09), T1/2(ε)>2.1×10^{13} y (1977Ar11), T1/2(ε)>1.0×10^{13} y (1967Sa05), T1/2>10^{10} y (1958Mi90), T1/2(ε)>1.6×10^{13} y, T1/2(β$^-$)>1.1×10^{13} y (1958Ba51). Others: 1955Eb14, 1958Eb09. μ: laser resonance spectroscopy (1994Wa34) Other: μ=4.77 *5* from atomic beam (LASER fluor.) μ(1+J/2). J from fits of μ(1+J/2) (exp.) to μ(1+J/2) (theory) for different J values (1980Bu09,1989Ra17). Q: laser resonance spectroscopy (1994Wa34). Additional information 2.
107.78[j] *4*	0$^-$	19.2 ns *7*	B D	Jπ: E1 108γ to 1$^+$. configuration=π9/2[514]ν9/2[624].
110.75[a] *6*	3$^+$		BcD HIJ	XREF: c(134). Jπ: 71γ to 2$^+$, band assignment; π=+ from L(d,t)=L(p,d)=6.
130.38[j] *7*	1$^-$		BcD	XREF: c(134).
171.12[j] *6*	2$^-$		BcD	XREF: c(181). Jπ: (M1) 40.7γ to 1$^-$, band assignment.
177.87[g] *11*	8$^+$	70.0 ns *14*	ABcD HIJ	XREF: c(181)J(172). Jπ: E1 100.8γ to 9$^-$, band head of K^π=8$^+$ band. configuration=π7/2[404]ν9/2[624].
184.92[a] *8*	4$^+$		BcD IJ	XREF: c(181). Jπ: 74.0γ to 3$^+$; band assignment.
234.35[j] *6*	3$^-$		BCD H	Jπ: (M1) 63.1γ to 2$^-$; band assignment.
258 *2*			H	
280.12[o] *12*	10$^-$		BCDE G	Jπ: 202.9γ to 9$^-$; band assignment.
310.88[a] *8*	5$^+$		B D HIJ	Jπ: 200γ to 3$^+$, 126γ to 4$^+$; band assignment.
318.21[j] *6*	4$^-$		BCD	Jπ: M1 to 3$^-$.
320.23[s] *4*	1$^+$		D	Jπ: M1 281γ to 2$^+$, M1+E2 320γ to 1$^+$.
357.01[d] *12*	7$^+$	42 ns *3*	BCD	Jπ: M1 179γ to 8$^+$, band head of K^π=7$^+$ band, π5/2[402]ν9/2[624].
370.82[s] *4*	2$^+$		D H	Jπ: M1 260γ to 3$^+$, M1+E2 371γ to 1$^+$; band assignment.
374.15[g] *12*	9$^+$		B D IJ	Jπ: M1+E2 196γ to 8$^+$; π=+ from L(p,d)=L(d,t)=6; band assignment.
416.32[a] *10*	6$^+$		B D HI	Jπ: 105γ to 5$^+$, 231γ to 4$^+$; band assignment.
419.86[j] *7*	5$^-$		BCD	XREF: C(426). Jπ: (M1) 102γ to 4$^-$, 185γ to 3$^-$; band assignment.
423.43[k] *4*	1$^-$		B D IJ	Jπ: M1 252γ to 2$^-$, M1 316γ to 0$^-$, band head of K^π=1$^-$ band, π7/2[404]ν5/2[512].
425.8			I	
447.86[s] *6*	3$^+$		D H	Jπ: 263γ to 4$^+$, 337γ to 3$^+$, 408γ to 2$^+$; band assignment.
463.62[h] *13*	7$^-$	31.2 ns *19*	B D HIJ	Jπ: E1(+M2) 285γ to 8$^+$, band head of K^π=7$^-$ band, π7/2[404]ν7/2[514].
478.11[k] *5*	2$^-$		B D IJ	Jπ: 55γ to 1$^-$, 244γ to 3$^-$; π=− from L(d,t)=L(p,d)=3; band assignment.
505.28[o] *12*	11$^-$		B DE G	Jπ: (E2) 428γ to 9$^-$, M1+E2 225γ to 10$^-$; band assignment. T1/2: <2.8 h or >6.6 h from 2000Po16.
508.1? *3*			B	

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Adopted Levels, Gammas (continued)

^{180}Ta Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[‡]	XREF	Comments
515.80[e] *12*	8^+	<1 ns	B D H	Jπ: (M1) 159γ to 7^+, M1+E2 338γ to 8^+; band assignment.
520.04[b] *9*	4^+	37.4 ns *20*	B D	Jπ: M1+E2 209γ to 5^+, M1 409γ to 3^+. configuration=π9/2[514]ν1/2[521].
x+519.0[c] *10*	(5)	16.1 ns *19*	B D	E(level): x=72.2 in ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ). A 72.2-keV transition is not supported by ce data of ^{180}Hf(p,nγ),(d,2nγ), which propose x≤80. Jπ: x transition to (4^+).
538.5? *3*			B	
544.20[k] *6*	3^-		B D HIJ	Jπ: M1 373γ to 4^-, 226γ to 2^-; band assignment.
547.84[j] *10*	6^-		B D	Jπ: (M1) 128γ to 5^-, 229.5γ to 4^-; band assignment.
547.90[s] *9*	4^+		D	Jπ: 237γ to 5^+, 437γ to 3^+; band assignment.
549.32[u] *7*	3^-		D I	Jπ: (M1) 71γ to 2^-, band assignment.
559.50[t] *5*	(2^+)		cD	XREF: c(563). Jπ: (M1,E2) 239γ to 1^+, 449γ to 3^+, assignment as $K^\pi=2^+$ bandhead, configuration=ν9/2[624]-π5/2[402].
572.2			c hI	XREF: c(563)h(571).
574.86[i] *13*	6^-	<2 ns	BcD hIJ	XREF: c(563)h(571)I(576.8)J(571). Jπ: M1(+E2) 111γ to 7^-, band head of $K^\pi=6^-$ band, π7/2[404]ν5/2[512]. $T_{1/2}$: other: ≈10 ns from ce-γ(t) in ^{180}Hf(p,nγ),(d,2nγ).
575.80[d] *13*	(8^+)	<1 ns	BcD	XREF: c(563). Jπ: 219γ to 7^+, 398γ to 8^+; $K^\pi=8^+$ bandhead, configuration=π9/2[541]ν7/2[514].
595.40[g] *12*	10^+		B D IJ	Jπ: E2 418γ to 8^+; band assignment.
600.30[a] *12*	(7^+)		B D I	Jπ: 184γ to 6^+, 289γ to 5^+; band assignment.
624.13[t] *5*	(3^+)		D H	Jπ: (M1) 65γ to (2^+); band assignment.
641.55[b] *12*	(5^+)		B D h	XREF: h(643). Jπ: 121γ to 4^+; band assignment.
645.63[u] *9*	(4^-)		D hI	XREF: h(643). Jπ: 101γ and 411γ to 3^-; band assignment.
653.50[v] *6*	1^-		D I	Jπ: 175.5γ to 2^-, 230γ to 1^-, 283γ to 2^+, 333γ to 1^+; $K^\pi=1^-$ bandhead with configuration=ν7/2[514]-π5/2[402].
658.37[k] *12*	(4^-)		B D IJ	Jπ: (M1) 114γ to 3^-; band assignment.
x+659.8[c] *10*	(6)		B D	Jπ: 141γ to (5); band assignment.
663.79[w] *9*	(4^-)		B D HI	Jπ: (M1) 114.5γ to 3^-; band assignment.
672.04 *14*			D	
676.36[s] *10*	(5^+)		D	Jπ: 128.5γ to 4^+; band assignment.
680.5			I	
680.64[h] *16*	(8^-)		B D IJ	XREF: I(682.7)J(671). Jπ: 271γ to 7^-; band assignment.
684.3 *4*			B D	
686.06[j] *10*	7^-		B D	Jπ: 138γ to 6^-, 266γ to 5^-; band assignment.
708.11[v] *6*	2^-		D	Jπ: 159γ to 3^-, 260γ to 3^+, 285γ to 1^-, 388γ to 1^+; band assignment.
717.3			I	
721.86 *7*	(4^-)	≈3 ns	B D HIJ	XREF: B(?)J(712). Jπ: 178γ to 3^-, L(p,d)=L(d,t)=1; $K^\pi=4^-$ bandhead with configuration=π7/2[404]+ν1/2[521]. $T_{1/2}$: from ce-γ(t) in ^{180}Hf(p,nγ),(d,2nγ); given as a range from 1-5 ns.
723.45[e] *13*	9^+		B D	Jπ: 208γ to 8^+, 367γ to 7^+; band assignment.
729.64 *12*			D	
731.16 *9*			D i	
735.22[a] *13*	(8^+)		B D i	Jπ: 135γ to (7^+), 319γ to 6^+; band assignment.
738.54 *12*			D	
752.42[o] *13*	12^-		B DE G	Jπ: 247γ to 11^-, 472γ to 10^-; band assignment.

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Adopted Levels, Gammas (continued)

^{180}Ta Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[‡]	XREF	Comments
756.80 *15*			D I	
763.62[i] *15*	7^-		B D IJ	XREF: J(753). Jπ: 189γ to 6^-, 300γ to 7^-; π=− from L(p,t)=L(d,t)=3; band assignment.
775.8? *11*			B	
784.33[w] *9*	(5^-)		D I	Jπ: 466γ to 4^-, 550γ to 3^-; band assignment.
787.24[b] *13*	(6^+)		B D	Jπ: 146γ to (5^+), 267γ to 4^+; band assignment.
787.94[v] *9*	(3^-)		D ij	XREF: j(775). Jπ: L(d,t)=L(p,d)=1, 417γ to 2^+.
788.41[x] *11*	3^-		D ij	XREF: j(775). Jπ: L(d,t)=L(p,d)=1, 310γ to 2^-, $K^\pi=3^-$ bandhead with configuration π7/2[404]-ν1/2[521].
792.54 *17*			D H	
806.95[d] *12*	(9^+)		B D	Jπ: (M1) 231γ to (8^+); band assignment.
809.39[#] *11*	(5^-)	≈2 ns	D i	Jπ: 151γ to (4^-), 265γ to 3^-, $K^\pi=5^-$ bandhead with possible configuration=π7/2[404]+ν3/2[512]. $T_{1/2}$: from ce-γ(t) in ^{180}Hf(p,nγ),(d,2nγ); given as a range from 1-5 ns.
809.44[#] *14*			D i	
820 *2*			H	
x+821.4[c] *10*	(7)		B D	Jπ: 161.5γ to (6), 302γ to (5); band assignment.
830.70 *13*			B D	
836.16 *16*	5^-		D IJ	XREF: J(822). Jπ: from (p,d) and (d,t).
840.99[g] *13*	11^+		B D	Jπ: 245.5γ to 10^+, 467γ to 9^+; band assignment.
857.11[j] *13*	8^-		B D H	
862.1 *3*			B	
863.91 *12*			D	
865.86 *16*			D	
876.80 *6*	(2^-)		D I	Jπ: possible configuration=π7/2[404]-ν3/2[512], $K^\pi=2^-$.
880.65 *7*			D	
884.15 *13*			D I	
891.94[&] *15*			B D I	
892.76[&] *12*			D hij	
893.04[&] *16*			D hIj	
906.43 *15*			B D	
907.35[@x] *10*	4^-		D IJ	XREF: J(893). Jπ: from (p,d). L(p,d)=1.
915.90 *7*			D I	
922.82[h] *15*	(9^-)		B D	Jπ: 242γ to (8^-), 459γ to 7^-; band assignment.
935.07[@] *8*			D j	XREF: j(893).
938.84[@] *20*			D j	XREF: j(893).
951.50[@] *7*			D IJ	XREF: J(930).
956.34[e] *13*	10^+		B D h	Jπ: 233γ to 9^+, 441γ to 8^+; band assignment.
956.59[b] *15*	(7^+)		B D h	Jπ: 169γ to (6^+), 315γ to (5^+); band assignment.
973.0[@]			IJ	XREF: J(930).
976.64[i] *14*	8^-		B D	Jπ: 296γ to (8^-), 402γ to 6^-; band assignment.
977.03[a] *13*	(9^+)		B D	Jπ: 242γ to (8^+), 377γ to (7^+); band assignment.
986.2[@]			Ij	XREF: j(948).
991.64[@] *12*			D j	XREF: j(948).
996.49 *8*			D	
1003.7			I	
x+1003.9[c] *10*	(8)	≤35 ps	B D F	XREF: F(1087).

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Adopted Levels, Gammas (continued)

^{180}Ta Levels (continued)

E(level)†	Jπ	$T_{1/2}$‡	XREF	Comments
				Jπ: 182γ to (7), 344γ to (6); band assignment.
				$T_{1/2}$: from ^{180}Ta(γ,γ′):Target=9⁻ isomer.
1016.7 *3*			B D	
1020.73[o] *14*	13⁻		B E G	$T_{1/2}$: <5.5 h or >23 h from 2000Po16.
				Jπ: 268γ to 12⁻, 515γ to 11⁻; band assignment.
1030.64[j] *13*	9⁻		B D	Jπ: 173.5γ to 8⁻, 345γ to 7⁻; band assignment.
1035.0? *11*			B	
1037.03 *8*			D	
1043.14 *14*			D	
1053.6 *10*			D	
1057.17[d] *13*	(10⁺)		B	Jπ: 250γ to (9⁺), (E2) 481.5γ to (8⁺); band assignment.
1062.6			I	
1075.9			I	
1080.0			I	
1100.75 *15*			D	
1110.08[g] *14*	12⁺		B	Jπ: 269γ to 11⁺, 515γ to 10⁺; band assignment.
1113.09 *8*			D	
1122 *2*			H	
1141.09[a] *14*	(10⁺)		B	Jπ: 164γ to (9⁺), 406γ to (8⁺); band assignment.
1149.54[b] *16*	(8⁺)		B D	Jπ: 193γ to (7⁺), 362γ to (6⁺); band assignment.
1175.02 *16*			B	
1189.24[h] *16*	(10⁻)		B	Jπ: 266γ to (9⁻), 509γ to (8⁻); band assignment.
1205.18 *12*			D H	
x+1205.2[c] *10*	(9)	≤7 ps	B F	XREF: F(1300).
				Jπ: 201γ to (8), 384γ to (7); band assignment.
				$T_{1/2}$: from ^{180}Ta(γ,γ′):Target=9⁻ isomer.
1212.48[e] *14*	11⁺		B	Jπ: 256γ to 10⁺, 489γ to 9⁺; band assignment.
1216.3[i] *3*	(9⁻)		B	Jπ: 453γ to 7⁻; band assignment.
1241.20[j] *14*	10⁻		B D	Jπ: 211γ to 9⁻, 384γ to 8⁻; band assignment.
1247 *3*			H	
1252.76 *15*			B	
1270.86 *23*			B	
1293.42 *23*			B	
1309.82[o] *15*	14⁻		B E GH	Jπ: 289γ to 13⁻, (E2) 557.5γ to 12⁻; band assignment.
1327.04[d] *14*	(11⁺)		B	Jπ: 270γ to (10⁺), 520γ to (9⁺); band assignment.
1339.09[n] *13*	11⁻		B G	Jπ: E2 258γ from 13⁻, 1059γ to 10⁻, 1262γ to 9⁻.
1353.9 *3*			B H	
1363.8[b] *7*	(9⁺)		B	Jπ: 214γ to (8⁺), 407.5γ to (7⁺); band assignment.
1389.58 *23*			B	
1401.78[g] *14*	13⁺		B	Jπ: 291γ to 12⁺, 561γ to 11⁺; band assignment.
x+1425.7[c] *10*	(10)		B F	XREF: F(1510).
				Jπ: 220.5γ to (9), 422γ to (8); band assignment.
1427 *4*			H	
1435.83[a] *15*	(11⁺)		B	Jπ: 295γ to (10⁺), 459γ to (9⁺); band assignment.
1447.28[j] *15*	11⁻		B D	Jπ: 206γ to 10⁻, 417γ to 9⁻; band assignment.
1452.39[p] *22*	15⁻	31.2 μs *14*	B E	Jπ: M1 143γ to 14⁻, 432γ to 13⁻; K^{π}=15⁻ bandhead with configuration=ν9/2[624]π7/2[404]π5/2[402]π9/2[514].
				$T_{1/2}$: other: 27 ns *8* from 2002Pf01.
1463.72 *23*			B	
1479.09[h] *17*	(11⁻)		B	Jπ: 290γ to (10⁻), 556γ to (9⁻); band assignment.
1490.36[e] *15*	12⁺		B	Jπ: 278γ to 11⁺, 534γ to 10⁺; band assignment.
1541.79 *16*			B	
1546.71[n] *20*	(12⁻)		B G	Jπ: 1042γ to 11⁻, 1266γ to 10⁻; band assignment.

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Adopted Levels, Gammas (continued)

^{180}Ta Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[‡]	XREF	Comments
1573.52 *23*			B	
1580.0 *7*			B	
1597.43[m] *13*	13^-	≤1 ns	B	Jπ: E2 1092γ to 11^-, 845γ to 12^-. configuration=π9/2[514]ν5/2[512]ν9/2[624]ν3/2[512].
1616.49[d] *16*	(12^+)		B f	Jπ: 289γ to (11^+), 560γ to (10^+); band assignment.
1618.94[o] *16*	15^-		B fG	Jπ: 309γ to 14^-, 598γ to 13^-; band assignment.
1630.58[a] *16*	(12^+)		B f	Jπ: 195γ to (11^+), 490γ to (10^+); band assignment.
x+1662.3[c] *10*	(11)		B	Jπ: 237γ to (10), 457γ to (9); band assignment.
1671.59 *15*	(12)		B	Jπ: 332.5γ to 11^-, 1391.5γ to 10^-.
1698.99[j] *16*	12^-		B	Jπ: 252γ to 11^-, 458γ to 10^-; band assignment.
1708.23 *15*		<1 ns	B	
1715.55[g] *15*	14^+		B	Jπ: (E2) 606γ to 12^+, 313.5γ to 13^+; band assignment.
1740 *3*			H	
1788.38[e] *15*	13^+		B	Jπ: 576γ to 11^+, 298γ to 12^+; band assignment.
1790.80[h] *19*	(12^-)		B	Jπ: 602γ to (10^-), 311.5γ to (11^-); band assignment.
1792.24[p] *24*	16^-		B E	Jπ: (M1) 340γ to 15^-; band assignment.
1805.85[n] *15*	(13^-)		B	1053γ to (12^-), 1301γ to (11^-); band assignment.
1822 *3*			H	
1841.39 *15*	(13^-)		B	Jπ: 1090γ to 12^-, 1336γ to 11^-.
1863.5 *3*			B H	XREF: H(1866).
1880.07[m] *15*	(14^-)		B	Jπ: 283γ to 13^-; band assignment.
1904.54 *16*			B f	XREF: f(1930).
1904.63 *15*			B F	
1924.97[d] *17*	(13^+)		B f	XREF: f(1930). Jπ: 598γ to (11^+), 308γ to (12^+); band assignment.
1941.63[l] *16*	(14)	<1 ns	B f	XREF: f(1930). Jπ: D 344γ to 13^-.
1941.79[j] *18*	13^-		B f	XREF: f(1930). Jπ: 495γ to 11^-, 243γ to 12^-; band assignment.
1947.12[o] *16*	16^-		B fG	XREF: f(1930). Jπ: 637γ to 14^-, 328γ to 15^-; band assignment.
1968.52[a] *16*	(13^+)		B	Jπ: 533γ to (11^+), 338γ to (12^+); band assignment.
1970.93 *18*			B	
2006.28 *24*			B	
2050.43[g] *17*	(15^+)		B	Jπ: 649γ to 13^+; band assignment.
2071.23 *24*			B	
2105.26[e] *16*	14^+		B	Jπ: 615γ to 12^+, 317γ to 13^+; band assignment.
2123.6[h] *3*	(13^-)		B	Jπ: 644γ to (11^-), 335γ to (12^-); band assignment.
2124.93[n] *24*	(14^-)		B	Jπ: 1372.5γ to 12^-; band assignment.
2157.26[p] *25*	17^-		B E	Jπ: 365γ to 16^-, 705γ to 15^-; band assignment.
2160.1 *4*			B	
2182.70[m] *15*	(15^-)		B	Jπ: 302γ to (14^-), 585γ to 13^-; band assignment.
2186.9 *3*			B	
2198.48[a] *18*	(14^+)		B	Jπ: 568γ to (12^+); band assignment.
2258.7 *3*			B F	
2294.36[o] *17*	17^-		B	Jπ: 676γ to 15^-, 347γ to 16^-; band assignment.
2321.03[l] *19*	(15)		B	Jπ: D 379γ to (14); band assignment.
2328.0 *7*			B	
2341.6 *3*			B	
2354.5 *3*			B	
2402.61[f] *17*	(16^+)		B	Jπ: 687γ to 14^+; band assignment.
2410.24[g] *17*	(16^+)		B	Jπ: 695γ to 14^+; band assignment.
2438.50[e] *18*	15^+		B f	XREF: f(2480).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{180}Ta Levels (continued)

E(level)†	Jπ	$T_{1/2}$‡	XREF	Comments
				Jπ: 333γ to 14^+, 650γ to 13^+; band assignment.
2452.6 *4*			B f	XREF: f(2480).
2504.19[m] *16*	(16^-)		B f	XREF: f(2480). Jπ: 321γ to (15^-), 624γ to (14^-); band assignment.
2545.3[p] *3*	18^-		B	Jπ: 388γ to 17^-, 753γ to 16^-; band assignment.
2561.2 *3*			B	
2568.62[a] *19*	(15^+)		B	Jπ: 600γ to (13^+); band assignment.
2588.3[q] *3*	(18^+)	22 ns *2*	B E	Jπ: stretched (E1) 431γ to (17^-), 1137γ to (15^-). configuration=ν7/2[514]ν9/2[624]ν11/2[615]π9/2[514].
2658.14[o] *18*	18^-		B	Jπ: 364γ to 17^-, 711γ to 16^-; band assignment.
2660.65[f] *17*	(17^+)		B	Jπ: 258γ to (16^+), 611γ to (15^+); band assignment.
2672.5 *3*			B	
2721.43[l] *22*	(16)		B D	Jπ: 400γ to (15); band assignment.
2780.53[g] *20*	(17^+)		B	Jπ: 730γ to (15^+).
2787.75[e] *19*	16^+		B	Jπ: 349γ to 15^+; 682.5γ to 14^+; band assignment.
2843.6[a] *4*	(16^+)		B	Jπ: 645γ to (14^+); band assignment.
2844.29[m] *18*	(17^-)		B f	XREF: f(2880). Jπ: 340γ to (16^-), 662γ to (15^-); band assignment.
2899.8[r] *3*	(19^-)	<2 ns	B Ef	XREF: f(2880). Jπ: stretched (E1) 311.5γ to (18^+), 742γ to (17^-).
2943.83[f] *18*	(18^+)		B	Jπ: 283γ to (17^+), 534γ to (16^+); band assignment.
2954.5[p] *3*	19^-		B	Jπ: 409γ to 18^-, 797γ to 17^-; band assignment.
2985.5[q] *3*	(19^+)		B	Jπ: 397γ to (18^+); band assignment.
3041.57[o] *20*	(19^-)		B	Jπ: 747γ to 17^-; band assignment.
3048.1 *3*			B	
3141.63[l] *24*	(17)		B	Jπ: 420γ to (16); band assignment.
3148.3[e] *3*	17^+		B	Jπ: 362γ to 16^+, 710γ to 15^+; band assignment.
3173.4 *3*			B	
3175?[g] *4*	(18^+)		B	
3200.9[m] *4*	(18^-)		B	Jπ: 697γ to (16^-); band assignment.
3253.51[f] *19*	(19^+)		B	Jπ: 310γ to (18^+), 593γ to (17^+); band assignment.
3309.1[r] *3*	(20^-)		B E	Jπ: (M1) 409γ to (19^-); band assignment.
3383.9[p] *3*	20^-		B	Jπ: 429γ to 19^-, 838γ to 18^-; band assignment.
3400.5[q] *3*	(20^+)		B	Jπ: 415γ to (19^+), 812γ to (18^+); band assignment.
3435.4[o] *3*	(20^-)		B	Jπ: 777γ to 18^-; band assignment.
3435.9 *11*			B	
3532.7 *3*			B	
3584.8?[g] *13*	(19^+)		B	Jπ: 804γ to (17^+); band assignment.
3678.9 *10*	(22^-)	2.0 μs *5*	E	$T_{1/2}$: from comparison of 492γ and 370γ intensities in 365γ gated spectrum in ^{180}Hf(^{238}U,Xγ). Jπ: (E2) 370γ to (20^-). configuration=ν7/2[503]ν7/2[514]ν9/2[624]π5/2[402]π7/2[404]π9/2[514].
3738.4[r] *3*	(21^-)		B	Jπ: 429γ to (20^-); band assignment.
3828.7[p] *3*	21^-		B	Jπ: 445γ to 20^-; band assignment.
3832.2[q] *3*	(21^+)		B	Jπ: 432γ to (20^+), 847γ to (19^+); band assignment.
3855.5?[o] *4*	(21^-)		B	Jπ: 814γ to (19^-); band assignment.
4170.9 *14*			E	
x+4169.9 *18*	(23,24,25)	17 μs *5*		E(level): possibly the same level as 4171.0-keV level. $T_{1/2}$: from γγ(t) in ^{180}Hf(^{238}U,Xγ).
4186.7[r] *3*	(22^-)		B	Jπ: 448γ to (21^-); band assignment.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{180}Ta Levels (continued)

† From a least-squares fit to Eγ′s by evaluator, except where noted.
‡ From γγ(t) in ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ), except where noted.
# 809.35 and 809.44 may correspond to one common level.
@ A constant of 40-50 keV was added to the level energy from ^{181}Ta(d,t) by the evaluator for energy scale consistency.
& 891.9-, 892.8-, and 893.0-keV levels may correspond to one common level.
a Band(A): $K^{\pi}=1^{+}$ band. Configuration=π7/2[404]ν9/2[624].
b Band(B): K=4^{+} band. Configuration=π9/2[514]ν1/2[521].
c Band(C): K=(5) band.
d Band(D): $K^{\pi}=7^{+}$ band. Configuration=π5/2[402]ν9/2[624].
e Band(E): $K^{\pi}=8^{+}$ band. Configuration=π9/2[514]ν7/2[503].
f Band(F): Side band of Band G. Configuration=π7/2[404]ν9/2[624]⊗$\nu^2 i_{13/2}$.
g Band(G): $K^{\pi}=8^{+}$ band. Configuration=π7/2[404]ν9/2[624].
h Band(H): $K^{\pi}=7^{-}$ band. Configuration=π7/2[404]ν7/2[514].
i Band(I): $K^{\pi}=6^{-}$ band. Configuration=π7/2[404]ν5/2[512].
j Band(J): $K^{\pi}=0^{-}$ band. Configuration=π9/2[514]ν9/2[624].
k Band(K): $K^{\pi}=1^{-}$ band. Configuration=π7/2[404]ν5/2[512].
l Band(L): K^{π}=(14) band, 4-quasiparticle band. Configuration=π9/2[514]π7/2[404]π5/2[402]ν7/2[514] or π9/2[514]π7/2[404]π5/2[402]ν7/2[503].
m Band(M): $K^{\pi}=13^{-}$ band. Configuration=π7/2[404]ν9/2[624]ν7/2[514]ν3/2[512].
n Band(N): $K^{\pi}=11^{-}$ band, [9^{-}]⊗γ−vibration.
o Band(O): $K^{\pi}=9^{-}$ band. Configuration=π9/2[514]ν9/2[624].
p Band(P): $K^{\pi}=15^{-}$ band. Configuration= ν9/2[624] π9/2[514]π7/2[404]π5/2[402].
q Band(Q): $K^{\pi}=(18^{+})$ band. Configuration=ν9/2[624]ν7/2[514]ν11/2[615] π9/2[514].
r Band(R): $K^{\pi}=(19^{-})$ band. Configuration=ν9/2[624]ν7/2[514]ν1/2[510] π5/2[402]π7/2[404]π9/2[514].
s Band(b): $K^{\pi}=1^{+}$ band. Configuration=π9/2[514]ν7/2[514].
t Band(f): $K^{\pi}=(2^{+})$ band. Configuration=ν9/2[624]π5/2[402].
u Band(g): $K^{\pi}=3^{-}$ band. Configuration=π7/2[404]ν1/2[510].
v Band(S): $K^{\pi}=1^{-}$ band. Configuration=ν7/2[514]-π5/2[402].
w Band(d): $K^{\pi}=(4^{-})$ band. Configuration=π7/2[404]ν1/2[510].
x Band(i): $K^{\pi}=(3^{-})$ band. Configuration=π7/2[404]ν1/2[521].

Adopted Levels, Gammas (continued)

γ(^{180}Ta)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α	Comments
39.54	2+	39.5 *1*	100	0.0	1+				
107.78	0−	107.69 *5*	100	0.0	1+	E1		0.303	α(K)=0.248 *4*; α(L)=0.0422 *6*; α(M)=0.00958 *14*; α(N)=0.00225 *4*; α(O)=0.000331 *5* α(P)=1.663×10^{-5} *24* B(E1)(W.u.)=6.79×10^{-6} *25*
110.75	3+	71.1 *1*	100	39.54	2+				
130.38	1−	(23)		107.78	0−				
171.12	2−	40.65 *10*	100 *18*	130.38	1−	(M1)		10.25 *17*	α(L)=7.94 *13*; α(M)=1.80 *3*; α(N)=0.431 *7*; α(O)=0.0681 *11*; α(P)=0.00470 *8*
		63.2	≈14	107.78	0−				
177.87	8+	100.71 *5*	100	77.2	9−	E1		0.360	α(K)=0.295 *5*; α(L)=0.0507 *8*; α(M)=0.01152 *17*; α(N)=0.00270 *4*; α(O)=0.000396 *6* α(P)=1.96×10^{-5} *3* B(E1)(W.u.)=2.18×10^{-6} *5* Mult.: α(exp)=2.5 *3* gives E1+M2 with δ=0.242 *18*. However, δ value is inconsistent with RUL for M2 transitions.
184.92	4+	74.0 *1*	100	110.75	3+				
		145.3[@]	≈8	39.54	2+				
234.35	3−	63.05 *15*	100	171.12	2−	(M1)		2.82 *5*	α(L)=2.19 *4*; α(M)=0.496 *8*; α(N)=0.1187 *19*; α(O)=0.0188 *3*; α(P)=0.001297 *21*
280.12	10−	202.93 *12*	100	77.2	9−				
310.88	5+	125.85 *15*	100	184.92	4+				
		200.2 *1*	≈13	110.75	3+				
318.21	4−	83.87 *5*	100	234.35	3−	(M1)		7.23	α(K)=6.00 *9*; α(L)=0.952 *14*; α(M)=0.216 *3*; α(N)=0.0516 *8*; α(O)=0.00817 *12* α(P)=0.000565 *8*
320.23	1+	280.7 *1*	66 *4*	39.54	2+	M1		0.242	α(K)=0.201 *3*; α(L)=0.0312 *5*; α(M)=0.00706 *10*; α(N)=0.001690 *24*; α(O)=0.000268 *4* α(P)=1.86×10^{-5} *3*
		320.2 *1*	100	0.0	1+	M1+E2	<1.1	0.14 *3*	α(K)=0.12 *3*; α(L)=0.0201 *17*; α(M)=0.0046 *4*; α(N)=0.00110 *8*; α(O)=0.000171 *17* α(P)=1.1×10^{-5} *3*
357.01	7+	179.08 *9*	100	177.87	8+	M1		0.834	α(K)=0.694 *10*; α(L)=0.1085 *16*; α(M)=0.0246 *4*; α(N)=0.00589 *9*; α(O)=0.000932 *14* α(P)=6.47×10^{-5} *9* B(M1)(W.u.)=5.0×10^{-5} *4*
370.82	2+	50.6 *1*	1.7 *4*	320.23	1+				
		260.1 *1*	59 *4*	110.75	3+	M1		0.297	α(K)=0.248 *4*; α(L)=0.0384 *6*; α(M)=0.00871 *13*; α(N)=0.00208 *3*; α(O)=0.000330 *5* α(P)=2.30×10^{-5} *4*
		331.3 *1*	45 *3*	39.54	2+				
		370.8 *1*	100	0.0	1+	M1+E2	<1.1	0.095 *20*	α(K)=0.078 *18*; α(L)=0.0132 *15*; α(M)=0.0030 *3*; α(N)=0.00072 *8*; α(O)=0.000112 *14* α(P)=7.1×10^{-6} *17*

From ENSDF

$^{180}_{73}Ta_{107}$-9

Adopted Levels, Gammas (continued)

γ(^{180}Ta) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.‡	δ‡	α	Comments
374.15	9^+	196.32 *6*	100	177.87	8^+	M1+E2	4.7 *11*	0.331 *11*	α(K)=0.192 *11*; α(L)=0.1055 *17*; α(M)=0.0260 *5*; α(N)=0.00610 *10*; α(O)=0.000835 *13* α(P)=1.44×10^{-5} *11* Mult.: D+Q from R(DCO) in ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ), Δπ=no from level scheme. δ: from R(DCO) in ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ).
416.32	6^+	105.4 *1*	100 *9*	310.88	5^+				
		231.4 *1*	44 *4*	184.92	4^+				
419.86	5^-	101.65 *4*	100 *7*	318.21	4^-	(M1)		4.16	α(K)=3.46 *5*; α(L)=0.545 *8*; α(M)=0.1237 *18*; α(N)=0.0296 *5*; α(O)=0.00468 *7* α(P)=0.000324 *5*
		185.3 *3*	16 *3*	234.35	3^-				
423.43	1^-	252.33 *17*	48 *14*	171.12	2^-	M1		0.323	α(K)=0.269 *4*; α(L)=0.0418 *6*; α(M)=0.00947 *14*; α(N)=0.00227 *4*; α(O)=0.000359 *5* α(P)=2.50×10^{-5} *4*
		293.0 *1*	≤3.4	130.38	1^-				
		315.59 *4*	100 *4*	107.78	0^-	M1		0.1760	α(K)=0.1468 *21*; α(L)=0.0227 *4*; α(M)=0.00513 *8*; α(N)=0.001228 *18*; α(O)=0.000195 *3* α(P)=1.356×10^{-5} *19*
		383.82 *9*	18 *4*	39.54	2^+				
		423.5 *1*	9 *2*	0.0	1^+				
447.86	3^+	262.8 *1*	32 *3*	184.92	4^+				
		337.2 *1*	25 *3*	110.75	3^+				
		408.4 *1*	100	39.54	2^+				
463.62	7^-	285.54 *12*	100	177.87	8^+	E1		0.0249	α(K)=0.0208 *3*; α(L)=0.00318 *5*; α(M)=0.000718 *10*; α(N)=0.0001703 *24*; α(O)=2.61×10^{-5} *4* α(P)=1.585×10^{-6} *23* B(E1)(W.u.)=2.85×10^{-7} *18* δ: <0.3 from α(K)exp in ^{176}Yb(^{11}B,α3nγ)(^{7}Li,3nγ). Other: 0.65 *19* from α(exp) also in ^{176}Yb(^{11}B,α3nγ)(^{7}Li,3nγ) gives M2 strength inconsistent with RUL.
478.11	2^-	54.6 *3*	100 *18*	423.43	1^-				
		243.74 *5*	32 *3*	234.35	3^-				
		307.2 *1*	≤12	171.12	2^-				
		347.4 *3*	30 *4*	130.38	1^-				
		438.7 *1*	34 *7*	39.54	2^+				
		478.2 *1*	46 *9*	0.0	1^+				
505.28	11^-	225.20 *6*	100 *3*	280.12	10^-	M1+E2	0.4	0.408	α(K)=0.334 *5*; α(L)=0.0577 *8*; α(M)=0.01324 *19*; α(N)=0.00316 *5*; α(O)=0.000490 *7* α(P)=3.07×10^{-5} *5* Mult.: D+Q from R(DCO) in ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ), Δπ=no from level scheme. δ: from R(DCO) in ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ).

From ENSDF

$^{180}_{73}Ta_{107}$-10

Adopted Levels, Gammas (continued)

γ(^{180}Ta) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α	Comments
505.28	11⁻	428.12 *8*	22.4 *9*	77.2	9⁻	(E2)		0.0301	α(K)=0.0225 *4*; α(L)=0.00579 *9*; α(M)=0.001377 *20*; α(N)=0.000326 *5*; α(O)=4.74×10^{-5} *7* α(P)=1.87×10^{-6} *3* δ: Q from R(DCO) in ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ), E2 from assumed band structure.
508.1?		378[@]	100	130.38	1⁻				
515.80	8⁺	158.75 *7*	24 *5*	357.01	7⁺	(M1)		1.170	α(K)=0.973 *14*; α(L)=0.1525 *22*; α(M)=0.0346 *5*; α(N)=0.00827 *12*; α(O)=0.001310 *19* α(P)=9.08×10^{-5} *13* B(M1)(W.u.)>0.00077
		337.91 *7*	100 *4*	177.87	8⁺	M1+E2	0.72 *19*	0.116 *11*	α(K)=0.094 *10*; α(L)=0.0168 *8*; α(M)=0.00387 *15*; α(N)=0.00092 *4*; α(O)=0.000142 *8* α(P)=8.6×10^{-6} *10* B(E2)(W.u.)>0.28; B(M1)(W.u.)>0.00018
		438.6 *1*	6.7 *9*	77.2	9⁻	[E1]		0.00912	α(K)=0.00766 *11*; α(L)=0.001134 *16*; α(M)=0.000255 *4*; α(N)=6.06×10^{-5} *9*; α(O)=9.42×10^{-6} *14* α(P)=6.04×10^{-7} *9* B(E1)(W.u.)>9.9×10^{-8}
520.04	4⁺	(71.8)		447.86	3⁺				
		209.2 *1*	17 *4*	310.88	5⁺	M1+E2	0.8 *4*	0.43 *8*	α(K)=0.33 *8*; α(L)=0.075 *4*; α(M)=0.0176 *11*; α(N)=0.00417 *25*; α(O)=0.000621 *15* α(P)=3.0×10^{-5} *8* B(E2)(W.u.)=0.027 *19*; B(M1)(W.u.)=4.4×10^{-6} *22*
		335.2 *1*	16 *3*	184.92	4⁺	[M1]		0.1497	α(K)=0.1249 *18*; α(L)=0.0193 *3*; α(M)=0.00436 *7*; α(N)=0.001043 *15*; α(O)=0.0001653 *24* α(P)=1.153×10^{-5} *17* B(M1)(W.u.)=1.7×10^{-6} *4*
		409.07 *14*	100 *20*	110.75	3⁺	M1		0.0882	α(K)=0.0736 *11*; α(L)=0.01128 *16*; α(M)=0.00255 *4*; α(N)=0.000611 *9*; α(O)=9.69×10^{-5} *14* α(P)=6.77×10^{-6} *10* B(M1)(W.u.)=5.7×10^{-6} *15*
x+519.0	(5)	x[@]		520.04	4⁺				E_γ: x=72.2 in ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ). A 72.2-keV transition is not supported by ce data of ^{180}Hf(p,nγ),(d,2nγ), which propose x≤80.
538.5?		114[@]	100	423.43	1⁻				
544.20	3⁻	66.14 *18*	52 *9*	478.11	2⁻				
		120.8 *1*	≈2	423.43	1⁻				
		226.04 *5*	13 *2*	318.21	4⁻				
		309.7 *1*	≤7	234.35	3⁻				
		373.0 *1*	100 *6*	171.12	2⁻	M1		0.1126	α(K)=0.0939 *14*; α(L)=0.01444 *21*; α(M)=0.00327 *5*; α(N)=0.000782 *11* α(O)=0.0001240 *18*; α(P)=8.65×10^{-6} *13*
547.84	6⁻	127.79 *10*	100 *4*	419.86	5⁻	(M1)		2.16	α(K)=1.80 *3*; α(L)=0.283 *4*; α(M)=0.0641 *9*; α(N)=0.01534 *22*;

From ENSDF

$^{180}_{73}Ta_{107}$-11

Adopted Levels, Gammas (continued)

γ(^{180}Ta) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α	Comments
								α(O)=0.00243 *4* α(P)=0.0001681 *24*
547.84	6⁻	229.7 *5*	5.9 *10*	318.21	4⁻			
547.90	4⁺	237.0 *1*	21 *4*	310.88	5⁺			
		437.2 *1*	100 *20*	110.75	3⁺			
549.32	3⁻	(71.3)		478.11	2⁻	(M1)	11.49	α(K)=9.52 *14*; α(L)=1.527 *22*; α(M)=0.346 *5*; α(N)=0.0828 *12*; α(O)=0.01311 *19* α(P)=0.000906 *13*
		378.2 *1*		171.12	2⁻			
559.50	(2⁺)	188.8 *1*	2.0 *4*	370.82	2⁺			
		239.2 *1*	13 *3*	320.23	1⁺	(M1,E2)	0.27 *11*	α(K)=0.21 *11*; α(L)=0.0480 *8*; α(M)=0.0113 *4*; α(N)=0.00268 *7*; α(O)=0.000397 *20* α(P)=1.8×10⁻⁵ *11*
		429.3 *1*	≤15	130.38	1⁻			
		448.7 *1*	53 *11*	110.75	3⁺			
		519.9 *1*	100 *20*	39.54	2⁺			
		559.6 *1*	23 *5*	0.0	1⁺			
574.86	6⁻	111.3 *1*	50 *10*	463.62	7⁻	M1(+E2)	2.8 *4*	α(K)=1.7 *10*; α(L)=0.9 *5*; α(M)=0.21 *12*; α(N)=0.05 *3*; α(O)=0.007 *4*; α(P)=0.00015 *10*
		217.88 *5*	100 *20*	357.01	7⁺	[E1]	0.0489	α(K)=0.0407 *6*; α(L)=0.00636 *9*; α(M)=0.001437 *21*; α(N)=0.000340 *5*; α(O)=5.17×10⁻⁵ *8* α(P)=3.00×10⁻⁶ *5* B(E1)(W.u.)>3.5×10⁻⁶
575.80	(8⁺)	218.75 *25*	73 *9*	357.01	7⁺			
		398.1 *1*	100 *7*	177.87	8⁺			
595.40	10⁺	221.20 *5*	69 *3*	374.15	9⁺			
		417.5 *1*	100 *4*	177.87	8⁺	E2	0.0321	α(K)=0.0239 *4*; α(L)=0.00629 *9*; α(M)=0.001497 *21*; α(N)=0.000354 *5*; α(O)=5.14×10⁻⁵ *8* α(P)=1.98×10⁻⁶ *3*
600.30	(7⁺)	183.9 *1*	100 *5*	416.32	6⁺			
		289.45 *15*	22.0 *22*	310.88	5⁺			
624.13	(3⁺)	64.63		559.50	(2⁺)	(M1)	2.62	α(L)=2.03 *3*; α(M)=0.461 *7*; α(N)=0.1104 *16*; α(O)=0.01746 *25*; α(P)=0.001206 *17* E_γ: observed only in ce spectrum.
		176.2 *1*	22 *5*	447.86	3⁺			
		253.3 *1*	78 *16*	370.82	2⁺			
		303.9 *1*	63 *13*	320.23	1⁺			
		624.3 *1*	100 *20*	0.0	1⁺			
641.55	(5⁺)	121.5 *2*	100	520.04	4⁺			
645.63	(4⁻)	101.4 *1*	100[#]	544.20	3⁻			
		411.3 *1*	100[#]	234.35	3⁻			
653.50	1⁻	175.5 *1*	28[#]	478.11	2⁻			
		230.1 *1*	100[#]	423.43	1⁻			

From ENSDF

$^{180}_{73}Ta_{107}$-12

Adopted Levels, Gammas (continued)

γ(^{180}Ta) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult. ‡	α	Comments
653.50	1⁻	282.6 *1*	27#	370.82	2⁺			
		333.2 *1*	51#	320.23	1⁺			
658.37	(4⁻)	114.15 *15*	100	544.20	3⁻	(M1)	2.99	α(K)=2.48 *4*; α(L)=0.391 *6*; α(M)=0.0886 *13*; α(N)=0.0212 *3*; α(O)=0.00335 *5* α(P)=0.000232 *4*
x+659.8	(6)	140.8 *1*	100	x+519.0	(5)			
663.79	(4⁻)	114.5 *1*	100#	549.32	3⁻	(M1)	2.96	α(K)=2.46 *4*; α(L)=0.387 *6*; α(M)=0.0878 *13*; α(N)=0.0210 *3*; α(O)=0.00333 *5* α(P)=0.000230 *4*
		429.4 *1*	≈70#	234.35	3⁻			
672.04		152.0 *1*	100	520.04	4⁺			
676.36	(5⁺)	128.5 *1*		547.90	4⁺			
		491.4 *1*		184.92	4⁺			
680.64	(8⁻)	217.0 *2*	100	463.62	7⁻			
684.3		327.3 *4*	100	357.01	7⁺			
686.06	7⁻	138.21 *5*	100 *4*	547.84	6⁻			
		266.4 *1*	8.0 *10*	419.86	5⁻			
708.11	2⁻	158.7 *1*	6#	549.32	3⁻			
		260.4 *1*	32#	447.86	3⁺			
		284.7 *1*	100#	423.43	1⁻			
		337.2 *1*	15#	370.82	2⁺			
		387.9 *1*	60#	320.23	1⁺			
721.86	(4⁻)	172.6 *1*	20#	549.32	3⁻	[M1]	0.925	α(K)=0.769 *11*; α(L)=0.1204 *17*; α(M)=0.0273 *4*; α(N)=0.00653 *10*; α(O)=0.001034 *15* α(P)=7.17×10^{-5} *11* B(M1)(W.u.)≈0.00013
		177.68 *5*	100#	544.20	3⁻	[M1]	0.853	α(K)=0.709 *10*; α(L)=0.1110 *16*; α(M)=0.0252 *4*; α(N)=0.00602 *9*; α(O)=0.000953 *14* α(P)=6.61×10^{-5} *10* B(M1)(W.u.)≈0.00058
723.45	9⁺	147.8 *3*	1.3 *4*	575.80	(8⁺)			
		207.6 *1*	100 *4*	515.80	8⁺			
		349.15 *15*	21.5 *12*	374.15	9⁺			
		366.4 *4*	8.5 *10*	357.01	7⁺			
		546.0 *2*	4.2 *11*	177.87	8⁺			
729.64		88.1 *1*	≈1	641.55	(5⁺)			
		209.6 *1*	100	520.04	4⁺			
731.16		412.9 *1*	55#	318.21	4⁻			
		560.1 *1*	100#	171.12	2⁻			
735.22	(8⁺)	134.9 *1*	100 *4*	600.30	(7⁺)			
		318.95 *15*	93 *5*	416.32	6⁺			
738.54		96.9 *1*	20 *4*	641.55	(5⁺)			

From ENSDF

$^{180}_{73}Ta_{107}$-13

Adopted Levels, Gammas (continued)

γ(^{180}Ta) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.‡	α	Comments
738.54		218.6 *1*	100 *10*	520.04	4^+			
752.42	12^-	247.10 *14*	100 *3*	505.28	11^-			
		472.3 *1*	55.0 *18*	280.12	10^-			
756.80		181.9 *1*	100	574.86	6^-			
763.62	7^-	188.75 *15*	89 *9*	574.86	6^-			
		300.0 *1*	100 *10*	463.62	7^-			
775.8?		668@	100	107.78	0^-			
784.33	(5^-)	466.0 *1*	53#	318.21	4^-			
		550.1 *1*	100#	234.35	3^-			
787.24	(6^+)	145.65 *10*	100 *7*	641.55	(5^+)			
		267.22 *14*	10.1 *19*	520.04	4^+			
787.94	(3^-)	417.0 *1*	100	370.82	2^+			
788.41	3^-	310.3 *1*	100	478.11	2^-			
792.54		120.5 *1*	100	672.04				
806.95	(9^+)	231.1 *1*	100 *6*	575.80	(8^+)	(M1)	0.411	α(K)=0.342 *5*; α(L)=0.0533 *8*; α(M)=0.01207 *17*; α(N)=0.00289 *4*; α(O)=0.000458 *7* α(P)=3.18×10^{-5} *5* Mult.: D from R(DCO) in ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ); Δπ=no from assumed band structure.
		291.0 *2*	19 *3*	515.80	8^+			
		432.9 *1*	76 *5*	374.15	9^+			
		449.80 *10*	24 *3*	357.01	7^+			
		629.3 *16*	14 *4*	177.87	8^+			
809.39	(5^-)	151.0 *1*	100#	658.37	(4^-)			
		265.2 *1*	100#	544.20	3^-			
809.44		289.4 *1*	100	520.04	4^+			
x+821.4	(7)	161.54 *7*	100 *7*	x+659.8	(6)			
		302.1 *3*	29 *7*	x+519.0	(5)			
830.70		255.8 *1*	81	574.86	6^-			
		367.1 *1*	≈5	463.62	7^-			
		473.7 *1*	100	357.01	7^+			
836.16	5^-	261.3 *1*	100	574.86	6^-			
840.99	11^+	245.5 *1*	22.1 *8*	595.40	10^+			
		467.0 *1*	100 *3*	374.15	9^+			
857.11	8^-	171.2 *2*	100 *3*	686.06	7^-			
		309.1 *1*	8.4 *9*	547.84	6^-			
862.1		181.5 *2*	100	680.64	(8^-)			
863.91		343.8 *1*	100	520.04	4^+			
865.86		291.0 *1*	100	574.86	6^-			
876.80	(2^-)	398.8 *1*	13#	478.11	2^-			
		453.3 *1*	100#	423.43	1^-			
		556.7 *1*	16#	320.23	1^+			

From ENSDF

$^{180}_{73}Ta_{107}$-14

Adopted Levels, Gammas (continued)

γ(^{180}Ta) (continued)

E_i(level)	J_i^π	E_γ [†]	I_γ [†]	E_f	J_f^π	Mult. [‡]	α	Comments
876.80	(2$^-$)	705.5 *1*		171.12	2$^-$			
880.65		256.6 *1*	100[#]	624.13	(3$^+$)			
		321.4 *1*	58[#]	559.50	(2$^+$)			
		456.9 *1*	70[#]	423.43	1$^-$			
884.15		154.5 *1*		729.64				
		242.6 *1*		641.55	(5$^+$)			
891.94		316.5 *4*	100 *20*	574.86	6$^-$			
		534.9 *1*	8 *2*	357.01	7$^+$			I_γ: from ^{180}Hf(p,nγ),(d,2nγ). Other: 240 *60* in ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ).
892.76		170.9 *1*	100	721.86	(4$^-$)			
893.04		154.5 *1*	100	738.54		(M1)	1.263	α(K)=1.050 *15*; α(L)=0.1646 *24*; α(M)=0.0373 *6*; α(N)=0.00893 *13*; α(O)=0.001414 *20* α(P)=9.80×10^{-5} *14*
906.43		149.6 *1*	≈10	756.80				
		331.6 *1*	100	574.86	6$^-$			
907.35	4$^-$	119.3 *1*	27[#]	787.94	(3$^-$)			
		185.6 *1*	100[#]	721.86	(4$^-$)			
915.90		492.4 *1*	42[#]	423.43	1$^-$			
		545.2 *1*	22[#]	370.82	2$^+$			
		595.6 *1*	100[#]	320.23	1$^+$			
922.82	(9$^-$)	241.95 *15*	100 *6*	680.64	(8$^-$)			
		459.1 *1*	80 *7*	463.62	7$^-$			
935.07		457.0 *1*	100[#]	478.11	2$^-$			
		614.8 *1*	70[#]	320.23	1$^+$			
938.84		146.3 *1*	100	792.54		(M1)	1.473	α(K)=1.225 *18*; α(L)=0.192 *3*; α(M)=0.0436 *7*; α(N)=0.01043 *15*; α(O)=0.001651 *24* α(P)=0.0001144 *17*
951.50		528.0 *1*	89[#]	423.43	1$^-$			
		580.7 *1*	100[#]	370.82	2$^+$			
		631.3 *1*	95[#]	320.23	1$^+$			
956.34	10$^+$	232.8 *1*	100 *4*	723.45	9$^+$			
		440.5 *1*	36.8 *20*	515.80	8$^+$			
		582.4 *2*	7.3 *13*	374.15	9$^+$			
956.59	(7$^+$)	169.3 *1*	100 *7*	787.24	(6$^+$)			
		315.2 *2*	42 *7*	641.55	(5$^+$)			
976.64	8$^-$	211.5[@] *15*	≤26	763.62	7$^-$			
		295.77 *15*	83 *26*	680.64	(8$^-$)			
		402.0 *1*	100 *30*	574.86	6$^-$			
		512.9 *1*		463.62	7$^-$			
977.03	(9$^+$)	241.8 *1*	100 *4*	735.22	(8$^+$)			
		376.7 *1*	35.4 *22*	600.30	(7$^+$)			
991.64		350.2 *1*	100 *20*	641.55	(5$^+$)			
		471.5 *1*	51 *10*	520.04	4$^+$			

From ENSDF

$^{180}_{73}Ta_{107}$-15

Adopted Levels, Gammas (continued)

γ(^{180}Ta) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α	Comments
996.49		548.6 *1*	61[#]	447.86	3^+			
		625.7 *1*	100[#]	370.82	2^+			
x+1003.9	(8)	182.3 *2*	100 *7*	x+821.4	(7)			
		344.1 *1*	60 *10*	x+659.8	(6)			
1016.7		186.0 *3*	100	830.70				
1020.73	13^-	268.23 *10*	100 *3*	752.42	12^-			
		515.45 *15*	93 *3*	505.28	11^-			
1030.64	9^-	173.5 *1*	100 *3*	857.11	8^-			
		344.70 *10*	14.3 *12*	686.06	7^-			
1035.0?		678[@]	100	357.01	7^+			
1037.03		666.2 *1*	84[#]	370.82	2^+			
		716.8 *1*	100[#]	320.23	1^+			
1043.14		523.1 *1*	100	520.04	4^+			
1053.6		169.5	100	884.15				
1057.17	(10^+)	250.0 *1*	100 *6*	806.95	(9^+)			
		333.9 *4*	11 *3*	723.45	9^+			
		461.7 *1*	30 *4*	595.40	10^+			
		481.50 *9*	32 *4*	575.80	(8^+)	(E2)	0.0222	α(K)=0.01696 *24*; α(L)=0.00400 *6*; α(M)=0.000944 *14*; α(N)=0.000224 *4*; α(O)=3.29×10^{-5} *5* α(P)=1.425×10^{-6} *20* Mult.: Q from R(DCO) in ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ).
1100.75		459.2 *1*	100	641.55	(5^+)			
1110.08	12^+	268.9 *1*	15.1 *7*	840.99	11^+			
		514.6 *1*	100 *3*	595.40	10^+			
1113.09		665.2 *1*	100[#]	447.86	3^+			
		742.3 *1*	63[#]	370.82	2^+			
1141.09	(10^+)	164.0 *1*	60 *3*	977.03	(9^+)			
		405.9 *1*	100 *5*	735.22	(8^+)			
1149.54	(8^+)	192.9 *3*	100 *11*	956.59	(7^+)			
		362.3 *1*	83 *13*	787.24	(6^+)			I_γ: from ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ). Other: 190 *40* from ^{180}Hf(p,nγ),(d,2nγ).
1175.02		894.9 *1*	100	280.12	10^-			
1189.24	(10^-)	266.2 *1*	47 *4*	922.82	(9^-)			
		508.8 *1*	100 *6*	680.64	(8^-)			
1205.18		341.2 *1*	≈60	863.91				
		685.2 *1*	100	520.04	4^+			
x+1205.2	(9)	200.8 *1*	84 *8*	x+1003.9	(8)			
		383.7 *1*	100 *9*	x+821.4	(7)			
1212.48	11^+	256.0 *1*	100 *4*	956.34	10^+			
		489.1 *1*	75 *4*	723.45	9^+			
1216.3	(9^-)	452.7 *3*	100	763.62	7^-			
1241.20	10^-	210.7 *2*	100 *4*	1030.64	9^-			

From ENSDF

$^{180}_{73}Ta_{107}$-16

Adopted Levels, Gammas (continued)

γ(^{180}Ta) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α	Comments
1241.20	10⁻	384.0 *1*	10.8 *11*	857.11	8⁻			
1252.76		878.6 *1*	100	374.15	9⁺			
1270.86		896.7 *2*	100	374.15	9⁺			
1293.42		1013.3 *2*	100	280.12	10⁻			
1309.82	14⁻	288.84 *12*	77 *3*	1020.73	13⁻			
		557.53 *12*	100 *3*	752.42	12⁻	(E2)	0.01543	α(K)=0.01207 *17*; α(L)=0.00258 *4*; α(M)=0.000605 *9*; α(N)=0.0001435 *21*; α(O)=2.14×10^{-5} *3* α(P)=1.025×10^{-6} *15* Mult.: Q from γ(θ) in ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ); E2 from assumed band structure.
1327.04	(11⁺)	269.7 *1*	100 *6*	1057.17	(10⁺)			
		520.2 *1*	90 *7*	806.95	(9⁺)			
1339.09	11⁻	1058.8 *2*	6.2 *8*	280.12	10⁻			
		1261.9 *1*	100 *16*	77.2	9⁻			
1353.9		178.9 *2*	100	1175.02				
1363.8	(9⁺)	214	≈75	1149.54	(8⁺)			
		407.5	≈100	956.59	(7⁺)			
1389.58		884.3 *2*	100	505.28	11⁻			
1401.78	13⁺	291.3 *1*	10.7 *8*	1110.08	12⁺			
		561.0 *1*	100 *4*	840.99	11⁺			
x+1425.7	(10)	220.0 *2*	56 *11*	x+1205.2	(9)			
		422.0 *1*	100 *13*	1075.9				
1435.83	(11⁺)	294.7 *1*	100 *5*	1141.09	(10⁺)			
		458.8 *1*	67 *4*	977.03	(9⁺)			
1447.28	11⁻	205.9 *1*	100 *4*	1241.20	10⁻			
		416.7 *1*	23.2 *21*	1030.64	9⁻			
1452.39	15⁻	142.7 *3*	7.5 *18*	1309.82	14⁻	M1	1.581	α(K)=1.315 *20*; α(L)=0.206 *4*; α(M)=0.0468 *8*; α(N)=0.01119 *17*; α(O)=0.00177 *3* α(P)=0.0001227 *19* B(M1)(W.u.)=1.5×10^{-8} *4*
		431.6 *2*	100	1020.73	13⁻	[E2]	0.0294	α(K)=0.0221 *3*; α(L)=0.00564 *8*; α(M)=0.001341 *19*; α(N)=0.000317 *5*; α(O)=4.62×10^{-5} *7* α(P)=1.84×10^{-6} *3* B(E2)(W.u.)=1.64×10^{-5} *10*
1463.72		1183.6 *2*	100	280.12	10⁻			
1479.09	(11⁻)	289.8 *1*	34 *6*	1189.24	(10⁻)			
		556.3 *1*	100 *9*	922.82	(9⁻)			
1490.36	12⁺	277.6 *1*	71 *3*	1212.48	11⁺			
		534.1 *1*	100 *5*	956.34	10⁺			
1541.79		202.7 *1*	100	1339.09	11⁻			
1546.71	(12⁻)	1042.3 *3*	35 *8*	505.28	11⁻			
		1266.2 *2*	100 *14*	280.12	10⁻			
1573.52		1293.4 *2*	100	280.12	10⁻			

From ENSDF

$^{180}_{73}Ta_{107}$-17

Adopted Levels, Gammas (continued)

γ(^{180}Ta) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α	Comments
1580.0		1300.8	100	280.12	10^-			
1597.43	13^-	258.3 *1*	48. *21*	1339.09	11^-	E2	0.1298	α(K)=0.0836 *12*; α(L)=0.0352 *5*; α(M)=0.00860 *13*; α(N)=0.00202 *3*; α(O)=0.000281 *4* α(P)=6.41×10^{-6} *9* B(E2)(W.u.)>2.1 Mult.: Q from R(DCO) in ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ), RUL excludes M2.
		845.0 *1*	33.2 *16*	752.42	12^-	[M1]	0.01365	α(K)=0.01145 *16*; α(L)=0.001712 *24*; α(M)=0.000386 *6*; α(N)=9.24×10^{-5} *13* α(O)=1.469×10^{-5} *21*; α(P)=1.037×10^{-6} *15* B(M1)(W.u.)>6.4×10^{-6}
		1092.2 *1*	100 *4*	505.28	11^-	E2	0.00360	α(K)=0.00298 *5*; α(L)=0.000481 *7*; α(M)=0.0001094 *16*; α(N)=2.61×10^{-5} *4*; α(O)=4.05×10^{-6} *6* α(P)=2.56×10^{-7} *4* B(E2)(W.u.)>0.0032 Mult.: Q from γ(θ) in ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ); assumed E2.
1616.49	(12^+)	289.3 *1*	100 *9*	1327.04	(11^+)			
		559.6 *2*	68 *10*	1057.17	(10^+)			
1618.94	15^-	308.9 *1*	49.3 *21*	1309.82	14^-			
		598.3 *1*	100 *3*	1020.73	13^-			
1630.58	(12^+)	194.7 *1*	50 *3*	1435.83	(11^+)			
		489.5 *1*	100 *5*	1141.09	(10^+)			
x+1662.3	(11)	236.8 *2*	22 *8*	x+1425.7	(10)			
		457.3 *1*	100 *13*	x+1205.2	(9)			
1671.59	(12)	332.5 *1*	100 *11*	1339.09	11^-			
		1391.5 *2*	94 *14*	280.12	10^-			
1698.99	12^-	251.6 *1*	100 *4*	1447.28	11^-			
		457.9 *1*	26.4 *21*	1241.20	10^-			
1708.23		1334.1 *1*	100	374.15	9^+			
1715.55	14^+	313.5 *1*	6.2 *5*	1401.78	13^+			
		605.6 *1*	100 *4*	1110.08	12^+	(E2)	0.01268	α(K)=0.01003 *14*; α(L)=0.00204 *3*; α(M)=0.000477 *7*; α(N)=0.0001132 *16* α(O)=1.698×10^{-5} *24*; α(P)=8.55×10^{-7} *12* Mult.: Q from R(DCO) in ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ), E2 from assumed band structure.
1788.38	13^+	297.9 *1*	37 *3*	1490.36	12^+			
		576.1 *1*	100 *5*	1212.48	11^+			
1790.80	(12^-)	311.5 *4*	13 *4*	1479.09	(11^-)			
		601.6 *1*	100 *8*	1189.24	(10^-)			
1792.24	16^-	339.8 *1*	100	1452.39	15^-	(M1)	0.1443	α(K)=0.1204 *17*; α(L)=0.0186 *3*; α(M)=0.00420 *6*; α(N)=0.001005 *14*; α(O)=0.0001593 *23* α(P)=1.111×10^{-5} *16* Mult.: D from R(DCO) in ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ); (M1) from assumed band structure.
1805.85	(13^-)	1052.7 *5*	15 *5*	752.42	12^-			
		1300.6 *1*	100 *8*	505.28	11^-			

From ENSDF

$^{180}_{73}Ta_{107}$-18

Adopted Levels, Gammas (continued)

γ(^{180}Ta) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	Comments
1841.39	(13$^-$)	1090	≈100	752.42	12$^-$		
		1336.1 *1*	≈100	505.28	11$^-$		
1863.5		1358.2 *3*	100	505.28	11$^-$		
1880.07	(14$^-$)	282.6 *1*	100	1597.43	13$^-$		
1904.54		307.1 *1*	≈86	1597.43	13$^-$		
		325.5	≈100	1580.0			
1904.63		502.8 *1*	70 *6*	1401.78	13$^+$		
		794.2 *8*	12 *5*	1110.08	12$^+$		
		1063.7 *1*	100 *10*	840.99	11$^+$		
1924.97	(13$^+$)	308.2 *2*	27 *5*	1616.49	(12$^+$)		
		598.0 *1*	100 *8*	1327.04	(11$^+$)		
1941.63	(14)	344.2 *1*	100	1597.43	13$^-$	D	Mult.: from R(DCO) in ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ).
1941.79	13$^-$	242.8 *1*	100 *4*	1698.99	12$^-$		
		494.7 *11*	4.2 *24*	1447.28	11$^-$		
1947.12	16$^-$	328.0 *1*	41.0 *20*	1618.94	15$^-$		
		637.4 *1*	100 *4*	1309.82	14$^-$		
1968.52	(13$^+$)	337.9 *1*	100 *11*	1630.58	(12$^+$)		
		532.7 *1*	93 *10*	1435.83	(11$^+$)		
1970.93		262.7 *1*	100	1708.23			
2006.28		896.2 *2*	100	1110.08	12$^+$		
2050.43	(15$^+$)	648.8 *1*	100	1401.78	13$^+$		
2071.23		473.8 *2*	100	1597.43	13$^-$		
2105.26	14$^+$	316.8 *1*	25 *3*	1788.38	13$^+$		
		614.8 *1*	100 *5*	1490.36	12$^+$		
2123.6	(13$^-$)	335	≈50	1790.80	(12$^-$)		
		644.4 *2*	≈100	1479.09	(11$^-$)		
2124.93	(14$^-$)	1372.5 *2*	100	752.42	12$^-$		
2157.26	17$^-$	364.9 *1*	100 *3*	1792.24	16$^-$		
		705.4 *4*	2.3 *8*	1452.39	15$^-$		
2160.1		1407.7 *4*	100	752.42	12$^-$		
2182.70	(15$^-$)	302.4 *1*	100 *6*	1880.07	(14$^-$)		
		585.3 *1*	61 *7*	1597.43	13$^-$		
2186.9		282.4 *3*	100	1904.54			
2198.48	(14$^+$)	567.9 *1*	100	1630.58	(12$^+$)		
2258.7		290.1 *2*	100 *22*	1968.52	(13$^+$)		
		553.5 *10*	29 *22*	1708.23			
2294.36	17$^-$	347.0 *1*	36 *3*	1947.12	16$^-$		
		675.5 *1*	100 *4*	1618.94	15$^-$		
2321.03	(15)	379.4 *1*	100	1941.63	(14)	D	Mult.: from R(DCO) in ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ).
2328.0		875.7 *11*	100	1452.39	15$^-$		
2341.6		373.1 *2*	100	1968.52	(13$^+$)		
2354.5		474.4 *2*	100	1880.07	(14$^-$)		
2402.61	(16$^+$)	687.0 *1*	100	1715.55	14$^+$		

From ENSDF

$^{180}_{73}Ta_{107}$-19

Adopted Levels, Gammas (continued)

γ(^{180}Ta) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α	Comments
2410.24	(16$^+$)	694.6 *1*	100	1715.55	14$^+$			
2438.50	15$^+$	332.5 *2*	38 *7*	2105.26	14$^+$			
		650.3 *1*	100 *9*	1788.38	13$^+$			
2452.6		1435.9 *3*	100	1016.7				
2504.19	(16$^-$)	321.3 *1*	68 *7*	2182.70	(15$^-$)			
		624.3 *1*	100 *8*	1880.07	(14$^-$)			
2545.3	18$^-$	388.0 *1*	100 *5*	2157.26	17$^-$			
		753.0 *1*	16.3 *23*	1792.24	16$^-$			
2561.2		770.4 *2*	100	1790.80	(12$^-$)			
2568.62	(15$^+$)	600.1 *1*	100	1968.52	(13$^+$)			
2588.3	(18$^+$)	431.07 *9*	100	2157.26	17$^-$	(E1)	0.00948	α(K)=0.00796 *12*; α(L)=0.001180 *17*; α(M)=0.000266 *4*; α(N)=6.31×10^{-5} *9*; α(O)=9.80×10^{-6} *14* α(P)=6.27×10^{-7} *9* B(E1)(W.u.)=1.11×10^{-7} *11* Mult.: D from R(DCO) in ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ), Δπ=yes from level scheme.
		1136.8	≈7	1452.39	15$^-$	[E3]	0.00710	α(K)=0.00567 *8*; α(L)=0.001105 *16*; α(M)=0.000257 *4*; α(N)=6.13×10^{-5} *9*; α(O)=9.36×10^{-6} *14* α(P)=5.27×10^{-7} *8*
2658.14	18$^-$	363.6 *1*	29 *4*	2294.36	17$^-$			
		711.2 *1*	100 *5*	1947.12	16$^-$			
2660.65	(17$^+$)	250.2 *1*	99 *9*	2410.24	(16$^+$)			
		257.8 *1*	100 *9*	2402.61	(16$^+$)			
		610.8 *2*	60 *9*	2050.43	(15$^+$)			
2672.5		344.6 *8*	6 *3*	2328.0				
		880.4 *1*	100 *8*	1792.24	16$^-$	(D)		Mult.: from R(DCO) in ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ).
2721.43	(16)	400.4 *1*	100	2321.03	(15)			
2780.53	(17$^+$)	730.1 *1*	100	2050.43	(15$^+$)			
2787.75	16$^+$	349.0 *9*	22 *12*	2438.50	15$^+$			
		682.5 *1*	100 *12*	2105.26	14$^+$			
2843.6	(16$^+$)	645.1 *3*	100	2198.48	(14$^+$)			
2844.29	(17$^-$)	339.8 *6*	27 *12*	2504.19	(16$^-$)			
		661.6 *1*	100 *13*	2182.70	(15$^-$)			
2899.8	(19$^-$)	311.5 *1*	100 *5*	2588.3	(18$^+$)	(E1)	0.0202	α(K)=0.01689 *24*; α(L)=0.00256 *4*; α(M)=0.000578 *9*; α(N)=0.0001372 *20*; α(O)=2.11×10^{-5} *3* α(P)=1.296×10^{-6} *19* B(E1)(W.u.)>2.9×10^{-6} Mult.: D from R(DCO) in ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ), Δπ=yes from level scheme.
		354.4 *2*	12.1 *19*	2545.3	18$^-$	[M1]	0.1290	α(K)=0.1076 *16*; α(L)=0.01657 *24*; α(M)=0.00375 *6*; α(N)=0.000897 *13* α(O)=0.0001423 *20*; α(P)=9.92×10^{-6} *14* B(M1)(W.u.)>2.4×10^{-5}

From ENSDF

Adopted Levels, Gammas (continued)

γ(^{180}Ta) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α	Comments
2899.8	(19⁻)	742.4 *6*	6.2 *25*	2157.26	17⁻	[E2]	0.00801	α(K)=0.00647 *10*; α(L)=0.001191 *17*; α(M)=0.000275 *4*; α(N)=6.54×10^{-5} *10* α(O)=9.96×10^{-6} *14*; α(P)=5.55×10^{-7} *8* B(E2)(W.u.)>0.0011
2943.83	(18⁺)	282.9 *1*	57 *9*	2660.65	(17⁺)			
		533.7 *1*	100 *10*	2410.24	(16⁺)			
		541.4 *1*	90 *9*	2402.61	(16⁺)			
2954.5	19⁻	409.2 *1*	100 *7*	2545.3	18⁻			
		797.4 *1*	37 *5*	2157.26	17⁻			
2985.5	(19⁺)	397.1 *1*	100	2588.3	(18⁺)			
3041.57	(19⁻)	747.2 *1*	100	2294.36	17⁻			
3048.1		376.3 *2*	49 *9*	2672.5				
		890.7 *1*	100 *17*	2157.26	17⁻			
3141.63	(17)	420.2 *1*	100	2721.43	(16)			
3148.3	17⁺	361.9 *13*	52 *22*	2787.75	16⁺			
		709.7 *3*	100 *26*	2438.50	15⁺			
3173.4		770.8 *3*	100	2402.61	(16⁺)			
3175?	(18⁺)	765[@] *4*	100	2410.24	(16⁺)			
3200.9	(18⁻)	696.7 *4*	100	2504.19	(16⁻)			
3253.51	(19⁺)	309.7 *1*	73 *13*	2943.83	(18⁺)			
		592.8 *2*	100 *13*	2660.65	(17⁺)			
3309.1	(20⁻)	409.3 *1*	100	2899.8	(19⁻)	(M1)	0.0880	α(K)=0.0735 *11*; α(L)=0.01126 *16*; α(M)=0.00255 *4*; α(N)=0.000610 *9*; α(O)=9.67×10^{-5} *14* α(P)=6.76×10^{-6} *10* Mult.: D from R(DCO) in ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ), (M1) from assumed band structure.
3383.9	20⁻	429.4 *1*	100 *14*	2954.5	19⁻			
		838.2 *2*	68 *10*	2545.3	18⁻			
3400.5	(20⁺)	415.0 *1*	100 *9*	2985.5	(19⁺)			
		812.4 *2*	85 *10*	2588.3	(18⁺)			
3435.4	(20⁻)	777.3 *3*	100	2658.14	18⁻			
3435.9		890.6 *11*	100	2545.3	18⁻			
3532.7		632.9 *1*	100	2899.8	(19⁻)			
3584.8?	(19⁺)	804.3[@] *13*	100	2780.53	(17⁺)			
3678.9	(22⁻)	369.8	100	3309.1	(20⁻)	(E2)	0.0448	α(K)=0.0325 *5*; α(L)=0.00945 *14*; α(M)=0.00226 *4*; α(N)=0.000535 *8*; α(O)=7.67×10^{-5} *11* α(P)=2.65×10^{-6} *4* B(E2)(W.u.)=0.00065 *17* Mult.: E2 or E3 from α(exp) in ^{180}Hf(^{238}U,Xγ); E3 excluded by comparison to RUL.
3738.4	(21⁻)	429.3 *1*	100	3309.1	(20⁻)			
3828.7	21⁻	444.8 *1*	100	3383.9	20⁻			
3832.2	(21⁺)	432.1 *3*	48 *14*	3400.5	(20⁺)			

From ENSDF

Adopted Levels, Gammas (continued)

$\gamma(^{180}Ta)$ (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Comments
3832.2	(21^+)	846.5 *2*	100 *14*	2985.5	(19^+)	
3855.5?	(21^-)	813.9@ *4*	100	3041.57	(19^-)	
4170.9		492.0	100	3678.9	(22^-)	
x+4169.9	(23,24,25)	x		4170.9		E_γ: x<60 keV.
4186.7	(22^-)	448.3 *1*	100	3738.4	(21^-)	

† Weighted average of all available data, except where noted.
‡ From ce data in ^{176}Yb(^{11}B,α3nγ),(^{7}Li,3nγ) and ^{180}Hf(p,nγ),(d2nγ), except where noted.
# From ^{180}Hf(p,nγ),(d,2nγ) where authors (2002We01) state the values are indicative only.
@ Placement of transition in the level scheme is uncertain.

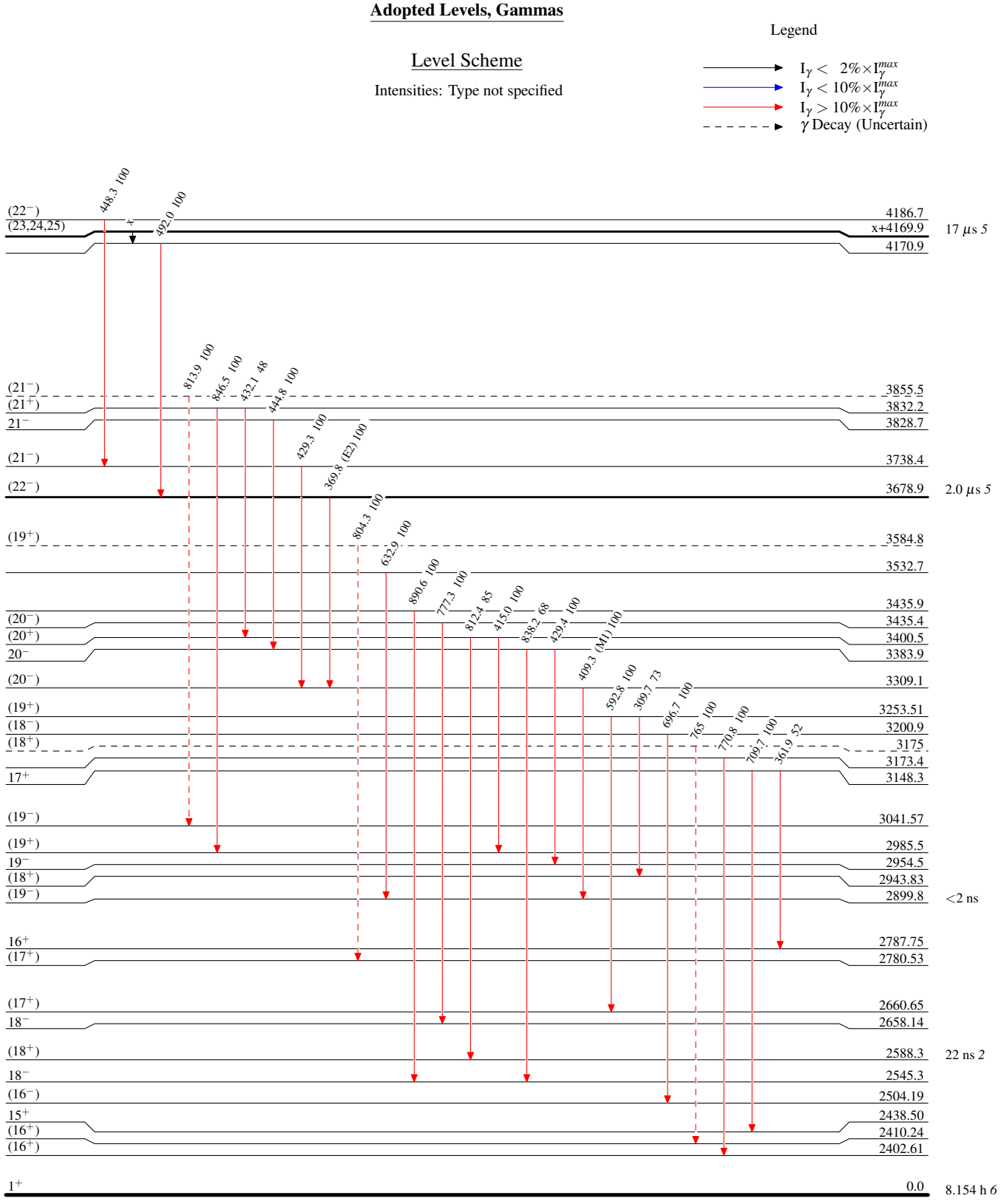
From ENSDF

$^{180}_{73}Ta_{107}$-22

Adopted Levels, Gammas

Level Scheme

Intensities: Type not specified

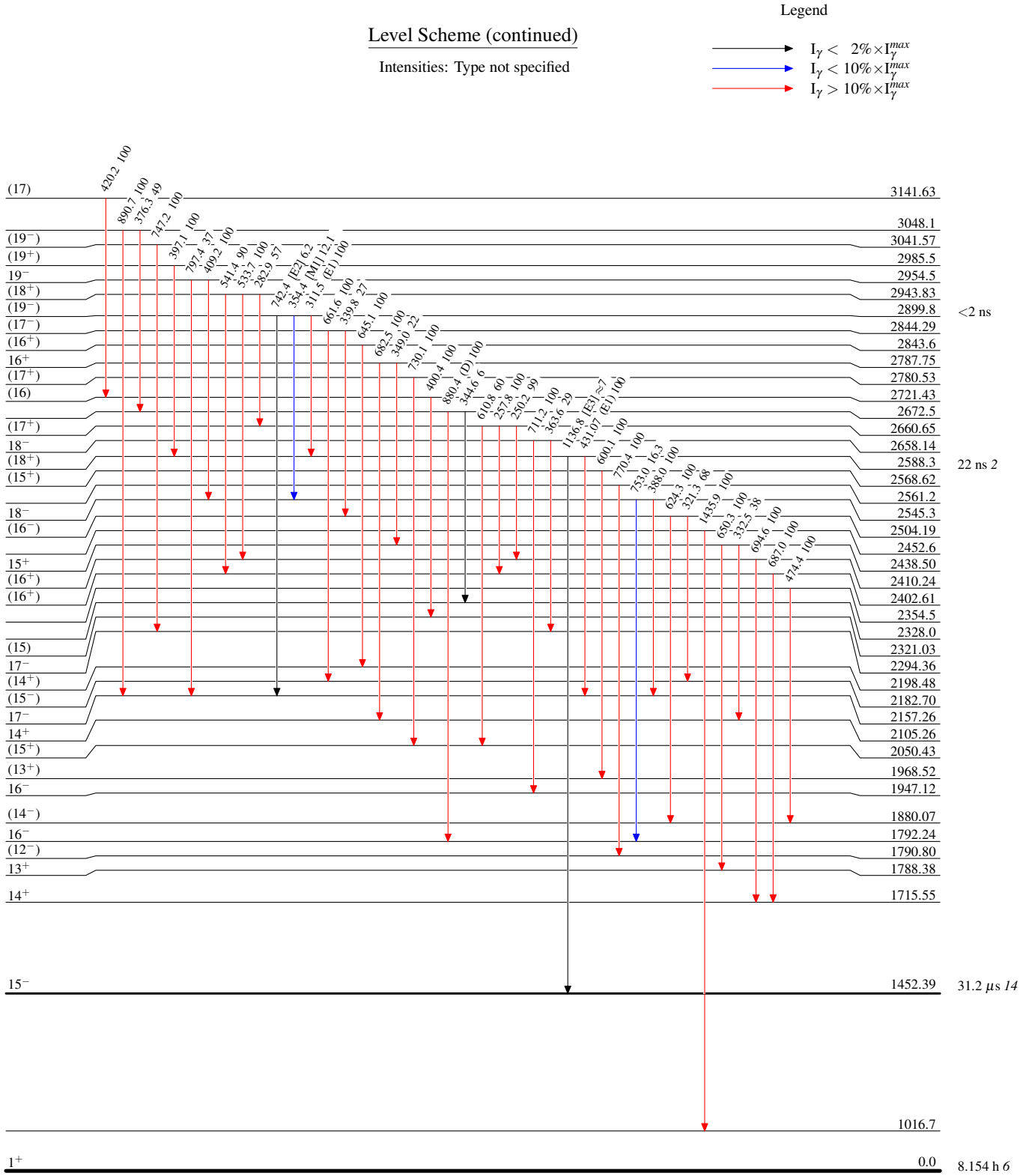


$^{180}_{73}Ta_{107}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

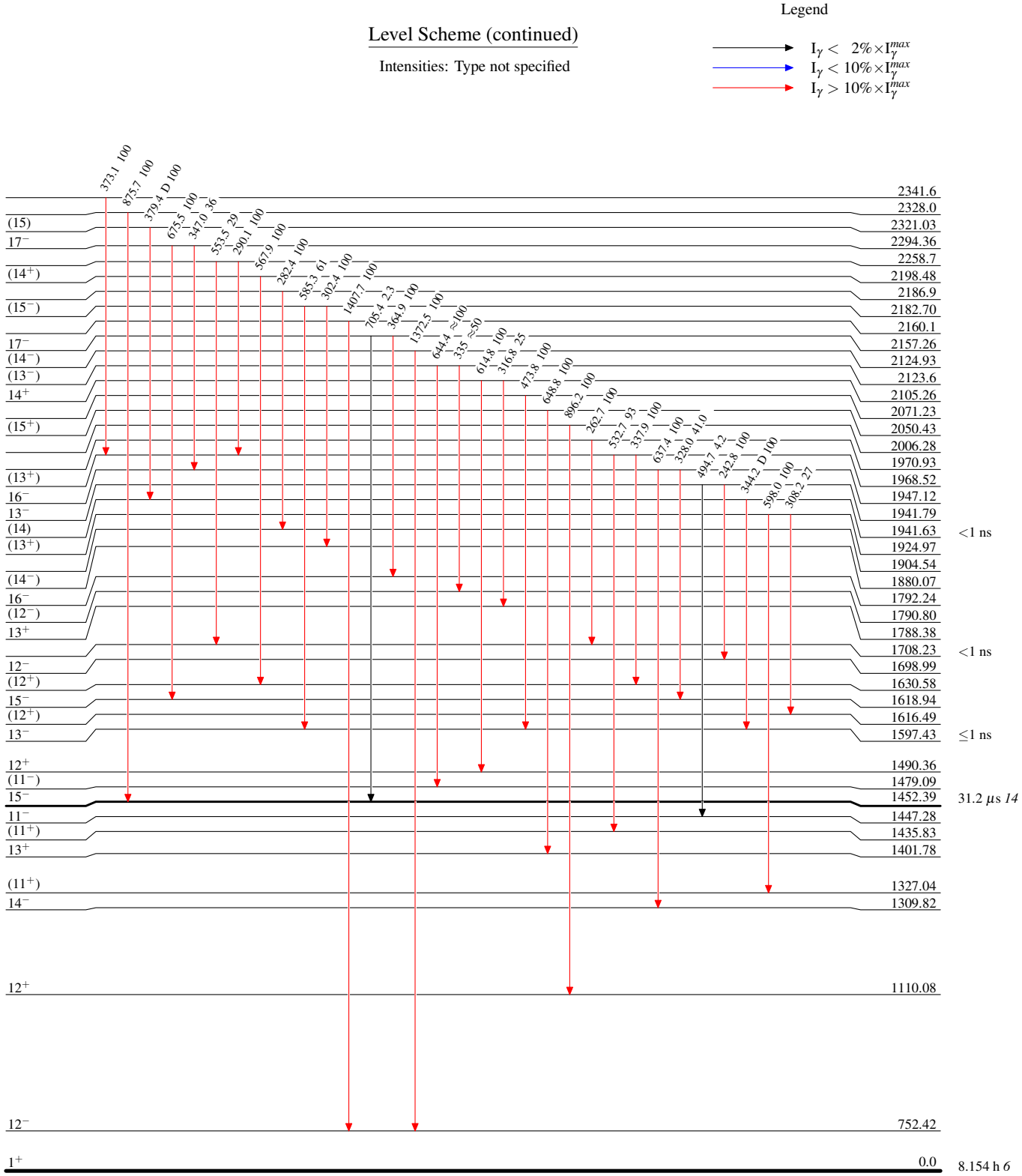


$^{180}_{73}Ta_{107}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

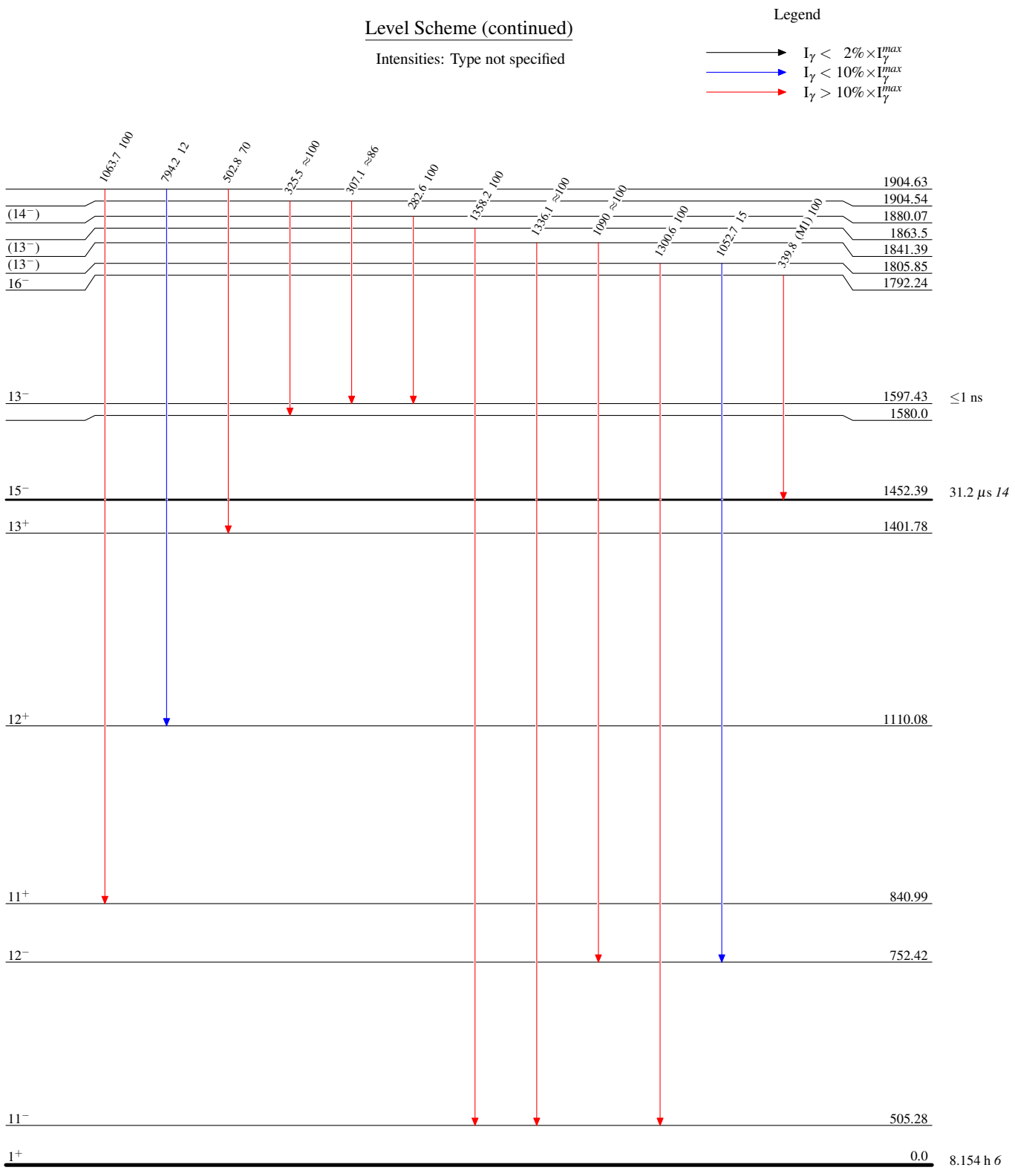


$^{180}_{73}Ta_{107}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

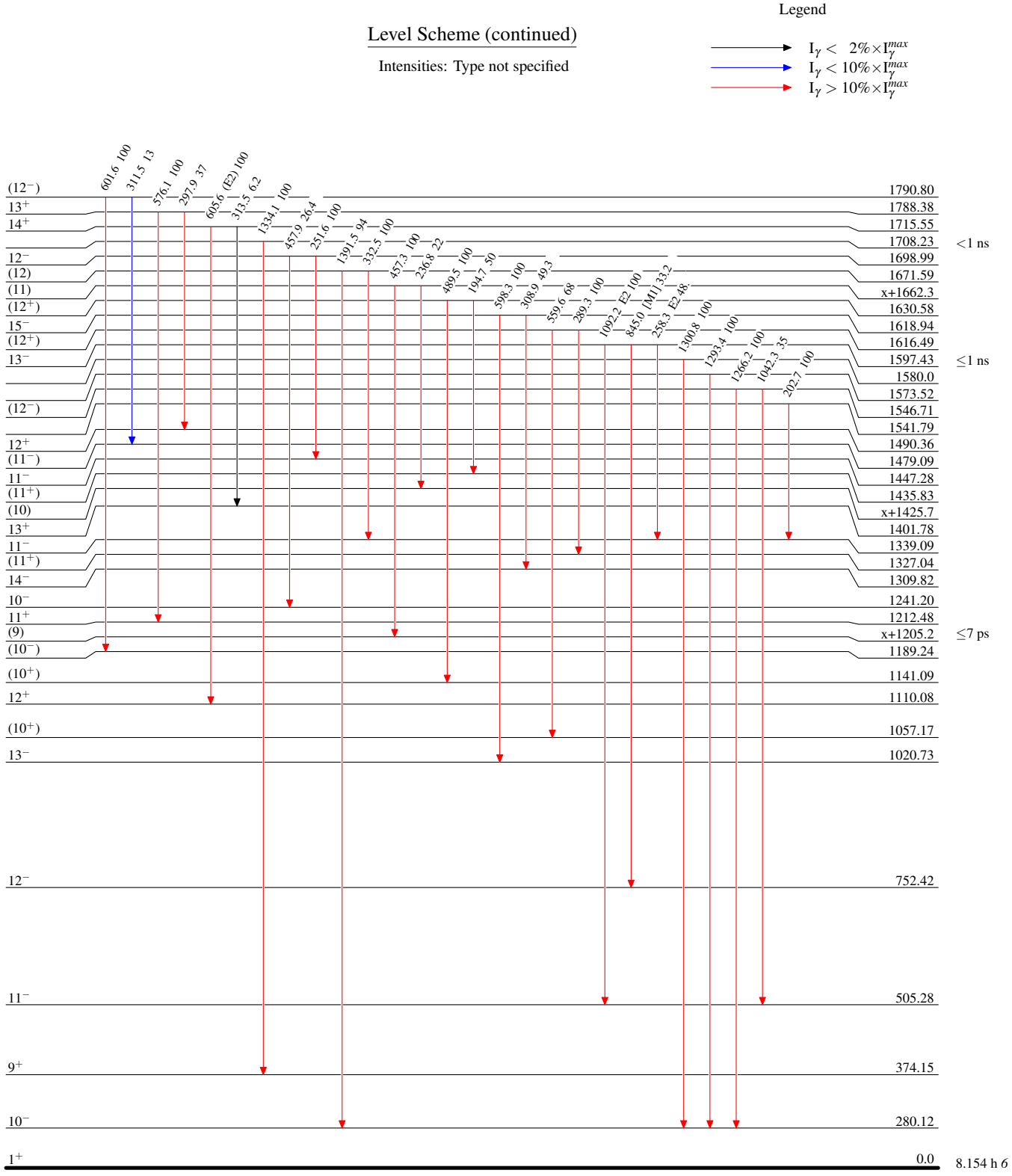


$^{180}_{73}Ta_{107}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

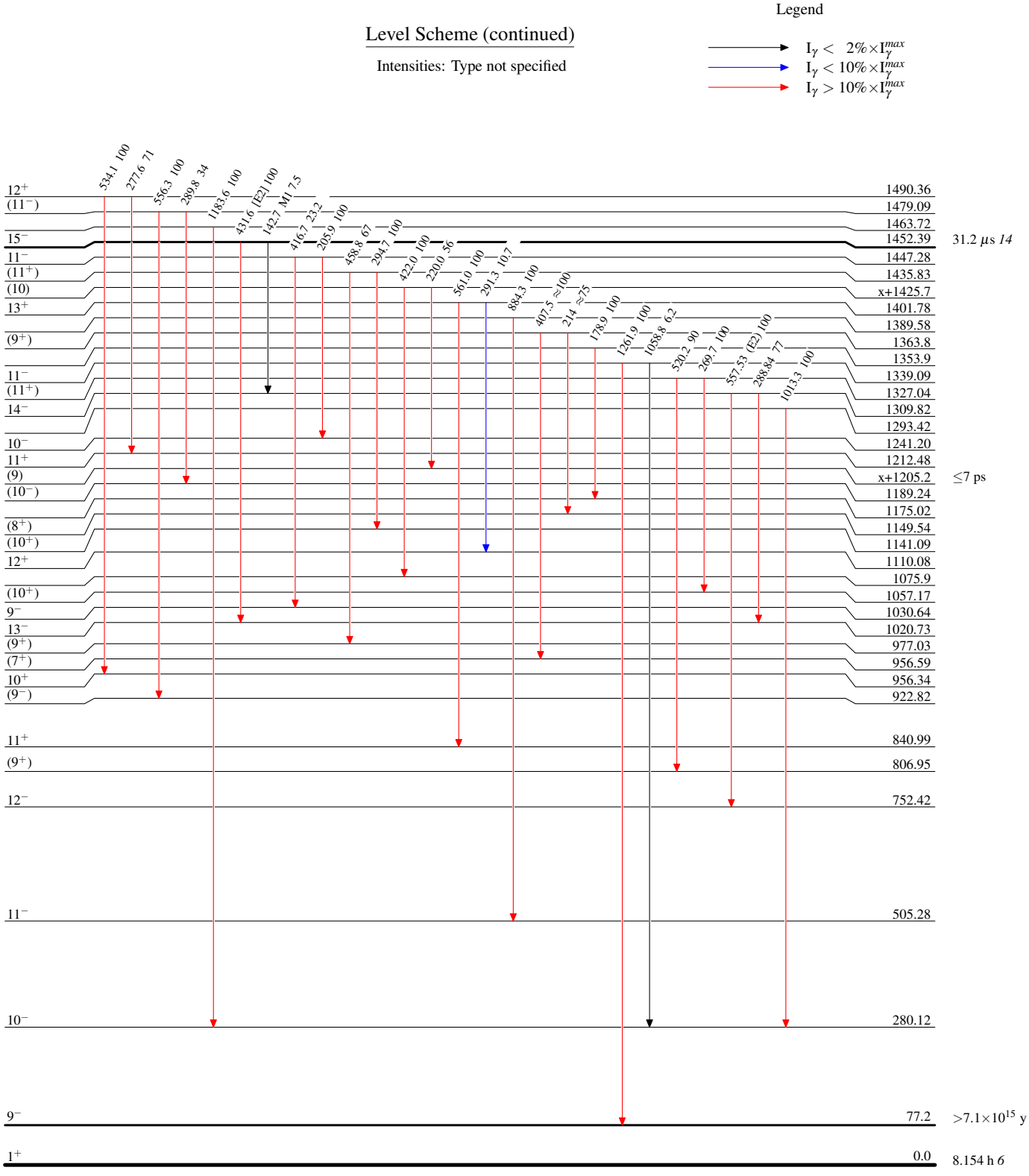


$^{180}_{73}Ta_{107}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

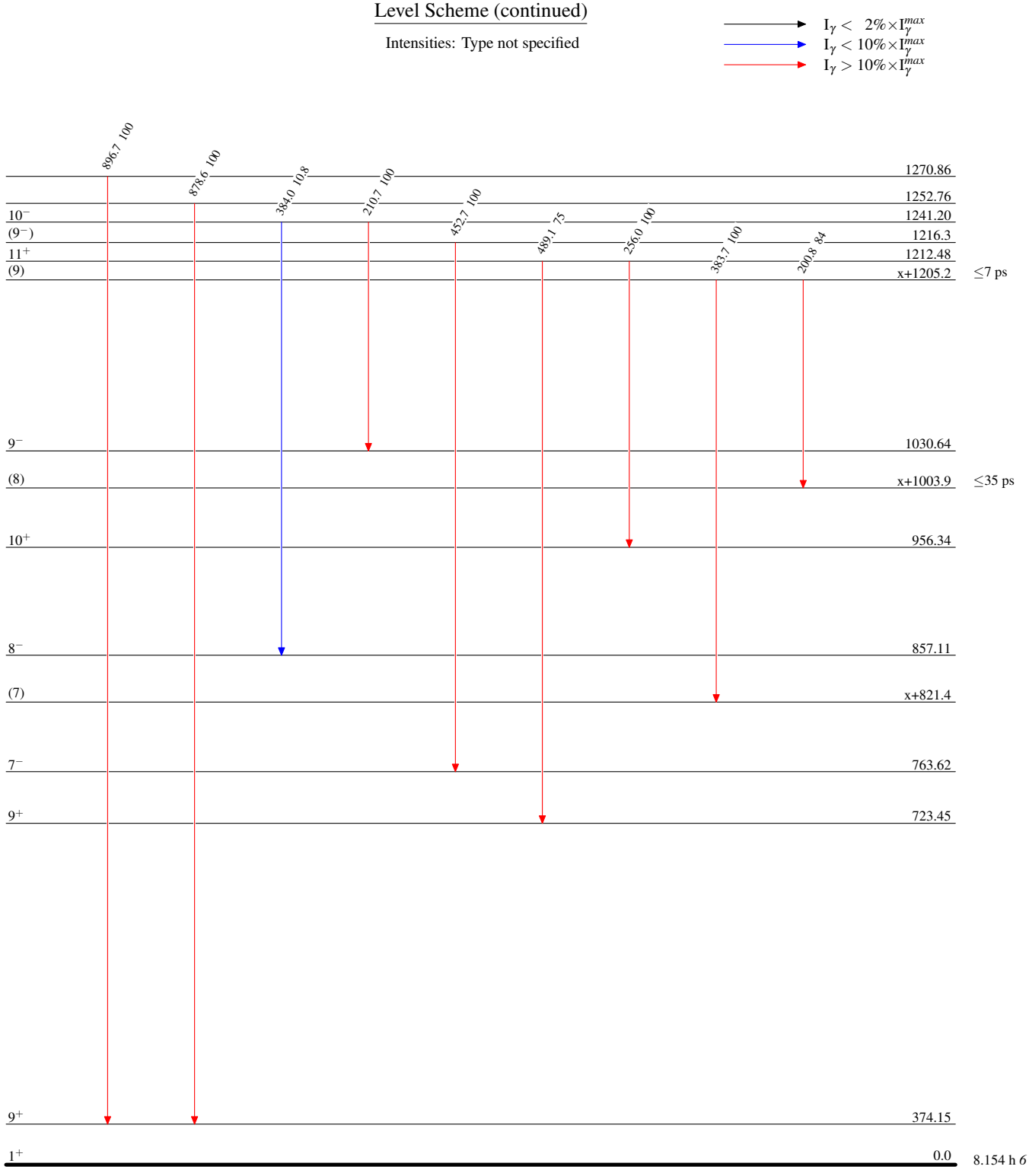


$^{180}_{73}Ta_{107}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified



$^{180}_{73}Ta_{107}$

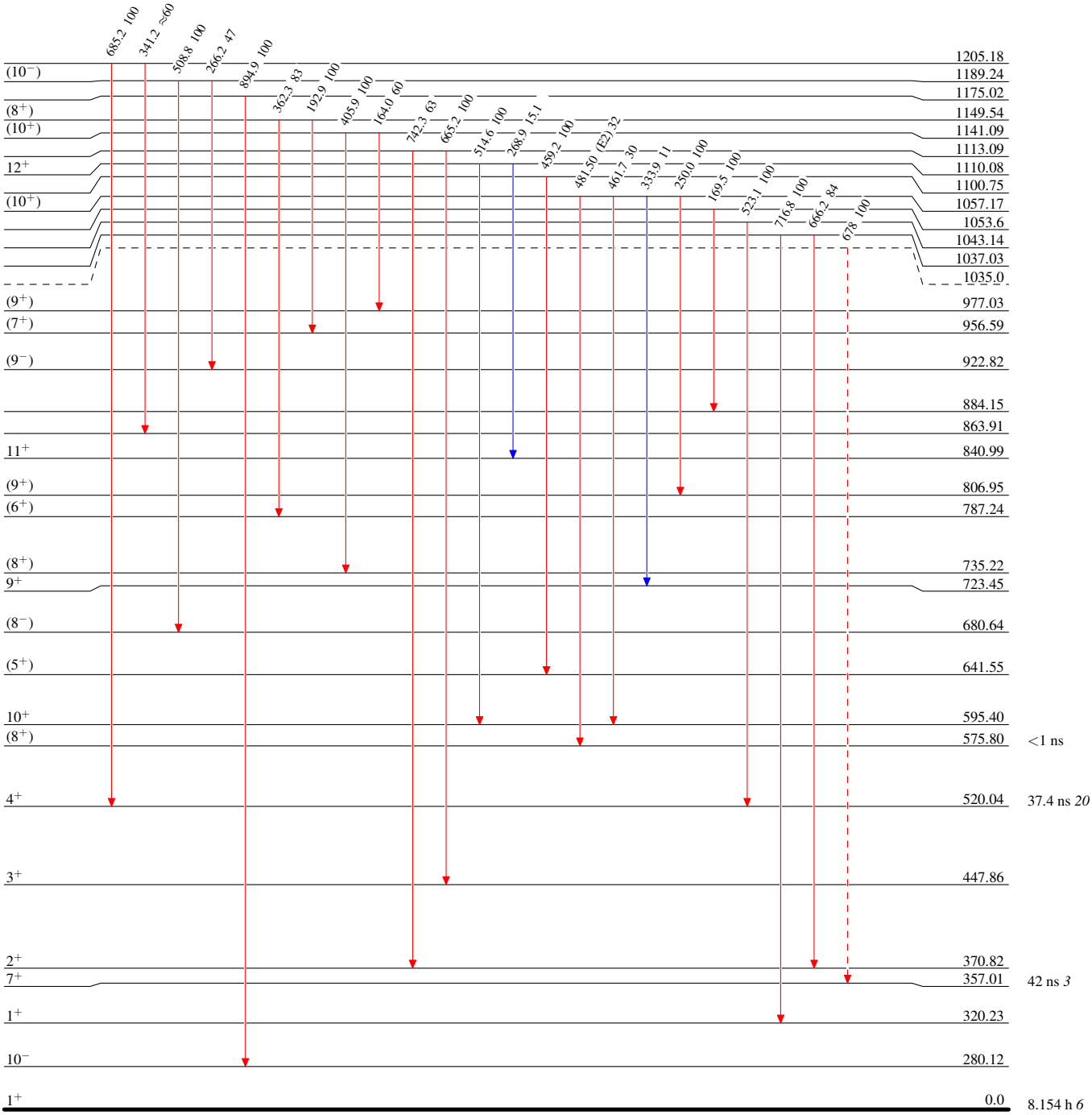
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)

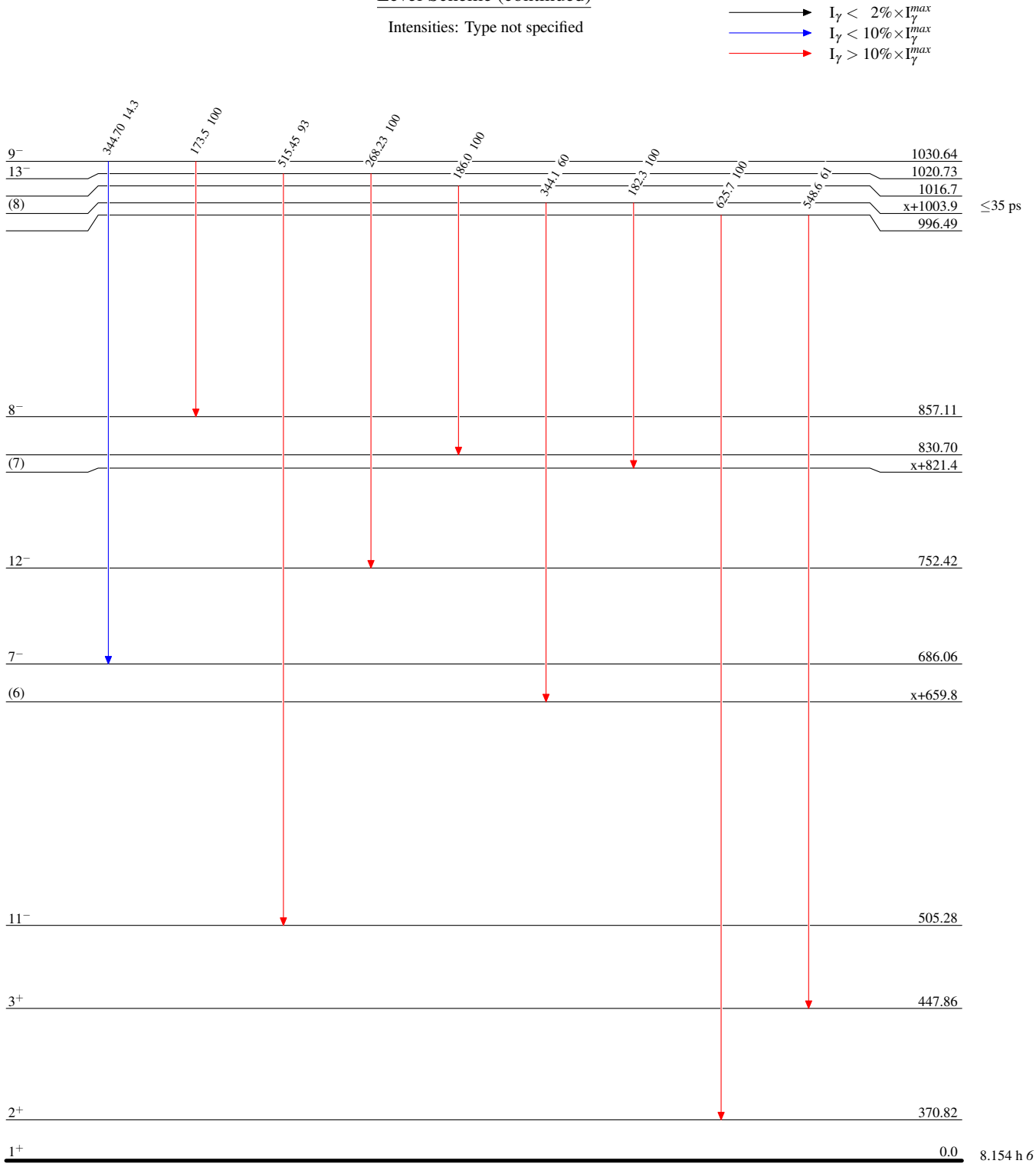


$^{180}_{73}Ta_{107}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

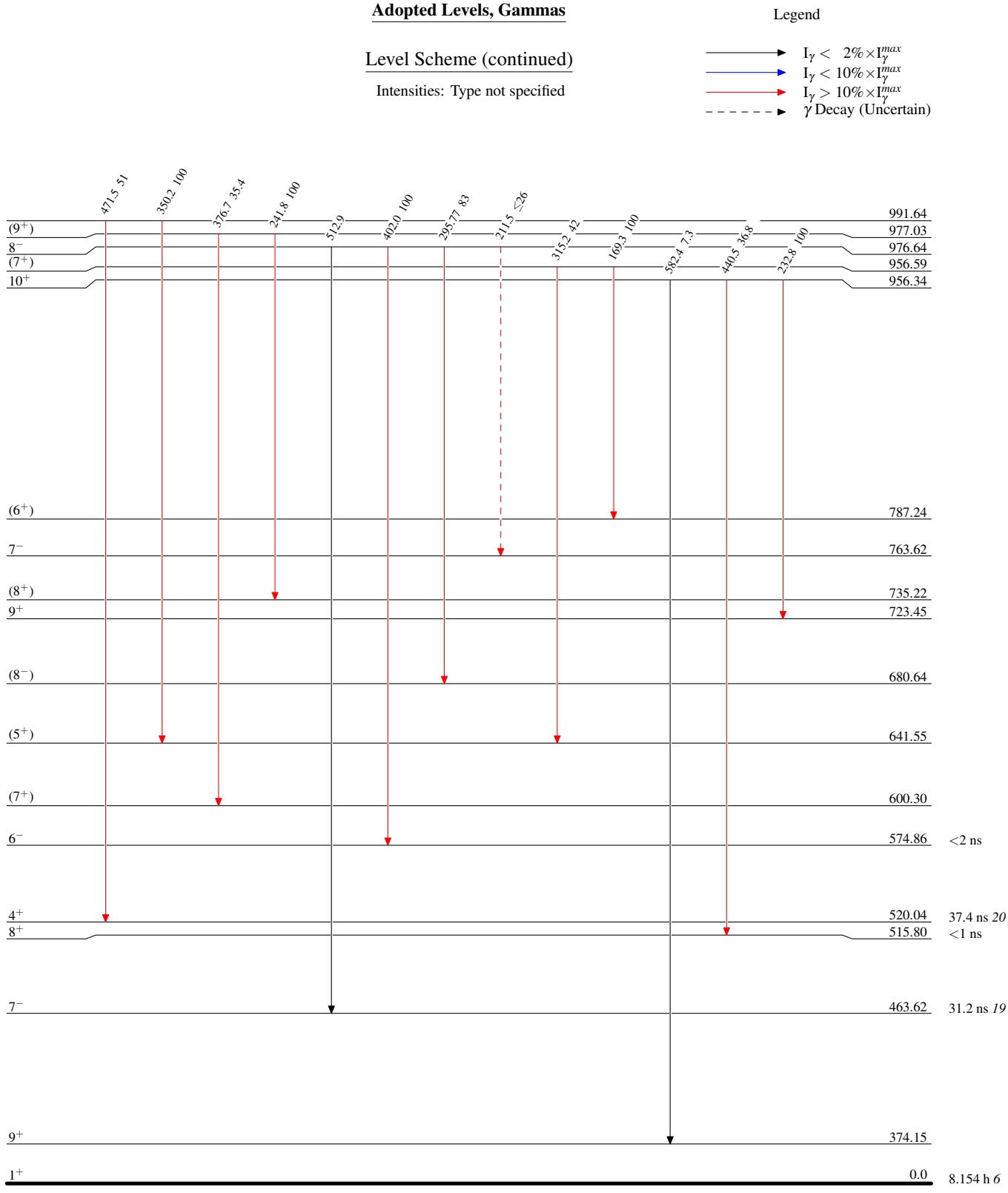


$^{180}_{73}Ta_{107}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

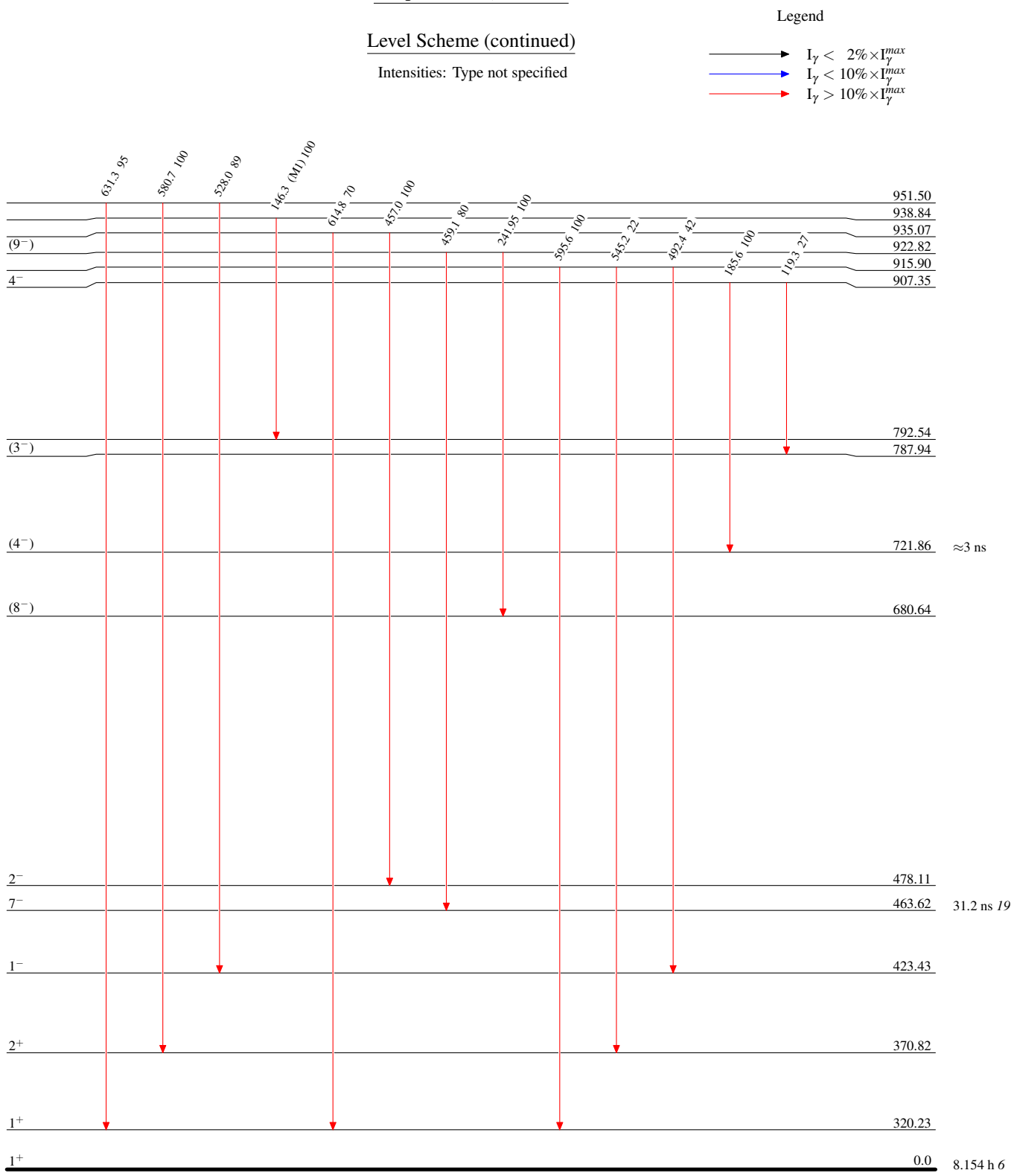


$^{180}_{73}Ta_{107}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

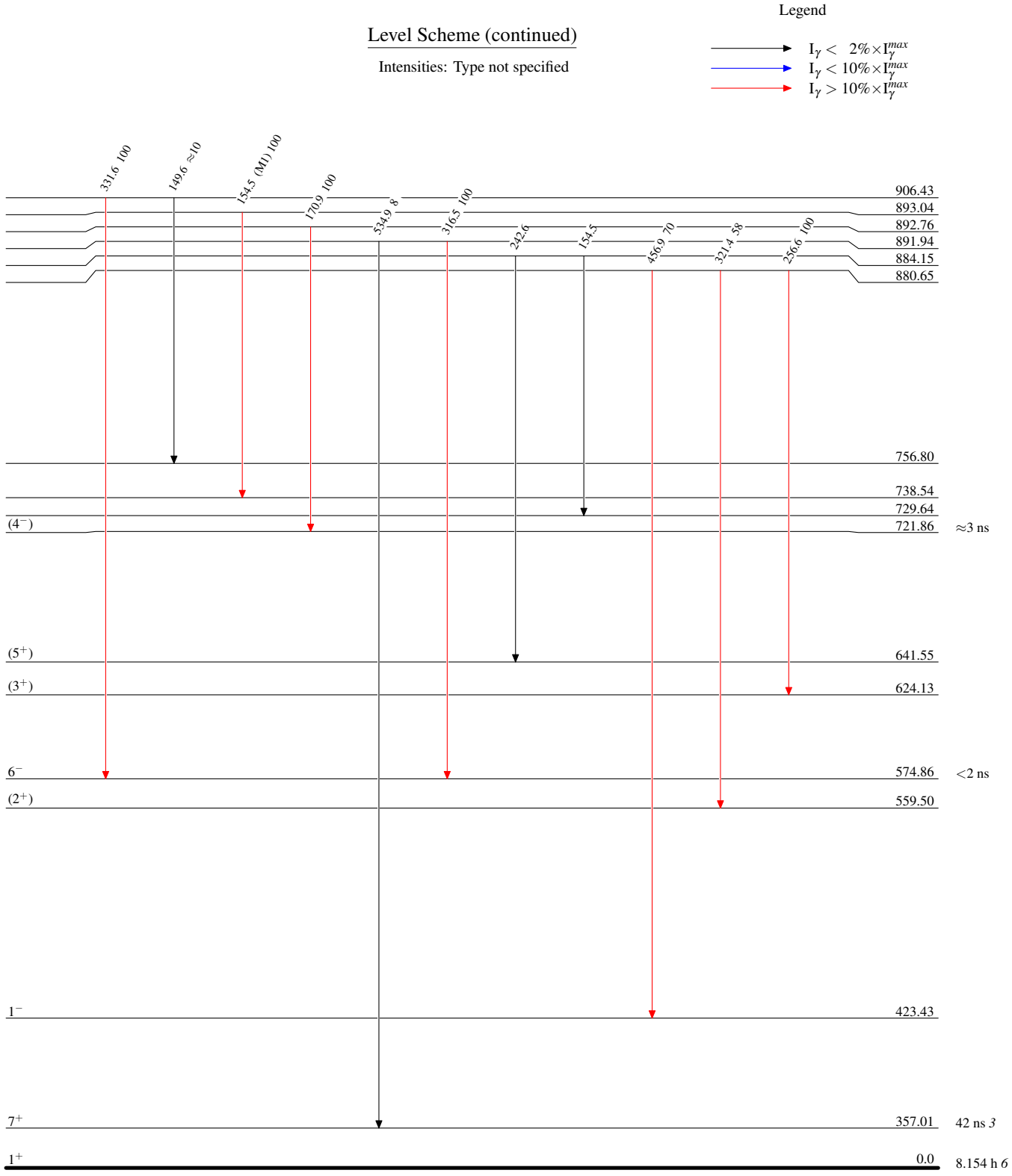


$^{180}_{73}Ta_{107}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

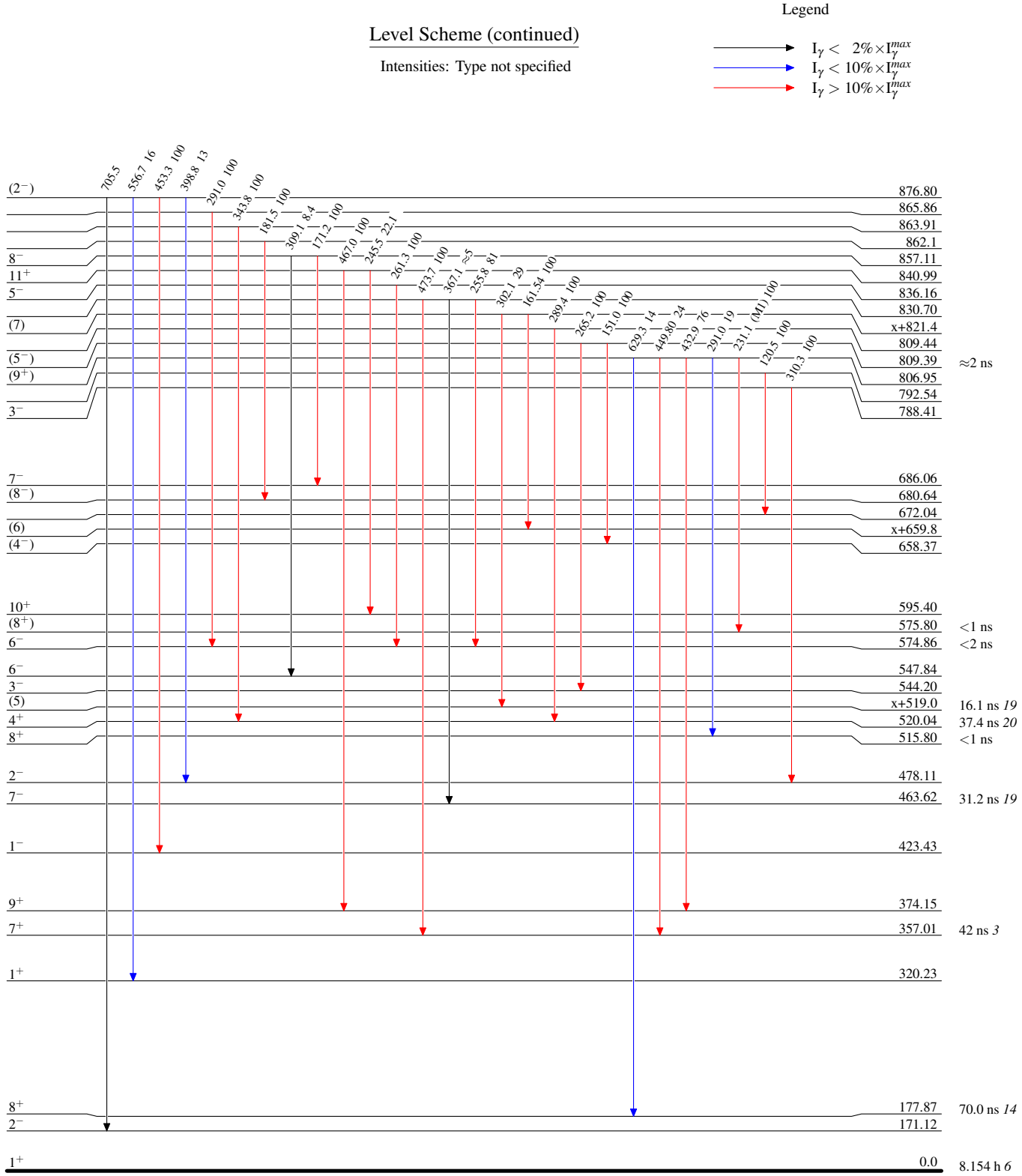


$^{180}_{73}Ta_{107}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

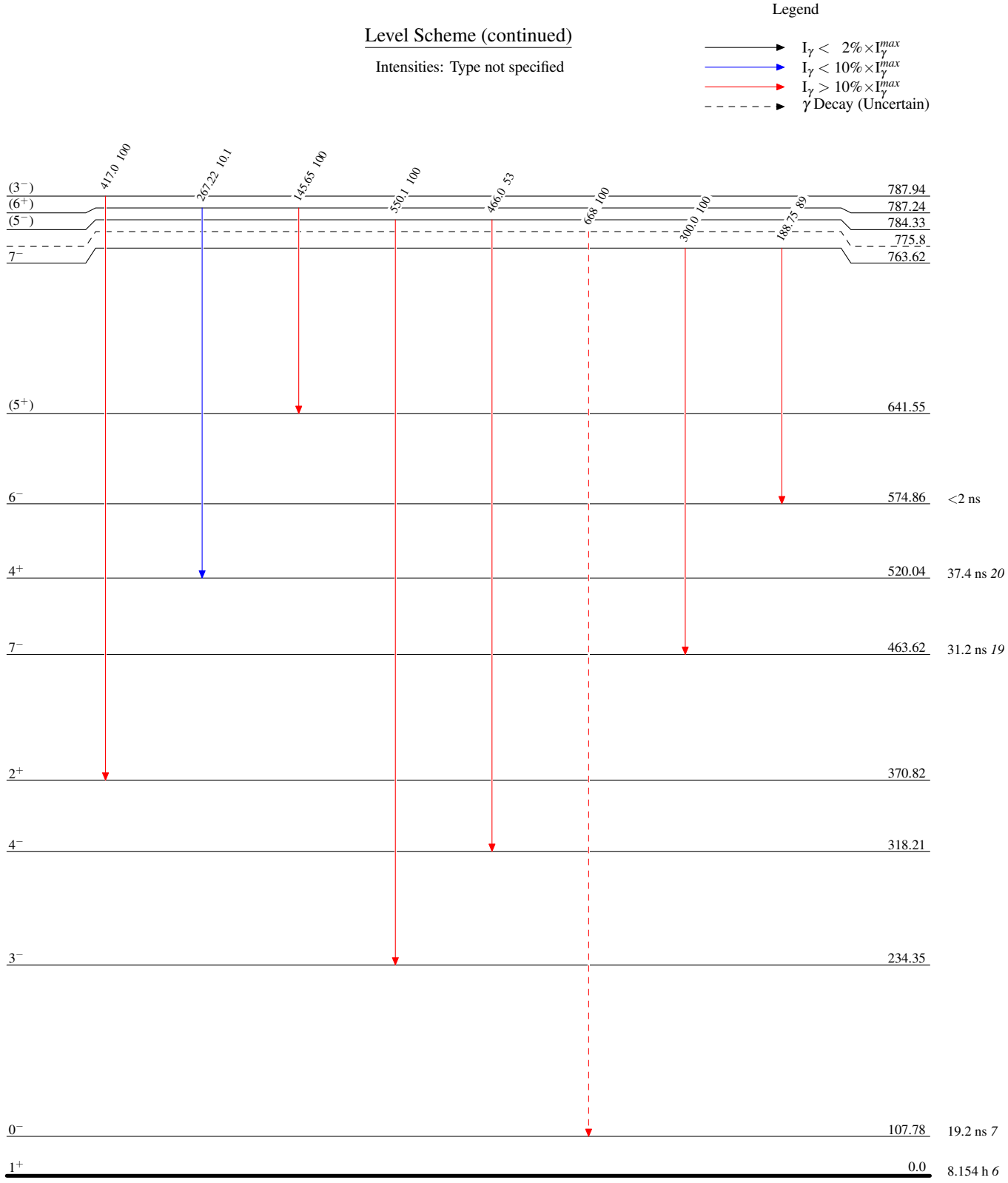


$^{180}_{73}Ta_{107}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

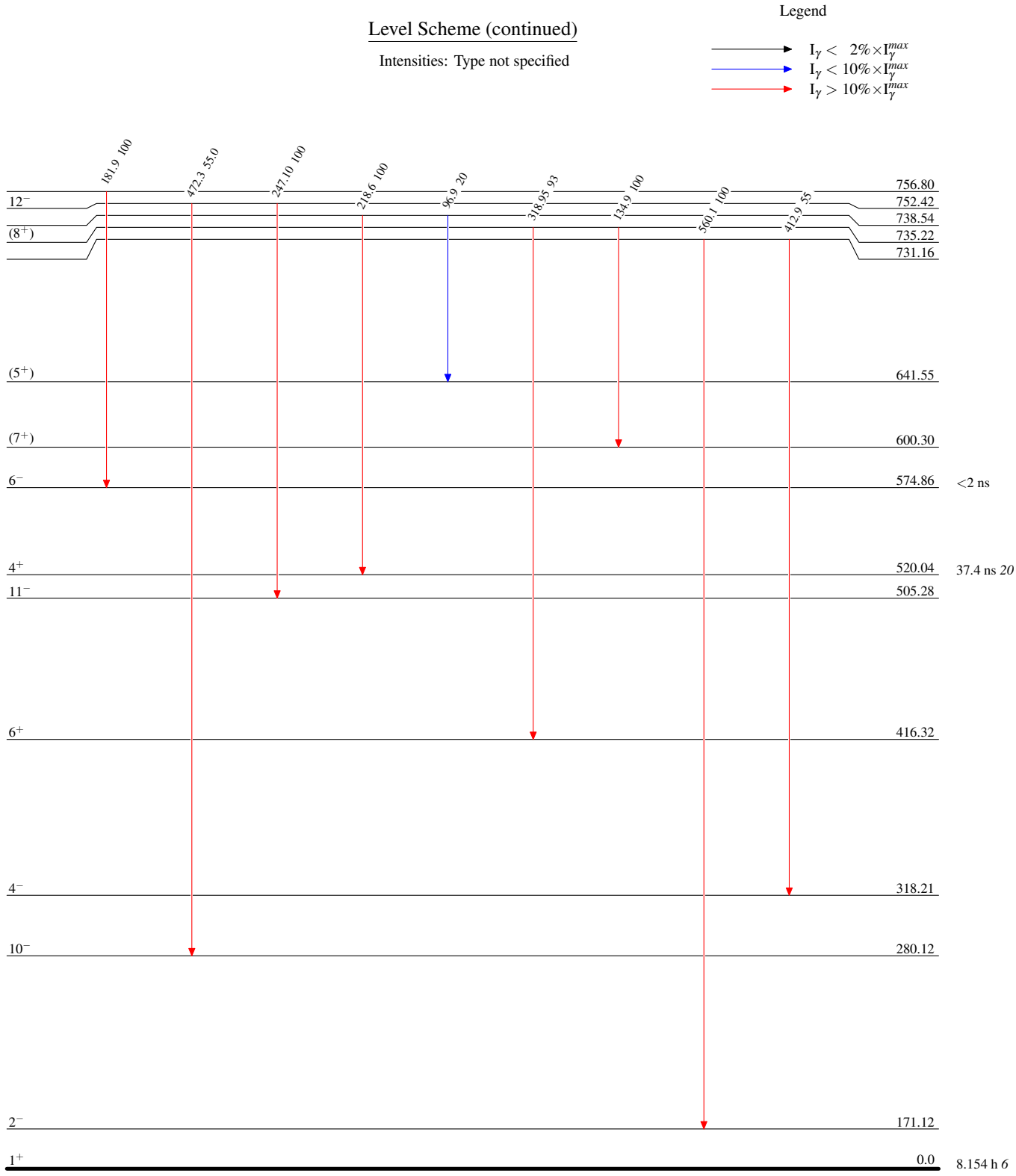


$^{180}_{73}Ta_{107}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

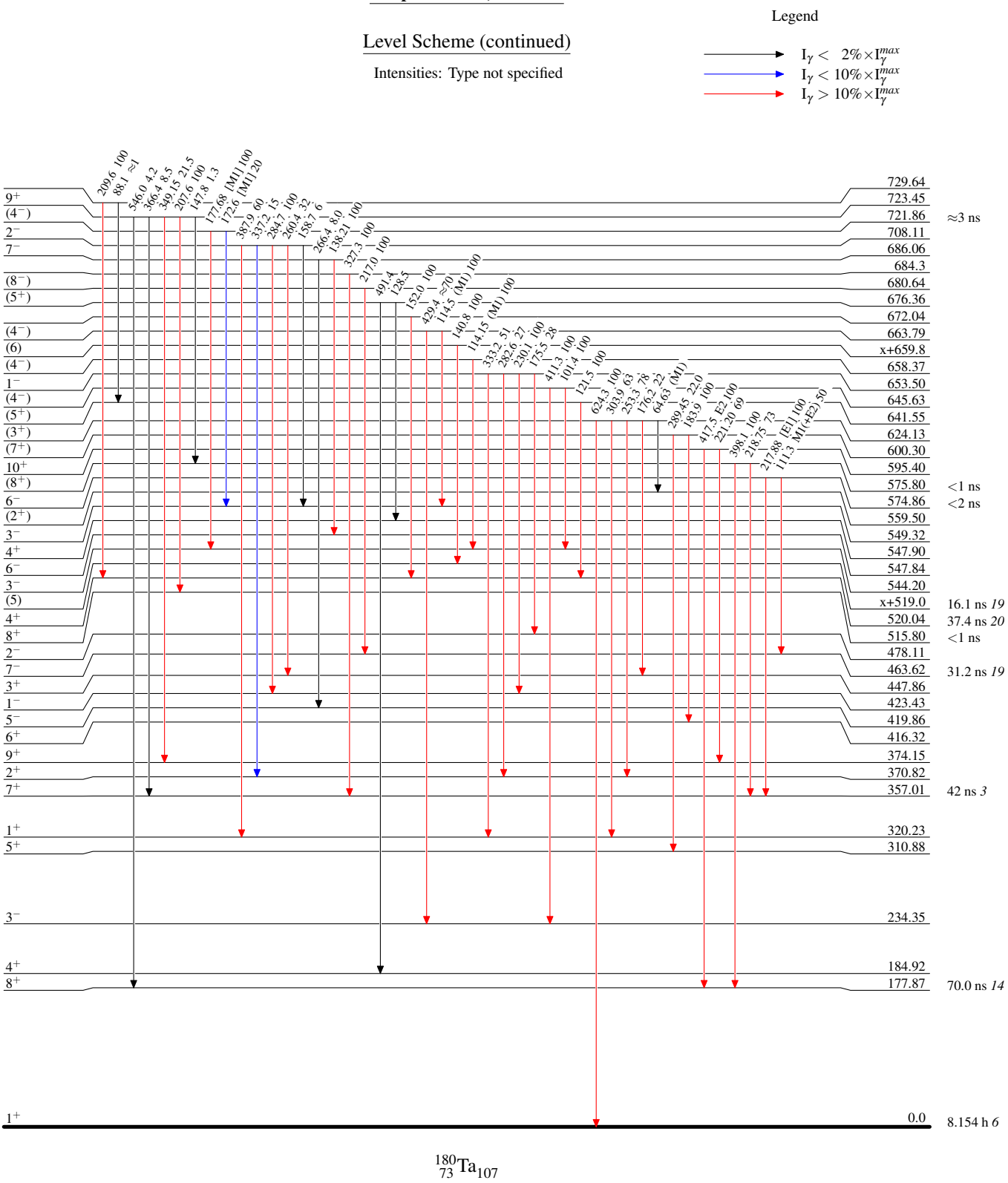


$^{180}_{73}Ta_{107}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

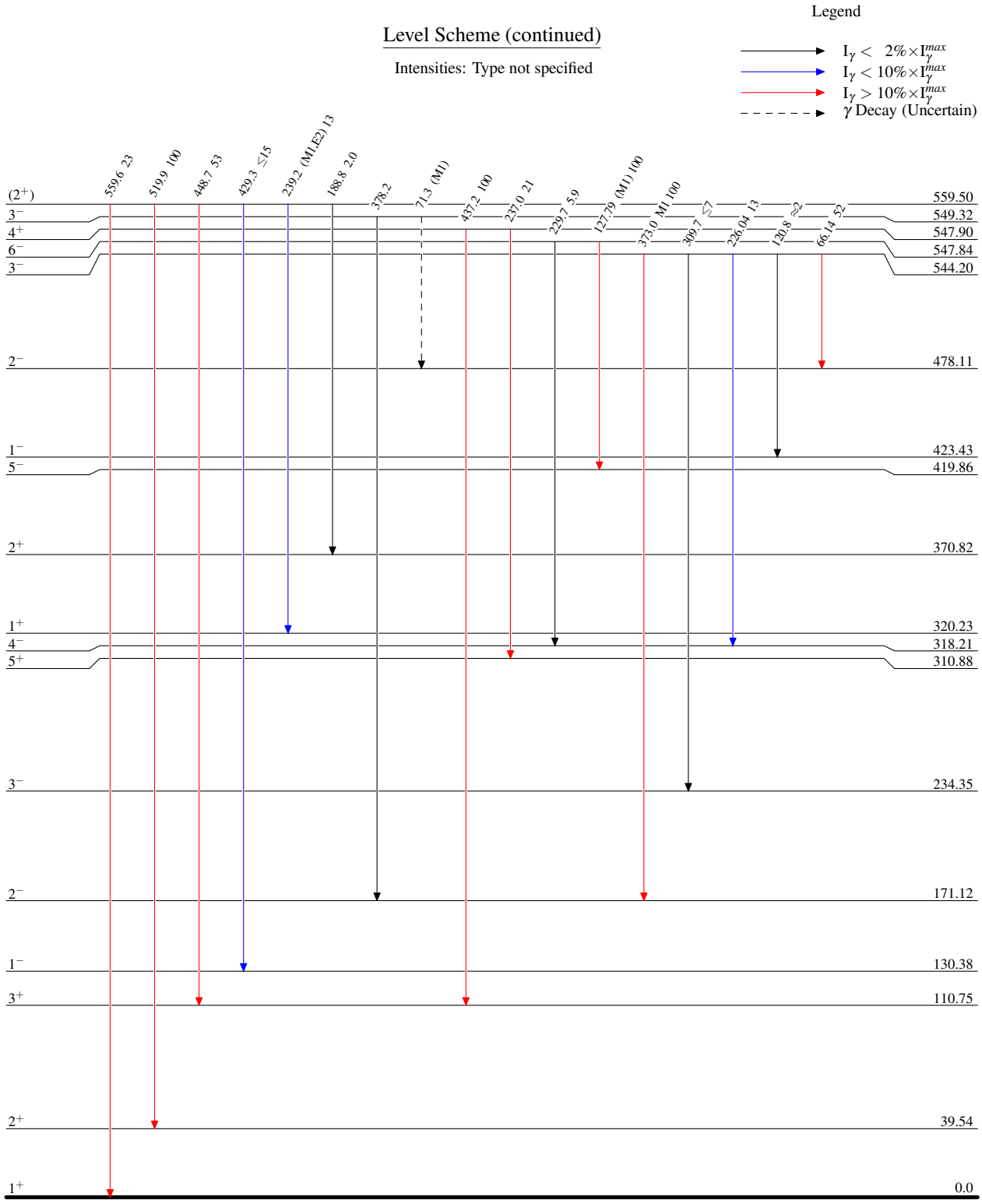


$^{180}_{73}Ta_{107}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

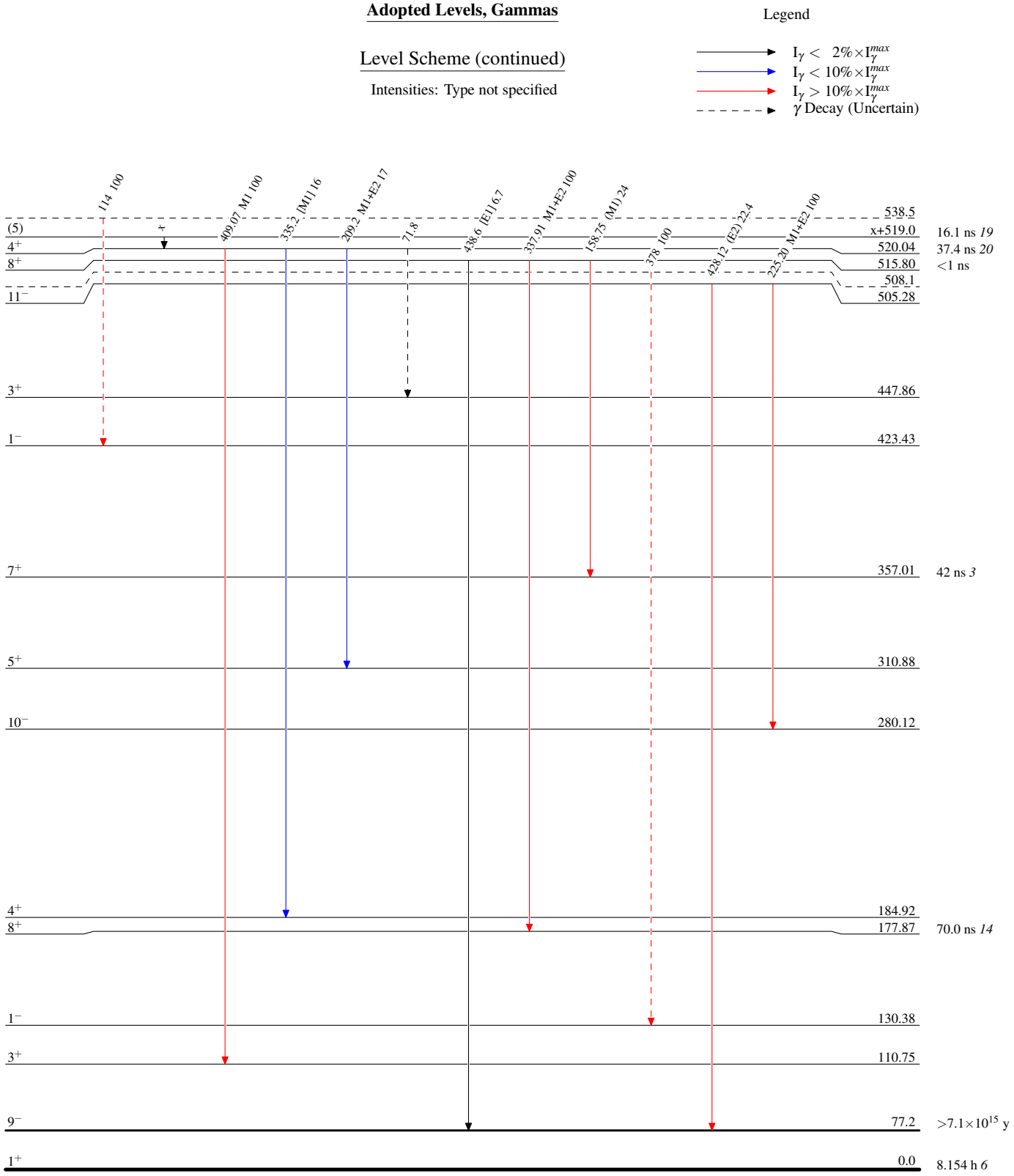


$^{180}_{73}Ta_{107}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified



$^{180}_{73}Ta_{107}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

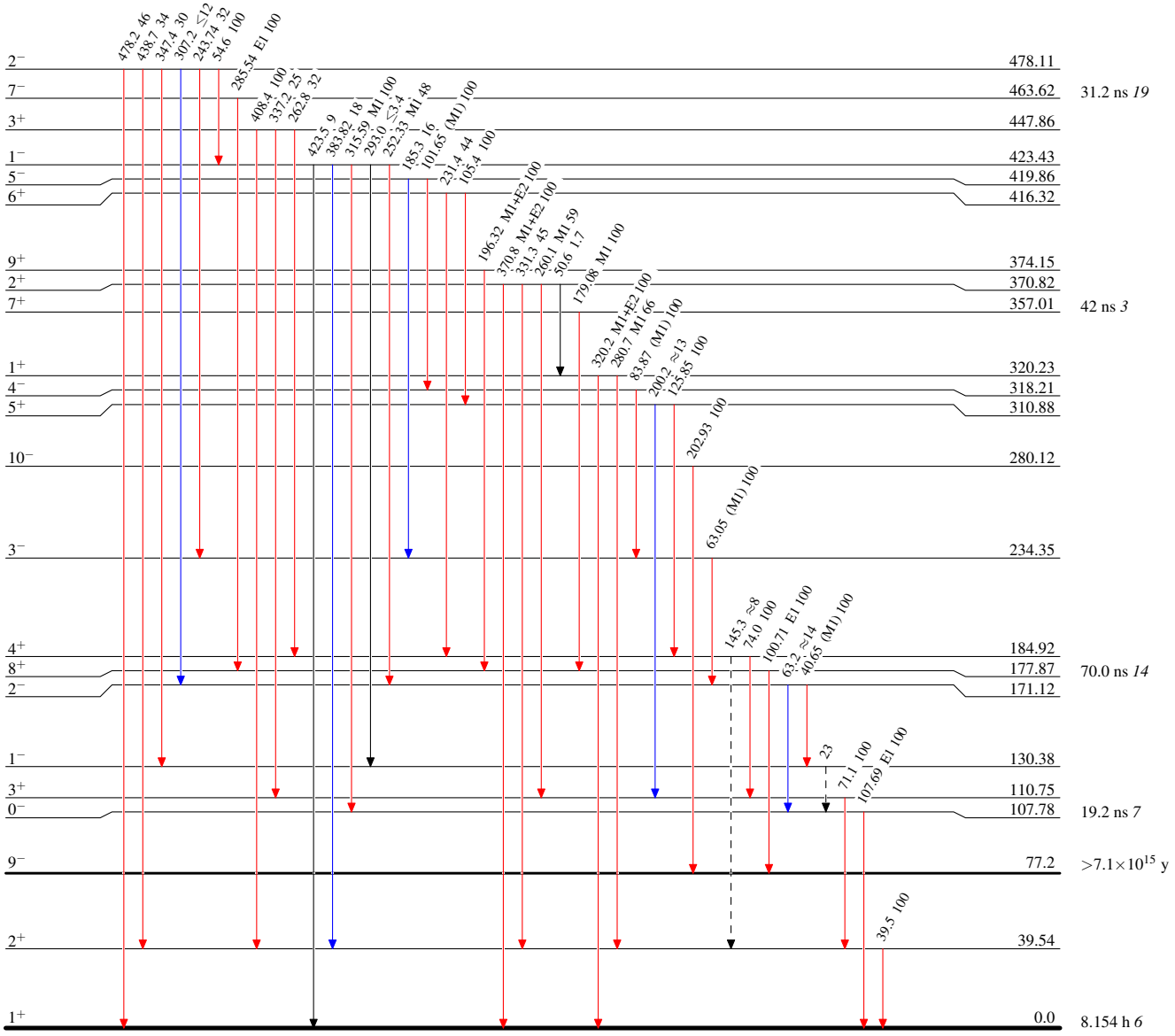
Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

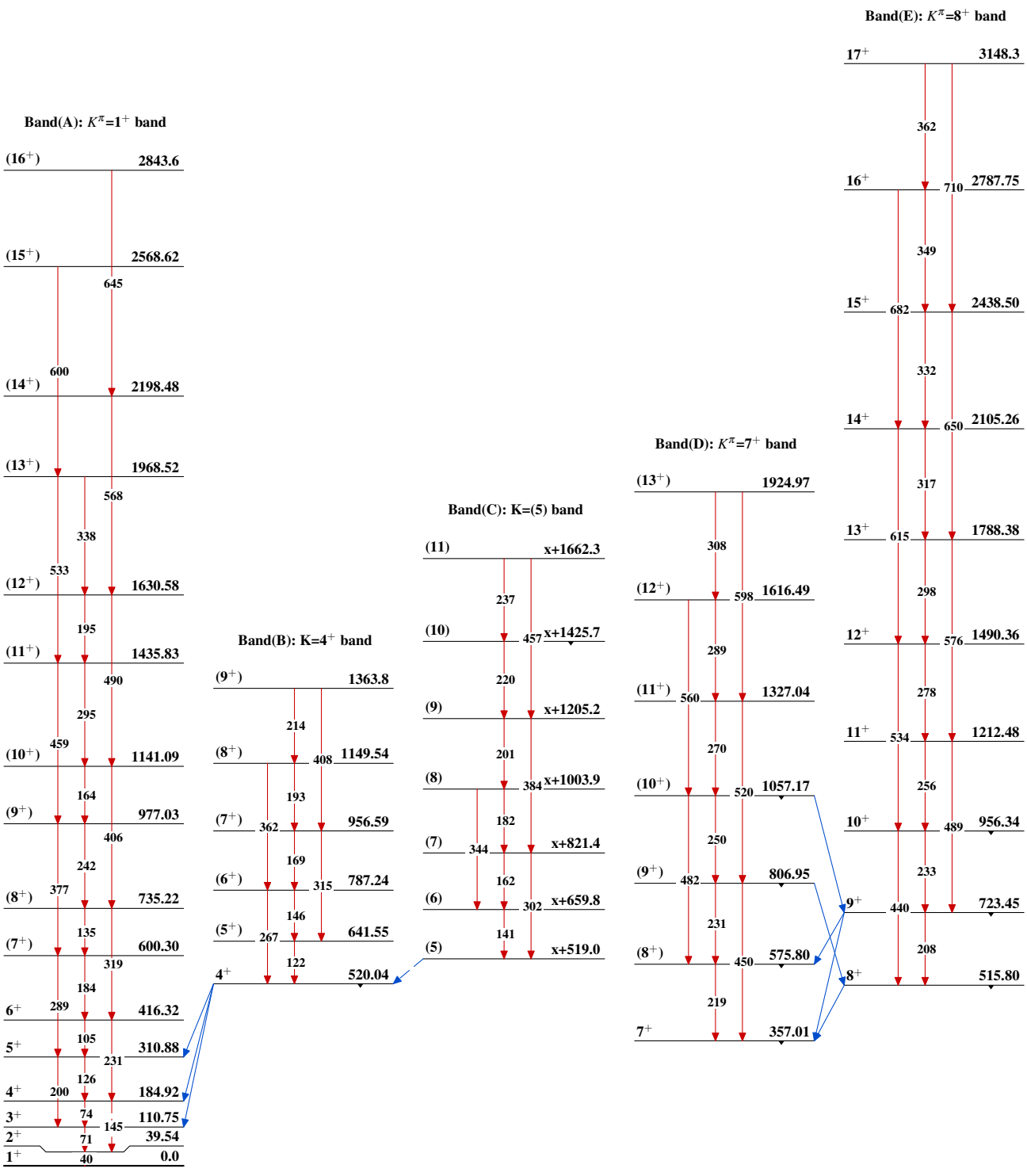
$I_\gamma > 10\% \times I_\gamma^{max}$

γ Decay (Uncertain)



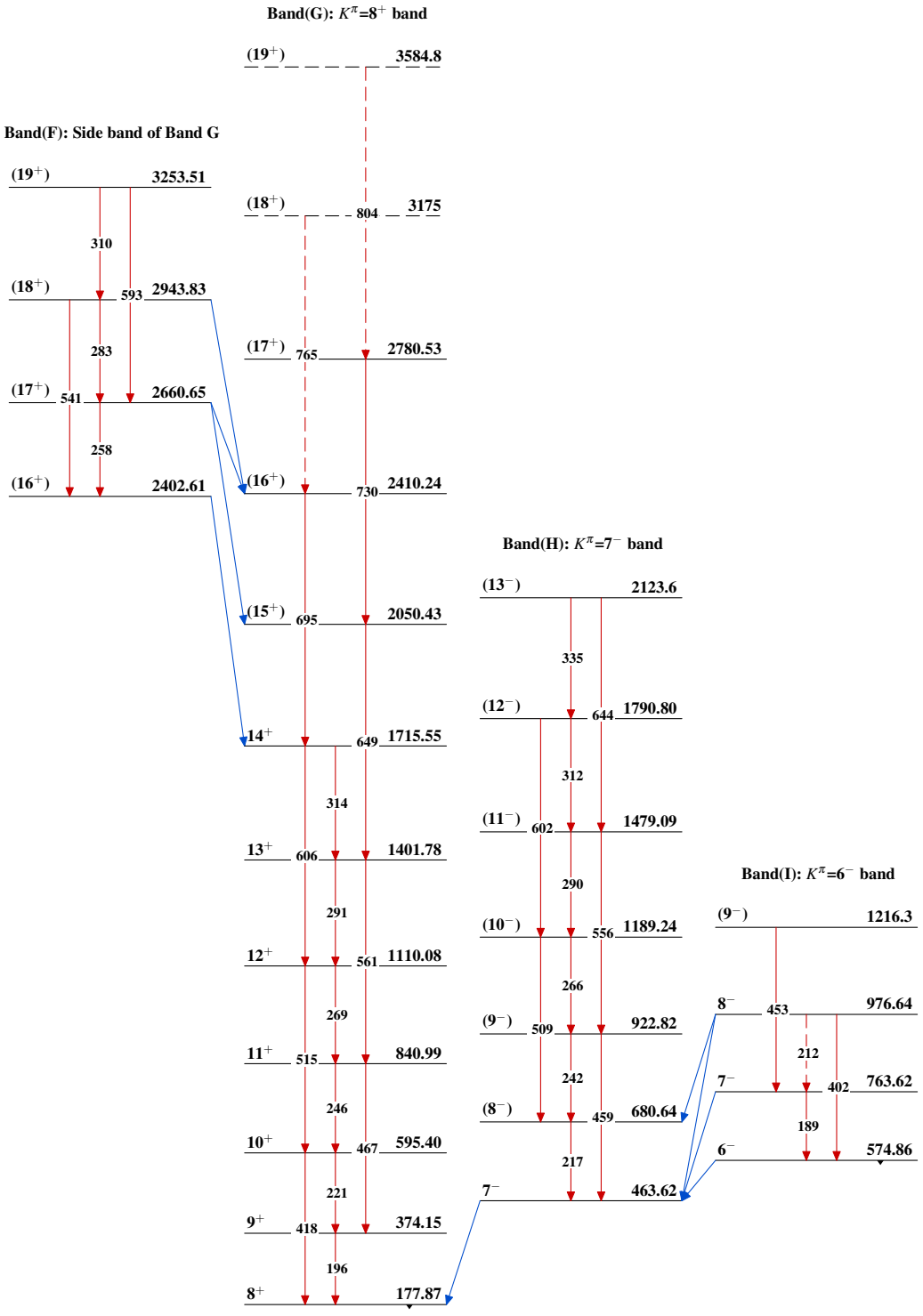
$^{180}_{73}Ta_{107}$

Adopted Levels, Gammas



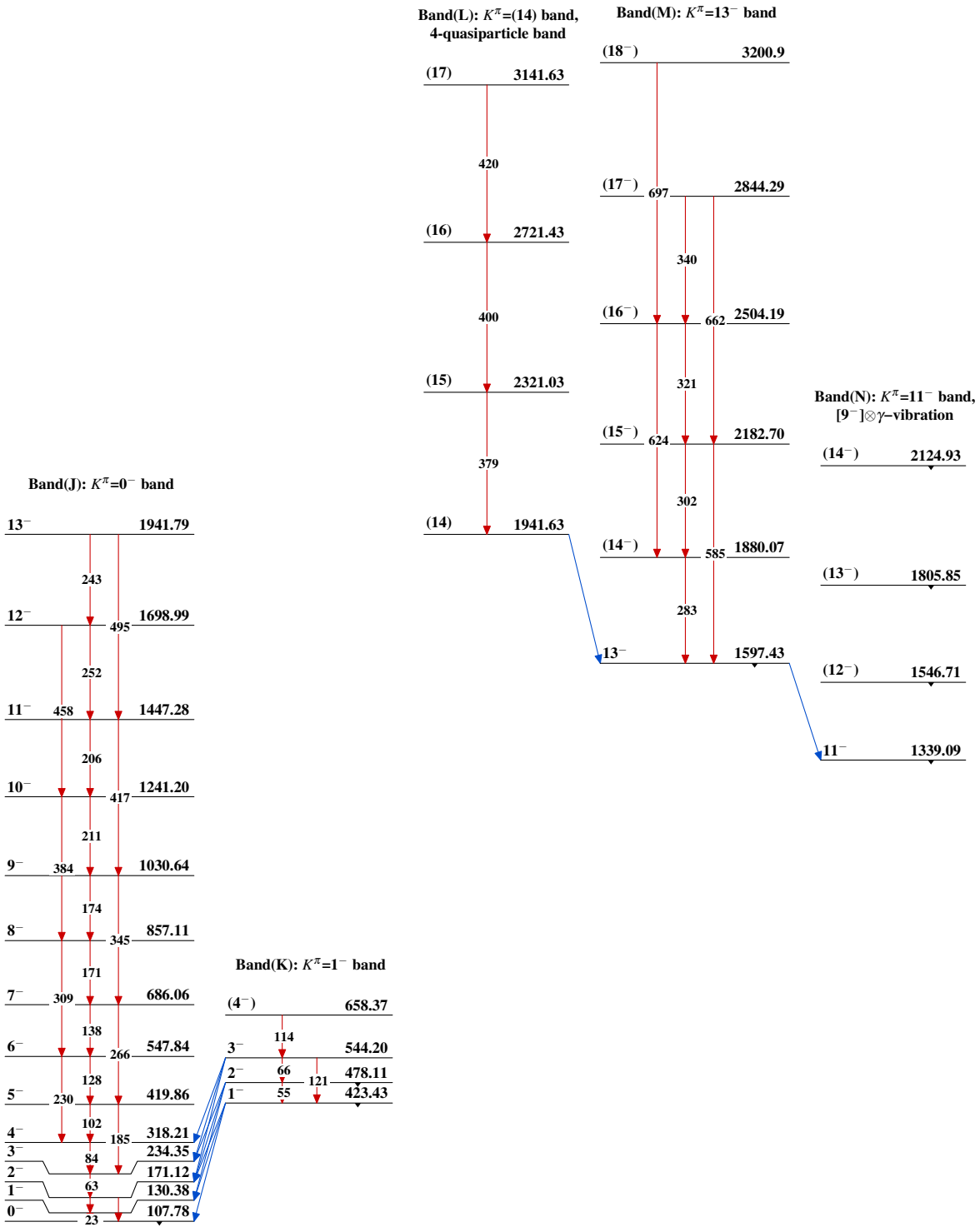
$^{180}_{73}Ta_{107}$

Adopted Levels, Gammas (continued)



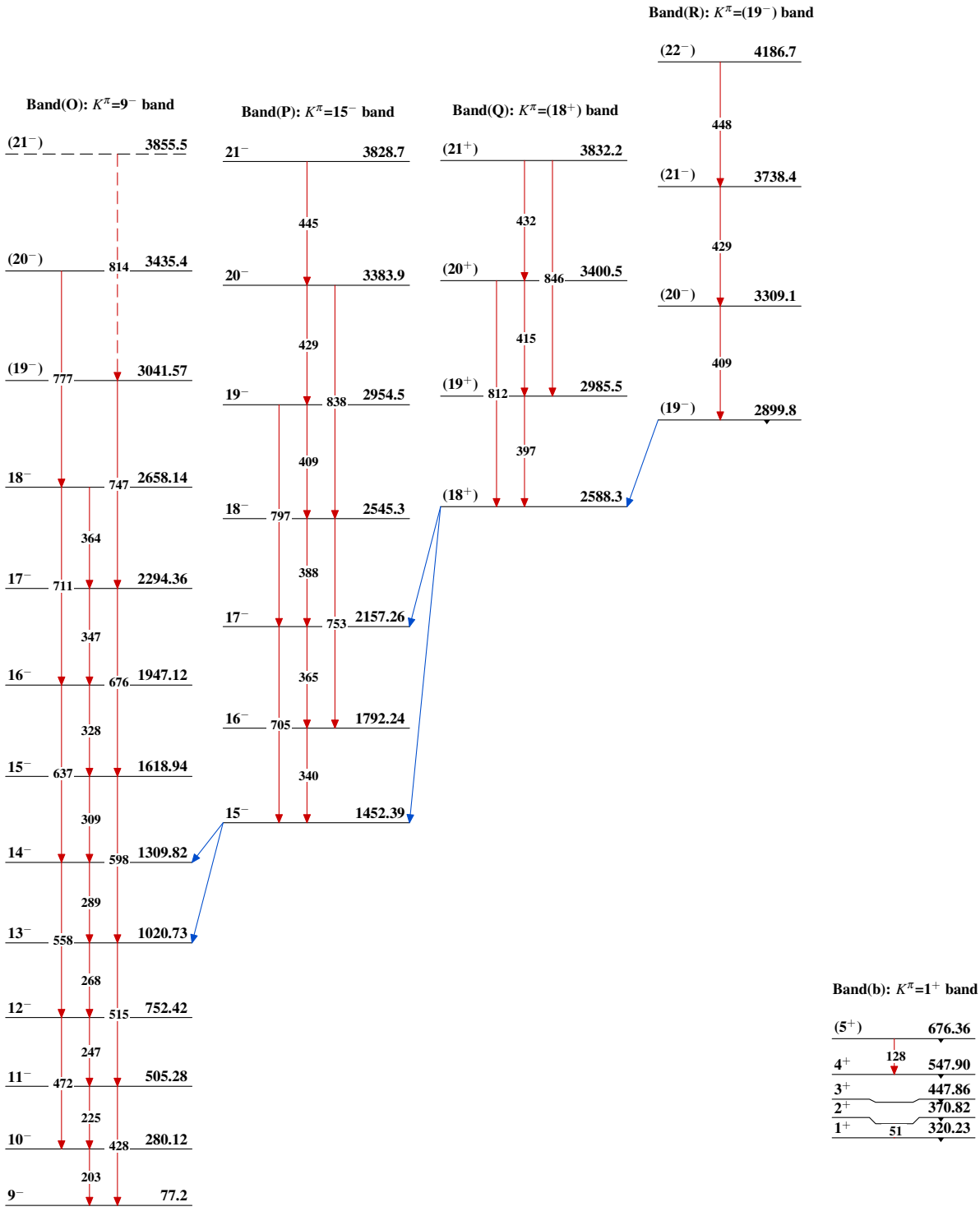
$^{180}_{73}Ta_{107}$

Adopted Levels, Gammas (continued)



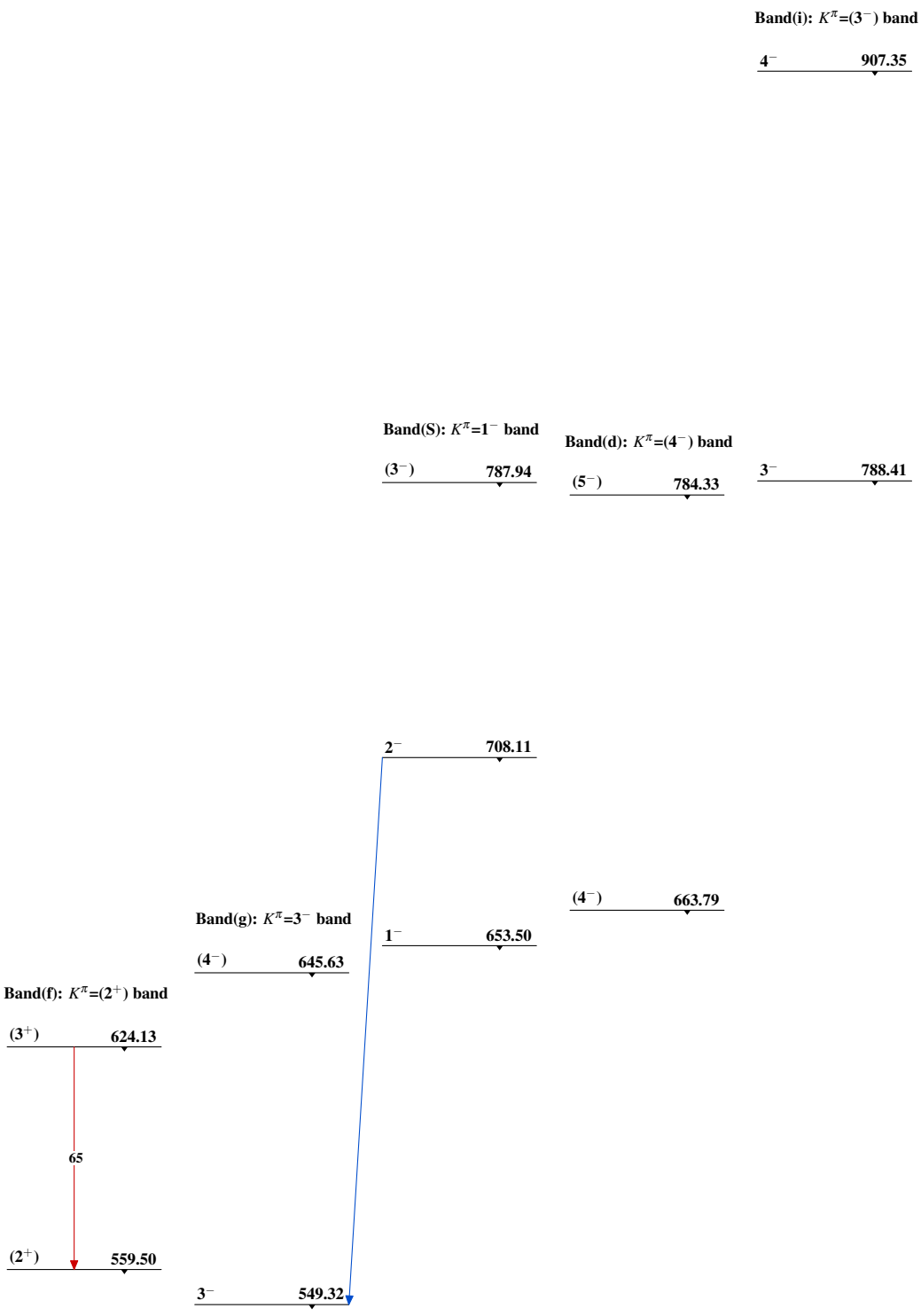
$^{180}_{73}Ta_{107}$

Adopted Levels, Gammas (continued)



$^{180}_{73}Ta_{107}$

Adopted Levels, Gammas (continued)



$^{180}_{73}Ta_{107}$