Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 105,223 (2005)	22-Jun-2005

Q(β^-)=−1864 *4*; S(n)=9444 *3*; S(p)=5022 *4*; Q(α)=−4311 *10* 2012Wa38
Note: Current evaluation has used the following Q record $ −1865 10 *9441* 9 *5019* 8 −4309 *12* 2003Au03.
Other reaction:
1979Wo03: ^{40}Ca(^{40}Ar,π) E=1.05 GeV/nucleon.
Additional information 1.
Mass measurement: 1998Is06, 1994Ot01, 1982Au01, 1979Al19.
Nuclear structure calculations: 2004Sh18.

^{80}Rb Levels

Cross Reference (XREF) Flags

A	^{80}Sr ε decay (106.3 min)	D	^{65}Cu(^{19}F,3npγ),^{66}Zn(^{18}O,3npγ),
B	^{51}V(^{32}S,2pnγ)	E	^{68}Zn(^{19}F,α3nγ)
C	^{55}Mn(^{28}Si,2pnγ)	F	^{79}Br(α,3nγ)

E(level)†	J$^\pi$‡	T$_{1/2}$#	XREF	Comments
0.0	1$^+$	33.4 s *7*	ABCDEF	%ε+%β^+=100 μ=−0.0836 *6* (1974NeZI,1989Ra17) Q=+0.348 *20* (1981Th04,1989Ra17) <r^2>$^{1/2}$=4.229 fm *7* (2004An14). Isotope-shift (^{80}Rb-^{87}Rb)=−352.8 MHZ 44 (1981Th04). Δ<r^2>(^{80}Rb−^{87}Rb)=0.2166 fm^2 *18* (1981Th04). T$_{1/2}$: from 1993Al03. Other: 34 s *4* (1961Ho13). J$^\pi$: log *ft*=4.79 from 0$^+$. In-beam optical pumping methodS (1974NeZI,1977CoZP). μ: value quoted by 1978Ek04 from measurement (atomic beam method using lasers) by 1974NeZI. Other: −0.0833 *17* (1981Th04,hyperfine structure study using lasers). Q: hyperfine structure measurement using LASER spectroscopy.
175.25 *22*	(2$^-$)		ABCD F	J$^\pi$: ΔJ=1 γ to 1$^+$; parity proposed by 1992Do10 based on systematics.
235.9? *8*	(≤3)		A	J$^\pi$: γ to 1$^+$.
334.5 *4*	(3$^-$)	3.5 ns *7*	BCDEF	J$^\pi$: ΔJ=1 γ to (2$^-$).
375.87 *24*	(3$^+$)		BCDEF	J$^\pi$: ΔJ=(2) γ to 1$^+$.
397.6 *5*	(4$^-$)	2.70 ns *21*	BCDEF	
418.5 *5*	(4$^-$)	1.11 ns *21*	BCDEF	
469.7 *5*	(4$^-$)	0.76 ns *21*	EF	
472.5 *4*	(4$^+$)	4.9 ns *7*	BCDEF	
485.9 *5*	(5$^-$)		BCD F	
493.9 *5*	(6$^+$)	1.63 μs *4*	BCDE	μ=+3.378 *24* (1996Io01) Q=0.51 *5* (1989Ra17) E(level): microsecond isomer first reported by 1980RaZL in ^{66}Zn(^{16}O,pnγ) reaction. From its possible deexcitation through a transition of high internal conversion, the estimated value was ≤50 keV above the 486 level. The current level energy is based on 494.4 from 1992Do10. T$_{1/2}$: γ(t) (1996Io01). Others: 1.60 μs *2* (1980RaZL,1979RaZS), 2.4 μs *2* (quoted by 1992Do10 from HMI-318 report, p80 (1979)). J$^\pi$: agreement of experimental g=+0.563 *4* (1996Io01) with calculated value of +0.543 for 2−quasiparticle configuration: $\pi g_{9/2}\nu g_{9/2}$. μ: Time−differential PAD method. Others: +3.36 *6* (1980RaZL, 1979RaZS,1989Ra17), +3.342 *30* (quoted by 1989Ra17 from HMI-318 report,

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Adopted Levels, Gammas (continued)

^{80}Rb Levels (continued)

E(level)†	J$^{\pi}$‡	T$_{1/2}$#	XREF	Comments
				p80 (1979)). Q: differential PAD in (HI,xnγ). Value quoted by 1989Ra17 is from measurement by Stenzel (thesis,1986, HMI).
496.4 *5*	(5$^-$)	0.42 ns *21*	BC EF	T$_{1/2}$: other: 8 ns *2* (γ(t),1977Be41).
553.7 *4*	1$^+$		A	J$^{\pi}$: log *ft*=4.89 from 0$^+$.
580.7 *8*	(5$^-$)		B D	
589.2 *4*	1$^+$		A	J$^{\pi}$: from log *ft*=4.32 from 0$^+$.
644.1 *5*	(6$^-$)		BCDE	
650.7 *6*	(8$^+$)	13.9 ns *14*	BCDE	
657.8 *5*	(7$^+$,6$^-$)		DE	J$^{\pi}$: 164γ to (6$^+$) is possibly dipole; γ from (8$^-$). (7$^+$) in 1992Do10; (6$^-$) in 2003We13.
764.8 *5*	(6$^-$)		B D	
884.0[a] *5*	(7$^-$)		BCDE	
1065.7[c] *8*	(7$^-$)		B D	
1108.2[e] *10*	(8$^-$)		D	
1123.1[@] *6*	(9$^+$)		BCDE	
1205.1[b] *5*	(8$^-$)		BCDE	
1411.1[d] *6*	(8$^-$)		B D	
1542.0[&] *6*	(10$^+$)	0.97 ps *35*	BCDE	
1591.7[a] *5*	(9$^-$)		BCDE	
1849.2[c] *8*	(9$^-$)		B D	
1933.5[e] *10*	(10$^-$)		D	
1999.6[b] *6*	(10$^-$)	1.0 ps *+10−4*	BCDE	
2026.5[@] *7*	(11$^+$)	0.30 ps *8*	BCDE	
2115.1 *12*	(11$^+$)		D	
2260.1[d] *12*	(10$^-$)		B D	
2506.8[a] *6*	(11$^-$)	0.48 ps *14*	BCDE	
2680.0[&] *7*	(12$^+$)	0.22 ps *7*	BCDE	
2787.2[c] *13*	(11$^-$)		B D	
2864.5[e] *14*	(12$^-$)		D	
2998.8[b] *7*	(12$^-$)	0.40 ps *9*	BCDE	
3113.8[f] *12*	(12$^-$)		D	
3130.1 *16*	(13$^+$)		D	
3151.9[@] *7*	(13$^+$)	0.23 ps *7*	BCDE	
3269.1[d] *16*	(12$^-$)		B D	
3598.8[a] *12*	(13$^-$)	0.31 ps *8*	BCDE	
3906.2[c] *17*	(13$^-$)		B D	
4032.9[&] *9*	(14$^+$)	0.12 ps *5*	BCDE	
4124.5[e] *17*	(14$^-$)		D	
4177.8[f] *16*	(14$^-$)		D	
4184.9[b] *12*	(14$^-$)	0.17 ps *6*	BCD	
4355.1[d] *19*	(14$^-$)		D	
4445.9[@] *11*	(15$^+$)	0.12 ps *3*	BCDE	
4842.8[a] *16*	(15$^-$)	<0.28 ps	BCD	
4901.8 *16*	(15$^-$)		D	
5027.2[c] *19*	(15$^-$)		D	
5379.1[d] *21*	(16$^-$)		D	
5407.8[f] *19*	(16$^-$)		D	
5543.0[&] *14*	(16$^+$)	<0.16 ps	BCD	

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Adopted Levels, Gammas (continued)

^{80}Rb Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF
5546.9[b] *16*	(16⁻)	<0.21 ps	BCD	8861.9[b] *21*	(20⁻)		D
5906.9[@] *15*	(17⁺)	0.06 ps *3*	BCD	9005.0[&] *20*	(20⁺)		D
6136.8[a] *19*	(17⁻)		BCD	9037.9[a] *23*	(21⁻)		B D
6261.8 *19*	(17⁻)		D	9329.0[@] *21*	(21⁺)	<0.083 ps	BCD
6578.1[d] *24*	(18⁻)		D	9397[d] *3*	(22⁻)		D
6790.8[f] *21*	(18⁻)		D	10761.9[b] *24*	(22⁻)		D
7112.9[b] *19*	(18⁻)		BCD	10785[a] *3*	(23⁻)		B D
7185.0[&] *17*	(18⁺)		D	11164.0[@] *23*	(23⁺)		B D
7543.8[a] *21*	(19⁻)	0.06 ps +*8*−*3*	BCD	12756[a] *3*	(25⁻)		D
7554.0[@] *18*	(19⁺)		BCD	13176.0[@] *25*	(25⁺)		B D
7875[d] *3*	(20⁻)		D				

[†] From least-squares fit to Eγ′s.
[‡] For high-spin (J>3) states, the assignments are from in-beam γ-ray studies (2003We13,2000Ca07,1998Ta07,1992Do10), based on angular correlation data and band associations. The parentheses in some cases are added by the evaluator since results of $\gamma\gamma(\theta)$ are not quoted by above authors and in general strong arguments for J^π assignments are lacking.
[#] Half-lives in the nanosecond region are from 1992Do10 in γγ(t) study using ^{68}Zn(^{19}F,α3nγ) reaction; those in the picosecond region are from 2000Ca07 using Doppler-shift attenuation method in ^{55}Mn(^{28}Si,2pnγ) study.
[@] Band(A): $\pi g_{9/2}\nu g_{9/2}$, α=1.
[&] Band(a): $\pi g_{9/2}\nu g_{9/2}$, α=0.
[a] Band(B): $\pi f_{5/2}\nu g_{9/2}$, α=1.
[b] Band(b): $\pi f_{5/2}\nu g_{9/2}$, α=0.
[c] Band(C): α=1 band. $\pi g_{9/2}\otimes\pi f_{5/2}$ or $\nu g_{9/2}\otimes\pi(f_{5/2}+p_{1/2})$. Band crossing at ħω=0.55 MeV.
[d] Band(c): α=0 band. $\pi g_{9/2}\otimes\pi f_{5/2}$ or $\nu g_{9/2}\otimes\pi(f_{5/2}+p_{1/2})$. Band crossings at ħω=0.51 MeV and another at 0.61 MeV.
[e] Band(D): γ sequence based on (8⁻).
[f] Band(E): γ sequence based on (12⁻).

γ(^{80}Rb)

E_i(level)	J^π_i	Eγ	Iγ	E_f	J^π_f	Mult.
175.25	(2⁻)	175.4 *3*	100	0.0	1⁺	D
235.9?	(≤3)	235.9[‡] *8*	100	0.0	1⁺	
334.5	(3⁻)	159.3 *3*	100	175.25	(2⁻)	D
375.87	(3⁺)	200.6 *3*	76 *8*	175.25	(2⁻)	D
		375.9 *3*	100 *10*	0.0	1⁺	(Q)
397.6	(4⁻)	63.0 *3*	100	334.5	(3⁻)	D
418.5	(4⁻)	83.8 *3*	100	334.5	(3⁻)	
469.7	(4⁻)	51.1		418.5	(4⁻)	
		72.0		397.6	(4⁻)	
		135.3 *3*		334.5	(3⁻)	
472.5	(4⁺)	96.6 *3*	100 *10*	375.87	(3⁺)	D
		297.3[‡] *3*	≤14	175.25	(2⁻)	
485.9	(5⁻)	(16.2)		469.7	(4⁻)	
		67.5		418.5	(4⁻)	
		88.3 *3*		397.6	(4⁻)	D
		151.4		334.5	(3⁻)	
493.9	(6⁺)	(8.0)		485.9	(5⁻)	
		(21.4)		472.5	(4⁺)	

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Adopted Levels, Gammas (continued)

$\gamma(^{80}Rb)$ (continued)

E_i(level)	J^π_i	E_γ	I_γ	E_f	J^π_f	Mult.	α[†]	Comments
496.4	(5⁻)	77.9 *3*		418.5	(4⁻)			
		98.7		397.6	(4⁻)			
553.7	1⁺	316.0[‡] *15*	15 *2*	235.9?	(≤3)			
		378.8 *5*	61 *6*	175.25	(2⁻)			
		553.4 *5*	100 *10*	0.0	1⁺			
580.7	(5⁻)	162		418.5	(4⁻)			
		183		397.6	(4⁻)			
589.2	1⁺	414.1 *5*	8.3 *8*	175.25	(2⁻)			
		589.0 *5*	100 *10*	0.0	1⁺			
644.1	(6⁻)	147.8		496.4	(5⁻)			
		150.2		493.9	(6⁺)			
		158.1		485.9	(5⁻)			
		246.6		397.6	(4⁻)			
650.7	(8⁺)	156.8	100	493.9	(6⁺)	[E2]	0.189	B(E2)(W.u.)=18 *2*
657.8	(7⁺,6⁻)	164.0		493.9	(6⁺)			E_γ: 161 in 2003We13 feeds 496 level.
764.8	(6⁻)	268		496.4	(5⁻)			
		346.4		418.5	(4⁻)			
		367		397.6	(4⁻)			
884.0	(7⁻)	226.3		657.8	(7⁺,6⁻)			
		239.9		644.1	(6⁻)			
		387.5		496.4	(5⁻)			
		390.0		493.9	(6⁺)			
		398.1		485.9	(5⁻)			
1065.7	(7⁻)	485.0		580.7	(5⁻)			
		580		485.9	(5⁻)			
1108.2	(8⁻)	224		884.0	(7⁻)			
1123.1	(9⁺)	472.3		650.7	(8⁺)			
1205.1	(8⁻)	321.2		884.0	(7⁻)			
		547.4		657.8	(7⁺,6⁻)			
		561.1		644.1	(6⁻)			
1411.1	(8⁻)	646.3	100	764.8	(6⁻)			
1542.0	(10⁺)	418.8	13 *1*	1123.1	(9⁺)			
		891.3	100 *3*	650.7	(8⁺)	[E2]		B(E2)(W.u.)=45 *17*
1591.7	(9⁻)	386.8		1205.1	(8⁻)			
		707.5		884.0	(7⁻)			
1849.2	(9⁻)	783.5	100	1065.7	(7⁻)			
1933.5	(10⁻)	342		1591.7	(9⁻)			
		825		1108.2	(8⁻)			
1999.6	(10⁻)	794.5	100	1205.1	(8⁻)	[E2]		B(E2)(W.u.)=90 *+60−45*
2026.5	(11⁺)	484.5	100 *4*	1542.0	(10⁺)			
		903.4	44 *2*	1123.1	(9⁺)	[E2]		B(E2)(W.u.)=47 *13*
2115.1	(11⁺)	992		1123.1	(9⁺)			
2260.1	(10⁻)	849	100	1411.1	(8⁻)			
2506.8	(11⁻)	507	≈20	1999.6	(10⁻)			I_γ: 915γ from 2505 level is the main transition, the 507γ is weak. Its branching estimated from thickness of arrows in level scheme figures given by 1998Ta07 and 2003We13.
		915.1	100	1591.7	(9⁻)	[E2]		B(E2)(W.u.)=75 *23*
2680.0	(12⁺)	653	8 *2*	2026.5	(11⁺)			
		1138.0	100 *6*	1542.0	(10⁺)	[E2]		B(E2)(W.u.)=61 *20*
2787.2	(11⁻)	938	100	1849.2	(9⁻)			
2864.5	(12⁻)	931		1933.5	(10⁻)			
2998.8	(12⁻)	999.2	100	1999.6	(10⁻)	[E2]		B(E2)(W.u.)=69 *16*
3113.8	(12⁻)	607		2506.8	(11⁻)			

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Adopted Levels, Gammas (continued)

$\gamma(^{80}Rb)$ (continued)

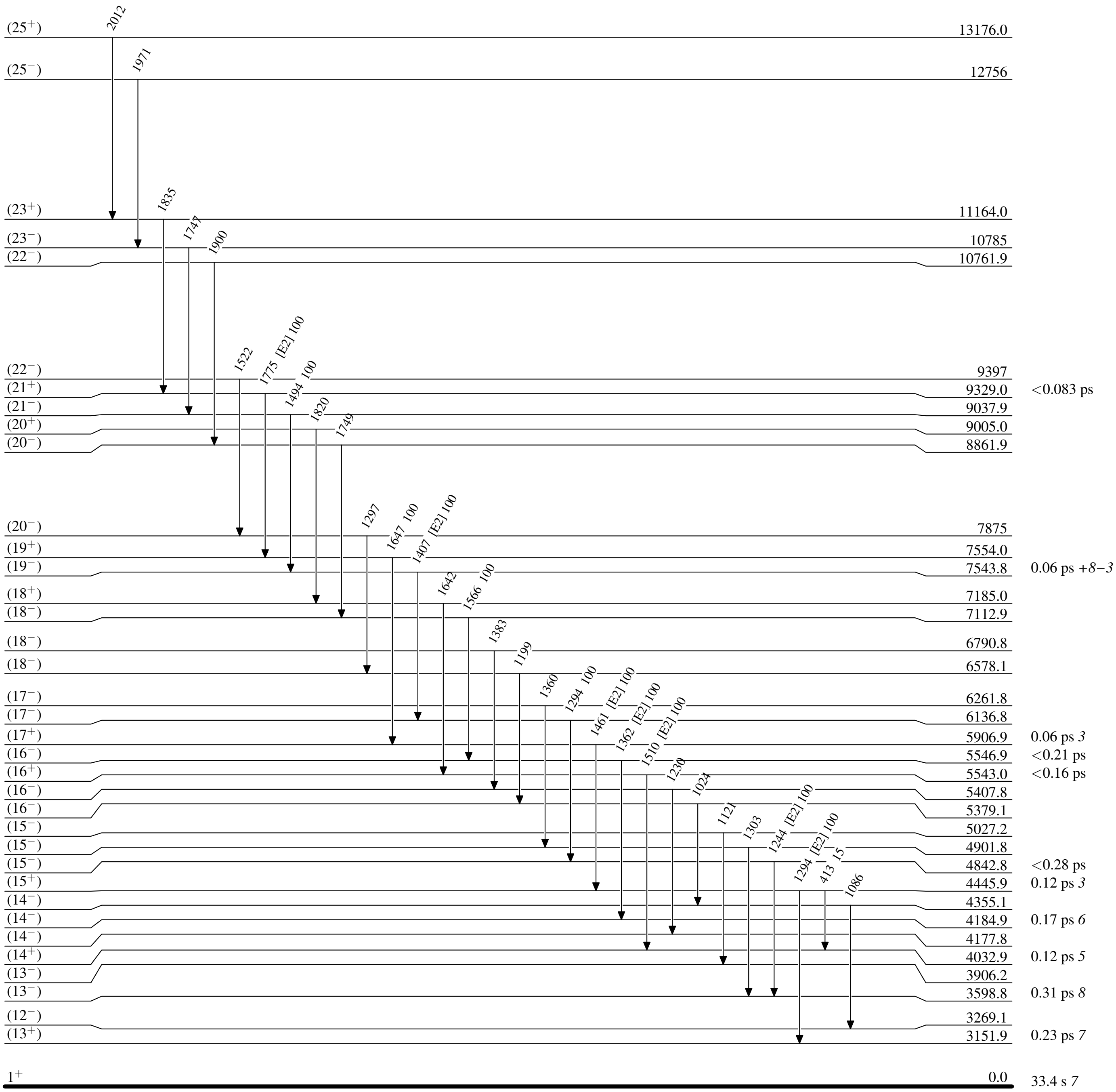
E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	Comments
3130.1	(13+)	1015		2115.1	(11+)		
3151.9	(13+)	471	43 *4*	2680.0	(12+)		
		1125.5	100 *7*	2026.5	(11+)	[E2]	B(E2)(W.u.)=47 *15*
3269.1	(12−)	1009	100	2260.1	(10−)		
3598.8	(13−)	1092	100	2506.8	(11−)	[E2]	B(E2)(W.u.)=57 *15*
3906.2	(13−)	1119		2787.2	(11−)		
4032.9	(14+)	881	10 *5*	3151.9	(13+)		
		1353	100 *10*	2680.0	(12+)	[E2]	B(E2)(W.u.)=46 *21*
4124.5	(14−)	1260		2864.5	(12−)		
4177.8	(14−)	1064		3113.8	(12−)		
4184.9	(14−)	1186	100	2998.8	(12−)	[E2]	B(E2)(W.u.)=69 *25*
4355.1	(14−)	1086		3269.1	(12−)		
4445.9	(15+)	413	15 *4*	4032.9	(14+)		
		1294	100 *7*	3151.9	(13+)	[E2]	B(E2)(W.u.)=55 *15*
4842.8	(15−)	1244	100	3598.8	(13−)	[E2]	B(E2)(W.u.)>33
4901.8	(15−)	1303		3598.8	(13−)		
5027.2	(15−)	1121		3906.2	(13−)		
5379.1	(16−)	1024		4355.1	(14−)		
5407.8	(16−)	1230		4177.8	(14−)		
5543.0	(16+)	1510	100	4032.9	(14+)	[E2]	B(E2)(W.u.)>22
5546.9	(16−)	1362	100	4184.9	(14−)	[E2]	B(E2)(W.u.)>28
5906.9	(17+)	1461	100	4445.9	(15+)	[E2]	B(E2)(W.u.)=70 *40*
6136.8	(17−)	1294	100	4842.8	(15−)		
6261.8	(17−)	1360		4901.8	(15−)		
6578.1	(18−)	1199		5379.1	(16−)		
6790.8	(18−)	1383		5407.8	(16−)		
7112.9	(18−)	1566	100	5546.9	(16−)		
7185.0	(18+)	1642		5543.0	(16+)		
7543.8	(19−)	1407	100	6136.8	(17−)	[E2]	B(E2)(W.u.)=80 *+80−45*
7554.0	(19+)	1647	100	5906.9	(17+)		
7875	(20−)	1297		6578.1	(18−)		
8861.9	(20−)	1749		7112.9	(18−)		
9005.0	(20+)	1820		7185.0	(18+)		
9037.9	(21−)	1494	100	7543.8	(19−)		
9329.0	(21+)	1775	100	7554.0	(19+)	[E2]	B(E2)(W.u.)>19
9397	(22−)	1522		7875	(20−)		
10761.9	(22−)	1900		8861.9	(20−)		
10785	(23−)	1747		9037.9	(21−)		
11164.0	(23+)	1835		9329.0	(21+)		
12756	(25−)	1971		10785	(23−)		
13176.0	(25+)	2012		11164.0	(23+)		

† 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.
‡ Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

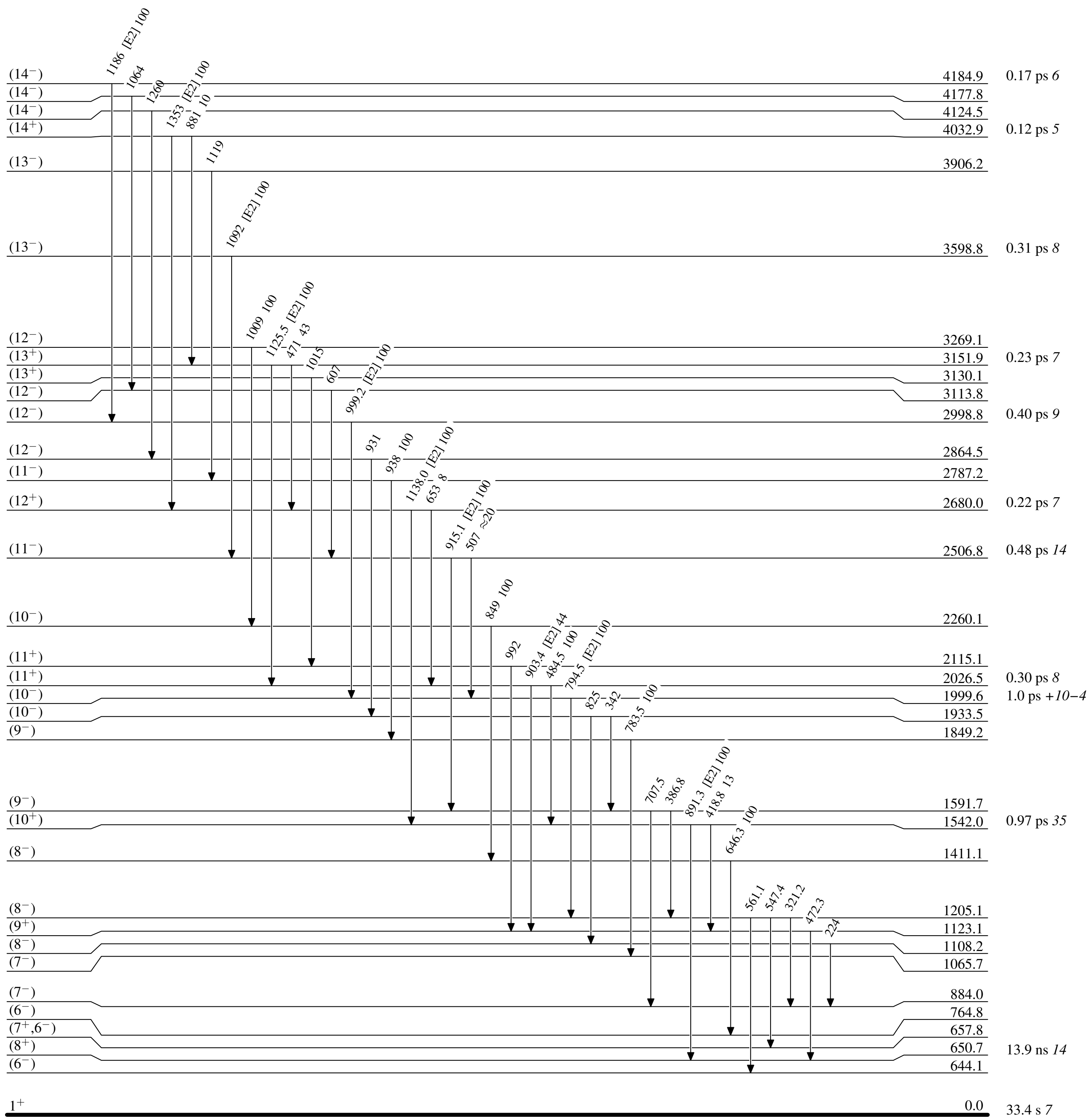


$^{80}_{37}Rb_{43}$

Adopted Levels, Gammas

Level Scheme (continued)

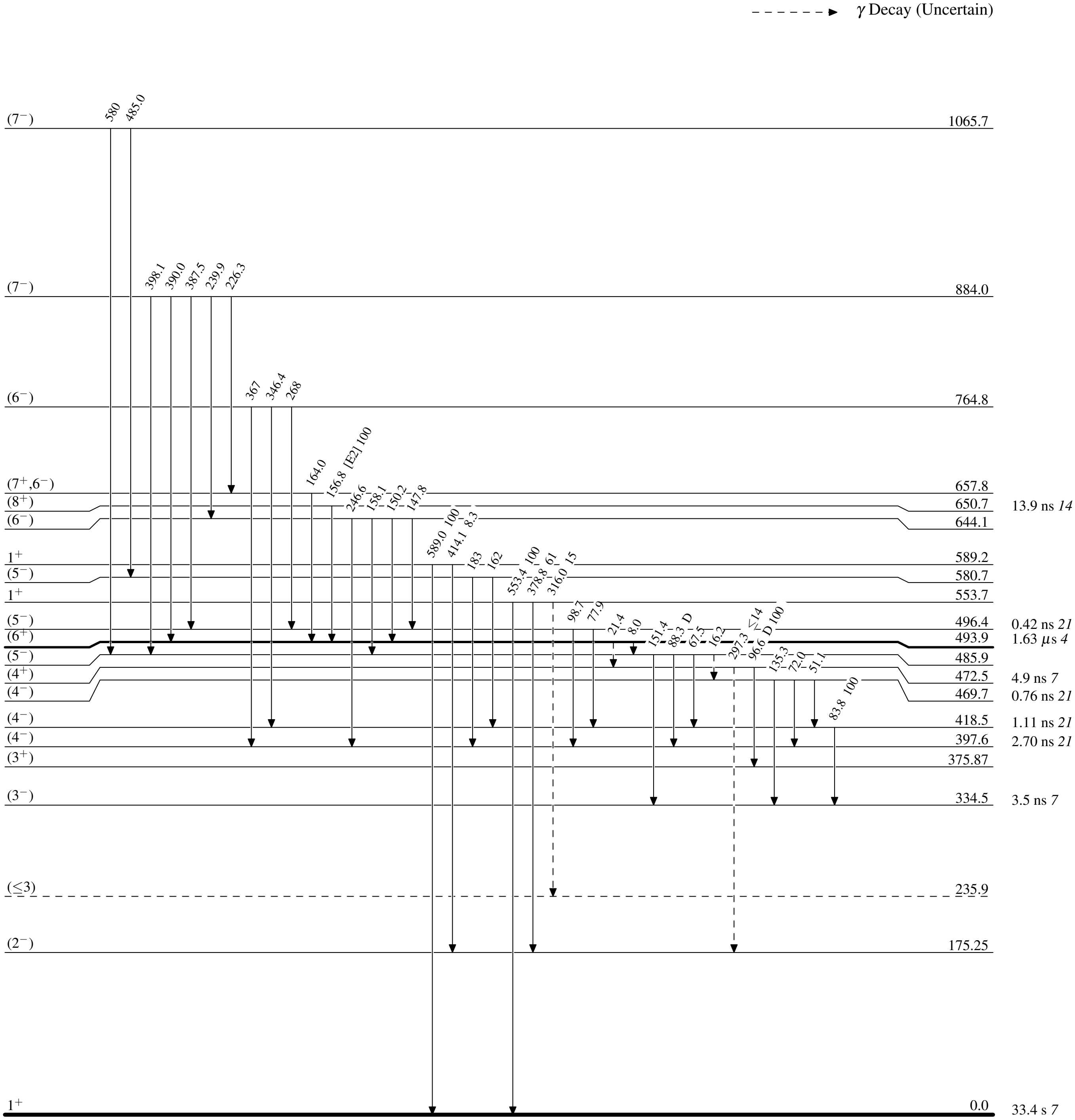
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{80}_{37}Rb_{43}$

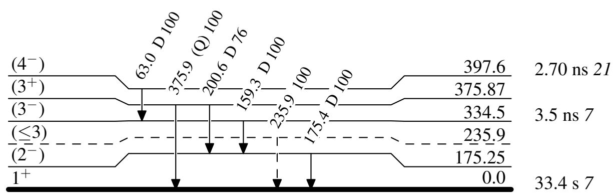
Adopted Levels, Gammas

Legend

Level Scheme (continued)

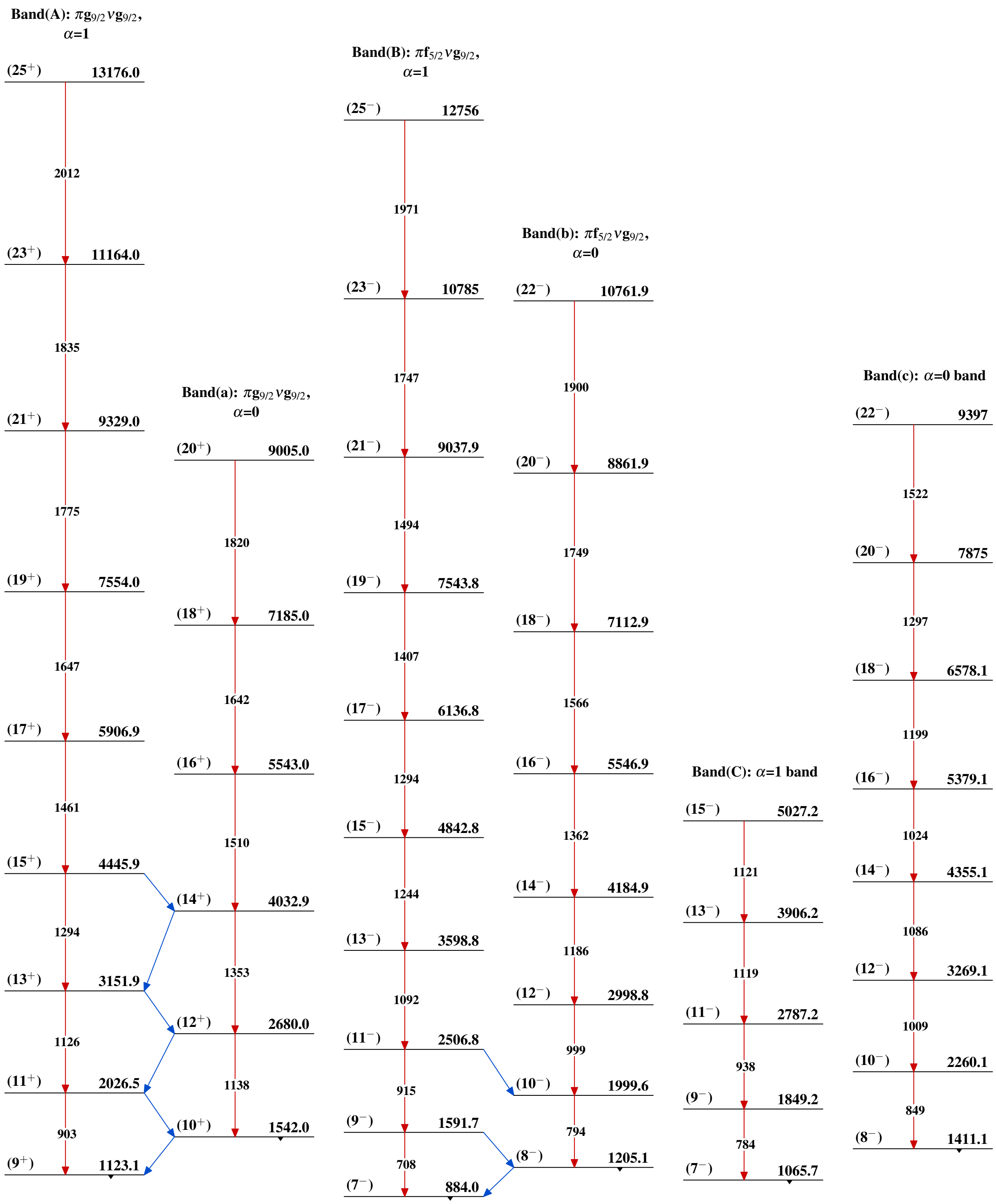
Intensities: Relative photon branching from each level

γ Decay (Uncertain)



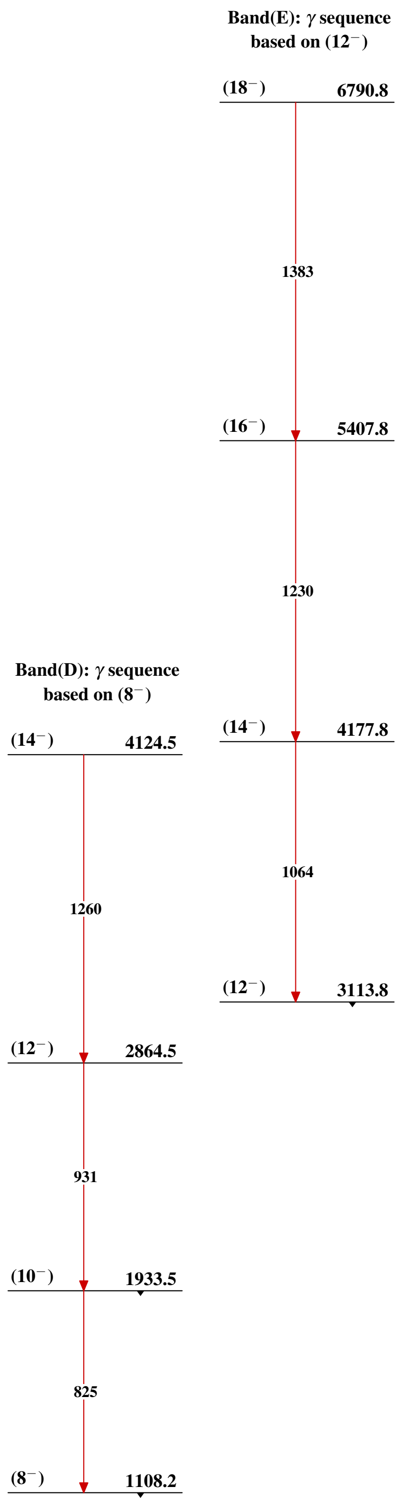
$^{80}_{37}Rb_{43}$

Adopted Levels, Gammas



$^{80}_{37}Rb_{43}$

Adopted Levels, Gammas (continued)



$^{80}_{37}Rb_{43}$