Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 127, 191 (2015)	1-Jun-2014

Q(β^-)=−147.4 *12*; S(n)=6154.3 *13*; S(p)=7507 *13*; Q(α)=4269.7 *29* 2012Wa38

Additional information 1.

Discovery of ^{238}U: 2013Fr03.

^{238}U double-beta decay: 2013St19, 2012Ko10, 2012Zu07, 2011Ba28, 2010Ba07, 2008RaZX, 2006Ba35, 2006BaZZ, 2005Tr01, 2004Ra13, 2003Cr04, 2003Fi13, 2002Ba52, 2002Hi09, 2002Tr04.

Cluster decay:

^{238}U(^{30}Mg): 2012Ku29, 2010Ni13.

^{238}U(^{20}O, ^{22}Ne, ^{24}Ne, ^{25}Ne, ^{26}Ne, ^{28}Mg, ^{29}Mg, ^{30}Mg): 2012Sa31.

^{238}U(^{34}Si): 2013Ta07, 2012Ta10, 2010Si12, 2009Ar11.

^{238}U(^{28}Mg): 2011Wa30.

^{238}U(p,p′): Measured σ (2010Ha06).

^{238}U(p,p′): E=20, 26, 65 MeV (2005YuZZ).

^{238}U(p,p′): E=20-65 MeV (2004Su12).

^{238}U(p,p′): Others: 2011Ma89, 2008Li05.

^{238}U(SF): 2010Sa09, 2008Sa24.

Nuclear Structure:

2014Lu01, 2014Ne03, 2014Vi01.

2013Af01, 2013Ag06, 2013Bo24, 2013Gi06, 2013Jo05, 2013Li30, 2013Ni02, 2013Ra05, 2013Se17, 2013To12, 2013Zo02.

2012Bu08, 2012Fr06, 2012Go13, 2012Hi11, 2012Is08, 2012Ja08, 2012Jo02, 2012Ko06, 2012Ku23, 2012Lu02, 2012Na10, 2012Ne04, 2012Pr09, 2012Re06, 2012Ro29, 2012Ro34.

2011Af04, 2011Bo12, 2011Ch65, 2011Du30, 2011Hi13, 2011In03, 2011Ko35, 2011Le21, 2011Li44, 2011Li53, 2011Na24, 2011Ni05, 2011No04, 2011Pe01, 2011Ri05, 2011Wa30, 2011Wu03, 2011Zh36.

2010Ab21, 2010Ab23, 2010Bo25, 2010Bu02, 2010Ko36, 2010Ku17, 2010Pi02, 2010Ra10, 2010To07, 2010Tr08, 2010Vr01, 2010Wa13, 2010Zh09.

2009Bu09, 2009De32, 2009Go05, 2009Ku13, 2009Ni06, 2009Pa46, 2009Ru12, 2009So12, 2009Ve07, 2009Wa01.

2008Bh07, 2008Bu11, 2008Ch15, 2008Ju06, 2008Kl03, 2008Pr05, 2008Sh06, 2008Sk02, 2008So03, 2008Te01, 2008Us02.

2007Ad24, 2007Ba18, 2007Bo46, 2007Bu20, 2007Do03, 2007Do06, 2007Gh11, 2007Ne04.

2006De25, 2006Fr21, 2006Go07, 2006Ne10, 2006Ni17, 2006Ra21.

2005Al40, 2005Ch12, 2005Do10, 2005Du11, 2005En01, 2005Go03, 2005La04, 2005Ma41, 2005Na44, 2005Po01, 2005Sh05, 2005Sh57, 2005Sw02, 2005Za02.

2004Ad15, 2004Ad30, 2004Ba16, 2004Ga03, 2004Hu05, 2004Is05, 2004Ja03, 2004Mo06, 2004Ne12, 2004Ro01, 2004Sa55, 2004Sh47.

2003Ad31, 2003Ad32, 2003Ad34, 2003Bu11, 2003Bu27, 2003De20, 2003Li01, 2003Li25, 2003Mb02, 2003Ne06, 2003Po15, 2003Ra17, 2003Sh02, 2003Za01.

2002Bu13, 2002Ga34, 2002Gi11, 2002Ka53, 2002Ma85, 2002Po16, 2002Ra25, 2002Tr12, 2002Ts01,

2001Af12, 2001Bu02, 2001De45, 2001Fa07, 2001Go07, 2001Ic02, 2001Ma66, 2001Mi34, 2001Mo13, 2001Mo28, 2001Sa54, 2001Tr19, 2001Tr23.

Antineutrino calculated spectrum: 2012Fa12.

Compilations: 2011Ch65, 2011He12, 2001Be81.

X-ray energies: 2003De44, 2002Ob01.

Systematics of alpha decay: 2006De05, 2006Xu08.

Calculated nuclear moments: 2006Sh37, 2003Ho07.

Alpha decay theory: 2010Wa23, 2010Wa31, 2006De05.

Energies of vibrational states (K=0^+,2^+,4^+,1^-,2^-,3^-) were calculated in 1965So04, 1970Ne08, 1971Ko31, 1969Bl13, 1974Du09, 1975IvZZ, 1975LeZR.

Adopted Levels, Gammas (continued)

^{238}U Levels

For calculations of levels see 1994Mi14,1994Tr09. For calculated rotational level energies, see 1976Az01, 1976Ra04, 1968Ho28, 1978BeYR, 1978To13, 1978Ba46 for example. High-spin rotational states were calculated in 1977Ma23.

Cross Reference (XREF) Flags

A	^{238}Pa β^- decay	F	^{238}U(γ,γ')
B	^{242}Pu α decay	G	^{236}U(t,p)
C	^{238}U(n,n'γ)	H	^{238}U(n,n')
D	Coulomb excitation	I	^{238}U IT decay (280 ns)
E	^{238}U(d,d')		

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         Octupole-vibrational band:
Ratios of reduced transition intensities are in agreement with Alaga
rule for K=0:
   B(E1)(680γ)/B(E1)(635γ)=0.60   5    observed in Coul. ex.
                          =0.50  theory for K=0
                          =2.0   theory for K=1.
   B(E1)(687γ)/B(E1)(583γ)=0.78   3    observed in Coul. ex.
                          =0.75  theory for K=0
                          =1.33  theory for K=1.
Negative-parity yrast states were calculated by 1976Vo01. The states with
low spin were interpreted as octupole states, but the higher spin
states become two-quasiparticle decoupled states. Octupole-vibrational
states were calculated by 1978Ko03. Levels in yrast band were calculated
by 1977Ra25.
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E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	XREF	Comments
0.0[e]	0$^+$	4.468×10^9 y *6*	ABCDEFGHI	%SF=5.45×10^{-5} *7*; %α=100 %SF: from recommended $T_{1/2}$(SF) of 2000Ho27. Intrinsic electric-quadruple moment: Q_0=13.9 *20* deduced by 1978Ge10 from optical isotope shift. Other measurement: Q_0=11.12 *7* (from Coulomb excitation). Other: 2002Ob01. $\Delta\langle r^2\rangle(^{233}U-^{238}U)$=−0.432 fm^2 *43* (1996El03). $T_{1/2}$: Weighted average (CHI**/N-1=4.0) of 4.468×10^9 y *5*, specific activity method (1971Ja07); 4.457×10^9 y 4, specific activity method (1959St45); 4.51×10^9 y 2, specific activity of natural uranium (1955Ko13); and 4.495×10^9 y 18, specific activity of enriched uranium (1949Ki26), recommended in 2004Sc03. $T_{1/2}$: Other values: 4.51×10^9 y (1957Cl16), 4.56×10^9 y *3* (1957Le21), $T_{1/2}$: Half-life ratio $T_{1/2}(^{238}U)/T_{1/2}(^{235}U)$=6.351 *31* (2008Po06). $T_{1/2}$(SF)=9.86×10^{15} y *15* (1968Ro15), 8.1×10^{15} y *3* (1952Se67), 7.19×10^{15} y *4* (1967Is04), 8.23×10^{15} y *10* (1967Sp12), 8.19×10^{15} y *6* (1970Ga27), 11×10^{15} y *2* (1971Co35), 10.2×10^{15} y *9* (1971Kl14), 9.50×10^{15} y *21* (1971Le11), 8.7×10^{15} y *10* (1971Sa08), 8.0×10^{15} y *4* (1971Th17), 9.9×10^{15} y *5* (1972Ni19), 10.2×10^{15} y *8* (1973Kh10), 9.73×10^{15} y *44* (1974Iv04), 9.6×10^{15} y *3* (1975Em03), 8.0×10^{15} y *6* (1975Wa37), 8.09×10^{15} y *40* (1976Th12), 8.43×10^{15} y *21* (1978Ka40), 6.77×10^{15} y *15* (1978Ri07), 8.8×10^{15} y *4* (1980Po09), 7.48×10^{15} y *15* (1980Sp10), 10.5×10^{15} y *3* (1981Ba70), 5.9×10^{15} y *4* (1982De22), 8.3×10^{15} y *4* (1983Be66), 8.42×10^{15} y *44* (1984Va35), 8.29×10^{15} y *27* (1985Iv01). 8.30×10^{15} y *16* (weighted average). 2000Ho27 recommend $T_{1/2}$(SF)=8.2×10^{15} y *1* based on

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Adopted Levels, Gammas (continued)

^{238}U Levels (continued)

E(level)[†]	J^π[‡]	$T_{1/2}$	XREF	Comments
				a weighted average of a selected set of the above values. Other values: 8.00×10^{15} y *35* (2003Gu18); 8.15×10^{15} y *17*, "Solid State Nuclear Track Detectors (SSNTD)" (2005Yo12). Calculated $T_{1/2}$(SF): 2005De44, 2005Re16, 2005Xu01, 1976Ra02. Other $T_{1/2}$(SF) measurements: 2010Sa09, 2003Ha06, 1966Ra25, 1964Fl07, 1963Me14, 1959Ku81, 1959Ge30, 1984Va34. The effects of boron and lithium on the ratio of induced to spontaneous fission in natural uranium were measured by 1979At01.
44.916[e] *13*	2^+	206 ps *3*	ABCDEFGHI	μ=0.51 *3* (1998Ts13) μ: 1998Ts13 quote μ=0.254 *15* in the abstract, but in the body of the paper, this same value is given as the g factor. Q(^{238}U)/Q(^{234}U)=1.13 *10*; μ(^{238}U)/μ(^{234}U)= 0.94 *9* (1974Me18). $T_{1/2}$: from B(E2)=12.30 *15* in Coul. ex. and α=609. Other: 225 ps *20* from (α)(ce 45γ)(t) in ^{242}Pu α decay (1960Be25).
148.38[e] *3*	4^+		ABCDE GH	
307.18[e] *8*	6^+		ABCDE H	
518.1[e] *3*	8^+	23 ps *3*	CDE	$T_{1/2}$: from BE2=4.7 *6* in Coulomb excitation.
680.11[f] *4*	1^-	35 fs *+19−9*	A CDEF HI	$T_{1/2}$: from B(E1)=0.00049 *17* in Coulomb excitation and %Iγ(680γ)=43 *3*.
731.93[f] *3*	3^-		A CDEF H	B(E3)↑=0.570 *36* (1994Mc03)
775.9[e] *4*	10^+	9.0 ps *10*	CD	$T_{1/2}$: from BE2=5.6 *2* in Coulomb excitation.
826.64[f] *11*	5^-		A CDE H	
927.21[o] *19*	0^+		CD F	J^π: member of K=0 band.
930.55[q] *9*	(1^-)		A CDEF H	J^π: gammas to 0^+,2^+,1^- levels, γ from 3^- level, fit to a band.
950.12[g] *20*	2^-		A CD F	J^π: fit to a band.
966.13[o] *4*	2^+	2.4 ps *+17−7*	A CD F	$T_{1/2}$: from B(E2)=0.017 *7* and Iγ(967γ)=12.0% *5*. J^π: 921.19γ to 2^+ is E0+M1+E2. The ratio of reduced transition intensities of 966, 818 gammas is in better agreement with the Alaga rule for K=0 than for K=1 or K=2: B(E2)(966γ)/B(E2)(818γ)=0.118 *8* observed in Coul. ex., 0.389 theory for K=0, 0.875 theory for K=1, 14.0 theory for K=2.
966.31[f] *21*	7^-		CD	
997.23[p] *24*	0^+		CD H	J^π: E0 transition to g.s.
997.58[q] *7*	3^-		A CDEF H	B(E3)↑=0.184 *18* (1994Mc03) J^π: from (d,d′), fit to a band.
1028[g]	4^-		CD	
1037.25[p] *7*	2^+	1.13 ps *12*	A CDEF H	$T_{1/2}$: from B(E2)=0.0645 *64* in Coulomb excitation and %Iγ(1037γ)=30.8 *8*. J^π: 993.0γ to 2^+ is E0+M1+E2.
1056.38[o] *21*	4^+		CD G	J^π: fit to a band. E2 γ to 6^+.
1059.66[n] *17*	(3^+)		A C F	J^π: γ′s to 2^+,4^+ levels; suggested as 3^+ bandhead in β^- decay.
1060.27[k] *14*	2^+	0.64 ps *4*	A CDEF H	$T_{1/2}$: from B(E2)=0.133 *8* in Coulomb excitation and %Iγ(1060γ)=40.0 *7*. J^π: gammas to 0^+,2^+,4^+ levels.
1076.7[e] *5*	12^+	4.4 ps *4*	D	$T_{1/2}$: weighted average of 4.5 ps *5* from B(E2) and 4.2 ps *6* from DSA in Coulomb excitation.
1105.71[j] *7*	3^+		A CD	J^π: fit to a band.
1128.84[m] *7*	(2^-)		A CD F	J^π: gammas to 2^+,1^-,3^- levels, fit to a band.
1130.75[p] *24*	4^+		A CDE H	
1135.7? *4*			A C	
1150.7[f] *4*	9^-		D	
1151[g]	6^-		D	
1163[k]	(4^+)		D	

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Adopted Levels, Gammas (continued)

^{238}U Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
1167.99 *9*	4+		A CD gH	Jπ: from γ(θ) and yield in Coulomb excitation. Assigned by 1994Mc04 as the 4+ member of the K=2 γ-vibrational band; however, 1996Wa11 show that this band member has an energy of 1163. Jπ: fit to a band.
1168.88[m] *23*	3−		A CDE g	B(E3)↑=0.166 *23* Jπ: from (d,d′), fit to a band.
1209.3 *3*			C	
1223.78 *14*	2+[d]	3.5 ps *4*	A CD	$T_{1/2}$: from B(E2)=0.0123 *12* in Coulomb excitation and %Iγ(1224γ)=41.6. The evaluators assume that the uncertainty in the branching is negligible compared with that in the B(E2) value.
1232[j]	5+		D	
1239.3? *2*			C	
1242.9?			A	
1260.9? *2*			C	
1269.2[p] *10*	6+		CD	Jπ: fit to a band.
1278.54 *12*	2+[d]	2.9 ps *3*	A CD	B(E2)↑=0.0043 *4* $T_{1/2}$: from B(E2)=0.00428 *43* in Coulomb excitation and %Iγ(1278γ)=15.0. The evaluators have assigned an uncertainty of 5% to this branching to get an uncertainty on $T_{1/2}$.
1311[k]	6+		CD	
1318[g]	8−		D	
1354.79 *24*	(1,2+)		C	Jπ: γ′s to 0+,2+ levels.
1375			E	
1378.8[f] *5*	11−		D	
1381.19 *9*			A C	Additional information 2.
1403[j]	7+		CD	The existence of this level in (n,n′γ) is not definite, since it is based on the observation of an 885.8 *2* transition that is doubly placed.
1414.0 *6*	2+[d]	1.18 ps *13*	A CD	$T_{1/2}$: from B(E2)=0.00549 *55* in Coulomb excitation and %Iγ(1413.3γ)=12.9. The evaluators have assigned an uncertainty of 5% to this branching to get an uncertainty for $T_{1/2}$.
1415.5[e] *6*	14+	2.55 ps *20*	D	$T_{1/2}$: weighted average of 2.54 ps *23* from B(E2) in Coul Ex and 2.56 ps *28* from DSA (1981Gr10).
1446.4[l] *9*	(7−)		D	
1455.39 *18*			C	
1482.41 *8*			C	
1504[k]	8+		D	
1516.5? *2*			C	
1528[g]	10−		D	
1530.2 *4*	2+[d]	0.150 ps *15*	CDE	$T_{1/2}$: from B(E2)=0.0105 *11* in Coulomb excitation and %Iγ(1530γ)=4.67. The evaluators have assigned an uncertainty of 5% to this branching to get an uncertainty for $T_{1/2}$.
1545.8[r] *14*	8+		D	
1561.6			A C	
1594.80 *12*	(4+)		C	
1617.5			A	
1619[j]	9+		D	
1630[i]			E	
1643.73 *12*			C	
1644[l]	(9−)		D	
1645.0			A E	
1649.2[f] *5*	13−		D	
1665[i]			E	
1672.01 *15*			C	

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Adopted Levels, Gammas (continued)

^{238}U Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$	XREF	Comments
1675.7 *3*			A C	
1712[i]			E	
1741[k]	10^+		D	
1760.9 *4*	(4^+)		C E	J^{π}: γ's to 2^+,6^+ levels.
1774.7[#]	$(3^-,4,5^-)$		A C E	J^{π}: γ's to 3^-,5^-.
1778[g]	12^-		D	
1782[a]	1[&]	33[c] fs *4*	F	
1782.3[a] *4*	2^+[d]	0.39 ps *4*	CD	$T_{1/2}$: from B(E2)=0.0179 *18* in Coulomb excitation, and %Iγ(1782.0γ)=44.8. The evaluators have assigned an uncertainty of 5% to the branching to get an uncertainty for $T_{1/2}$.
1786.7[r] *15*	10^+		D	
1788.4[e] *6*	16^+	1.74 ps *13*	D	
1793	1[&]	80[c] fs *+40−20*	C F	
1846	1[&]	31[c] fs *4*	C F	
1866[l]	(11^-)		D	
1875[j]	11^+		D	
1934.3	(3^-)		A C	
1959.2[f] *6*	15^-		D	
1992.2	(3^-)		A C	E(level): level proposed in β decay, but two common transitions suggest population in (n,n$'\gamma$) also; however, the branchings are not in agreement. The evaluators have added several transitions from (n,n$'\gamma$) based on energy fit alone.
1996.7[b] *3*	1^-		F	
2017.7[b] *4*	1^+		F	
2018[k]	12^+		D	
2033[i]	(12^+)		D	
2048.7[r] *15*	12^+		D	
2063.9	(2^-)		A	
2066[g]	14^-		D	
2079.3[b] *4*	1^+		F	
2080.7[b] *4*	1^-		F	
2093.3[b] *4*	1^-		F	
2122[l]	(13^-)		D	
2125.3 *6*	2^+		C	
2145.6[b] *3*	1^-		F	
2163.5 *3*			C	
2171[j]	13^+		D	
2175.8[b] *3*	1^+[@]	0.058[c] eV *5*	F	
2191.1[e] *7*	18^+	1.18 ps *11*	D	$T_{1/2}$: From DSA (1981Gr10).
2208.8[b] *3*	1^+[@]		C F	
2244.4[b] *3*	1^+[@]	0.00142[c] eV *3*	F	
2294.1[b] *3*	1^+[@]	0.0040[c] eV *5*	F	
2306.7[f] *7*	17^-		D	
2332.7[b] *3*	1^-		F	
2333[k]	14^+		D	
2346.4[r] *16*	14^+		D	
2356[i]	(14^+)		D	
2365.6[b] *3*	1^-		F	
2389[g]	16^-		D	

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Adopted Levels, Gammas (continued)

^{238}U Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$	XREF	Comments
2410.0[b] 3	1+[@]	0.011 eV 2	F	
2418[l]	(15−)		D	
2422.8[b] 3	1−[@]	0.0062[c] eV 7	F	
2467.8[b] 5	1+[@]	0.048[c] eV 5	F	
2491.5[b] 5	1−		F	
2499.4[b] 3	1+		F	
2502[j]	15+		D	
2529.0[b] 3	1−		F	
2557.9 5	0+	280 ns 6	C HI	%IT=97.4 4; %SF=2.6 4 Intrinsic electric quadrupole moment=29 3 (1979Ul01). %ternary fission ≈0.1 (1989Ma54) %α<0.5 (1971Be62). Jπ: 2558γ to 0+ is E0. $T_{1/2}$: from IT DECAY.
2578.5 3	2+		C	
2593.7[b] 6	1−		F	
2602.5[b] 4	1−		F	
2619.1[e] 8	20+	0.91 ps 8	D	$T_{1/2}$: from Coulomb excitation.
2624.6 6	4+		C	
2638.3[b] 3	1+		F	
2645[h]	(14+)		D	
2647.3[b] 8	1+		F	
2675.2[r] 17	16+		D	
2683[k]	16+		D	
2689.4[f] 8	19−		D	
2702.2[b] 3	1+		F	
2712[i]	(16+)		D	
2738.9[b] 9	1+		F	
2744[g]	18−		D	
2751[l]	(17−)		D	
2756.4[b] 3	1+		F	Additional information 3.
2773.0[b] 3	1+		F	
2816.8[b] 4	1+		F	
2844.2[b] 9	1−		F	
2862.2[b] 5	1−		F	
2868[j]	17+		D	
2877.1[b] 3	1−		F	
2881.4[b] 5	1+		F	
2896.6[b] 3	1−		F	
2908.9[b] 3	1−		F	
2910.0[b] 4	1−		F	
2932.6[b] 6	1+		F	
2951.2[b] 3	1+		F	
2963.9[b] 8	1+		F	
2991[h]	(16+)		D	
3005.9[b] 4	1−		F	
3014.5[b] 3	1+		F	
3018.9[b] 3	1−		F	

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Adopted Levels, Gammas (continued)

^{238}U Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
3030.6[b] *3*	1^+		F	
3031.2[r] *19*	18^+		D	
3037.7[b] *3*	1^+		F	
3042.5[b] *6*	1^+		F	
3043.6[b] *3*	1^-		F	
3046.9[b] *3*	1^-		F	
3051.7[b] *3*	1^-		F	
3057.1 *4*	1^-		F	
3060.6[b] *3*	1^-		F	
3065[k]	18^+		D	
3068.1[e] *9*	22^+	0.76 ps *10*	D	$T_{1/2}$: from Coulomb excitation.
3086.7[b] *5*	1^-		F	
3091.0[b] *3*	1^-		F	
3095[i]	(18^+)		D	
3096.4[b] *3*	1^-		F	
3101.7[b] *4*	1^-		F	
3104.3[f] *12*	21^-		D	
3117.7[b] *4*	1^-		F	
3120[l]	(19^-)		D	
3128[g]	20^-		D	
3135.0[b] *3*	1^+		F	
3153.7[b] *3*	1^+		F	
3172.9[b] *3*	1^+		F	
3207.8[b] *4*	1^-		F	
3217.6[b] *6*	1^+		F	
3234.5[b] *7*	1^+		F	
3239.6[b] *3*	1^-		F	
3253.194[b] *15*	1^-	0.24 ps *8*	F	Jπ: J=1 from angular correlation, $\pi=-$ based on the relative intensities of the deexciting γ transitions.
3265[j]	19^+		D	
3274.4[b] *3*	1^-		F	
3297.2[b] *4*	1^-		F	
3303.6[b] *3*	1^-		F	
3307.32[b] *3*	1^+		F	
3329.1[b] *6*	1^-		F	
3348.33[b] *3*	1^+		F	
3366.0[b] *5*	1^+		F	
3368[h]	(18^+)		D	
3384.3[b] *3*	1^-		F	
3397.9[b] *8*	1^-		F	
3411.2[r] *22*	20^+		D	
3416.0[b] *4*	1^-		F	
3421.5[b] *5*	1^-		F	
3441.0[b] *9*	1^-		F	
3448.3[b] *6*	1^+		F	
3454.1[b] *4*	1^-		F	

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Adopted Levels, Gammas (continued)

^{238}U Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
3460.7[b] 3	1^+		F	
3467.8[b] 6	1^-		F	
3470.7[b] 3	1^-		F	
3474[k]	20^+		D	
3475.2[b] 3	1^-		F	
3479.0[b] 3	1^-		F	
3489.0[b] 3	1^-		F	
3500.5[b] 3	1^-		F	
3502[i]	(20^+)		D	
3509.1[b] 9	1^-		F	
3521[l]	(21^-)		D	
3528.0[b] 4	1^-		F	
3535.3[e] 12	24^+	0.51 ps 8	D	$T_{1/2}$: from B(E2) in Coulomb excitation.
3538[g]	22^-		D	
3547.7[f] 13	23^-		D	
3548.0[b] 6	1^-		F	
3562.8[b] 3	1^-		F	
3594.9[b] 5	1^-		F	
3608.7[b] 3	1^-		F	
3615.9[b] 3	1^-		F	
3623.9[b] 3	1^-		F	
3640.1[b] 3	1^-		F	
3650.5[b] 3	1^-		F	
3659.7[b] 6	1^-		F	
3673.7[b] 6	1^-		F	
3686[j]	21^+		D	
3728.0[b] 9	1^-		F	
3738.5[b] 8	1^-		F	
3759.9[b] 3	1^-		F	
3773[h]	(20^+)		D	
3805.1[b] 3	1^-		F	
3809[b]	$(1,2^+)$		F	
3811.2[r] 24	22^+		D	
3819.0[b] 6	1^-		F	
3828.7[b] 3	1^-		F	
3906[k]	22^+		D	
3947[l]	(23^-)		D	
3965.7[b] 4	1^-		F	
3971[g]	24^-		D	
3990.7[b] 9	1^-		F	
3995.8[b] 3	1^-		F	
4017[f]	25^-		D	
4018.1[e] 16	26^+	0.40 ps 7	D	$T_{1/2}$: from Coulomb excitation.
4023.7[b] 7	1^-		F	
4031.4[b] 7	1^-		F	
4046.7[b] 3	1^-		F	

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Adopted Levels, Gammas (continued)

^{238}U Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$	XREF	Comments
4065.3[b] 3	1^-		F	
4072.1[b] 6	1^-		F	
4088.9[b] 7	1^-		F	
4093.4[b] 3	1^-		F	
4100.2[b] 3	1^-		F	
4105.2[b] 3	1^-		F	
4122.9[b] 5	1^-		F	
4127[j]	23^+		D	
4138.9[b] 7	1^-		F	
4145.8[b] 3	1^-		F	
4151.3[b] 6	1^-		F	
4155.4[b] 3	1^-		F	
4175.8[b] 4	1^-		F	
4181.5[b] 7	1^-		F	
4205[h]	(22^+)		D	
4217.3[b] 8	1^-		F	
4232[r] 3	24^+		D	
4239.1[b] 3	1^-		F	
4358[k]	24^+		D	
4393[l]	(25^-)		D	
4424[g]	26^-		D	
4495[b]	$(1,2^+)$		F	
4504[f]	27^-		D	
4517[e]	28^+	0.36 ps 9	D	$T_{1/2}$: from Coulomb excitation.
4586[j]	25^+		D	
4592[b]	$(1,2^+)$		F	
4677[r] 3	26^+		D	
4807[b]	(1)		F	Additional information 4.
4825[k]	26^+		D	
4895[g]	28^-		D	
5003[f]	29^-		D	
5035.1[e] 21	30^+	<0.9 ps	D	
5063[j]	27^+		D	
5140[b]			F	
5144[r] 3	28^+		D	
5206[b]	$(1,2^+)$		F	
5513[f]	31^-		D	
5581[e] 3	32^+		D	
6037[f] 3	33^-		D	
6146[e] 4	34^+		D	

† Level energies are from a least-squares fit to the γ energies.

‡ From excitation in Coulomb excitation, γ deexcitation pattern, and assignment to a rotational band. Band assignments are mainly from 1996Wa11.

\# Data are from ^{238}Pa β^- decay. This level may be populated also in (n,n′γ); however, the agreement in branchings is poor. From

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Adopted Levels, Gammas (continued)

^{238}U Levels (continued)

(n,n′γ) one has Eγ=606.6 *2*, 647.7 *4*, 1043.0 *10*, and 1627.8 *6* with Iγ values of 100 *12*, 24 *8*, 4 *4*, and 12 *4*. The 1094.5 (placement in the decay scheme is uncertain) and 1730 γ′s have not been observed.

[@] From $\gamma(\theta)$ in (γ,γ′) and form factor in (e,e′) (1988He02).

[&] From $\gamma(\theta)$ in (γ,γ′) (1995Zi02).

[a] J=1 for a 1782 level in (γ,γ′), and J=2 for a 1782 level in Coulomb excitation, both spins determined by $\gamma(\theta)$. Both reactions report transitions to the 45 level and the g.s. It is possible that both reactions are exciting both levels, in which case the branching ratios may be incorrect.

[b] From ^{238}U(γ,γ′).

[c] From Γ data in (γ,γ′) and adopted branching ratios.

[d] Level is Coulomb excited and J=2 from $\gamma(\theta)$ in Coulomb excitation.

[e] Band(A): K$^{\pi}$=0^{+} ground-state band. Coulomb excitation. Member of ground-state rotational band based on γ-deexcitation pattern and energy fit to rotational formula.

[f] Band(B): K$^{\pi}$=0^{-} octupole-vibrational band. Coulomb excitation. Member of octupole-vibrational band based on γ deexcitation pattern and energy fit.

[g] Band(C): K$^{\pi}$=1^{-}, α=0. Coulomb excitation. Member of K^{π}=1^{-}, α=0 band based on γ deexcitation pattern and energy fit.

[h] Band(D): Unassigned, but possibly built on the 1414 or 1530 2^{+} levels.

[i] Band(E): Possibly associated with the 1037 *2+* level, assigned by 1994Mc03 as the second K=0 β-vibrational bandhead.

[j] Band(F): K$^{\pi}$=2^{+} γ-vibrational band. α=1.

[k] Band(G): K$^{\pi}$=2^{+} γ-vibrational band. α=0.

[l] Band(H): Probably associated with the octupole band built on the 1129 *2-* level, and thus probably K^{π}=2^{-} with α=1.

[m] Band(I): K$^{\pi}$=2^{-}.

[n] Band(J): K$^{\pi}$=3^{+} ν 1/2(631)+ν 5/2(622).

[o] Band(K): K$^{\pi}$=0^{+} band.

[p] Band(L): K$^{\pi}$=0^{+} second β-vibrational band.

[q] Band(M): K$^{\pi}$=1^{-}. α=1.

[r] Band(N): Band based on J$^{\pi}$=8^{+} (2010Zh09).

Adopted Levels, Gammas (continued)

γ(^{238}U)

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Mult.[#]	α[r]	Comments
44.916	2^+	44.915[&] *13*	100	0.0	0^+	E2	609	α(L)= 444; α(M)= 123 B(E2)(W.u.)=281 *4* α: theoretical values of α, α(L), and α(M) are reduced by 2% (see 1987Ra01).
148.38	4^+	103.50[&] *4*	100	44.916	2^+	[E2]	11.6	α(L)=8.405; α(M)=2.332; α(N+..)=0.878
307.18	6^+	159.018[&] *16*	100	148.38	4^+	[E2]	1.871	α(K)= 0.2135; α(L)= 1.201; α(M)= 0.333; α(N+..)= 0.1239
518.1	8^+	210.6 *4*	100	307.18	6^+	[E2]	0.626	α(K)= 0.143; α(L)= 0.351; α(M)= 0.096; N+= 0.0357 B(E2)(W.u.)=410 *60*
680.11	1^-	635.3[a] *3*	100.0 *20*	44.916	2^+	[E1][dp]	0.020 *4*	α(K)exp=0.016 *4*; B(E1)(W.u.)=0.011 *4* E_γ: From Coulomb excitation.
		680.2[a] *5*	79 *4*	0.0	0^+	[E1][dp]	0.020 *5*	α(K)exp=0.016 *5*; B(E1)(W.u.)=0.0070 *24* E_γ: From Coulomb excitation.
731.93	3^-	51.8[b]		680.11	1^-			
		583.55 *3*	81.4 *16*	148.38	4^+	E1[p]	0.01003	α(K)=0.00812; α(L)=0.00144
		686.99 *3*	100.0 *20*	44.916	2^+	[E1]		
775.9	10^+	257.8[a] *4*	100	518.1	8^+	[E2]	0.313	α(K)= 0.101; α(L)= 0.154; α(M)= 0.0419; N+= 0.0156 B(E2)(W.u.)=480 *60*
826.64	5^-	519.46 *8*	50 *3*	307.18	6^+	[E1]		
		678.3[a] *3*	100 *6*	148.38	4^+	[E1]		
927.21	0^+	882.3 *6*	100	44.916	2^+	[E2]		
930.55	(1^-)	251.2 *7*	13.1 *14*	680.11	1^-			
		885.46[a] *10*	100 *4*	44.916	2^+	[E1]	0.00465	α(K)=0.00379; α(L)=0.00065
		931.1 *2*	25.2 *13*	0.0	0^+	[E1]	0.00426	α(K)=0.00347; α(L)=0.00059
950.12	2^-	218.1 *3*	53 *6*	731.93	3^-			
		270.1 *4*	48 *8*	680.11	1^-			
		905.5 *5*	100 *6*	44.916	2^+	[E1]	0.00447	α(K)=0.00365; α(L)=0.00062
966.13	2^+	234.5[a] *10*	13.9 *14*	731.93	3^-	[E1]	0.0689	α(K)= 0.0544; α(L)=0.01092; α(M)=0.00263; α(N+..)=0.00093 B(E1)(W.u.)=3.5×10^{-4} *15*
		286.3[a] *10*	8.1 *7*	680.11	1^-	[E1]	0.0438	α(K)= 0.0348; α(L)=0.00679; α(M)=0.00163; α(N+..)=0.00058 B(E1)(W.u.)=1.1×10^{-4} *5*
		818.06 *13*	100 *4*	148.38	4^+	[E2][p]	0.0166	α(K)= 0.0121; α(L)=0.00341 B(E2)(W.u.)=3.3 *14* α(K)exp=0.012 *8*
		921.19[a] *3*	60 *3*	44.916	2^+	E2+M1+E0[p]	0.23 *4*	B(M1)↓=1.1×10^{-4} *8*; B(E2)(W.u.)=1.0 *4* α(K)exp=0.191 *30* α: from α(K)exp and α/α(K)=1.19 (E0 theory). δ: δ(E2/M1)=+4.1 *+6−5* from Coulomb excitation (1994Mc03). ρ^2=0.0099 *18* from Coulomb excitation (2001Ga55).
		966.9 *3*	27.3 *14*	0.0	0^+	[E2]	0.0120	α(K)= 0.0090; α(L)=0.00226 B(E2)(W.u.)=0.38 *16*
966.31	7^-	449		518.1	8^+			E_γ,I_γ: from Coulomb excitation. E=448.4 *9* is reported in (n,n′γ), but the

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$\gamma(^{238}U)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[@]	α[r]	Comments
									transition is multiply placed with most of the intensity being placed from the 1129 2- level.
966.31	7^-	659.1[f] *2*	100 *14*	307.18	6^+				
997.23	0^+	952.06 *5*		44.916	2^+				
		997.23[a] *24*		0.0	0^+	E0[p]			
997.58	3^-	67.1[b]		930.55	(1^-)				
		318.0[a] *10*	8.0 *4*	680.11	1^-	[E2]		0.1611	α(K)= 0.0682; α(L)= 0.0678; α(M)=0.01827; α(N+..)=0.00679 B(E2)(W.u.)=2.8 *5* (1994Mc03)
		849.1[a] *4*	100 *3*	148.38	4^+	E1[p]		0.00502	α(K)=0.00409; α(L)=0.00070 α(K)exp=0.0046 *27*
		952.65 *7*	56.8 *13*	44.916	2^+	[E1]		0.00409	α(K)=0.00334; α(L)=0.00057 I_γ: I(952.7γ)/I(849γ)=1.1 *4* from (n,n′γ).
1028	4^-	78.1[f] *4*	64[g] *42*	950.12	2^-				
		295.86[f] *6*	<190[g]	731.93	3^-				
		879.63[f] *11*	100[g] *6*	148.38	4^+				
1037.25	2^+	305.5[a] *6*	11.8 *5*	731.93	3^-	E1		0.0379	α(K)= 0.0302; α(L)=0.00584; α(M)=0.00140; α(N+..)=0.00050 B(E1)(W.u.)=2.00×10^{-4} *22*
		357.5[a] *6*	9.5 *4*	680.11	1^-	E1		0.0270	α(K)=0.02161; α(L)=0.00408; α(M)=0.00097; α(N+..)=0.00035 B(E1)(W.u.)=1.00×10^{-4} *12*
		888.9[a] *3*	71.7 *15*	148.38	4^+	E2		0.0141	α(K)= 0.0104; α(L)=0.00277 B(E2)(W.u.)=2.28 *23*
		992.32[a] *7*	72.9 *15*	44.916	2^+	E2+M1+E0[p]		0.78 *4*	B(E2)(W.u.)=1.23 *14*; B(M1)(W.u.)=3.4×10^{-4} *6* α(K)exp=0.653 *33* δ: δ(E2/M1)=+3.50 *+20−25* from Coulomb excitation (1994Mc03). ρ^2=0.175 *26* from Coulomb excitation (2001Ga55). α: from α(K)exp and α/α(K)=1.19 (E0 theory).
		1037.3 *2*	100.0 *21*	0.0	0^+	E2		0.0105	α(K)=0.00795; α(L)=0.00192 B(E2)(W.u.)=1.47 *16*
1056.38	4^+	749.2 *2*	100	307.18	6^+	E2		0.01978	α(K)=0.01409; α(L)=0.00428
		908[a]	41	148.38	4^+				
1059.66	(3^+)	911.3[e] *2*		148.38	4^+				
		1015[c]		44.916	2^+				
1060.27	2^+	911.9[a] *4*	3.57 *20*	148.38	4^+	E2		0.0134	α(K)= 0.0100; α(L)=0.00260 B(E2)(W.u.)=0.33 *3*
		1015.3[ac] *2*	100.0 *20*	44.916	2^+	M1+E2[p]	10.0 *+15−14*	0.0109	α(K)=0.00826; α(L)=0.00202 B(E2)(W.u.)=5.3 *4*; B(M1)(W.u.)=2.0×10^{-4} *6* α(K)exp=0.0075 *7*
		1060.3[ai] *2*	69.8 *14*	0.0	0^+	E2		0.0101	α(K)=0.00765; α(L)=0.00182 B(E2)(W.u.)=3.04 *18*

γ(^{238}U) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[@]	α[r]	Comments
1076.7	12+	300.6[a] 9	100	775.9	10+	[E2]		0.191	α(K)= 0.0758; α(L)= 0.0841; α(M)= 0.0227; N+=0.00844 B(E2)(W.u.)=500 50
1105.71	3+	957.80[f] 4	30 2	148.38	4+				
		1060.32[fi] 2	100	44.916	2+				
1128.84	(2−)	68.1[h]		1060.27	2+				
		68.8[h]		1059.66	(3+)				
		130.7[h]		997.58	3−				
		178.2[h]	36	950.12	2−	[M1]		4.51	α(K)= 3.58; α(L)= 0.699; α(M)= 0.1692; α(N+..)= 0.0616
		198.6[f] 3	15	930.55	(1−)				Iγ: masked by an impurity line in Coulomb excitation. From Iγ/Iγ(1084γ)=0.18 in β decay.
		396.3 2	26.0 13	731.93	3−				
		448.1[t] 2	100[t] 4	680.11	1−				
		1084.08 7	81 4	44.916	2+				
1130.75	4+	982.44[a] 24	100	148.38	4+				
1135.7?		208.3[hfu] 10	100 29	927.21	0+				
		1090.9[hfu] 2	71 6	44.916	2+				
1150.7	9−	184[a]		966.31	7−				
		374.8[a] 4		775.9	10+				
		632.6[a] 4		518.1	8+				
1151	6−	123[a]		1028	4−				
		324[a]		826.64	5−				
		843[a]		307.18	6+				
1163	(4+)	855[a]		307.18	6+				
		1015[a]		148.38	4+				
1167.99	4+	861[a]	13.5	307.18	6+	E2		0.01504	α(K)=0.01105; α(L)=0.00300
		1018.88[fk] 3	100	148.38	4+	E2		0.01085	α(K)=0.00820; α(L)=0.00200
		1123[ak]	6.8	44.916	2+	E2		0.00904	α(K)=0.00691; α(L)=0.00160
1168.88	3−	41.4[j]		1128.84	(2−)				
		109.4[hu]		1059.66	(3+)				
		172[a]	44.3	997.58	3−	[M1]		5.05	α(K)= 4.00; α(L)= 0.783; α(M)= 0.1894; α(N+..)= 0.0690
		202.6[a]	16.8	966.13	2+	[E1]		0.0957	α(K)= 0.0751; α(L)=0.01547; α(M)=0.00374; α(N+..)=0.00132
		436.9 3	100	731.93	3−	M1+E2	+0.23 +11−8	0.366 17	α(K)= 0.291 15; α(L)= 0.0567 20; α(M)= 0.0137 5; α(N+..)=0.00498 17
		489.0[a] 10	23.4	680.11	1−	E2		0.0505	α(K)= 0.0303; α(L)=0.01482; α(M)=0.00389; α(N+..)=0.00143
		1021[ak]	49.6	148.38	4+	[E1]		0.00362	α(K)=0.00296; α(L)=0.00050
		1123[ak]	27.0	44.916	2+	[E1]		0.00307	α(K)=0.00251; α(L)=0.00042

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$\gamma(^{238}U)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Mult.[#]	α[r]	Comments
1209.3		282.2[f] *8*	100[g] *43*	927.21	0^+			
		1060.98[f] *3*	<1014[g]	148.38	4^+			
		1209.3[f] *3*	86[g] *14*	0.0	0^+			
1223.78	2^+	258[a]	4.7	966.13	2^+	E2	0.312	α(K)= 0.1009; α(L)= 0.1537; α(M)= 0.0418; α(N+..)=0.01552 B(E2)(W.u.)=32
		274[a]	17.8	950.12	2^-	E1	0.0483	α(K)= 0.0383; α(L)=0.00753; α(M)=0.00181; α(N+..)=0.00064 B(E1)(W.u.)=1.8×10^{-4}
		293[a]	7.2	930.55	(1^-)	E1	0.0416	α(K)= 0.0331; α(L)=0.00644; α(M)=0.00154; α(N+..)=0.00055 B(E1)(W.u.)=6.0×10^{-5}
		296[a]	8.0	927.21	0^+	E2	0.2004	α(K)= 0.0781; α(L)= 0.0893; α(M)=0.02414; α(N+..)=0.00897 B(E2)(W.u.)=27
		1076[a]	3.2	148.38	4^+	E2	0.00980	α(K)=0.00745; α(L)=0.00176 B(E2)(W.u.)=0.017
		1179.3 *3*	96	44.916	2^+	M1+E2		E_γ: weighted average of 1179.2 *4* from Coulomb excitation, and 1179.4 *2* from 1984BlZS, 1179.6 *3* from 1978De41, and 1179.0 *2* from 1972Mc19 in (n,n′γ). δ: δ=+7.0 *+14−10* or −0.295 from $\gamma(\theta)$ in Coulomb excitation.
		1223.3 *2*	100	0.0	0^+	E2	0.00770	α(K)=0.00594; α(L)=0.00132 B(E2)(W.u.)=0.29
1232	5^+	69[a]		1163	(4^+)			
		127[a]		1105.71	3^+			
		925[a]		307.18	6^+			
		1084[a]		148.38	4^+			
1239.3?		932.30[f] *7*	≤156[g]	307.18	6^+			
		1090.9[fu] *2*	100	148.38	4^+			
1242.9?		1094.5[shu]	[s]	148.38	4^+			
1260.9?		1112.0[u] *5*	29 *3*	148.38	4^+			
		1215.31[u] *5*	100 *6*	44.916	2^+			
1269.2	6^+	962.0[f] *10*	100	307.18	6^+			
1278.54	2^+	546.93[f] *10*	48	731.93	3^-	E1	0.01136	α(K)=0.00917; α(L)=0.00164 B(E1)(W.u.)=4.8×10^{-5} *7*
		1130.31[f] *12*	60 *4*	148.38	4^+	E2	0.00893	α(K)=0.00684; α(L)=0.00158 B(E2)↓=0.29 *3* E_γ: from 1994Mc03.
		1233.65[f] *7*	82	44.916	2^+	E2	0.00758	α(K)=0.00586; α(L)=0.00130 B(E2)(W.u.)=0.37 *5* E_γ: E=1233 in Coulomb excitation.
		1278.57[f] *7*	100 *60*	0.0	0^+	E2	0.00709	α(K)=0.00550; α(L)=0.00120 B(E2)(W.u.)=0.098 *9*
1311	6^+	79[a]		1232	5^+			

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γ(^{238}U) (continued)

E_i(level)	J^{π}_i	E_γ[†]	I_γ[‡]	E_f	J^{π}_f	Mult.[#]	α[r]	Comments
1311	6^+	149[a]		1163	(4^+)			
		793[a]		518.1	8^+			
		1004[a]		307.18	6^+			
1318	8^-	167[a]		1151	6^-			
		352[a]		966.31	7^-			
1354.79	$(1,2^+)$	405.8[f] *10*	40 *20*	950.12	2^-			
		423.8[f] *3*	100 *20*	930.55	(1^-)			
		1310.5[f] *4*	50 *10*	44.916	2^+			
		1354.5[fl] *10*	30 *10*	0.0	0^+			
1378.8	11^-	228.1[a] *4*		1150.7	9^-			
		302.3[a] *4*		1076.7	12^+			
		602.9[a] *4*		775.9	10^+			
1381.19		554.28[f] *7*	100	826.64	5^-			
		1073.82[f] *11*		307.18	6^+			
1403	7^+	92[a]		1311	6^+			
		171[a]		1232	5^+			
		885[a]		518.1	8^+			E_γ: E=885.8 *2* is reported in (n,n′γ) for a doubly-placed transition.
1414.0	2^+	354[a]	4.3	1060.27	2^+	E2	0.1194	α(K)= 0.0562; α(L)= 0.0462; α(M)=0.01240; α(N+..)=0.00460 B(E2)(W.u.)=36
		1370[a]	100	44.916	2^+			
		1413.4[f] *2*	15.5	0.0	0^+	E2	0.00589	α(K)=0.00461; α(L)=0.00096 B(E2)(W.u.)=0.125
1415.5	14^+	338.8[a] *4*	100	1076.7	12^+	[E2]	0.134	α(K)= 0.0605; α(L)= 0.0534; α(M)= 0.0143; N+=0.00533 B(E2)(W.u.)=491 *38*
1446.4	(7^-)	480[a]	100	966.31	7^-			
1455.39		1306.5[f] *1*	81 *9*	148.38	4^+			
		1410.1[f] *1*	100 *9*	44.916	2^+			
1482.41		422.1[f] *3*	4	1060.27	2^+			
		551.63[f] *8*	21	930.55	(1^-)			
		802.9[f] *2*	32	680.11	1^-			
		1437.39[f] *8*	100	44.916	2^+			
1504	8^+	102[a]		1403	7^+			
		193[a]		1311	6^+			
1516.5?		1367.3[sl] *2*	95[s]	148.38	4^+			
		1470.56 *10*	100	44.916	2^+			
1528	10^-	210[a]		1318	8^-			
		377[a]		1150.7	9^-			
1530.2	2^+	400.6[a]	8.5	1128.84	(2^-)	E1	0.0213	α(K)=0.0171; α(L)=0.00317 B(E1)(W.u.)=6.4×10^{-4}
		564[a]	17.8	966.13	2^+	[E2]	0.0362	α(K)=0.02342; α(L)=0.00958 B(E2)(W.u.)=55

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Adopted Levels, Gammas (continued)

γ(^{238}U) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[r]	Comments
1530.2	2^+	599[a]	41.7	930.55	(1^-)	[E1]	0.00955	α(K)=0.00773; α(L)=0.00137 B(E1)(W.u.)=9.4×10^{-4}
		798.4[a]	23.9	731.93	3^-	[E1]	0.00560	α(K)=0.00456; α(L)=0.00079 B(E1)(W.u.)=2.3×10^{-4}
		1382.11[f] *12*	100 *8*	148.38	4^+	E2	0.00615	α(K)=0.00480; α(L)=0.00101 B(E2)(W.u.)=3.57 *43* (1994Mc03)
		1485.3[f] *3*	35 *6*	44.916	2^+	M1+E2		δ: δ=−30 *10* or −0.51 from $\gamma(\theta)$ in Coulomb excitation.
		1530[a]	11.3	0.0	0^+	E2	0.00401	α(K)=0.00401 B(E2)(W.u.)=0.240 *24* (1994Mc03)
1545.8	8^+	1028[q]	100	518.1	8^+			
1561.6		501.9[h]	100	1059.66	(3^+)			
		1413[h]	12	148.38	4^+			
		1516.5[h]	<15	44.916	2^+			
1594.80	(4^+)	768.40[f] *7*	<50	826.64	5^-			
		1287.0[f] *5*	22 *5*	307.18	6^+			
		1446.12[f] *11*	≤100	148.38	4^+			
		1549.88[f] *12*	100 *8*	44.916	2^+			
1617.5		448.3[thu]	≈7[t]	1168.88	3^-			I_γ: most of the intensity belongs with the 1129 level.
		489.0[h]	100	1128.84	(2^-)			
		557.9[h]	≈25	1059.66	(3^+)			I_γ: estimated by evaluators.
1619	9^+	114[a]		1504	8^+			
		216[a]		1403	7^+			
		843[a]		775.9	10^+			
1643.73		1336.34[f] *12*	100	307.18	6^+			
1644	(9^-)	197[a]		1446.4	(7^-)			
		493[a]		1150.7	9^-			
1645.0		476.2[h]	100[m]	1168.88	3^-			
		1496.6[h]	42[m]	148.38	4^+			
		1600[h]	16[m]	44.916	2^+			
1649.2	13^-	234[a]		1415.5	14^+			
		270.5[a] *4*		1378.8	11^-			
		572.4[a] *4*		1076.7	12^+			
1672.01		566.20[f] *11*	50	1105.71	3^+			
		1523.63[f] *15*	100 *8*	148.38	4^+			
		1627.0[f] *2*	<53	44.916	2^+			
1675.7		547.0[f] *3*	100[m]	1128.84	(2^-)			

γ(^{238}U) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[@]	α[r]	Comments
1675.7		943.5[h]	17.5[m]	731.93	3⁻				
		995.4[h]	25[m]	680.11	1⁻				
		1527.1[h]	9[m]	148.38	4⁺				
		1630.5[h]	7.5[m]	44.916	2⁺				
1741	10⁺	122[a]		1619	9⁺				
		237[a]		1504	8⁺				
1760.9	(4⁺)	655.3 *3*	<1.4	1105.71	3⁺				
		701.9 *2*	0.5	1059.66	(3⁺)				
		1454.8 *2*	<0.4	307.18	6⁺				
		1613.2 *3*	0.6	148.38	4⁺				
		1716.2 *4*	100 *15*	44.916	2⁺				
1774.7	(3⁻,4,5⁻)	605.7[h]	100[m]	1168.88	3⁻				
		646.4[h]	90[m]	1128.84	(2⁻)				
		1042.4[h]	80[m]	731.93	3⁻				
		1094.5[sh]	≤50[sm]	680.11	1⁻				Placement in level scheme is uncertain.
		1626[h]	30[m]	148.38	4⁺				
		1730[h]	30[m]	44.916	2⁺				
1778	12⁻	250[a]		1528	10⁻				
		399[a]		1378.8	11⁻				
1782	1	1737[n]	55[n] *5*	44.916	2⁺				
		1782[n]	100[n]	0.0	0⁺				
1782.3	2⁺	1737.8[f] *5*	89 *10*	44.916	2⁺	M1+E2	11 *+19−4*		B(E2)(W.u.)=0.57 *6* B(M1)(W.u.)=5×10^{-5} *+7−4*
		1782.3[f] *4*	100 *11*	0.0	0⁺	E2			B(E2)(W.u.)=0.41 *4*
1786.7	10⁺	241[q]		1545.8	8⁺				
		259[q]		1528	10⁻				
		408[q]		1378.8	11⁻				
		636[q]		1150.7	9⁻				
		1011[q]		775.9	10⁺				
1788.4	16⁺	372.9[a] *4*	100	1415.5	14⁺	[E2]		0.102	α(K)= 0.0505; α(L)= 0.0376; α(M)= 0.0101; N+=0.00373 B(E2)(W.u.)=490 *21*
1793	1	1748[n]	100[n]	44.916	2⁺				
		1793[n]	90[n] *23*	0.0	0⁺				
1846	1	1802[n]	51[n] *5*	44.916	2⁺				
		1846[n]	100[n]	0.0	0⁺				
1866	(11⁻)	222[a]		1644	(9⁻)				
		487[a]		1378.8	11⁻				
1875	11⁺	134[a]		1741	10⁺				
		256[a]		1619	9⁺				

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Adopted Levels, Gammas (continued)

$\gamma(^{238}U)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Comments
1875	11^+	798[a]		1076.7	12^+	
1934.3	(3^-)	289.1[h]	9[m]	1645.0		
		317.0[h]	16[m]	1617.5		
		373[h]	≤14[m]	1561.6		
		765.3[h]	9[m]	1168.88	3^-	
		805.7[h]	100[m]	1128.84	(2^-)	
		874.4[h]	20[m]	1059.66	(3^+)	
		984.6[h]	16[m]	950.12	2^-	
		1003.6[h]		930.55	(1^-)	
		1785.7[h]		148.38	4^+	
		1889.1[h]	39[m]	44.916	2^+	
1959.2	15^-	309.9[a] *4*		1649.2	13^-	
		543.7[a] *4*		1415.5	14^+	
1992.2	(3^-)	375		1617.5		E_γ,I_γ: reported only in β^- decay. $I\gamma/I\gamma(863.5\gamma)<0.11$.
		768.3 *2*		1223.78	2^+	E_γ,I_γ: E=769 is seen in β^- with $I\gamma/I\gamma(863.5\ \gamma)\approx0.02$, unplaced by authors.
		823.2		1168.88	3^-	E_γ,I_γ: reported only in β^- decay. $I\gamma/I\gamma(863.5\gamma)=0.17$.
		863.7 *2*		1128.84	(2^-)	E_γ,I_γ: from (n,n′γ). E=863.3 in β^- decay.
		932.30 *7*		1059.66	(3^+)	E_γ,I_γ: from (n,n′γ), with $I\gamma/I\gamma(863.5\gamma)<10$. E=932.5 in β^- decay, with $I\gamma/I\gamma(863.5\gamma)<0.11$.
1996.7	1^-	1951.8[n]	18[n] *2*	44.916	2^+	
		1996.7[n] *3*	100[n]	0.0	0^+	
2017.7	1^+	1972.8[n]	187[n] *47*	44.916	2^+	
		2017.7[n] *4*	100[n]	0.0	0^+	
2018	12^+	143[a]		1875	11^+	
		277[a]		1741	10^+	
2033	(12^+)	957[a]	100	1076.7	12^+	
2048.7	12^+	262[q]		1786.7	10^+	
		271[q]		1778	12^-	
		400[q]		1649.2	13^-	
		670[q]		1378.8	11^-	
		973[q]		1076.7	12^+	
2063.9	(2^-)	1332.0[h]	70	731.93	3^-	
		1383.9[h]	100	680.11	1^-	
		2019[h]	100	44.916	2^+	
2066	14^-	288[a]	100	1778	12^-	
2079.3	1^+	2079.3[n] *4*	100[n]	0.0	0^+	
2080.7	1^-	2035.8[n]	150[n] *19*	44.916	2^+	
		2080.7[n] *4*	100[n]	0.0	0^+	
2093.3	1^-	2093.3[n] *4*	100[n]	0.0	0^+	
2122	(13^-)	257[a]		1866	(11^-)	

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Adopted Levels, Gammas (continued)

γ(^{238}U) (continued)

E$_i$(level)	J^π_i	E$_γ$[†]	I$_γ$[‡]	E$_f$	J^π_f	Mult.[#]	α[r]	Comments
2122	(13$^-$)	473[a]		1649.2	13$^-$			
2125.3	2$^+$	1394.1[f] *9*	51[g] *27*	731.93	3$^-$			
		1976.7[f] *6*	100[g] *26*	148.38	4$^+$			
		2080.9[f] *6*	87[g] *25*	44.916	2$^+$			
		2124.9[f] *6*	40[g] *11*	0.0	0$^+$			
2145.6	1$^-$	2145.6[n] *3*	100[n]	0.0	0$^+$			
2163.5		1857.1[f] *4*	100[g] *13*	307.18	6$^+$			
		2015.8[f] *2*	78[g]	148.38	4$^+$			
2171	13$^+$	153[a]		2018	12$^+$			
		296[a]		1875	11$^+$			
		755[a]		1415.5	14$^+$			
2175.8	1$^+$	2130.9[n]	54[n] *3*	44.916	2$^+$			
		2175.8[n] *3*	100[n]	0.0	0$^+$	[M1]		B(M1)(W.u.)=0.173 *16*
2191.1	18$^+$	402.6[a] *4*	100	1788.4	16$^+$	[E2]	0.0828	α(K)= 0.0437; α(L)= 0.0286; α(M)=0.00763; N+=0.00283 B(E2)(W.u.)=480 *30*
2208.8	1$^+$	2163.9[n] *3*	21[n] *8*	44.916	2$^+$			
		2208.8[n] *3*	100[n]	0.0	0$^+$	[M1]		B(M1)(W.u.)=0.162 *20*
2244.4	1$^+$	2199.5[n]	14[n] *1*	44.916	2$^+$			
		2244.4[n] *3*	100[n]	0.0	0$^+$	[M1]		B(M1)(W.u.)=0.087 *9*
2294.1	1$^+$	2249.2[n]	103[n] *6*	44.916	2$^+$			
		2294.1[n] *3*	100[n]	0.0	0$^+$	[M1]		B(M1)(W.u.)=0.035 *6*
2306.7	17$^-$	347.5[a] *4*		1959.2	15$^-$			
		518.3[a] *4*		1788.4	16$^+$			
2332.7	1$^-$	2287.8[n]	132[n] *9*	44.916	2$^+$			
		2332.7[n] *3*	100[n]	0.0	0$^+$			
2333	14$^+$	162[a]		2171	13$^+$			
		315[a]		2018	12$^+$			
2346.4	14$^+$	281[q]		2066	14$^-$			
		298[q]		2048.7	12$^+$			
		387[q]		1959.2	15$^-$			
		698[q]		1649.2	13$^-$			
		931[q]		1415.5	14$^+$			
2356	(14$^+$)	323[a]		2033	(12$^+$)			
		941[a]		1415.5	14$^+$			
2365.6	1$^-$	2365.6[n] *3*	100[n]	0.0	0$^+$	[E1]		
2389	16$^-$	323[a]	100	2066	14$^-$			
2410.0	1$^+$	2365.1[n]	170[n] *9*	44.916	2$^+$			
		2410.0[n] *3*	100[n]	0.0	0$^+$	[M1]		B(M1)(W.u.)=0.061 *7*
2418	(15$^-$)	296[a]		2122	(13$^-$)			
2422.8	1$^-$	2422.8[n] *3*	100[n]	0.0	0$^+$			

γ(^{238}U) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Mult.[#]	α[r]	$I_{(\gamma+ce)}$	Comments
2467.8	1+	2467.8[n] 5	100[n]	0.0	0+	[M1]			B(M1)(W.u.)=0.066 9
2491.5	1−	2446.6[n]	66[n] 28	44.916	2+				
		2491.5[n] 5	100[n]	0.0	0+				
2499.4	1+	2454.5[n]	47[n] 5	44.916	2+				
		2499.4[n] 3	100[n]	0.0	0+				
2502	15+	169[a]		2333	14+				
		332[a]		2171	13+				
		713[a]		1788.4	16+				
2529.0	1−	2484.1[n]	28[n] 9	44.916	2+				
		2529.0[n] 3	100[n]	0.0	0+				
2557.9	0+	1879[o]	49[o] 13	680.11	1−	[E1]			B(E1)(W.u.)=3.1×10^{-11} 8
		2512.7[o] 5	100[o] 19	44.916	2+	[E2]			B(E2)(W.u.)=1.54×10^{-7} 19
		2558 2		0.0	0+	E0		0.34 6	$I_{(\gamma+ce)}$: from IT decay.
2578.5	2+	2430.0[f] 3	97 18	148.38	4+				
		2533.6[f] 3	100 15	44.916	2+				
2593.7	1−	2548.8[n]	17[n] 4	44.916	2+				
		2593.8[n] 6	100[n]	0.0	0+				
2602.5	1−	2557.6[n]	38[n] 9	44.916	2+				
		2602.5[n] 4	100[n]	0.0	0+				
2619.1	20+	427.9[a] 4	100	2191.1	18+	[E2]	0.0707		α(K)= 0.0390; α(L)= 0.0232; α(M)=0.00616; N+=0.00228 B(E2)(W.u.)=460 40
2624.6	4+	2317.3[f] 9	62 23	307.18	6+				
		2476.2[f] 6	100 23	148.38	4+				
2638.3	1+	2593.4[n]	133[n] 9	44.916	2+				
		2638.3[n] 3	100[n]	0.0	0+				
2645	(14+)	857[a]	100	1788.4	16+				
2647.3	1+	2602.4[n]	80[n] 8	44.916	2+				
		2647.3[n] 8	100[n]	0.0	0+				
2675.2	16+	329[q]		2346.4	14+				
		368[q]		2306.7	17−				
		716[q]		1959.2	15−				
2683	16+	182[a]		2502	15+				
		350[a]		2333	14+				
2689.4	19−	382.7[a] 4		2306.7	17−				
		498.3[a]		2191.1	18+				
2702.2	1+	2702.2[n] 3	100[n]	0.0	0+				
2712	(16+)	356[a]		2356	(14+)				
		924[a]		1788.4	16+				
2738.9	1+	2694.0[n]	143[n] 48	44.916	2+				
		2738.9[n] 9	100[n]	0.0	0+				
2744	18−	355[a]	100	2389	16−				

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γ(^{238}U) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f
2751	(17⁻)	333[a]	100	2418	(15⁻)
2756.4	1⁺	2756.4[n] *3*	100[n]	0.0	0⁺
2773.0	1⁺	2728.1[n] *3*	105[n] *29*	44.916	2⁺
		2773.0[n] *3*	100[n]	0.0	0⁺
2816.8	1⁺	2816.8[n] *4*	100[n]	0.0	0⁺
2844.2	1⁻	2844.2[n] *9*	100[n]	0.0	0⁺
2862.2	1⁻	2817.3[n]	143[n] *29*	44.916	2⁺
		2862.2[n] *5*	100[n]	0.0	0⁺
2868	17⁺	184[a]		2683	16⁺
		365[a]		2502	15⁺
		677[a]		2191.1	18⁺
2877.1	1⁻	2877.1[n] *3*	100[n]	0.0	0⁺
2881.4	1⁺	2836.5[n]	134[n] *29*	44.916	2⁺
		2881.4[n] *5*	100[n]	0.0	0⁺
2896.6	1⁻	2851.7[n]	76[n] *19*	44.916	2⁺
		2896.6[n] *3*	100[n]	0.0	0⁺
2908.9	1⁻	2864.0[n]	76[n] *19*	44.916	2⁺
		2908.9[n] *3*	100[n]	0.0	0⁺
2910.0	1⁻	2865.1[n]	105[n] *10*	44.916	2⁺
		2910.0[n] *4*	100[n]	0.0	0⁺
2932.6	1⁺	2887.7[n]	143[n] *38*	44.916	2⁺
		2932.6[n] *6*	100[n]	0.0	0⁺
2951.2	1⁺	2906.3[n]	86[n] *10*	44.916	2⁺
		2951.2[n] *3*	100[n]	0.0	0⁺
2963.9	1⁺	2963.9[n] *8*	100[n]	0.0	0⁺
2991	(16⁺)	346[a]		2645	(14⁺)
		800[a]		2191.1	18⁺
		1203[a]		1788.4	16⁺
3005.9	1⁻	2961.0[n]	67[n] *76*	44.916	2⁺
		3005.9[n] *4*	100[n]	0.0	0⁺
3014.5	1⁺	2969.6[n]	38[n] *10*	44.916	2⁺
		3014.5[n] *3*	100[n]	0.0	0⁺
3018.9	1⁻	2974.0[n]	96[n] *29*	44.916	2⁺
		3018.9[n] *3*	100[n]	0.0	0⁺
3030.6	1⁺	3030.6[n] *3*	100[n]	0.0	0⁺
3031.2	18⁺	356[q]		2675.2	16⁺
		724[q]		2306.7	17⁻
3037.7	1⁺	2992.8[n]	115[n] *19*	44.916	2⁺
		3037.7[n] *3*	100[n]	0.0	0⁺
3042.5	1⁺	3042.5[n] *6*	100[n]	0.0	0⁺
3043.6	1⁻	3043.6[n] *3*	100[n]	0.0	0⁺
3046.9	1⁻	3046.9[n] *3*	100[n]	0.0	0⁺

γ(^{238}U) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Mult.[#]	α[r]	Comments
3051.7	1⁻	3006.8[n]	67[n] *10*	44.916	2⁺			
		3051.7[n] *3*	100[n]	0.0	0⁺			
3057.1	1⁻	3012.2[n]	3[n] *1*	44.916	2⁺			
		3057.1[n] *4*	100[n]	0.0	0⁺			
3060.6	1⁻	3015.7[n]	55[n] *5*	44.916	2⁺			
		3060.6[n] *3*	100[n]	0.0	0⁺			
3065	18⁺	197[a]		2868	17⁺			
		382[a]		2683	16⁺			
3068.1	22⁺	448.9[a] *4*	100	2619.1	20⁺	[E2]	0.0626	α(K)= 0.0357; α(L)= 0.0198; α(M)=0.00522; N+=0.00193 B(E2)(W.u.)=490 *75*
3086.7	1⁻	3041.8[n]	28[n] *3*	44.916	2⁺			
		3086.7[n] *5*	100[n]	0.0	0⁺			
3091.0	1⁻	3046.1[n] *4*	23[n] *2*	44.916	2⁺			
		3091.0[n] *4*	100[n]	0.0	0⁺			
3095	(18⁺)	383[a]		2712	(16⁺)			
		904[a]		2191.1	18⁺			
3096.4	1⁻	3051.5[n]	105[n] *29*	44.916	2⁺			
		3096.4[n] *3*	100[n]	0.0	0⁺			
3101.7	1⁻	3056.8[n]	62[n] *6*	44.916	2⁺			
		3101.7[n] *4*	100[n]	0.0	0⁺			
3104.3	21⁻	415.1[a] *4*	100	2689.4	19⁻			
3117.7	1⁻	3072.8[n]	96[n] *10*	44.916	2⁺			
		3117.7[n] *4*	100[n]	0.0	0⁺			
3120	(19⁻)	369[a]	100	2751	(17⁻)			
3128	20⁻	384[a]	100	2744	18⁻			
3135.0	1⁺	3090.1[n]	86[n] *29*	44.916	2⁺			
		3135.0[n] *3*	100[n]	0.0	0⁺			
3153.7	1⁺	3108.8[n]	37[n] *5*	44.916	2⁺			
		3153.7[n] *3*	100[n]	0.0	0⁺			
3172.9	1⁺	3128.0[n]	105[n] *10*	44.916	2⁺			
		3172.9[n] *3*	100[n]	0.0	0⁺			
3207.8	1⁻	3162.9[n]	40[n] *6*	44.916	2⁺			
		3207.8[n] *4*	100[n]	0.0	0⁺			
3217.6	1⁺	3172.7[n]	58[n] *19*	44.916	2⁺			
		3217.6[n] *6*	100[n]	0.0	0⁺			
3234.5	1⁺	3189.6[n]	163[n] *38*	44.916	2⁺			
		3234.5[n] *7*	100[n]	0.0	0⁺			
3239.6	1⁻	3194.7[n]	249[n] *67*	44.916	2⁺			
		3239.6[n] *3*	100[n]	0.0	0⁺			
3253.194	1⁻	2125[n]	44[n]	1128.84	(2⁻)			
		2217[n]	9[n]	1037.25	2⁺	[E1]		B(E1)(W.u.)=4.2×10^{-7}

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Adopted Levels, Gammas (continued)

γ(^{238}U) (continued)

E_i(level)	J^{π}_i	E_{γ}[†]	I_{γ}[‡]	E_f	J^{π}_f	Mult.[#]	Comments
3253.194	1^-	2256[n]	8[n]	997.58	3^-	[E2]	B(E2)(W.u.)=0.0025 *9*
		2288[n]	91[n]	966.13	2^+	[E1]	B(E1)(W.u.)=3.8×10^{-6} *13*
		2303[n]	16[n]	950.12	2^-		
		2323[n]	32[n]	930.55	(1^-)		
		2327[n]	33[n]	927.21	0^+	[E1]	B(E1)(W.u.)=1.3×10^{-6} *5*
		2522[n]	14[n]	731.93	3^-	[E2]	B(E2)(W.u.)=0.0025 *9*
		2574[n]	28[n]	680.11	1^-		
		3209[n]	22[n]	44.916	2^+	[E1]	B(E1)(W.u.)=3.3×10^{-7} *12*
		3253[n]	100[n]	0.0	0^+	[E1]	B(E1)(W.u.)=1.5×10^{-6} *5*
3265	19^+	397[a]	100	2868	17^+		
3274.4	1^-	3229.5[n]	86[n] *10*	44.916	2^+		
		3274.4[n] *3*	100[n]	0.0	0^+		
3297.2	1^-	3297.2[n] *4*	100[n]	0.0	0^+		
3303.6	1^-	3258.7[n]	106[n] *10*	44.916	2^+		
		3303.6[n] *3*	100[n]	0.0	0^+		
3307.32	1^+	3262.4[n]	58[n] *19*	44.916	2^+		
		3307.3[n] *3*	100[n]	0.0	0^+		
3329.1	1^-	3284.2[n]	85[n] *9*	44.916	2^+		
		3329.1[n] *6*	100[n]	0.0	0^+		
3348.33	1^+	3303.4[n]	192[n] *19*	44.916	2^+		
		3348.3[n] *3*	100[n]	0.0	0^+		
3366.0	1^+	3321.1[n]	53[n] *6*	44.916	2^+		
		3366.0[n] *5*	100[n]	0.0	0^+		
3368	(18^+)	377[a]		2991	(16^+)		
		749[a]		2619.1	20^+		
		1177[a]		2191.1	18^+		
3384.3	1^-	3339.4[n]	41[n] *5*	44.916	2^+		
		3384.3[n] *3*	100[n]	0.0	0^+		
3397.9	1^-	3353.0[n]	37[n] *4*	44.916	2^+		
		3397.9[n] *8*	100[n]	0.0	0^+		
3411.2	20^+	380[q]	100	3031.2	18^+		
3416.0	1^-	3371.1[n]	384[n] *38*	44.916	2^+		
		3416.0 *4*	100	0.0	0^+		
3421.5	1^-	3421.5[n] *5*	100[n]	0.0	0^+		
3441.0	1^-	3396.1[n]	48[n] *19*	44.916	2^+		
		3441.0[n] *9*	100[n]	0.0	0^+		
3448.3	1^+	3403.4[n]	106[n] *10*	44.916	2^+		
		3448.3[n] *6*	100[n]	0.0	0^+		
3454.1	1^-	3409.2[n]	250[n] *29*	44.916	2^+		
		3454.1[n] *4*	100[n]	0.0	0^+		
3460.7	1^+	3415.8[n]	56[n] *7*	44.916	2^+		

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$\gamma(^{238}U)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[r]	Comments
3460.7	1^+	3460.7[n] 3	100[n]	0.0	0^+			
3467.8	1^-	3422.9[n]	58[n] 10	44.916	2^+			
		3467.8[n] 6	100[n]	0.0	0^+			
3470.7	1^-	3425.8[n]	29[n] 29	44.916	2^+			
		3470.7[n] 3	100[n]	0.0	0^+			
3474	20^+	409[a]	100	3065	18^+			
3475.2	1^-	3430.3[n]	58[n] 29	44.916	2^+			
		3475.2[n] 3	100[n]	0.0	0^+			
3479.0	1^-	3434.1[n]	43[n] 9	44.916	2^+			
		3479.0[n] 3	100[n]	0.0	0^+			
3489.0	1^-	3444.1[n]	144[n] 58	44.916	2^+			
		3489.0[n] 3	100[n]	0.0	0^+			
3500.5	1^-	3500.5[n] 3	100[n]	0.0	0^+			
3502	(20^+)	408[a]		3095	(18^+)			
		882[a]		2619.1	20^+			
3509.1	1^-	3464.2[n]	67[n] 19	44.916	2^+			
		3509.1[n] 9	100[n]	0.0	0^+			
3521	(21^-)	401[a]	100	3120	(19^-)			
3528.0	1^-	3528.0[n] 4	100[n]	0.0	0^+			
3535.3	24^+	467[a] 1	100	3068.1	22^+	[E2]	0.0568	α(K)= 0.0332; α(L)= 0.0173; α(M)=0.00457; N+=0.00168 B(E2)(W.u.)=530 85
3538	22^-	410[a]	100	3128	20^-			
3547.7	23^-	443.6[a] 4	100	3104.3	21^-			
3548.0	1^-	3503.1[n]	193[n] 29	44.916	2^+			
		3548.0[n] 6	100[n]	0.0	0^+			
3562.8	1^-	3517.9[n]	125[n] 29	44.916	2^+			
		3562.8[n] 3	100[n]	0.0	0^+			
3594.9	1^-	3550.0[n]	116[n] 19	44.916	2^+			
		3594.9[n] 5	100[n]	0.0	0^+			
3608.7	1^-	3563.8[n]	48[n] 8	44.916	2^+			
		3608.7[n] 3	100[n]	0.0	0^+			
3615.9	1^-	3571.0[n]	250[n] 48	44.916	2^+			
		3615.9[n] 3	100[n]	0.0	0^+			
3623.9	1^-	3579.0[n]	144[n] 29	44.916	2^+			
		3623.9[n] 3	100[n]	0.0	0^+			
3640.1	1^-	3595.2[n]	77[n] 19	44.916	2^+			
		3640.1[n] 3	100[n]	0.0	0^+			
3650.5	1^-	3605.6[n]	87[n] 10	44.916	2^+			
		3650.5[n] 3	100[n]	0.0	0^+			
3659.7	1^-	3614.8[n]	67[n] 10	44.916	2^+			
		3659.7[n] 6	100[n]	0.0	0^+			
3673.7	1^-	3628.8[n]	193[n] 39	44.916	2^+			

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γ(^{238}U) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[r]	Comments
3673.7	1^-	3673.7[n] *6*	100[n]	0.0	0^+			
3686	21^+	421[a]	100	3265	19^+			
3728.0	1^-	3683.1[n]	87[n] *29*	44.916	2^+			
		3728.0[n] *9*	100[n]	0.0	0^+			
3738.5	1^-	3693.6[n]	77[n] *19*	44.916	2^+			
		3738.5[n] *8*	100[n]	0.0	0^+			
3759.9	1^-	3715.0[n]	87[n] *19*	44.916	2^+			
		3759.9[n] *3*	100[n]	0.0	0^+			
3773	(20^+)	405[a]		3368	(18^+)			
		1154[a]		2619.1	20^+			
3805.1	1^-	3760.2[n]	87[n] *10*	44.916	2^+			
		3805.1[n] *3*	100[n]	0.0	0^+			
3809	$(1,2^+)$	2882[n]	55[n] *22*	927.21	0^+			
		3128[n]	28[n] *22*	680.11	1^-			
		3764[n]	96[n] *14*	44.916	2^+			
		3809[n]	100[n]	0.0	0^+			
3811.2	22^+	400[q]	100	3411.2	20^+			
3819.0	1^-	3774.1[n]	106[n] *19*	44.916	2^+			
		3819.0[n] *6*	100[n]	0.0	0^+			
3828.7	1^-	3828.7[n] *3*	100[n]	0.0	0^+			
3906	22^+	432[a]	100	3474	20^+			
3947	(23^-)	426[a]	100	3521	(21^-)			
3965.7	1^-	3920.8[n]	47[n] *4*	44.916	2^+			
		3965.7[n] *4*	100[n]	0.0	0^+			
3971	24^-	433[a]	100	3538	22^-			
3990.7	1^-	3945.8[n]	116[n] *10*	44.916	2^+			
		3990.7[n] *9*	100[n]	0.0	0^+			
3995.8	1^-	3950.9[n]	58[n] *39*	44.916	2^+			
		3995.8[n] *3*	100[n]	0.0	0^+			
4017	25^-	469[a]		3547.7	23^-			
		481[a]		3535.3	24^+			
4018.1	26^+	482.8[a] *10*	100	3535.3	24^+	[E2]	0.0524	α(K)= 0.0312; α(L)= 0.0156; α(M)=0.00410; N+=0.00151 B(E2)(W.u.)=585 *60*
4023.7	1^-	3978.8[n]	97[n] *10*	44.916	2^+			
		4023.7[n] *7*	100[n]	0.0	0^+			
4031.4	1^-	3986.5[n]	48[n] *10*	44.916	2^+			
		4031.4[n] *7*	100[n]	0.0	0^+			
4046.7	1^-	4001.8[n]	126[n] *39*	44.916	2^+			
		4046.7[n] *3*	100[n]	0.0	0^+			
4065.3	1^-	4020.4[n]	164[n] *39*	44.916	2^+			
		4065.3[n] *3*	100[n]	0.0	0^+			
4072.1	1^-	4027.2[n]	58[n] *10*	44.916	2^+			

Adopted Levels, Gammas (continued)

$\gamma(^{238}U)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Mult.[#]	α[r]	Comments
4072.1	1^-	4072.1[n] *6*	100[n]	0.0	0^+			
4088.9	1^-	4044.0[n]	97[n] *29*	44.916	2^+			
		4088.9[n] *7*	100[n]	0.0	0^+			
4093.4	1^-	4048.5[n]	39[n] *4*	44.916	2^+			
		4093.4[n] *3*	100[n]	0.0	0^+			
4100.2	1^-	4055.3[n]	174[n] *19*	44.916	2^+			
		4100.2[n] *3*	100[n]	0.0	0^+			
4105.2	1^-	4105.2[n] *3*	100[n]	0.0	0^+			
4122.9	1^-	4078.0[n]	81[n] *9*	44.916	2^+			
		4122.9[n] *5*	100[n]	0.0	0^+			
4127	23^+	441[a]	100	3686	21^+			
4138.9	1^-	4094.0[n]	40[n] *7*	44.916	2^+			
		4138.9[n] *7*	100[n]	0.0	0^+			
4145.8	1^-	4100.9[n]	58[n] *58*	44.916	2^+			
		4145.8[n] *3*	100[n]	0.0	0^+			
4151.3	1^-	4106.4[n]	97[n] *29*	44.916	2^+			
		4151.3[n] *6*	100[n]	0.0	0^+			
4155.4	1^-	4155.4[n] *3*	100[n]	0.0	0^+			
4175.8	1^-	4130.9[n]	27[n] *3*	44.916	2^+			
		4175.8[n] *4*	100[n]	0.0	0^+			
4181.5	1^-	4136.6[n]	97[n] *10*	44.916	2^+			
		4181.5[n] *7*	100[n]	0.0	0^+			
4205	(22^+)	432[a]	100	3773	(20^+)			
4217.3	1^-	4172.4[n]	107[n] *10*	44.916	2^+			
		4217.3[n] *8*	100[n]	0.0	0^+			
4232	24^+	421[q]	100	3811.2	22^+			
4239.1	1^-	4239.1[n] *3*	100[n]	0.0	0^+			
4358	24^+	452[a]	100	3906	22^+			
4393	(25^-)	446[a]	100	3947	(23^-)			
4424	26^-	453[a]	100	3971	24^-			
4495	$(1,2^+)$	4450[nu]	32[n] *28*	44.916	2^+			
		4495[n]	100[n]	0.0	0^+			
4504	27^-	487[a]	100	4017	25^-			
4517	28^+	499.3[a] *8*	100	4018.1	26^+	[E2]	0.0483	α(K)= 0.0293; α(L)= 0.0140; α(M)=0.00367; N+=0.00135 B(E2)(W.u.)=540 *130*
4586	25^+	459[a]	100	4127	23^+			
4592	$(1,2^+)$	4546[n]	190[n]	44.916	2^+			
		4592[n]	100[n]	0.0	0^+			
4677	26^+	445[q]	100	4232	24^+			
4807	(1)	3840[n]	47[n] *17*	966.13	2^+			
		4807[n]	100[n]	0.0	0^+			
4825	26^+	467[a]	100	4358	24^+			

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$\gamma(^{238}U)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Mult.[#]	α[r]	Comments
4895	28^-	471[a]	100	4424	26^-			
5003	29^-	499[a]	100	4504	27^-			
5035.1	30^+	517.7[a] *10*	100	4517	28^+	[E2]	0.0436	B(E2)(W.u.)=185 *2*
5063	27^+	477	100	4586	25^+			
5140		5140[n]	100[n]	0.0	0^+			
5144	28^+	467[q]	100	4677	26^+			
5206	$(1,2^+)$	4148[nu]	33[n] *26*	1059.66	(3^+)			
		5160[n]	90[n] *28*	44.916	2^+			
		5206[n]	100[n]	0.0	0^+			
5513	31^-	510[a]	100	5003	29^-			
5581	32^+	542[a]	100	5035.1	30^+			
6037	33^-	524[a]	100	5513	31^-			
6146	34^+	565[a]	100	5581	32^+			

[†] Weighted average from Coulomb excitation and (n,n′γ), except where noted otherwise.

[‡] From Coulomb excitation, except where noted otherwise.

[#] From α(K)exp, except where noted otherwise.

[@] From Coulomb excitation (1994Mc03).

[&] From ^{242}Pu α decay.

[a] From Coulomb excitation.

[b] From Coulomb excitation. Transition not directly observed, but required to account for the yield of transitions from the J-2 member of this band.

[c] E=1015.06 *2* in (n,n′γ) for a transition placed from the 1060 3^+ and 1060 *2*+ levels. The division of the intensity between these two levels cannot be determined.

[d] Anomalous E1 transition. α(K)exp is larger than E1 theory and agrees with E2 theory. Similar anomalous E1 transitions have been observed in ^{236}U. See 1983Fa15.

[e] E=911.3 *2* in (n,n′γ) for a transition placed from the 1060 3^+ and 1060 *2*+ levels. From branching in Coulomb excitation, most of the intensity belongs with the 1060 *3*+ level.

[f] From (n,n′γ).

[g] From (n,n′γ).

[h] From ^{238}Pa β decay.

[i] From Coulomb excitation. E=1060.98 *3* is reported in (n,n′γ) for a transition placed from the 1060 *2*+ and 1106 *3*+ levels.

[j] From Coulomb excitation. Transition not directly observed, but required to account for the yield of transitions from the J-1 member of this band.

[k] E=1019.61 *8* and 1123.1 *2* in (n,n′γ) for transitions doubly placed from the 1169 *4*+ and 1169 *3*- levels. From branching in Coulomb excitation,most of the intensity of the 1019γ belongs with the 1169 *4*+ level. The 1123γ is more evenly divided between the two levels.

[l] The 1368.3γ 2 is placed by 1984BlZS from the 1368 level. It may belong also with the 1414 and/or 1515 level, as suggested by 1978De41, all from (n,n′γ).

[m] Branching is from ^{238}Pa β^- decay.

[n] From (γ,γ′).

[o] From ^{238}U IT decay.

γ(^{238}U) (continued)

[p] From Coulomb excitation.
[q] From Coulomb excitation (2010Zh09).
[r] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
[s] Multiply placed with undivided intensity.
[t] Multiply placed with intensity suitably divided.
[u] Placement of transition in the level scheme is uncertain.

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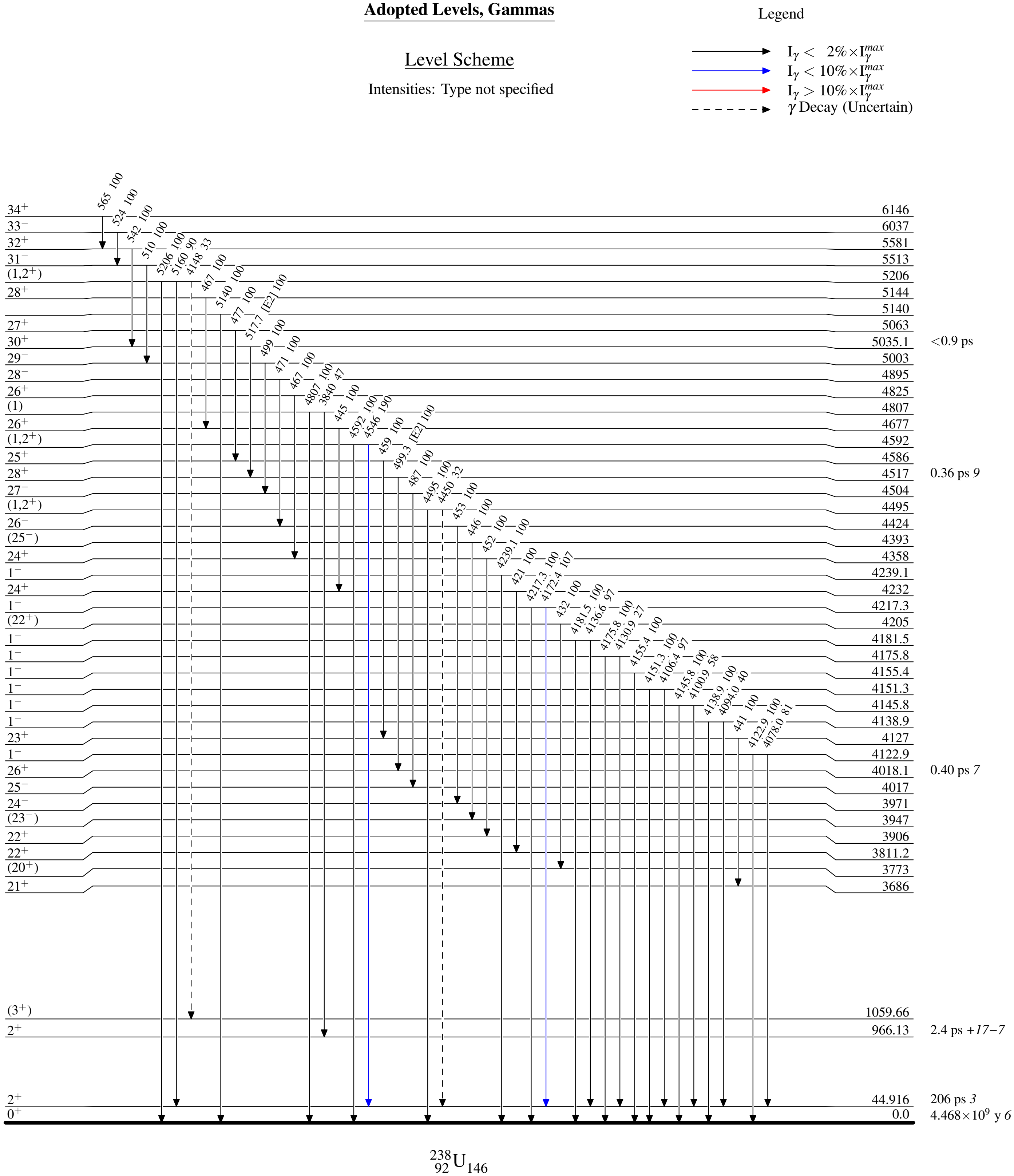
Adopted Levels, Gammas

Level Scheme

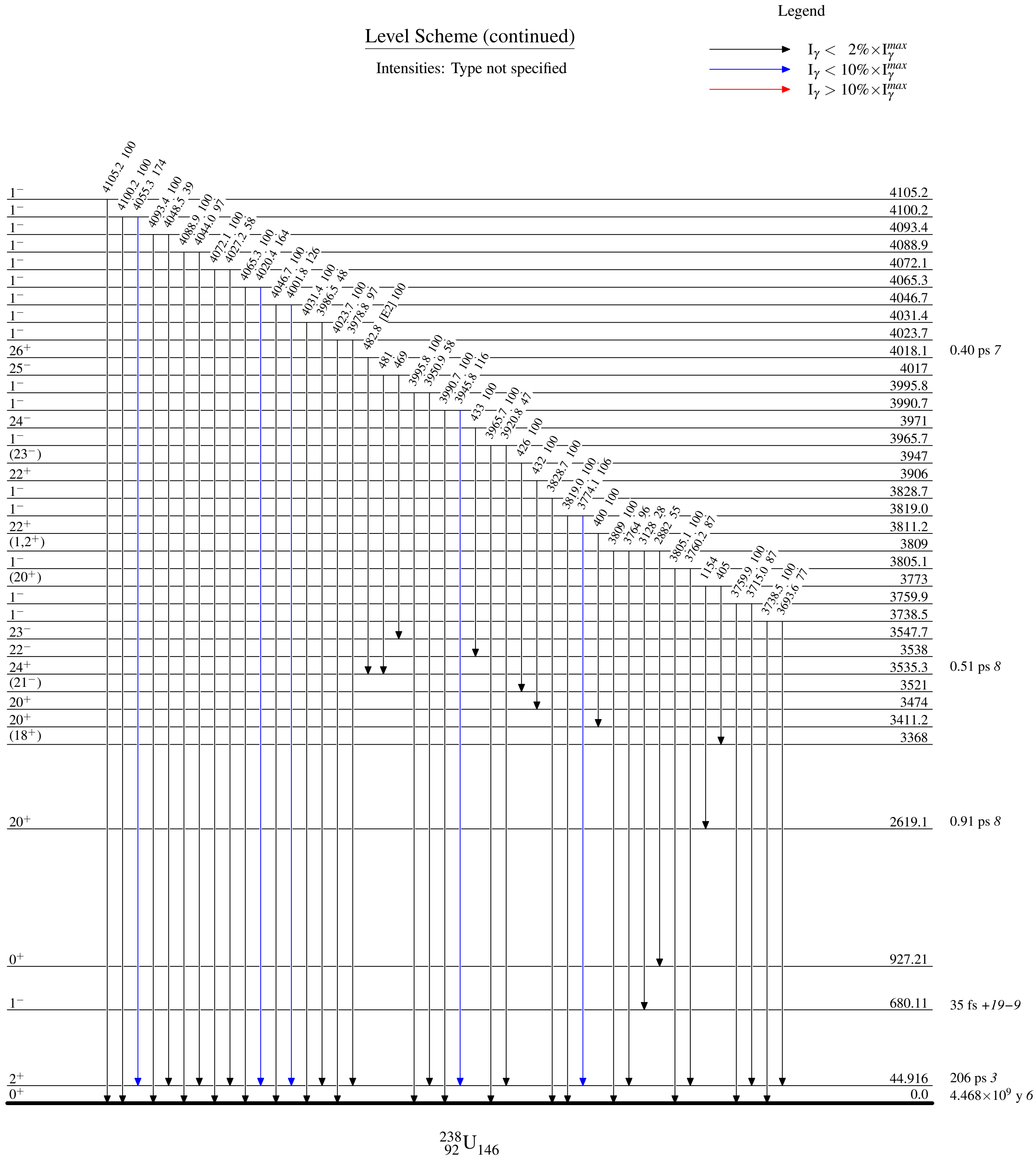
Intensities: Type not specified



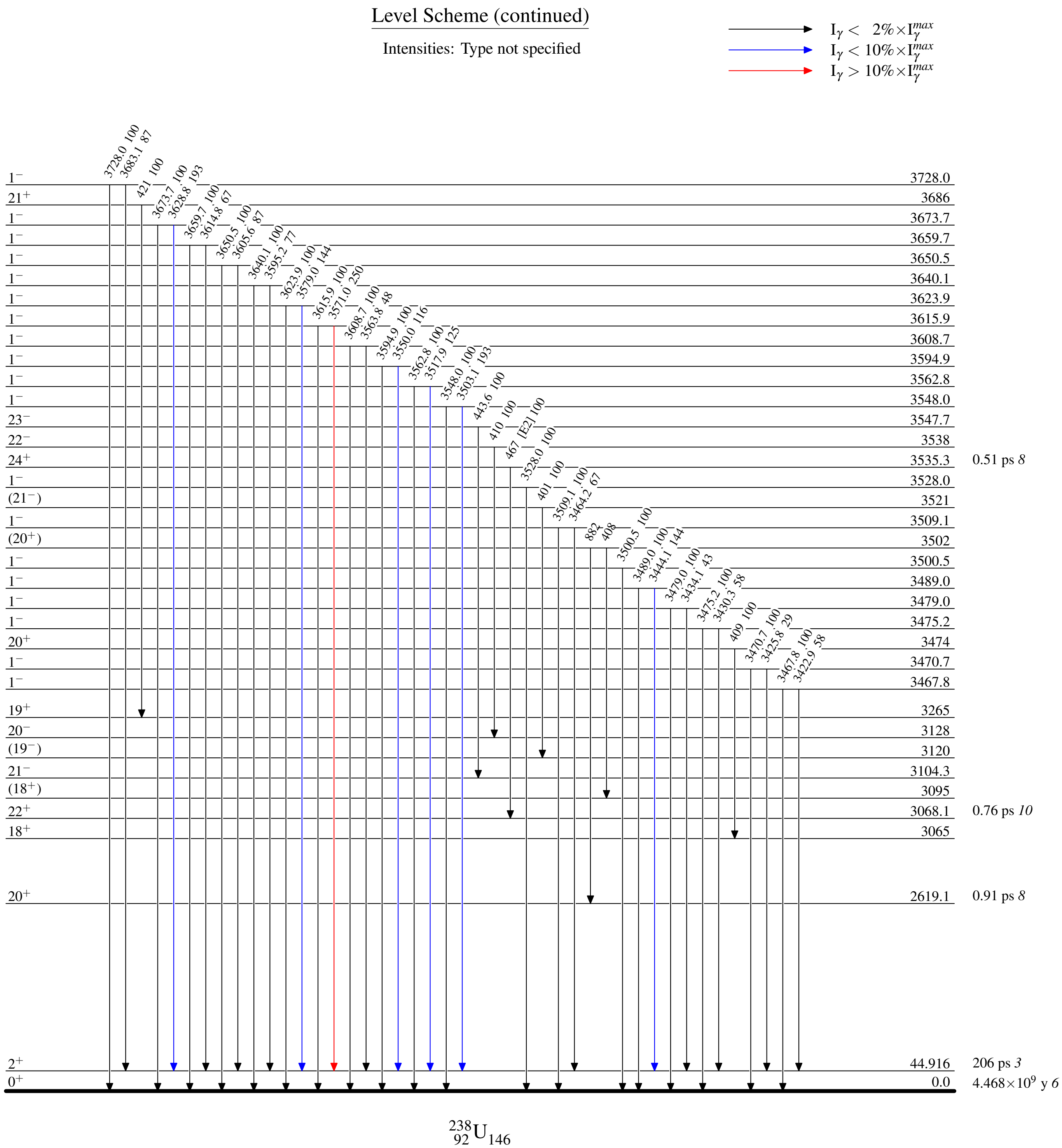
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified



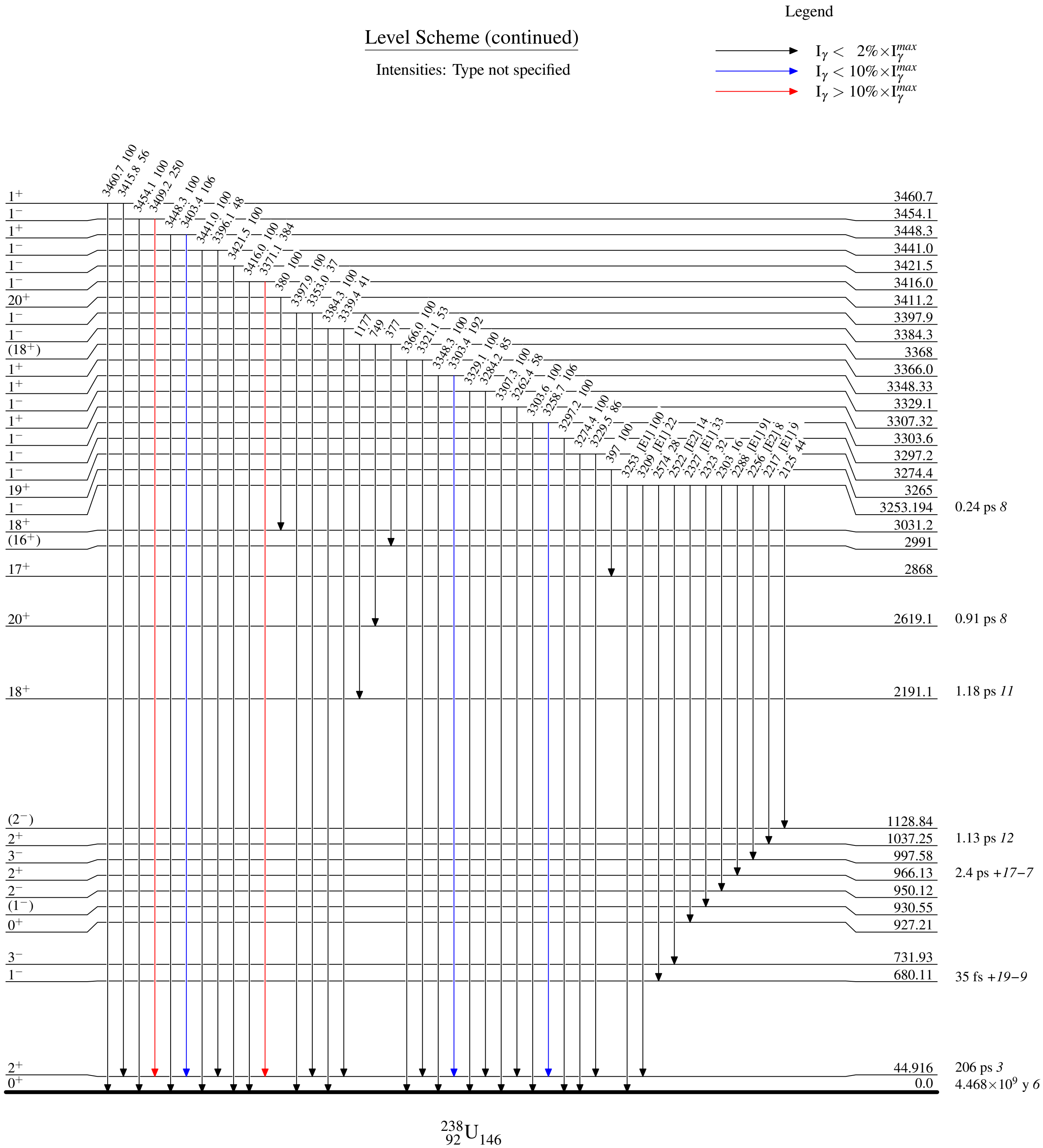
Adopted Levels, Gammas



Adopted Levels, Gammas

Level Scheme (continued)

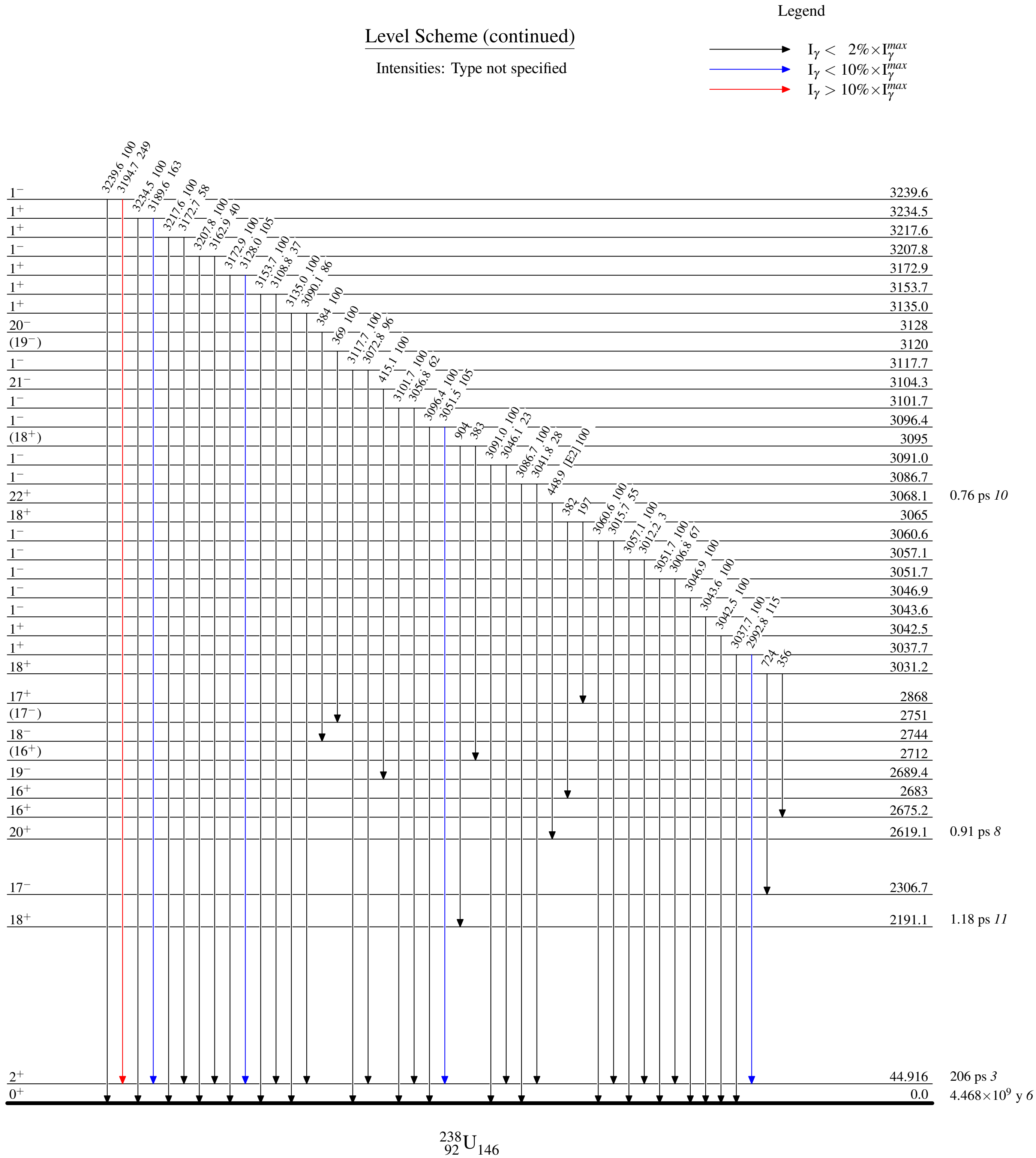
Intensities: Type not specified



Adopted Levels, Gammas

Level Scheme (continued)

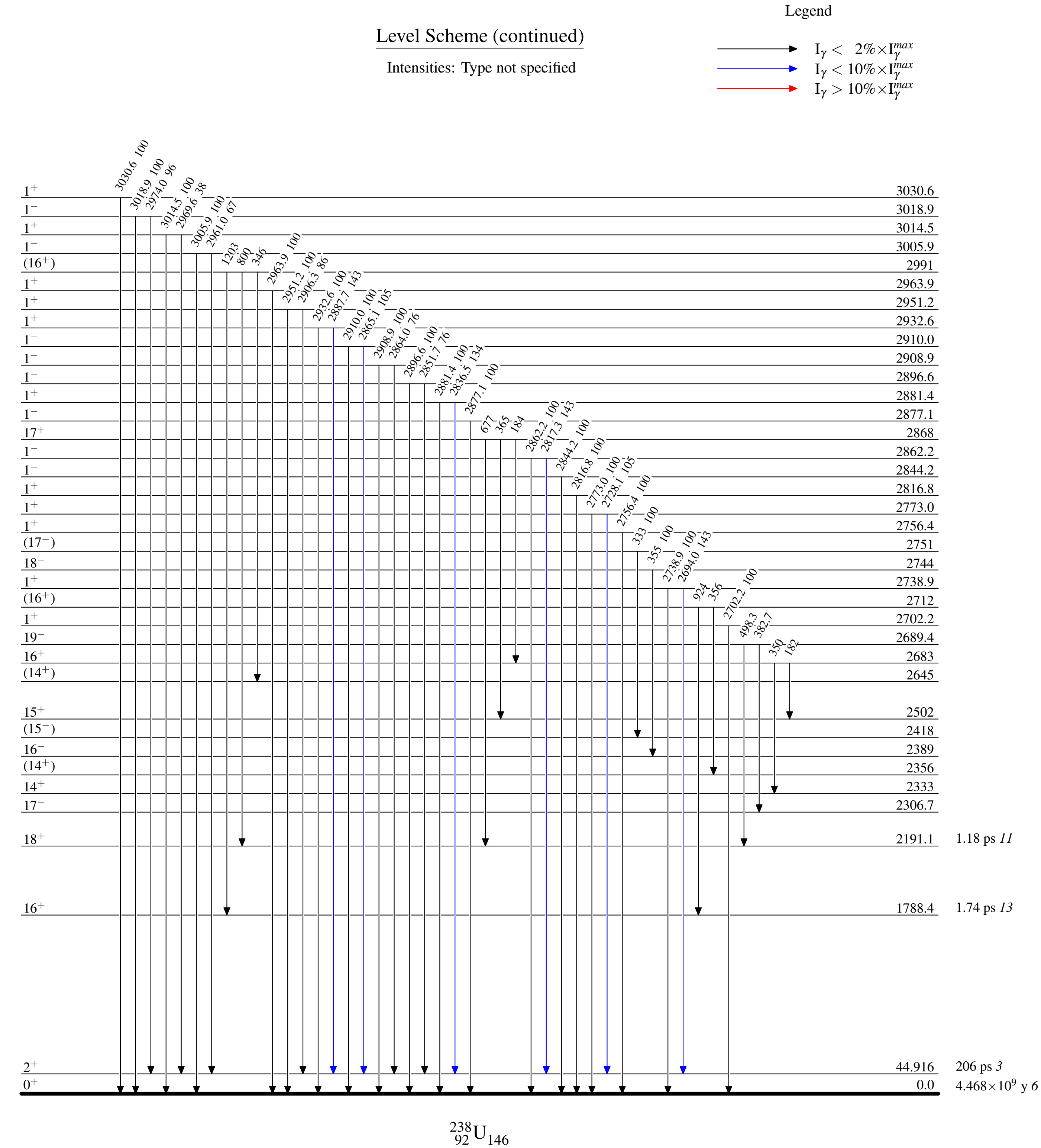
Intensities: Type not specified



Adopted Levels, Gammas

Level Scheme (continued)

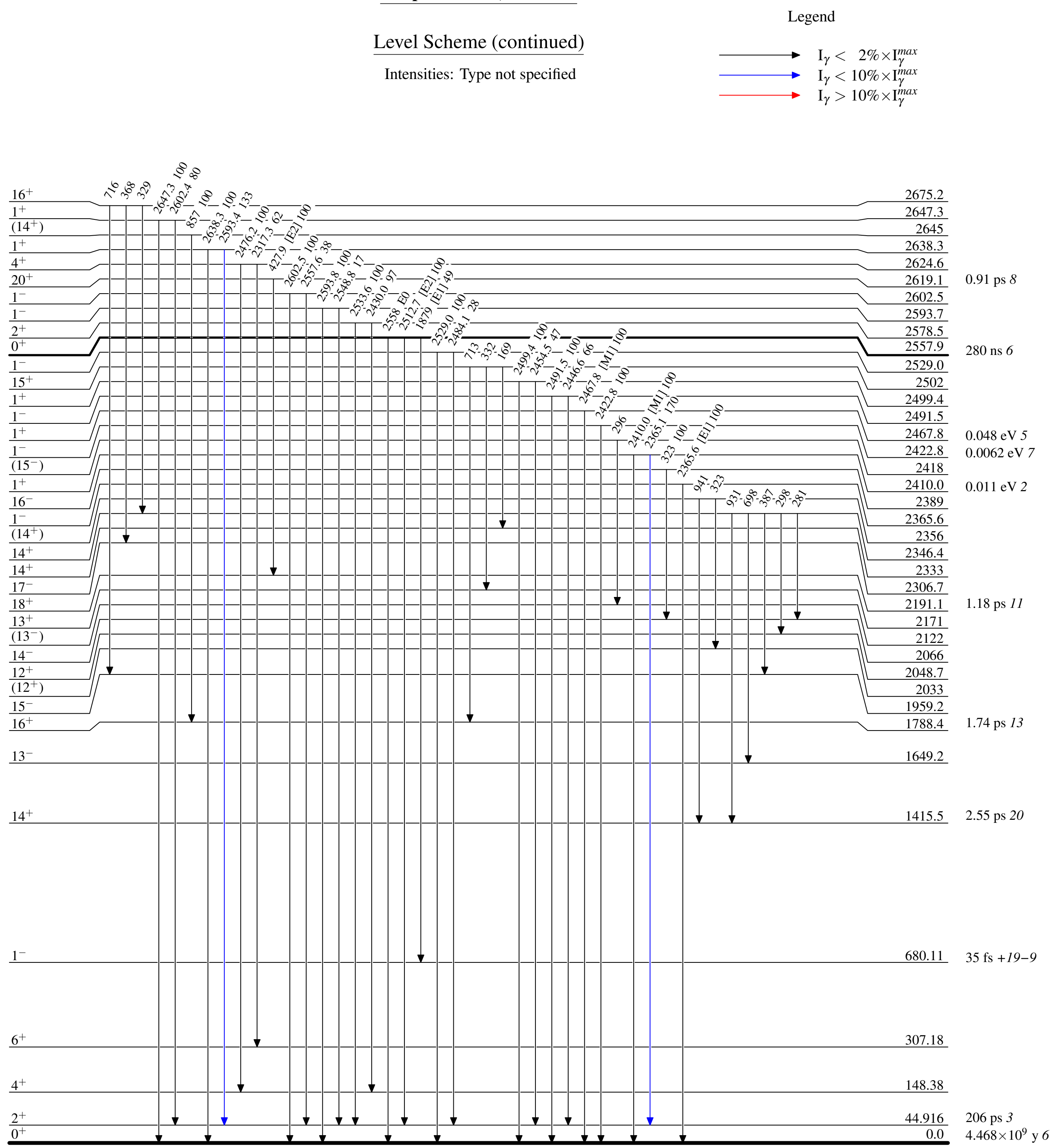
Intensities: Type not specified



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

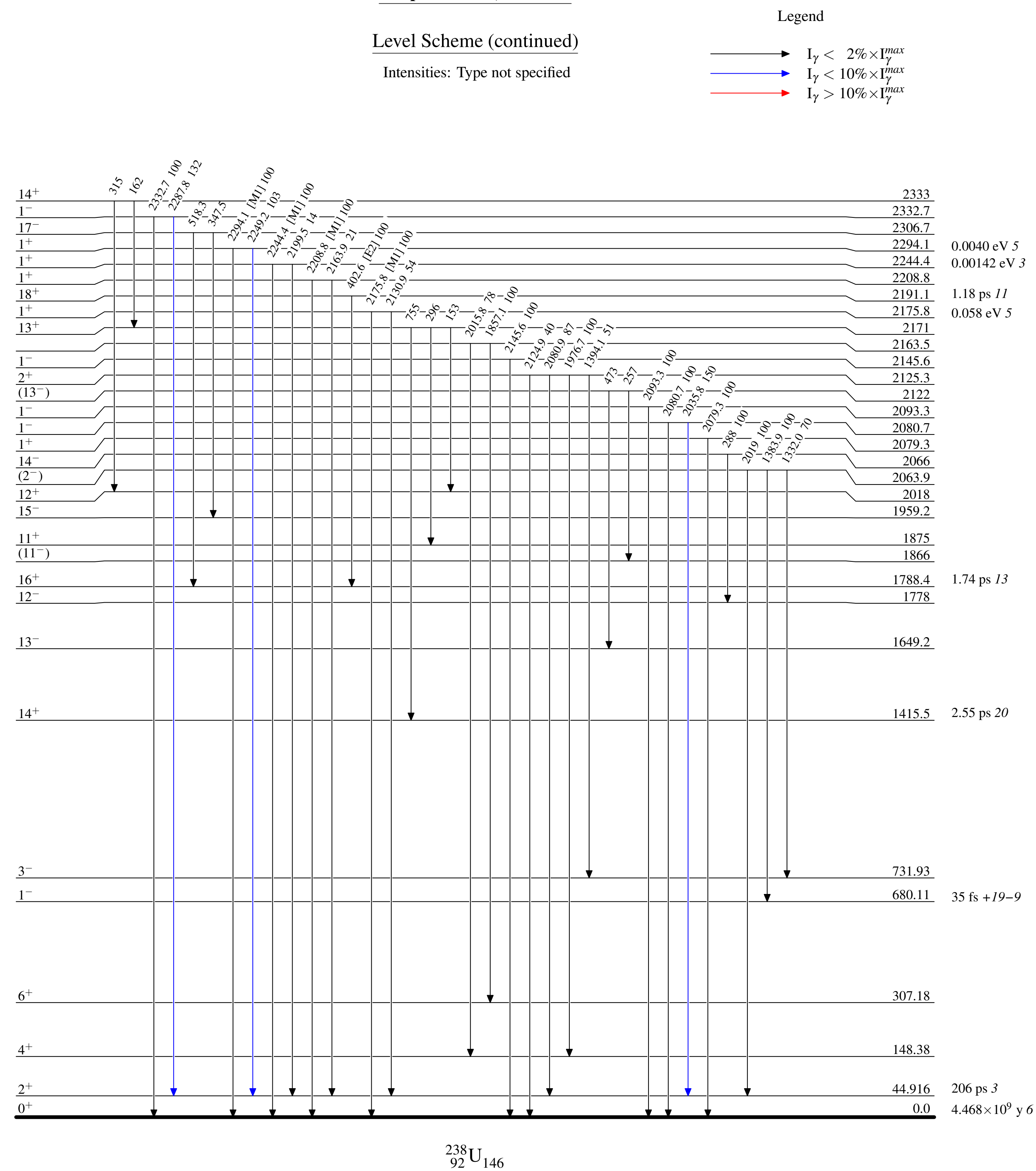


$^{238}_{92}U_{146}$

Adopted Levels, Gammas

Level Scheme (continued)

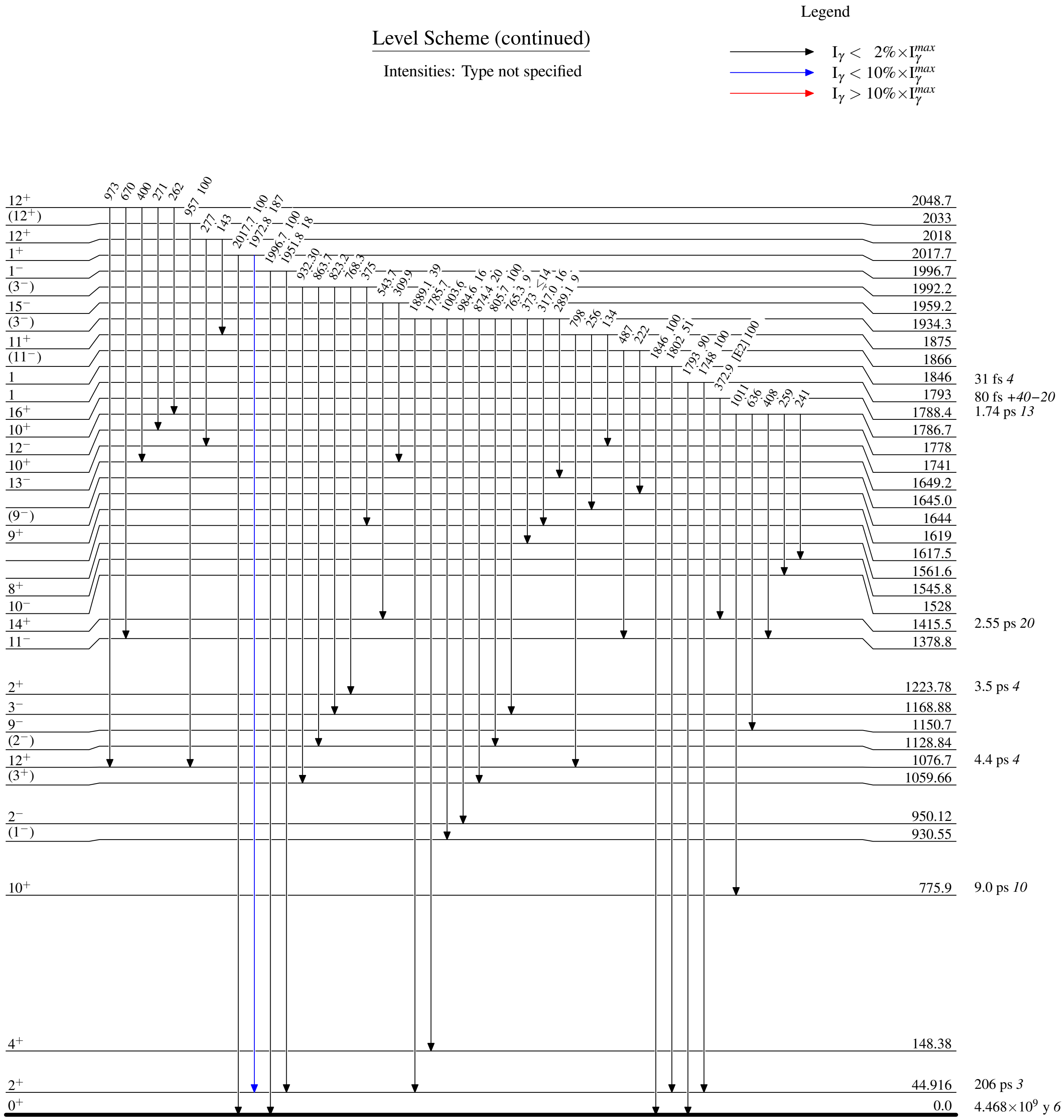
Intensities: Type not specified



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified



$^{238}_{92}U_{146}$

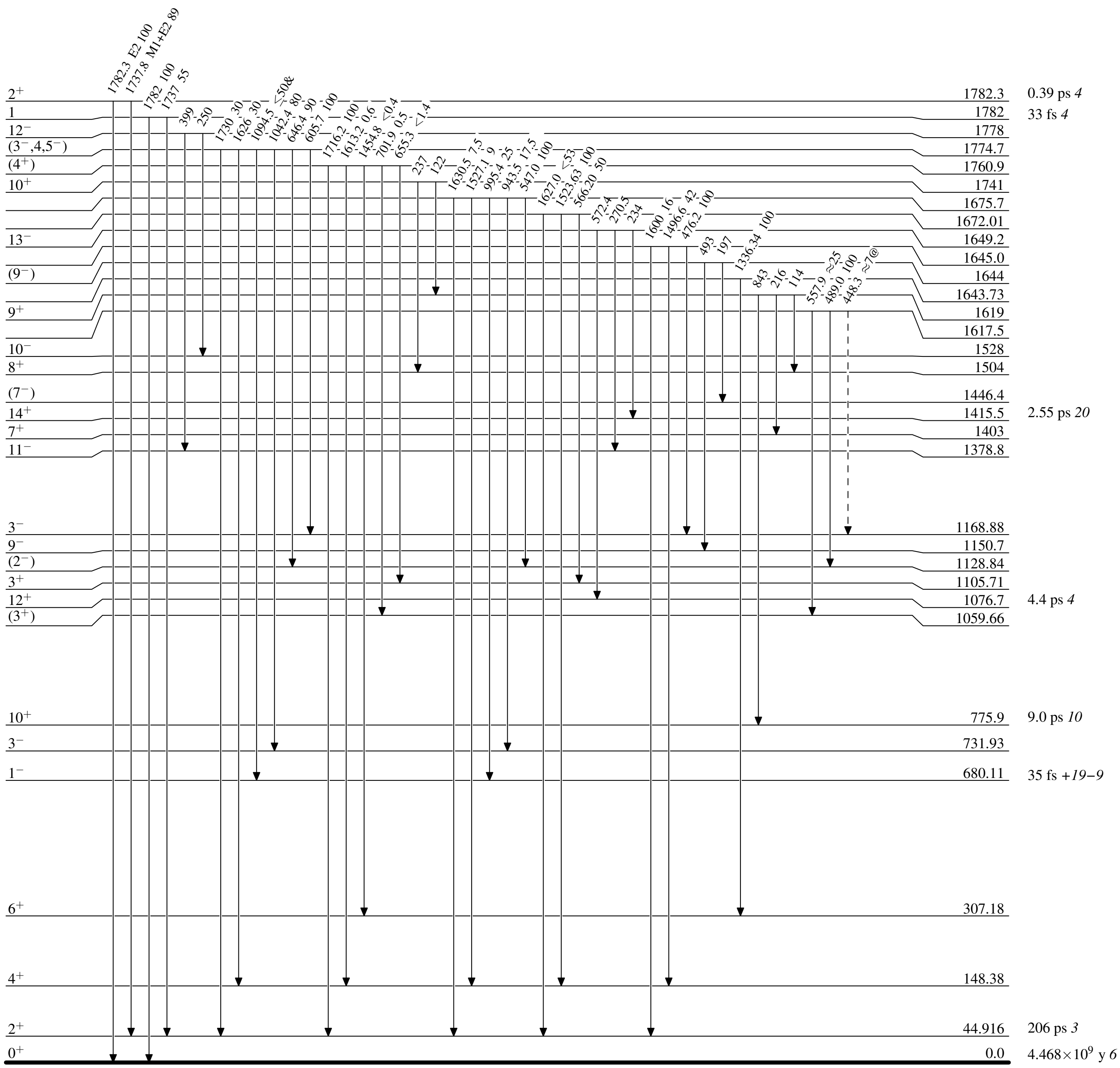
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

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)

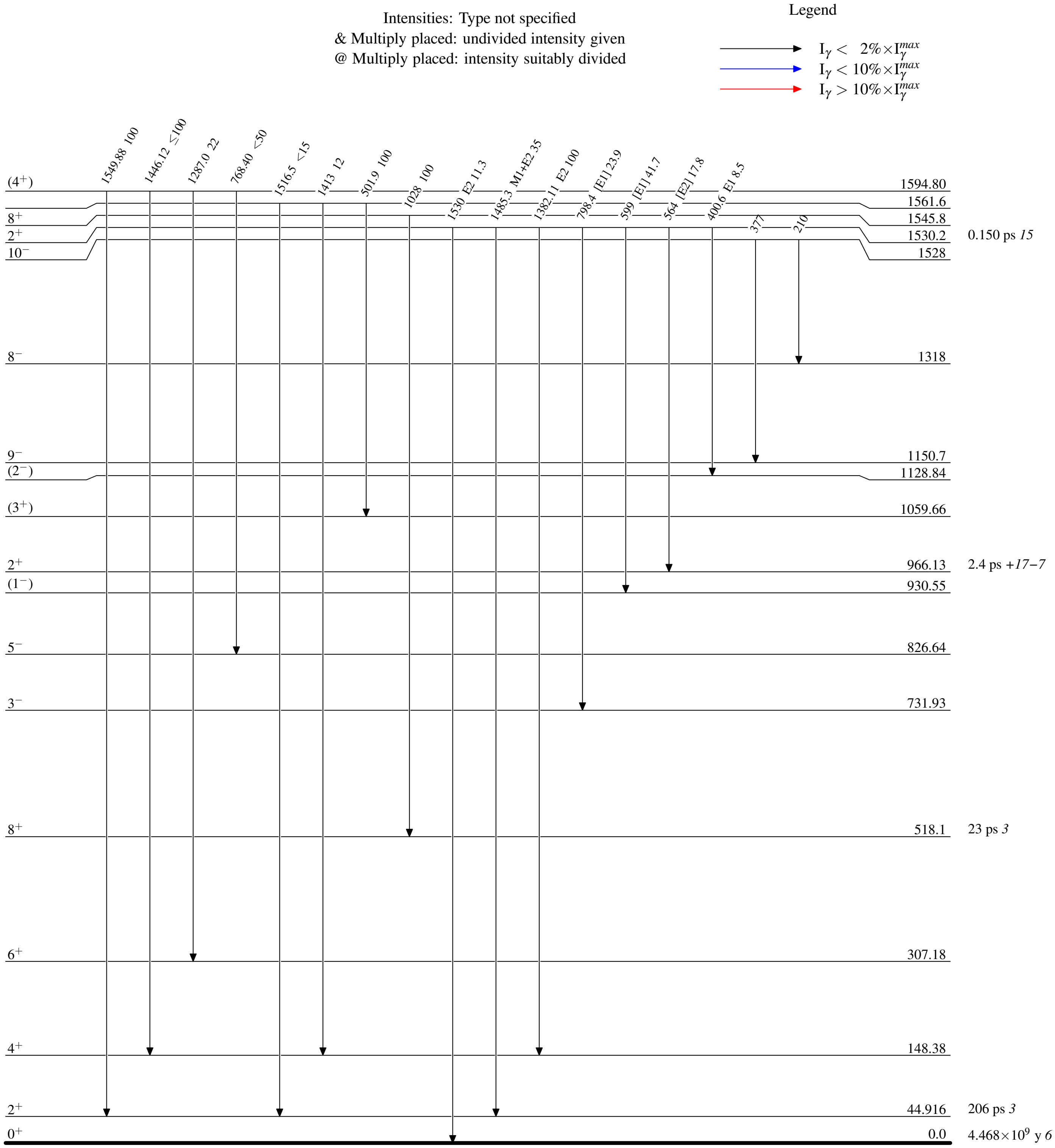


$^{238}_{92}U_{146}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

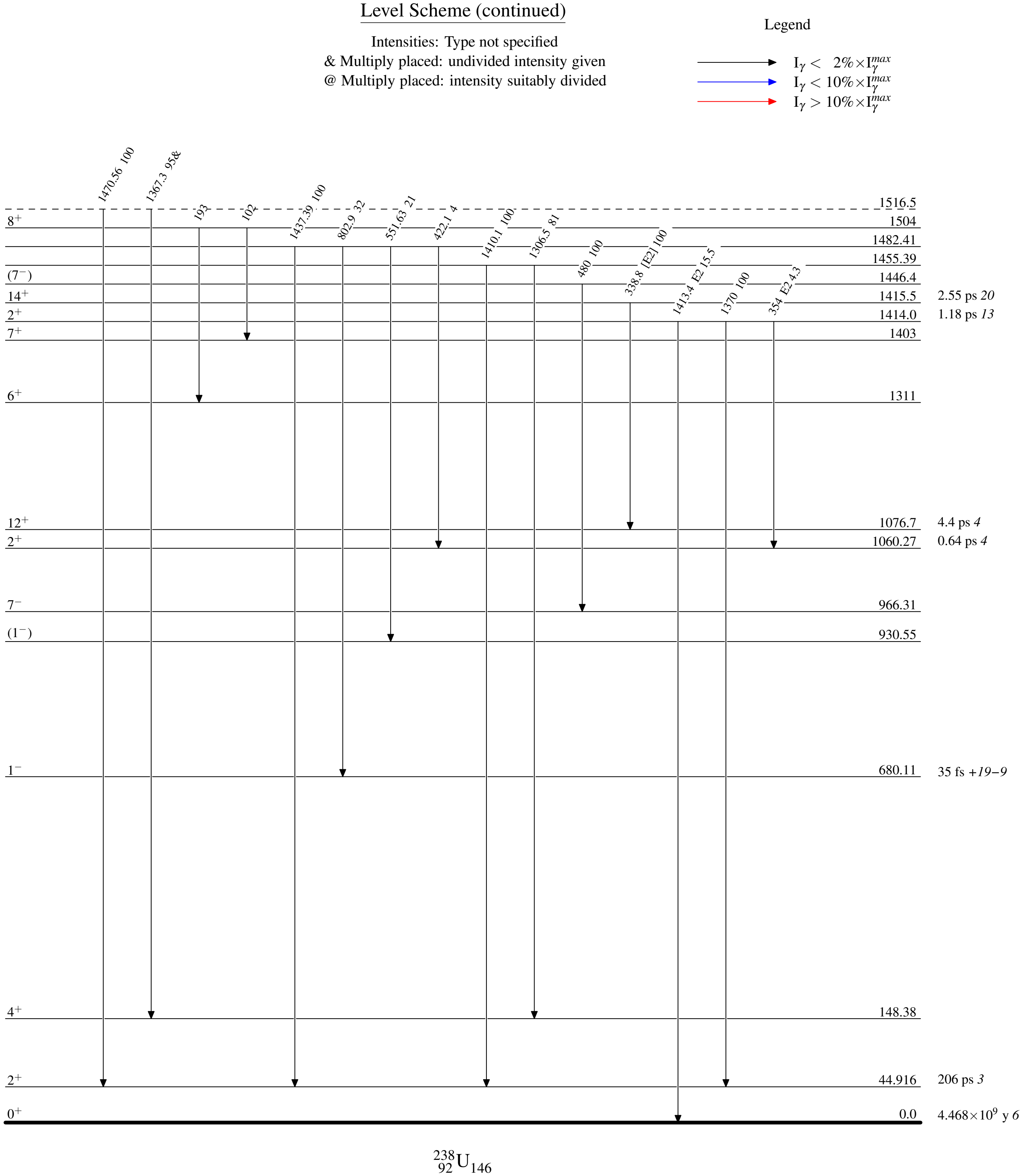


$^{238}_{92}U_{146}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

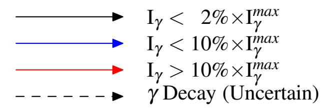


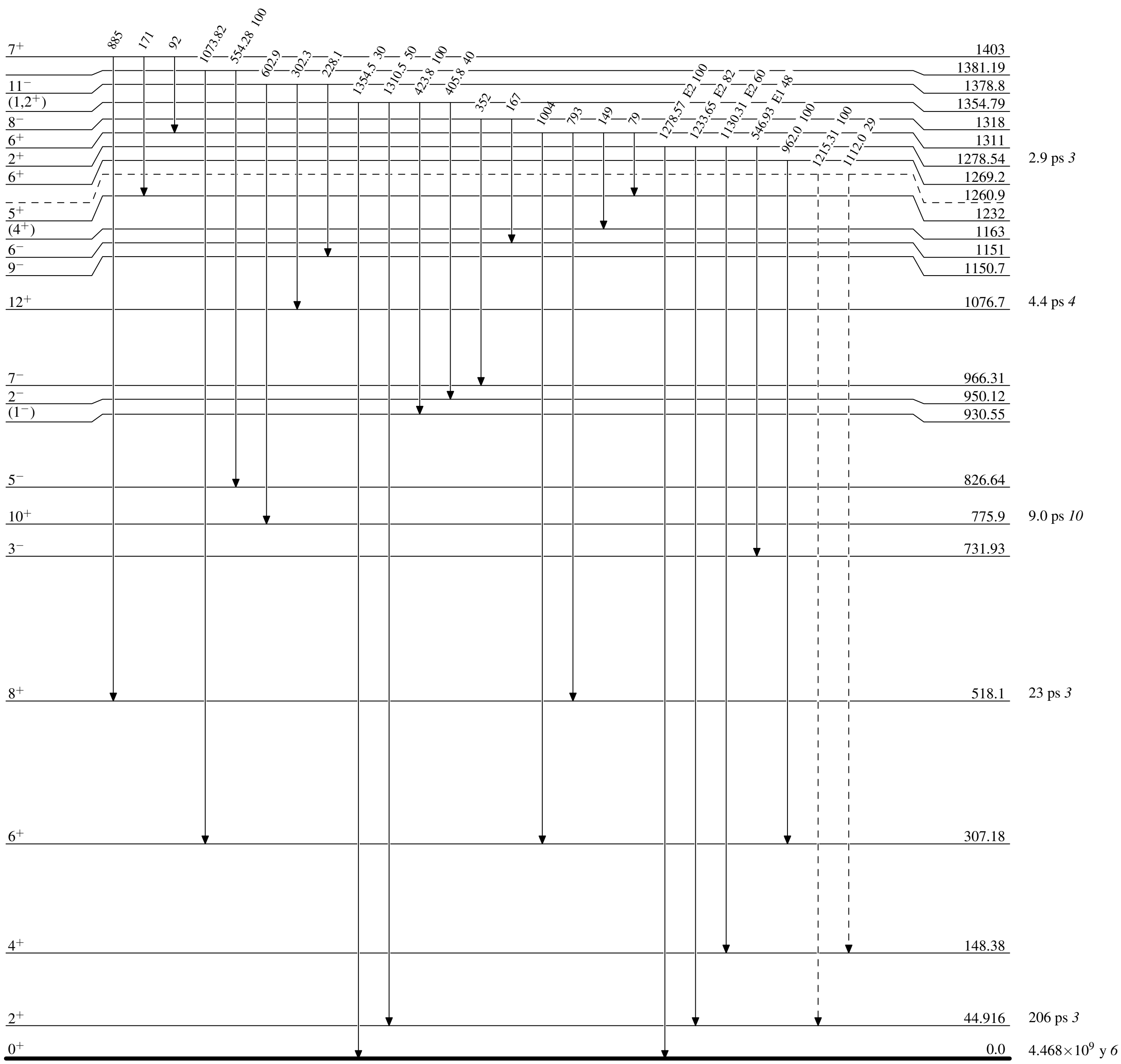
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend



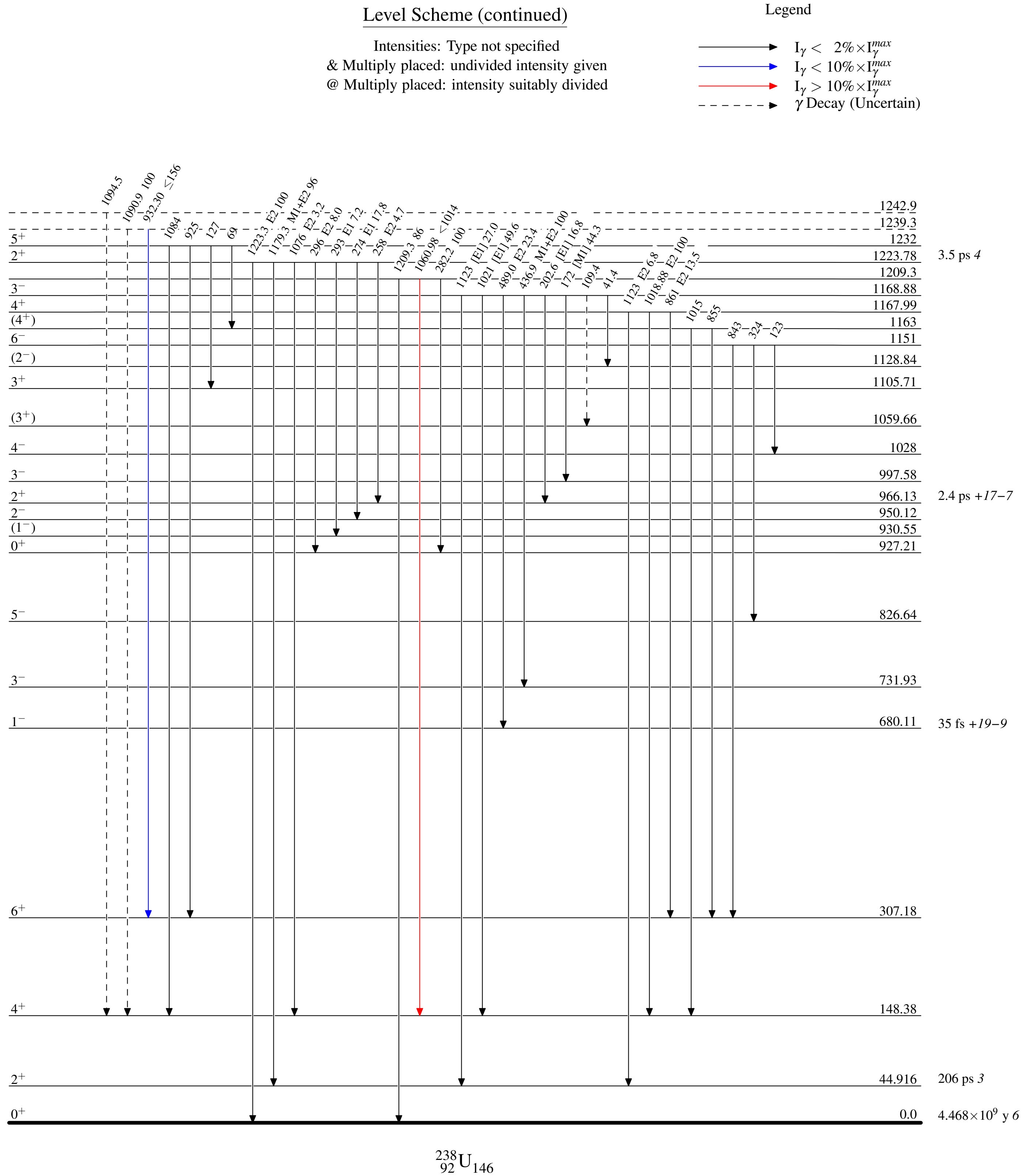


$^{238}_{92}U_{146}$

Adopted Levels, Gammas

Level Scheme (continued)

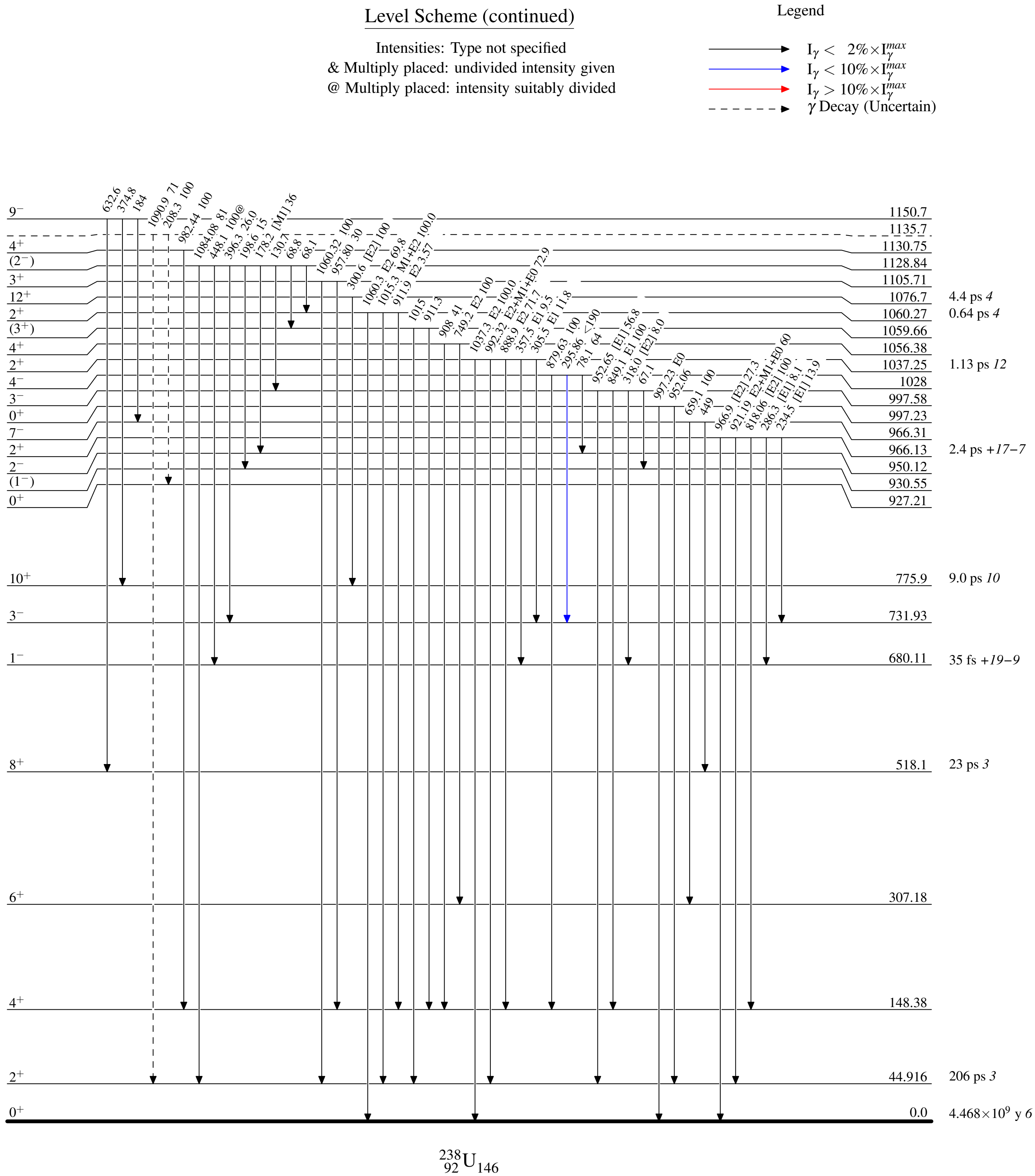
Intensities: Type not specified
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided



Adopted Levels, Gammas

Level Scheme (continued)

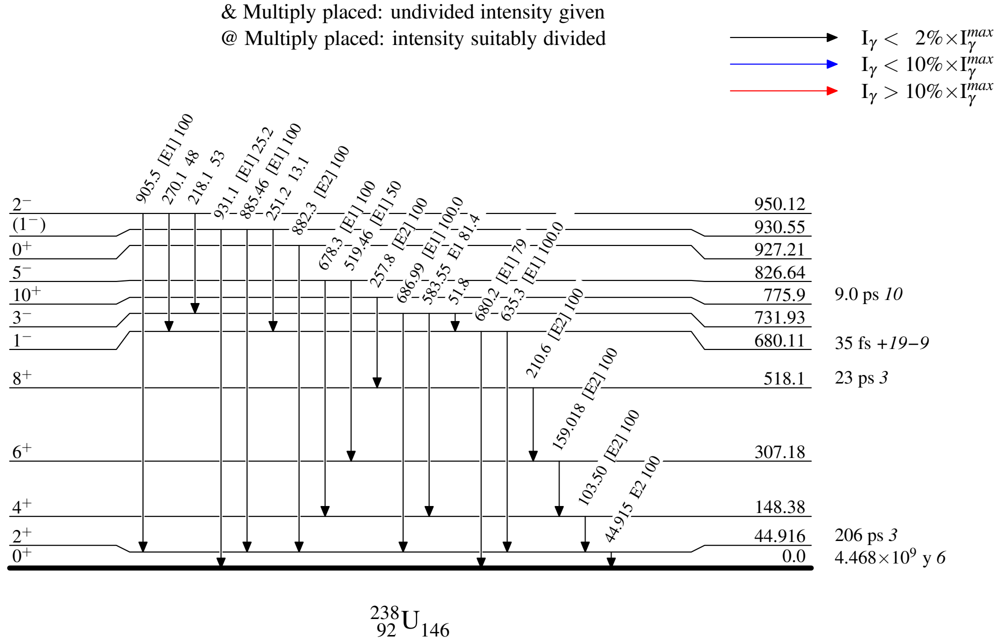
Intensities: Type not specified
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided



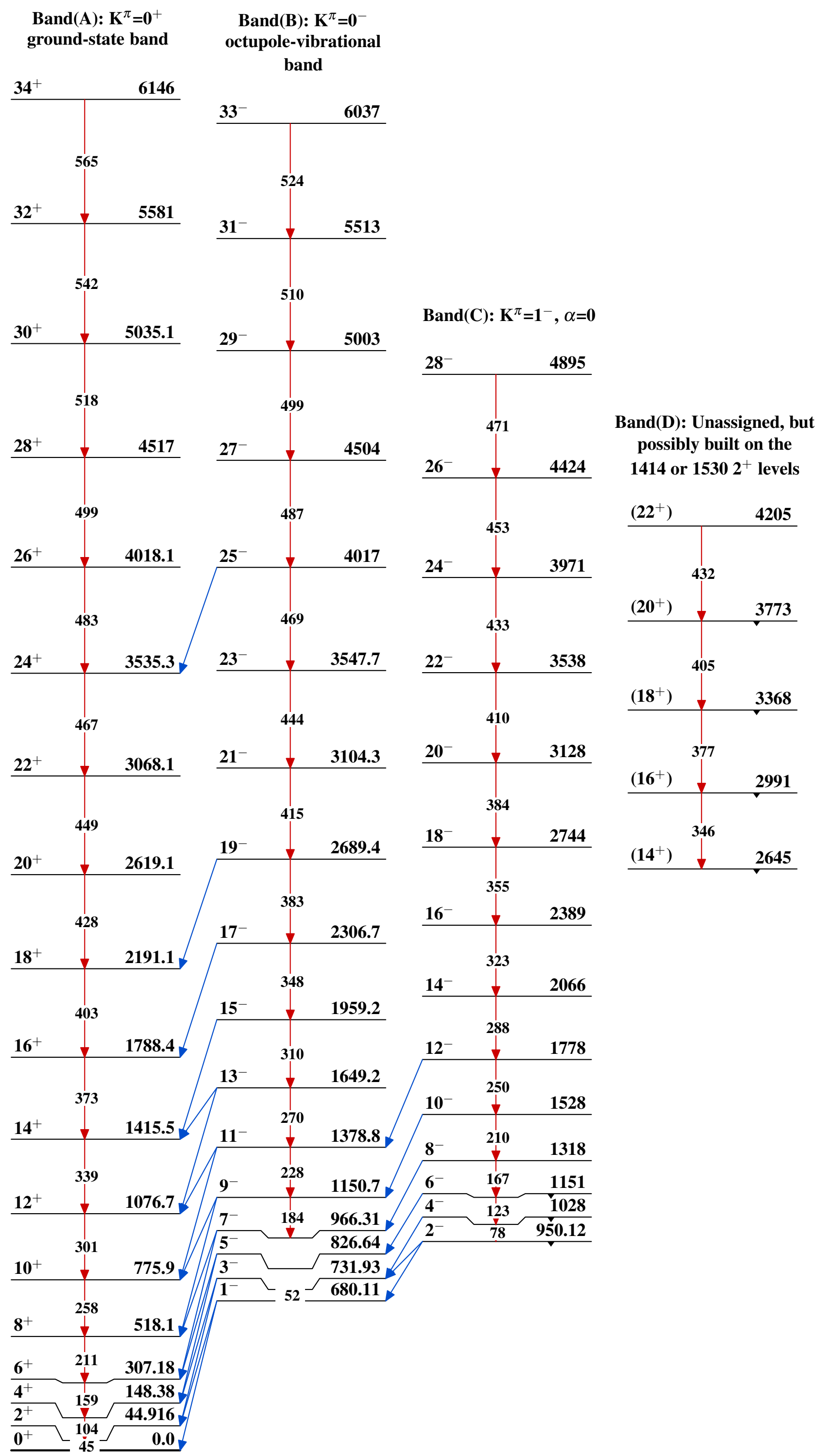
Adopted Levels, Gammas

Level Scheme (continued)

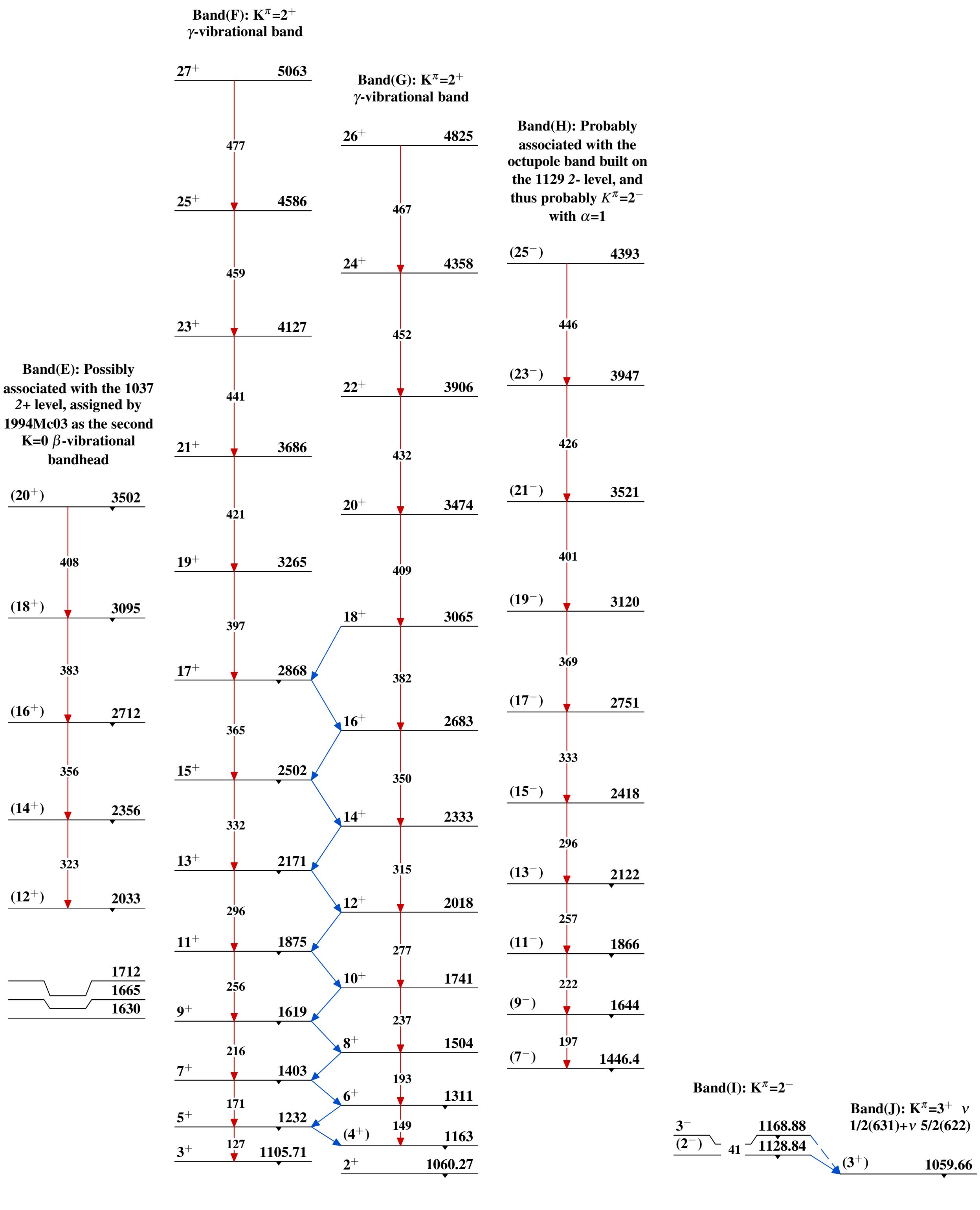
Intensities: Type not specified
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided



Adopted Levels, Gammas



Adopted Levels, Gammas (continued)



$^{238}_{92}U_{146}$

Adopted Levels, Gammas (continued)