Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	B. Singh, J. K. Tuli, E. Browne	NDS 170, 499 (2020)	8-Oct-2020

Q(β^-)=−1030 *50*; S(n)=5761.7 *25*; S(p)=6316 *8*; Q(α)=4908.7 *12* 2017Wa10
S(2n)=13029 *3*, S(2p)=11474.7 *21* (2017Wa10).
See ^{232}U(n,γ),(n,n):resonances dataset for 42 neutron resonances in the energy range of 5.98 eV to 213.2 eV, as given in 2018MuZZ evaluation.
1998Bu27: calculated magnetic dipole and electric quadrupole moments, levels, J^π, B(E2), B(M1) using Pb-Ne-n cluster model.
2001Ro18: calculated levels, J^π using Lipkin-Nogami pairing model.
Additional information 1.
Theoretical studies: consult the NSR database at www.nndc.bnl.gov for 44 references dealing with theoretical structure calculations, and 87 related to decay modes and half-lives.

^{233}U Levels

Cross Reference (XREF) Flags

A	^{233}Pa β^- decay (26.975 d)	E	^{232}Th(α,3nγ)	I	^{233}U(^{208}Pb,^{208}Pb′γ),
B	Muonic atom	F	^{232}U(n,γ),(n,n):resonances	J	^{234}U(pol d,t),(d,t)
C	^{233}Np ε decay (36.2 min)	G	^{233}U(d,d′)	K	^{234}U(^{3}He,α)
D	^{237}Pu α decay (45.43 d)	H	Coulomb excitation	L	^{235}U(p,t)

E(level)[†]	J^π[‡]	$T_{1/2}$	XREF	Comments
0.0[@]	5/2+	1.5919×10^5 y *15*	ABCDE GHIJ L	%α=100; %SF<6×10^{-11}; %^{24}Ne=7.2×10^{-11} *9* %^{28}Mg<1.3×10^{-13} (1991Pr02) μ=+0.59 *5* (1990Ga28,2019StZV) Q=+3.663 *8* (1984Zu02,2016St14) XREF: L(?). Evaluated rms charge radius: <r^2>$^{1/2}$=5.8203 fm *49* (2013An02). Evaluated change in radius δ<r^2>(^{233}U,^{238}U)=−0.435 fm *1* (2013An02). J^π: spin measured by optical and EPR methods (1954Va01,1955Ko36, 1956Ka53,1956Zi05,1957Do40); 5/2[633] orbital assignment is consistent with the experimental μ (see 1972El21). $T_{1/2}$: weighted average from 1.5925×10^5 y *40* (1976Va02), 1.5911×10^5 y *15* (1974Ja08), 1.5937×10^5 y *22* (1979Ge11), 1.5885×10^5 y *75* (1980Ag04). Other measurements: 1.560×10^5 y *3* (1968Oe02, corrected by 1974Ja08 for ^{232}U daughter activities), 1.553×10^5 y *10* (1968Ke15), 1.621×10^5 y *3* (1967Ih01), 1.615×10^5 y *9* (1961Po10), 1.626×10^5 y *8* (1959Do63), 1.62×10^5 y *1* (1949Hy02). T(SF)>2.7×10^{17} Y (1981Vo02), T(SF)=1.2×10^{17} Y *3* (1966Al23). T(α)/T(^{24}Ne) ≤ 9.5×10^{-13} (1986Ba65); T(α)/T(cluster)=7.5×10^{-13} *25* (1986Tr10); T(α)/T(^{24}Ne) ≤ 7×10^{-12} (1985Al28). T(α)/T(^{24}Ne)=7.2×10^{-13} *7* (1991Pr02), %^{28}Mg/%^{24}Ne<0.0018; track-recording glass detector. Measured δ<r^2>$^{1/2}$=−0.416 fm *26* (with respect to ^{238}U) (1992An17,1998El02), −0.432 fm *43* (1997Be64), 0.088 fm *10* (with respect to ^{234}U) (1990GaZI). δ<r^2>=2.598 fm^2 *11* (with respect to ^{236}U) (1990Ga28); δ<r^2>=0.383 fm^2 *44* (1990Ga28). Measured isotope shift $\delta\nu$(^{233}U,^{238}U)=−7730 MHz *7* for 5758 A optical

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{233}U Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
				line, −13174 MHz *3* for 5915 A optical line (1990Ga28). μ: from $\mu/\mu(^{235}U)=-1.5604$ *14* (ABLS method, 1990Ga28) and $\mu(^{235}U)=-0.38$ *3* (1983Ni08, 2019StZV). Note that μ is negative in 2019StZV evaluation. Others: 0.59 *5* (EPR method, 1983Lu10), 0.74 (1969Be29), 1968Ma42, 1960Ro27, 1958Da21, 0.54 (1957Do40), positive (1954Va01,1956Va27), 1956Ka53, 1955Ko36. Q: From muonic x rays (1984Zu02); sign from EPR method used in earlier studies. Others: $Q/Q(^{235}U)=0.746$ *2* (ABLS method,1990Ga28) gives Q=3.682 *10* using $Q(^{235}U)=4.936$ *6* from 1984Zu02, 7.9 (1969Be29), 1968Ma42, 1960Ro27, 1958Da21, 3.5 *7* (1957D040), positive (1956Va27), 1956Ka53, +13 *5* (1956Zi05), large (1954Va01).
40.351[&] *7*	7/2$^+$	0.11 ns *8*	ABCDE GHIJK	B(E2)↑=5.041 *16* (1984Zu02) Q=0.64 *3* (1984Zu02,2016St14) Jπ: 40.35γ to 5/2$^+$ is M1+E2; level is Coulomb excited. $T_{1/2}$: deduced from B(E2) in muonic x rays. Other: ≈0.12 ns from B(E2)=5 *3* in Coulomb excitation. B(E2)↑,Q: from muonic x rays (1984Zu02). In 2016St14, level half-life is quoted as 50 ps, and the sign of Q is listed as positive.
92.15[@] *4*	9/2$^+$		ABCDE GHIJK	Jπ: level is Coulomb excited; γ rays to 5/2$^+$ and 7/2$^+$ levels. The (d,d′), (d,t), (^{3}He,α), and (α,3nγ) reactions support the assignment. B(E2)(from g.s.)=1.76 *3* (Muonic atom). B(E2)(from 40.3,7/2$^+$)=3.97 *4* (Muonic atom).
155.23[&] *8*	11/2$^+$		B DE GHIJK	Jπ: level is Coulomb excited; γ transition to the 7/2$^+$ state. (d,d′), (d,t), (^{3}He,α), and (α,3nγ) data support the assignment.
174 *1*	1/2$^-$,3/2$^+$		J	
197 *4*			G	
229.46[@] *9*	(13/2$^+$)		E GHIJK	
298.815[a] *10*	(5/2$^-$)		A CD GH j	Jπ: γ rays to 5/2[633] g.s. band; (d,d′) data; possible bandhead.
301.94 *9*	(5/2$^-$)		A H j	Jπ: γ to 5/2$^+$; very weak β feeding from 3/2$^-$. possible 5/2[752] bandhead.
311.906[b] *6*	3/2$^+$	0.120 ns *15*	A C H JK	XREF: K(?). Jπ: E2 γ to 7/2$^+$; M1+E2 γ to 5/2$^+$; band assignment. $T_{1/2}$: βγ(t) in ^{233}Pa β^- decay.
314.59[&] *10*	(15/2$^+$)		E gHIjk	XREF: k(?).
320.77[a] *5*	7/2$^-$		A CD gH jkL	XREF: k(?). Jπ: L(p,t)=0 from 7/2$^-$ target; γ rays to 5/2$^+$ and 9/2$^+$. The α hindrance factor of ≈5.8 from 7/2$^-$ parent supports the assignment.
330.42 *14*	(7/2$^+$)		H	Jπ: possible 7/2[624] bandhead.
340.478[b] *6*	5/2$^+$	52 ps *10*	A C J	Jπ: M1+E2 γ rays to 5/2$^+$ and 7/2$^+$; log *ft*=7.0 from 3/2$^-$ ^{233}Pa parent. $T_{1/2}$: βγ(t) in ^{233}Pa β^- decay.
353.78[a] *12*	9/2$^-$		D GH L	Jπ: γ rays to g.s. band; L(p,t)=2 from 7/2$^-$ target; band member.
380.38[b] *8*	(7/2$^+$)		A J	Jπ: (d,t) data.
397.55[a] *21*	11/2$^-$		D GH jKL	Jπ: energy fit to the band; γ to the 9/2$^+$ state of g.s. band only; band member.
398.496[c] *8*	1/2$^+$	55 ps *20*	A j	Jπ: E2 γ to 5/2$^+$; M1+E2 γ to 3/2$^+$; ν1/2[631] bandhead. $T_{1/2}$: β(ce)(t) in ^{233}Pa β^- decay.
411.17[@] *11*	(17/2$^+$)		E HI	
415.761[c] *7*	3/2$^+$	≤30 ps	A J	Jπ: M1+E2 γ rays to 5/2$^+$ and 1/2$^+$; (d,t) data. $T_{1/2}$: β(ce)(t) in ^{233}Pa β^- decay.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{233}U Levels (continued)

E(level)[†]	J^π[‡]	S	XREF	Comments
425 *4*	$(17/2^+)$		G	
433.5[b] *5*	$(9/2^+)$		JK	J^π: from (^{3}He,α), (d,t) data.
455.96[c] *10*	$(5/2^+)$		A J	J^π: from (d,t) data.
495.5[c] *7*	$7/2^+$	14.1 *5*	J	E(level),J^π: from $\sigma(\theta)$ and $A_y(\theta)$, this state is consistent with $7/2^+$ and not $11/2^+$, thus it is not the $11/2^+$ member of 3/2[631] band.
503.62[d] *10*	$7/2^-$		D G L	J^π: L(p,t)=0 from $7/2^-$ target; α hindrance factor.
517.54[&] *13*	$(19/2^+)$		E GHI	
522[a] *2*	$(15/2^-)$		JK	J^π: from (d,t) and (^{3}He,α) data.
546.54[e] *18*	$(5/2^+)$		C J	XREF: J(?). J^π: γ transitions to the $7/2^+$, $7/2^-$, $3/2^+$ states suggest 5/2,$7/2^+$. Between the possible 5/2[622] and 7/2[624] Nilsson orbitals, 5/2[622] is preferred because of rather strong 234.3γ to the $3/2^+$, 3/2[631] state.
561.5[d] *20*	$(9/2^-)$		D G	XREF: D(?). J^π: (d,d′) data.
567 *2*	$^-$		L	J^π: L(p,t)=2 from $7/2^-$ target.
572.2[f] *3*	$(1/2^-)$		G J	XREF: G(575). J^π: from (d,t).
597.24[e] *22*	$(7/2^+)$		C	J^π: γ rays to $5/2^+$, $7/2^+$, $9/2^+$ levels suggest $5/2^+$, 7/2±. Ratios of reduced transition rates of γ rays to g.s. band are in fair agreement with theory for K=5/2, J=7/2.
609.6[f] *3*	$(5/2^-)$		J	J^π: from (pol d,t); $3/2^-$, $5/2^-$ states of 1/2[501] band were suggested by 1978Jo05 for the 610- and 620-keV levels from their (d,t) data. $7/2^+$ is less likely, but not completely ruled out.
619.2[f] *3*	$3/2^-$		J	J^π: From (pol d,t).
635.27[@] *23*	$(21/2^+)$		E HI	
646 *3*	$^-$		L	J^π: L(p,t)=4 from $7/2^-$ target.
658.8 *6*	$9/2^+,7/2^-$[#]		J	
700 *1*	$(1/2^+)$[#]		JK	XREF: K(?). J^π: $(9/2^-)$ is less likely, but not completely ruled out. If $(9/2^-)$, then it could be a member of 1/2[501] band.
718.2[f] *7*	$(7/2^-)$[#]		J	J^π: $(5/2^+)$ is less likely, but not completely ruled out.
749.1[g] *4*	$(5/2^-)$		G JK	J^π: assignment was made by 1976Th01 from (d,d′) data, and by 1978Jo05 from (d,t), (^{3}He,α) data.
761.64[&] *24*	$(23/2^+)$		E HI	
766 *3*			G	
774 *3*			J	
790[g] *2*	$(7/2^-)$		G	J^π: from (d,d′).
804.1 *9*			JK	
819 *2*	$7/2^-$		L	J^π: L(p,t)=0 from $7/2^-$ target.
838[g] *2*	$(9/2^-)$		G J	XREF: J(?). J^π: from (d,d′).
865.6 *3*	$3/2^-$[#]		JKL	
893.6 *3*	$5/2^-$[#]		JK	
899.4[@] *3*	$(25/2^+)$		E GHI	
914.3 *5*	$5/2^-$[#]		JK	
916[g] *1*	$(11/2^-)$		G	J^π: from (d,d′).
923 *2*	$(^-)$		L	J^π: L(p,t)=(2).
938.4 *3*	$5/2^+$[#]		G J	
952[h] *4*	$(9/2^-)$		G	J^π: from (d,d′).
963.8 *3*	$1/2^+$[#]		G JK	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{233}U Levels (continued)

E(level)[†]	Jπ[‡]	XREF	Comments
982 2	(−)	L	Jπ: L(p,t)=(2).
1001[h] 2	(11/2−)	G K	XREF: K(1007). Jπ: from (d,d′).
1001.8 3	5/2+[#]	J	
1017.0[l] 3	3/2−[#]	G J	3/2−, 3/2[501] state was tentatively assigned by 1978Jo05 from strong (d,t) population. Angular distribution was consistent with L=0 or L=1 momentum transfer.
1043.8[&] 3	(27/2+)	E HI	
1046 4		G	
1054.5[l] 3	5/2−[#]	JK	
1071[i] 3	(9/2+)	G	Jπ: from (d,d′).
1079? 4		J	
1090? 4		JK	
1104.7[l] 6	7/2−,5/2+[#]	J	
1114? 4		J	
1126 1	3/2−,5/2+[#]	J	
1150[i] 6	(11/2+)	G JK	XREF: J(?)K(?). Jπ: from (d,d′).
1167.8[l] 9	(9/2−)[#]	J	
1191.8 7	1/2+[#]	J	
1200.6[@] 5	(29/2+)	E HI	
1214.4 7	3/2−[#]	J	
1227? 4		G JK	XREF: J(?).
1233.9 7	5/2+[#]	J	
1262.1 6		JK	
1276? 4		J	
1286.0 6	−	G J	Jπ: L(d,d′)=3.
1301.2 8	3/2−[#]	J	
1311[j] 6	(5/2+)	G	Jπ: from (d,d′).
1347[j] 6	(7/2+)	G	Jπ: from (d,d′).
1361.7[&] 5	(31/2+)	E HI	
1366[k] 6	(7/2−)	G	Jπ: from (d,d′).
1369 1	3/2−[#]	J	
1420[k] 6	(9/2−)	G	Jπ: from (d,d′).
1476 1	3/2−[#]	J	
1482[k] 6	(11/2−)	G	Jπ: from (d,d′).
1493 2	3/2−[#]	J	
1520 2	[#]	J	
1536.8[@] 7	(33/2+)	E HI	XREF: I(1530.6).
1575 2	5/2−,3/2+[#]	J	
1599 2	3/2−[#]	J	
1635 2	3/2−[#]	J	
1651 2	3/2−[#]	J	
1663 1	3/2−,5/2+[#]	J	
1671 2	7/2+[#]	J	
1712.4[&] 12	(35/2+)	HI	
1824 3	7/2−	L	Jπ: L(p,t)=0 from 7/2− target.
1900 6		G	
1904.3[@] 13	(37/2+)	HI	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{233}U Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	XREF	Comments
1931 *6*		G	
2021 *4*		L	
2070 *3*	7/2$^-$	L	J$^{\pi}$: L(p,t)=0 from 7/2$^-$ target.
2094.1[&] *15*	(39/2$^+$)	HI	
2302.1[@] *16*	(41/2$^+$)	HI	
2503.9[&] *16*	(43/2$^+$)	I	
2725.3[@] *17*	(45/2$^+$)	I	
2940.4[&] *16*	(47/2$^+$)	I	
3174.0[@] *17*	(49/2$^+$)	I	

[†] From least-squares fit to Eγ data. For levels populated in particle-transfer reactions only, averages were taken of available data.

[‡] Assignments from (p,t) reaction were based on angular distributions; assignments from (d,d′) reaction were based on relative population of levels, deduced angular momentum transfer and energy fit to rotational bands. The assignments for high-spin states (J≥13/2) are based on population of yrast states in Coulomb excitation, (α,3nγ) and deep-inelastic scattering, and associated band structures.

[#] From (pol d,t).

[@] Band(A): g.s. band, ν5/2[633],α=+1/2. Main configuration is a mixture of ν5/2[633] and ν5/2[622] orbitals; ν1/2[651] starts contributing at 15/2$^+$, becoming the dominant configuration above 25/2$^+$ (1990StZZ).

[&] Band(a): ν5/2[633],α=−1/2 band. For configuration, see comment for α=+1/2 signature partner.

[a] Band(B): ν5/2[752] band. This band is strongly Coriolis coupled with the 7/2[743] band.

[b] Band(C): ν3/2[631] band. A=5.7.

[c] Band(D): ν1/2[631] band.

[d] Band(E): ν7/2[743] band. A=6.8; Coriolis coupled with the 5/2[752] band.

[e] Band(F): Possible ν5/2[622] band. A=7.2.

[f] Band(G): ν1/2[501] band.

[g] Band(H): ν5/2[633]⊗(K^{π}=0$^-$ octupole vibration). A significant admixture of 5/2[503] band was deduced by 1978Jo05 from large (d,t) and (^{3}He,α) cross sections. A=6.0.

[h] Band(I): K^{π}=9/2$^-$, octupole-vibrational band. The assignment was suggested by 1978St11 from (d,d′) data.

[i] Band(J): K^{π}=9/2$^+$, γ-vibrational band. The assignment was proposed by 1978St11 from (d,d′) data.

[j] Band(K): K^{π}=5/2$^+$, β-vibrational band. The assignment was proposed by 1978St11 from (d,d′) data.

[k] Band(L): K^{π}=7/2$^-$, octupole-vibrational band. The assignment was proposed by 1978St11 from (d,d′) data.

[l] Band(M): ν3/2[501] band. A=7.34 keV.

γ(^{233}U)

E$_i$(level)	J^π_i	E$_\gamma$[†]	I$_\gamma$[†]	E$_f$	J^π_f	Mult.[‡]	δ[‡]	α[a]	Comments
40.351	7/2$^+$	40.351 *10*	100	0.0	5/2$^+$	M1+E2	0.93 *11*	5.1×10^2 *6*	B(M1)(W.u.)=0.0032 +*85*−*13*; B(E2)(W.u.)=5×10^2 +*13*−*2*
92.15	9/2$^+$	51.5 *5*	≈21	40.351	7/2$^+$	[M1+E2]		1.7×10^2 *15*	I$_\gamma$: From 1958Ne03 in Coul. Ex.
		92.1 *5*	100	0.0	5/2$^+$	[E2]		19.6 *6*	
155.23	11/2$^+$	63.4[@] *2*		92.15	9/2$^+$				
		114.92 *10*		40.351	7/2$^+$				
229.46	(13/2$^+$)	74.5[@] *2*	23 *9*	155.23	11/2$^+$				
		137.2 *1*	100 *9*	92.15	9/2$^+$	(E2)[#]		3.34	
298.815	(5/2$^-$)	258.45 *3*	22.3 *17*	40.351	7/2$^+$				I$_\gamma$: from ^{237}Pu α decay.
		298.81 *2*	100.0 *25*	0.0	5/2$^+$				I$_\gamma$: from ^{237}Pu α decay.
301.94	(5/2$^-$)	261.4[@] *2*	100	40.351	7/2$^+$				
		301.99 *10*	67	0.0	5/2$^+$				
311.906	3/2$^+$	271.556 *10*	0.84 *1*	40.351	7/2$^+$	E2		0.258	B(E2)(W.u.)=0.174 *23*
		311.901 *11*	100.0 *10*	0.0	5/2$^+$	M1+E2	−0.10 *1*	0.80[&] *3*	B(M1)(W.u.)=0.0033 *5*; B(E2)(W.u.)=0.103 *25*
314.59	(15/2$^+$)	85.1[@] *1*	27 *10*	229.46	(13/2$^+$)				
		159.4 *1*	100 *8*	155.23	11/2$^+$	(E2)[#]		1.80	
320.77	7/2$^-$	228.57 *5*	31 *5*	92.15	9/2$^+$				
		280.58 *8*	100 *12*	40.351	7/2$^+$				
		320.73 *10*	37.7 *23*	0.0	5/2$^+$				
330.42	(7/2$^+$)	238.0[@] *2*	45 *15*	92.15	9/2$^+$				
		290.4[@] *2*	100 *30*	40.351	7/2$^+$				
		330.0[@] *5*	30 *15*	0.0	5/2$^+$				
340.478	5/2$^+$	28.562 *11*	1.12 *6*	311.906	3/2$^+$	M1+E2	0.16 *2*	3.2×10^2 *4*	B(M1)(W.u.)=0.030 *9*; B(E2)(W.u.)=2.9×10^2 *11*
		41.660 *10*	0.20 *2*	298.815	(5/2$^-$)	[E1]		1.254	B(E1)(W.u.)=1.4×10^{-5} *4*
		248.37 *4*	0.92 *2*	92.15	9/2$^+$	[E2]		0.346	B(E2)(W.u.)=0.19 *4*
		300.128 *10*	100.0 *10*	40.351	7/2$^+$	M1+E2	−0.08 *2*	0.87[&] *3*	B(M1)(W.u.)=0.0024 *5*; B(E2)(W.u.)=0.05 *3*
		340.477 *10*	67.9 *7*	0.0	5/2$^+$	M1+E2	−0.23 *5*	0.62[&] *3*	B(M1)(W.u.)=0.00105 *22*; B(E2)(W.u.)=0.14 *7*
353.78	9/2$^-$	198.61 *20*	26 *4*	155.23	11/2$^+$				
		261.66 *20*	65 *4*	92.15	9/2$^+$				
		313.34 *20*	100 *6*	40.351	7/2$^+$				
380.38	(7/2$^+$)	288.33 *10*	100 *10*	92.15	9/2$^+$				
		380.28 *10*	19 *5*	0.0	5/2$^+$				
397.55	11/2$^-$	305.4 *2*	100	92.15	9/2$^+$				
398.496	1/2$^+$	57.9[c]	≈0.046	340.478	5/2$^+$	[E2]		178 *4*	B(E2)(W.u.)≈9
		86.591 *10*	100.0 *34*	311.906	3/2$^+$	M1(+E2)	<0.09	7.09 *13*	B(M1)(W.u.)=0.043 +*25*−*11*; B(E2)(W.u.)<13
		398.494 *10*	67.5 *12*	0.0	5/2$^+$	E2		0.0835	B(E2)(W.u.)=0.9 *4*
411.17	(17/2$^+$)	96.49[@] *15*	35 *10*	314.59	(15/2$^+$)				
		181.7 *1*	100 *12*	229.46	(13/2$^+$)	(E2)[#]		1.08	
415.761	3/2$^+$	17.26 *4*	0.55 *22*	398.496	1/2$^+$	M1+E2	0.13 *2*	5.0×10^2 *10*	B(M1)(W.u.)>0.038; B(E2)(W.u.)>4.6×10^2

Adopted Levels, Gammas (continued)

$\gamma(^{233}U)$ (continued)

E_i(level)	J^{π}_i	E_γ[†]	I_γ[†]	E_f	J^{π}_f	Mult.[‡]	δ[‡]	α[a]	Comments
415.761	3/2+	75.274 10	74.1 13	340.478	5/2+	M1+E2	+0.15 8	11.4 12	B(M1)(W.u.)>0.069
		103.860 10	48.9 5	311.906	3/2+	M1(+E2)	0.1 1	4.21 21	B(M1)(W.u.)>0.019
		375.407 10	39.1 4	40.351	7/2+	E2		0.098	B(E2)(W.u.)>0.72
		415.767[b] 10	100.0 11	0.0	5/2+	M1+E2	2.5 1	0.121 4	B(M1)(W.u.)>8×10^{-5}; B(E2)(W.u.)>0.94
455.96	(5/2+)	415.767[bc]		40.351	7/2+				
		455.96 10	100	0.0	5/2+				
503.62	7/2−	181.8[c] 10	≈12	320.77	7/2−				
		205.05 20	46 12	298.815	(5/2−)				
		411.1 2	25 8	92.15	9/2+				
		463.1 2	49 15	40.351	7/2+				
		503.9 2	100 19	0.0	5/2+				
517.54	(19/2+)	106.27[@] 15	8 4	411.17	(17/2+)				
		203.0 1	100 11	314.59	(15/2+)	(E2)[#]		0.707	
546.54	(5/2+)	226.0 5	12.7 10	320.77	7/2−				
		234.3 3	55 3	311.906	3/2+				
		247.6 4	14.3 18	298.815	(5/2−)				
		506.5 5	55 8	40.351	7/2+				
		546.9 4	100 5	0.0	5/2+				
561.5	(9/2−)	241[c] 2	≈63	320.77	7/2−				
		521.1[c] 20	100	40.351	7/2+				
597.24	(7/2+)	256.0 5	100 7	340.478	5/2+				
		504.8 5	98 15	92.15	9/2+				
		557.1 4	67 7	40.351	7/2+				
		597.7 4	63 5	0.0	5/2+				
635.27	(21/2+)	224.1 2		411.17	(17/2+)	(E2)[#]		0.495	
761.64	(23/2+)	244.1 2		517.54	(19/2+)	(E2)[#]		0.367	
899.4	(25/2+)	264.1 2		635.27	(21/2+)				
1043.8	(27/2+)	282.2 2		761.64	(23/2+)				
1200.6	(29/2+)	301.2 4		899.4	(25/2+)				
1361.7	(31/2+)	317.9 4		1043.8	(27/2+)				
1536.8	(33/2+)	336.2 5		1200.6	(29/2+)				
1712.4	(35/2+)	350.7		1361.7	(31/2+)				
1904.3	(37/2+)	367.5		1536.8	(33/2+)				
2094.1	(39/2+)	381.7		1712.4	(35/2+)				
2302.1	(41/2+)	397.8		1904.3	(37/2+)				
2503.9	(43/2+)	409.8 4		2094.1	(39/2+)				
2725.3	(45/2+)	423.2 4		2302.1	(41/2+)				
2940.4	(47/2+)	436.5 4		2503.9	(43/2+)				
3174.0	(49/2+)	448.7 4		2725.3	(45/2+)				

$\gamma(^{233}U)$ (continued)

† From ^{233}Pa β^- decay, ^{233}Np ε decay and ^{237}Pu α decay for gamma rays from low-spin (J≤11/2), and from (α,3nγ, Coulomb excitation, and (^{208}Pb,^{208}Pb′γ) for gamma rays from levels of higher (J>11/2) spins. Weighted averages taken when gamma ray data for a level are available from different datasets.

‡ From ce data in ^{233}Pa β^- decay, unless otherwise stated.

Tentative assignment from (α,3nγ).

@ From Coul. ex.

& From ^{233}U β^- decay, where measured conversion coefficients are from 1989Br24, who found this transition to have penetration effects.

[a] 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.

[b] Multiply placed.

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

$^{233}_{92}U_{141}$-8

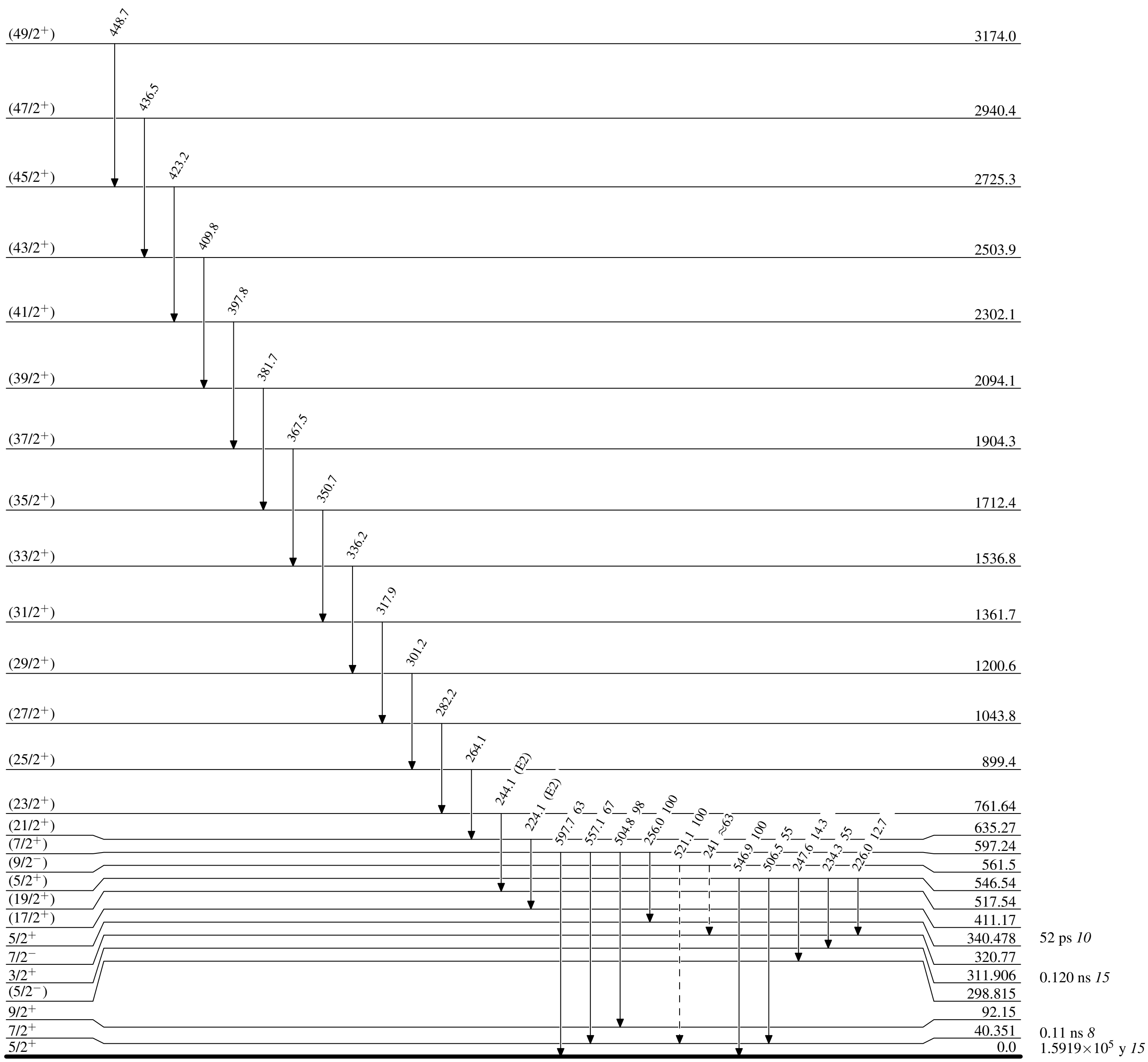
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)

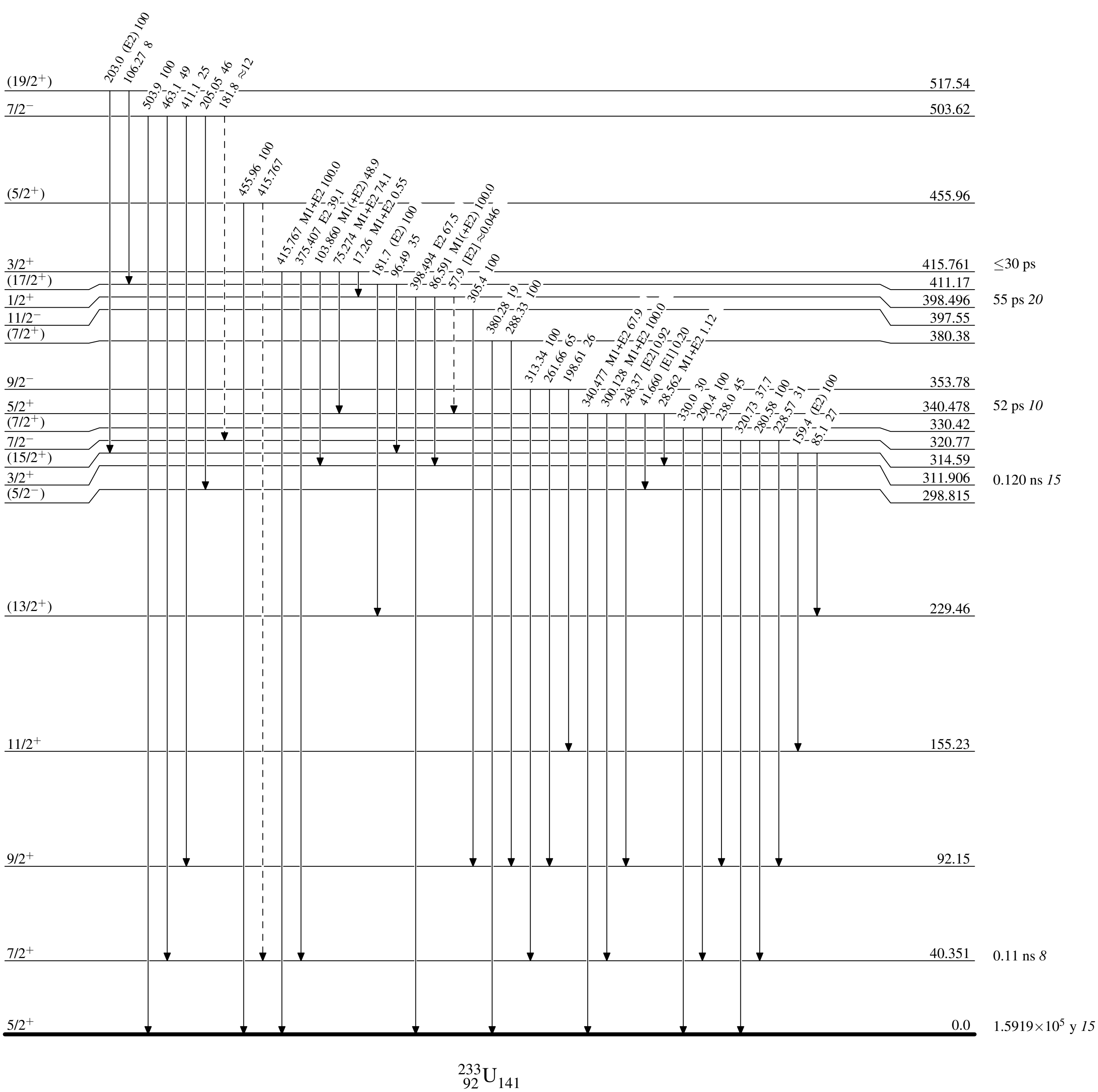


$^{233}_{92}U_{141}$

Adopted Levels, Gammas

Level Scheme (continued)

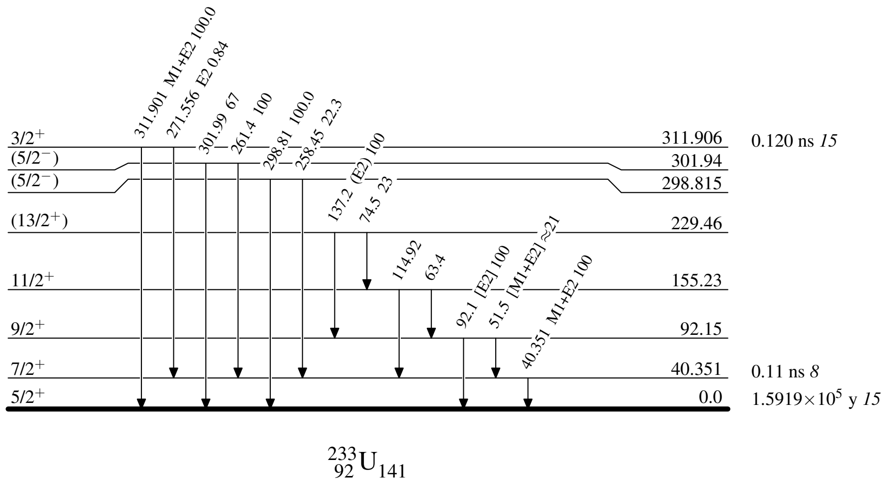
Intensities: Relative photon branching from each level



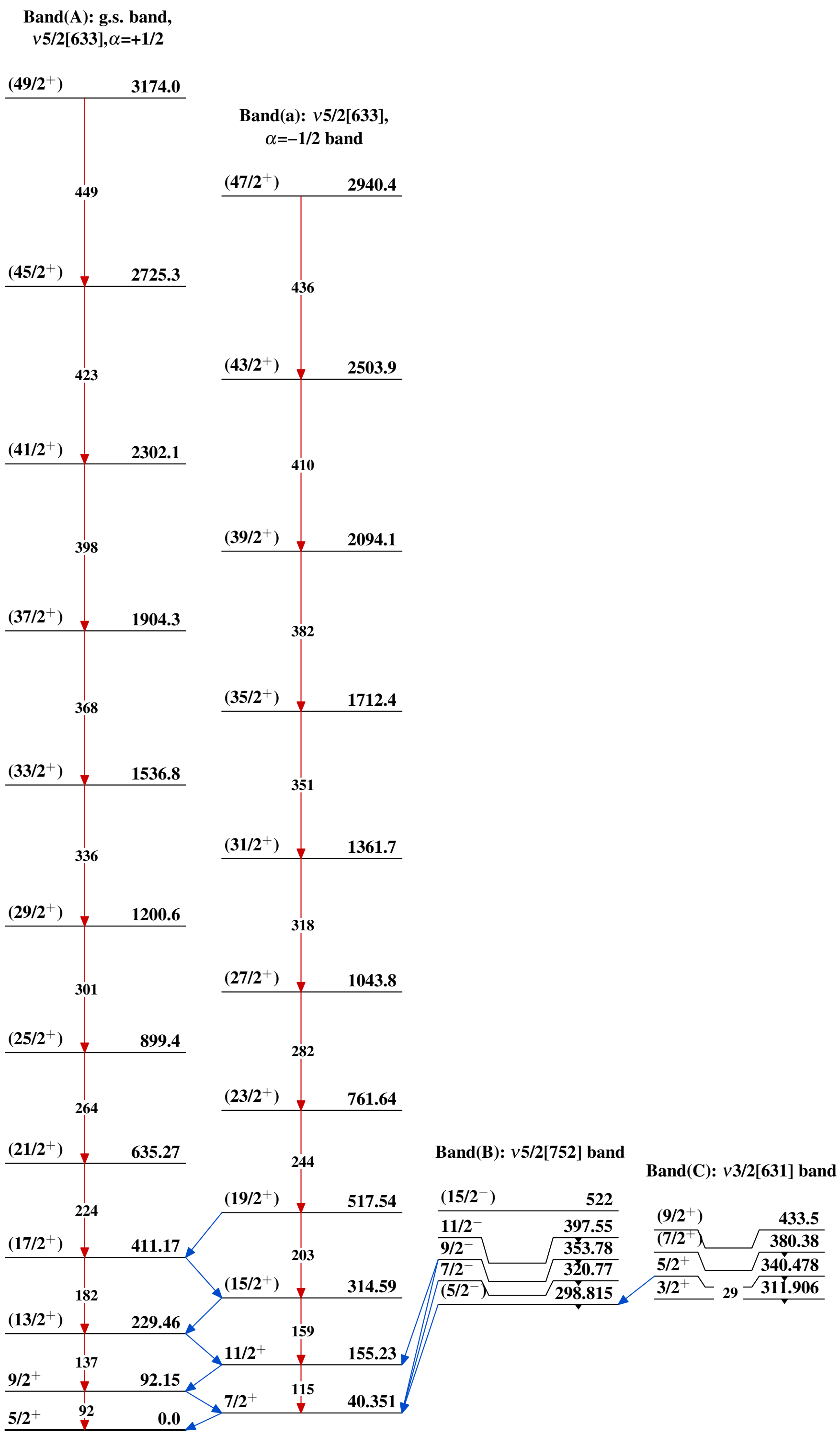
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

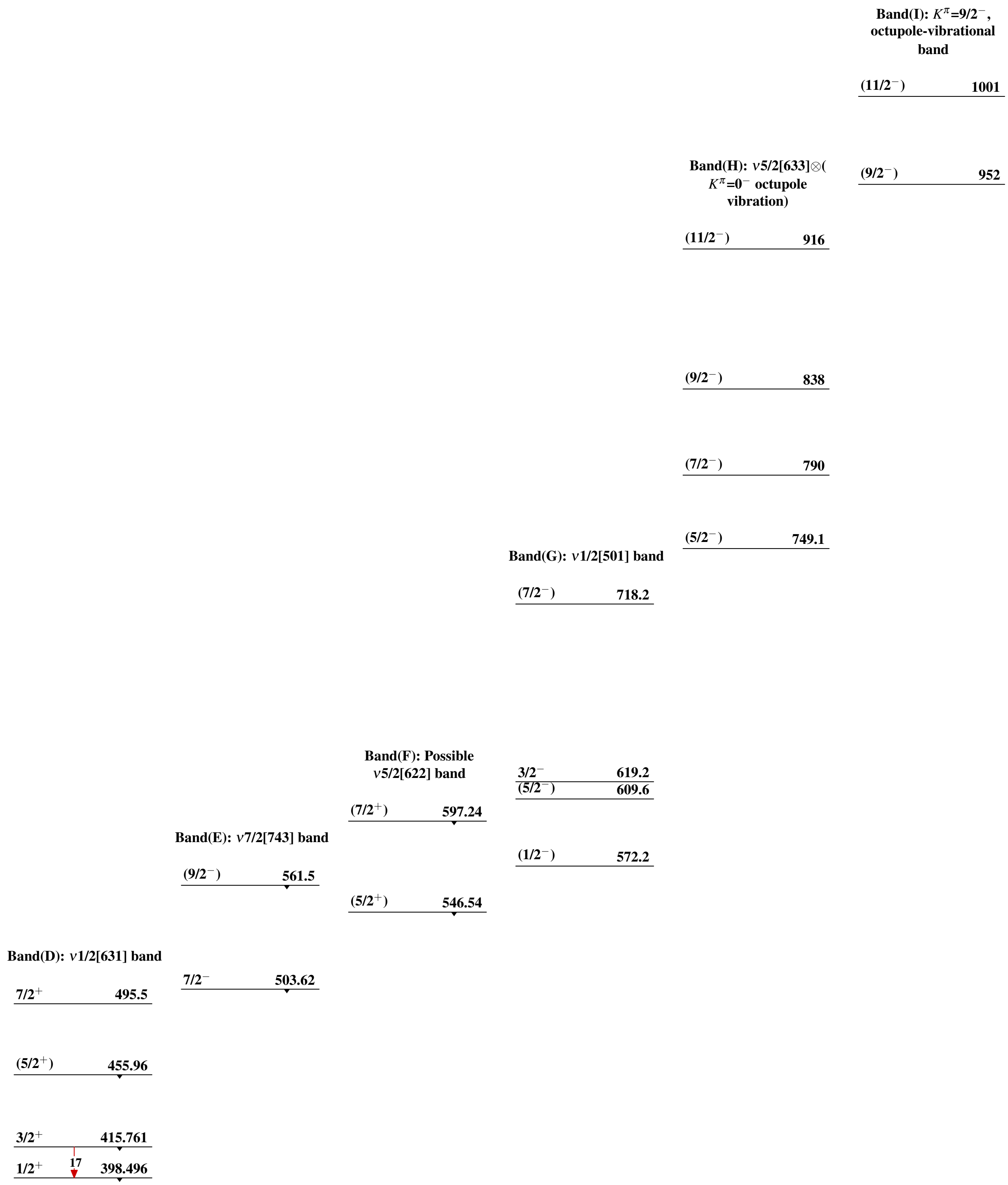


Adopted Levels, Gammas



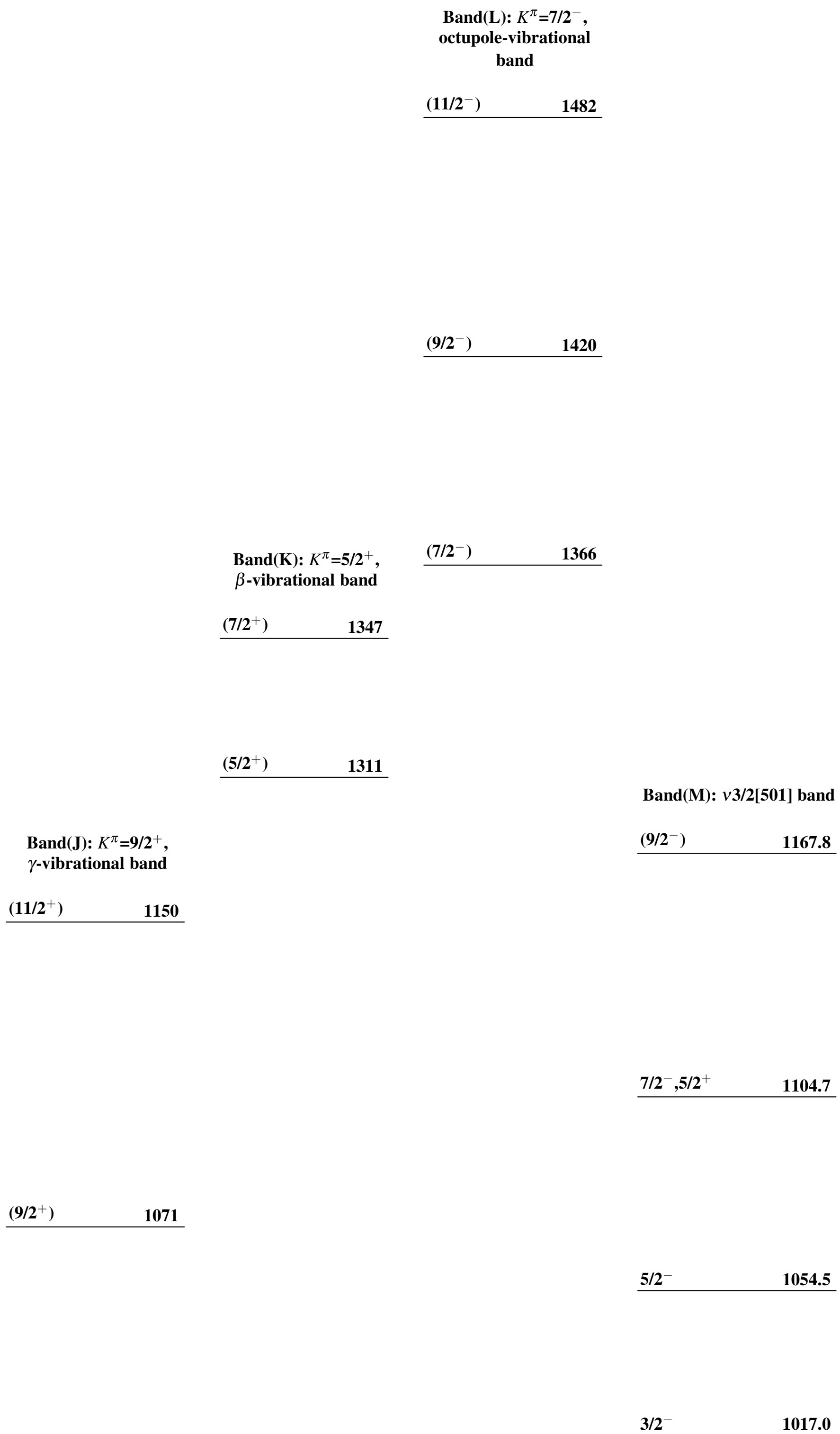
$^{233}_{92}U_{141}$

Adopted Levels, Gammas (continued)



$^{233}_{92}U_{141}$

Adopted Levels, Gammas (continued)



$^{233}_{92}U_{141}$