Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	30-Sep-2020

Q(β^-)=−7027 *8*; S(n)=12422.7 *16*; S(p)=3106 *4*; Q(α)=−3608 *7* 2017Wa10
S(2n)=23754.4 *18*, S(2p)=10301 *4* (2017Wa10).
Identifications and production of ^{77}Rb isotope: 1972Ar02, 1972Ve02, 1972De40.
Additional information 1.
Mass measurement: 2007Ke09 (Penning trap), 1994Ot01, 1987Bo59, 1979Ep01, 1987TeZY.
Hyperfine structure using laser spectroscopy: 1986Du16.
Search for proton decay from a predicted isomer of ^{77}Rb: 1998Ro13.
Theoretical calculations: consult the NSR database at www.nndc.bnl.gov for 12 primary theory references dealing with nuclear structure calculations, and half-lives in radioactive decays.

^{77}Rb Levels

Band assignments are primarily from 1997Ha08.

Cross Reference (XREF) Flags

A ^{77}Sr ε decay (9.0 s)
B ^{40}Ca(^{40}Ca,3pγ)

E(level)	J$^\pi$[†]	T$_{1/2}$	XREF	Comments
0.0[c]	3/2$^-$	3.78 min *4*	AB	%ε+%β^+=100 μ=+0.65434 *2* (1986Du16,1981Th04,2019StZV) Q=+0.84 *17* (1981Th04,2016St14) Evaluated rms charge radius <r^2>$^{1/2}$=2.2356 fm *80* (2013An02). Evaluated δ<r^2>(^{87}Rb,^{77}Rb)=0.2884 fm^2 *69* (2013An02). μ,Q: from hyperfine-structure measurement using laser technique on a mass-separated atomic beam of ^{77}Rb produced by the fission of uranium or by spallation reaction on niobium (1986Du16,1981Th04). Measured μ=+0.6568 *41* (1981Th04), +0.6544680 *16* (1986Du16) is re-evaluated to +0.65434 *2* by 2019StZV. Other: +0.652 *7* (1978Ek04). Q=+0.70 *4* in 1981Th04 is re-evaluated to +0.84 *17* in 2016St14. Δ<r^2>(^{77}Rb−^{87}Rb)=0.283 fm^2 *7*; rms charge radius=4.2335 fm *26* (1981Th04). J$^\pi$: from atomic-beam method (1978Ek04). Parity from agreement of measured magnetic dipole moment with shell-model calculations. T$_{1/2}$: weighted average of 3.78 min *4* (1993Al03), 3.62 min *10* (1975BaWR), 3.8 min *3* (1975Ra03), 3.9 min *1* (1975Li13), 3.9 min *1* (1972Ar02) and 3.6 min *2* (1972De40). Others: 6.1 min in 1972Ve02 probably belongs to ^{78}Rb, 2.8 min *10* (1971Do01, assignment to ^{77}Rb or isomer in ^{77}Kr).
144.83[d] *3*	5/2$^-$	0.54[‡] ns *3*	AB	J$^\pi$: ΔJ=1, M1+E2 γ to 3/2$^-$; 1/2 not allowed by $\gamma(\theta)$.
146.934[&] *20*	5/2$^{(+)}$	5.1 ns *4*	AB	J$^\pi$: ΔJ=1 γ to 3/2$^-$; 1/2 not allowed by $\gamma(\theta)$.
307.03[a] *4*	(7/2$^+$)	0.39[‡] ns *3*	AB	J$^\pi$: ΔJ=1 γ to 5/2$^-$ and ΔJ=1, M1+E2 γ to 5/2$^{(+)}$.
331.63[&] *10*	9/2$^{(+)}$	0.687 ns *25*	B	J$^\pi$: ΔJ=2, E2 γ to 5/2$^{(+)}$; 1/2 not allowed by $\gamma(\theta)$.
368.18[c] *6*	7/2$^-$	29.1[‡] ps *21*	B	J$^\pi$: ΔJ=2, E2 γ to 3/2$^-$.
614.75[d] *8*	9/2$^-$	8.0[‡] ps *6*	B	J$^\pi$: ΔJ=2, E2 γ to 5/2$^-$ and ΔJ=1, M1+E2 γ to 7/2$^-$; 1/2 not allowed by $\gamma(\theta)$.
788? *3*			A	
804.33[a] *11*	(11/2$^+$)	3.6[‡] ps *7*	B	J$^\pi$: ΔJ=2, E2 γ to (7/2$^+$) and ΔJ=1, M1+E2 γ to 9/2$^{(+)}$.
833.46[&] *13*	(13/2$^+$)	6.4[‡] ps *4*	B	J$^\pi$: ΔJ=2, E2 γ to 9/2$^{(+)}$.

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Adopted Levels, Gammas (continued)

^{77}Rb Levels (continued)

E(level)	J^{π}[†]	$T_{1/2}$	XREF	Comments
943.93[c] *13*	$11/2^-$	2.9[‡] ps *3*	B	J^{π}: ΔJ=2, E2 γ to $7/2^-$; ΔJ=(1) γ to $9/2^-$ does not allow 3/2.
1153.78[b] *18*	$(9/2^+)$		B	
1249? *3*			A	
1280.40[d] *15*	$(13/2^-)$	0.96 ps *12*	B	$T_{1/2}$: weighted average of 0.89 ps *6* (DSA, 1997Ha08), 1.41 ps *17* (DSA) 1.09 ps *26* (RDDS). The last two values are quoted by 1997Ha08 from thesis by Luhmann. 1986Lu08 give 1.28 ps *21* from DSA.
1541.2 *5*			A	
1575.98[&] *17*	$(17/2^+)$	0.65 ps *3*	B	$T_{1/2}$: weighted average of 0.64 ps *3* (DSA, 1997Ha08), 0.78 ps *15* (DSA), 0.88 ps *18* (RDDS). The last two values are quoted by 1997Ha08 from thesis by Luhmann. 1986Lu08 give 0.83 ps *10* from DSA.
1590.40[a] *16*	$(15/2^+)$	0.62[#] ps *4*	B	
1717.38[c] *17*	$(15/2^-)$	0.46 ps *3*	B	$T_{1/2}$: weighted average of 0.451 ps *21* (DSA, 1997Ha08) and 0.67 ps *14* (DSA, 1986Lu08).
1882.56[b] *14*	$(13/2^+)$		B	
2124.95[d] *20*	$(17/2^-)$	0.32 ps *3*	B	$T_{1/2}$: weighted average of 0.31 ps *3* (DSA, 1997Ha08) and 0.33 ps *4* (DSA, 1986Lu08).
2149.5[g] *3*	$(11/2^-)$		B	
2388.1[g] *3*	$(13/2^-)$		B	
2390.6[h] *8*			B	
2529.38[&] *22*	$(21/2^+)$	0.252 ps *14*	B	$T_{1/2}$: weighted average of 0.256 ps *14* (DSA, 1997Ha08) and 0.22 ps *4* (DSA, 1986Lu08).
2596.81[b] *18*	$(17/2^+)$		B	
2630.59[a] *20*	$(19/2^+)$	0.132[#] ps *21*	B	$T_{1/2}$: other: 0.69 ps *35* (RDDS, effective $T_{1/2}$ quoted by 1997Ha08 from thesis by Luhmann).
2668.1[g] *3*	$(15/2^-)$		B	
2680.5[c] *3*	$(19/2^-)$	0.23 ps *3*	B	$T_{1/2}$: weighted average of 0.243 ps *21* (DSA, 1997Ha08) and 0.15 ps *6* (DSA, 1986Lu08).
2991.4[g] *3*	$(17/2^-)$		B	
3134.1[d] *3*	$(21/2^-)$	0.17 ps *3*	B	$T_{1/2}$: weighted average of 0.180 ps *21* (DSA, 1997Ha08) and 0.12 ps *4* (DSA, 1986Lu08).
3229.8[e] *5*	$(19/2^-)$		B	
3343.1[g] *3*	$(19/2^-)$		B	
3353.7[h] *8*			B	
3411.33[b] *25*	$(21/2^+)$	0.64[#] ps *3*	B	
3674.41[&] *25*	$(25/2^+)$	0.096 ps *17*	B	$T_{1/2}$: weighted average of 0.104 ps *14* (DSA, 1997Ha08) and 0.06 ps *3* (DSA, 1986Lu08).
3701.2 *6*	$(21/2^-)$		B	
3776.2[g] *4*	$(21/2^-)$		B	
3823.4[c] *4*	$(23/2^-)$	0.118[#] ps *21*	B	
3894.58[a] *24*	$(23/2^+)$	0.069[#] ps *14*	B	
4122.9[e] *6*	$(23/2^-)$		B	
4216.7[g] *4*	$(23/2^-)$		B	
4303.5[d] *4*	$(25/2^-)$	0.111[#] ps *7*	B	
4329.7[b] *3*	$(25/2^+)$	0.374[#] ps *21*	B	
4417.5[h] *8*			B	
4711.6 *4*	$(25/2^-)$		B	
4758.6[g] *7*	$(25/2^-)$		B	
5006.1[&] *3*	$(29/2^+)$	0.049[#] ps *7*	B	
5103.9[e] *4*	$(27/2^-)$	0.146[#] ps *14*	B	

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Adopted Levels, Gammas (continued)

^{77}Rb Levels (continued)

E(level)	J^{π}†	$T_{1/2}$	XREF	E(level)	J^{π}†	$T_{1/2}$	XREF
5176.5[c] *4*	(27/2$^-$)		B	8519.8[f] *8*	(37/2$^-$)		B
5317.6[g] *8*	(27/2$^-$)		B	8627.5[a] *13*	(35/2$^+$)		B
5345.4[a] *5*	(27/2$^+$)	≤0.21[@] ps	B	8832.1 *15*	(37/2$^-$)		B
5441.3[b] *3*	(29/2$^+$)	0.201[#] ps *14*	B	8892.1[d] *15*	(37/2$^-$)		B
5478.5[h] *12*			B	8954.5[g] *25*	(37/2$^-$)		B
5639.1[d] *4*	(29/2$^-$)	≤0.17[@] ps	B	9146.0[e] *12*	(39/2$^-$)		B
5681.5[h] *11*			B	9794[h] *3*			B
5851.6 *9*	(29/2$^-$)		B	9817.3[b] *10*	(41/2$^+$)		B
5956.4[g] *11*	(29/2$^-$)		B	10096.8[f] *13*	(41/2$^-$)		B
6299.5[e] *4*	(31/2$^-$)	≤0.24[@] ps	B	10103.5[c] *24*	(39/2$^-$)		B
6525.5[&] *4*	(33/2$^+$)	0.028[#] ps *7*	B	10209.6[&] *5*	(41/2$^+$)	≤0.076[@] ps	B
6615.6[g] *13*	(31/2$^-$)		B	10365.1 *18*	(41/2$^-$)		B
6642.5[c] *6*	(31/2$^-$)		B	10774.1[d] *25*	(41/2$^-$)		B
6752.3[b] *4*	(33/2$^+$)	0.118[#] ps *14*	B	10860.0[e] *16*	(43/2$^-$)		B
6806.6[h] *12*			B	11476[h] *4*			B
6927.5[a] *7*	(31/2$^+$)		B	11582.3[b] *14*	(45/2$^+$)		B
7087.1[f] *6*	(33/2$^-$)		B	11869.8[f] *16*	(45/2$^-$)		B
7198.1[d] *11*	(33/2$^-$)		B	12264.8[&] *10*	(45/2$^+$)		B
7358.4[g] *15*	(33/2$^-$)		B	12558.6 *11*			B
7506 *3*			B	12807.0[e] *19*	(47/2$^-$)		B
7635.0[e] *6*	(35/2$^-$)		B	13551.3[b] *18*	(49/2$^+$)		B
8079.7[g] *24*	(35/2$^-$)		B	13888[f] *3*	(49/2$^-$)		B
8168.4[b] *5*	(37/2$^+$)	≤0.13[@] ps	B	15013[e] *3*	(51/2$^-$)		B
8263.6[h] *16*			B	15797[b] *3*	(53/2$^+$)		B
8300.5[c] *12*	(35/2$^-$)		B	17485[e] *4*	(55/2$^-$)		B
8316.8[&] *4*	(37/2$^+$)	0.042[#] ps *14*	B	18376[b] *4*	(57/2$^+$)		B

† From 1997Ha08 based on $\gamma(\theta)$, $\gamma\gamma(\theta)$, γ-ray asymmetry ratio, probable band associations and cranked shell-model calculations. Many J^{π} values have been given in parentheses (by evaluator) due to lack of strong arguments for such assignments.

‡ Recoil-distance Doppler-shift (RDDS) method (1986Lu08).

Doppler-shift attenuation (DSA) method (1997Ha08).

@ Effective half-life from DSA (1997Ha08).

& Band(A): $\pi 3/2[431]^{-1}\otimes\nu 5/2[422]^2$,$\alpha$=+1/2.

a Band(a): $\pi 3/2[431]^{-1}\otimes\nu 5/2[422]^2$,$\alpha$=−1/2.

b Band(B): $\pi 3/2[431]^{-1}\otimes\nu 3/2[301]^2$,$\alpha$=+1/2.

c Band(C): $\pi 3/2[312]^{-1}\otimes\nu 5/2[422]^2$,$\alpha$=−1/2.

d Band(c): $\pi 3/2[312]^{-1}\otimes\nu 5/2[422]^2$,$\alpha$=+1/2.

e Band(D): 3-qp band,α=−1/2. Configuration=$\pi 3/2[312]^{-1}\otimes\nu 3/2[301]^2$ or $\pi 3/2[312]^{-1}\otimes\pi 1/2[310]^{-2}$.

f Band(d): 3-qp band,α=+1/2. Configuration=$\pi 3/2[312]^{-1}\otimes\nu 3/2[301]^2$ or $\pi 3/2[312]^{-1}\otimes\pi 1/2[310]^{-2}$.

g Band(E): ΔJ=1 band, 3-qp band. Configuration=$\pi 3/2[431]^{-1}\otimes\nu 5/2[422]\otimes\nu 3/2[301]$.

h Seq.(F): γ cascade.

Adopted Levels, Gammas (continued)

γ(^{77}Rb)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.[†]	δ[‡]	α[@]	$I_{(\gamma+ce)}$	Comments
144.83	5/2$^-$	144.82 *3*	100	0.0	3/2$^-$	E2+M1	−1.8 *5*	0.20 *3*		α(K)=0.175 *23*; α(L)=0.023 *4*; α(M)=0.0038 *6* α(N)=0.00041 *6*; α(O)=1.38×10^{-5} *18* B(M1)(W.u.)=0.0026 *12*; B(E2)(W.u.)=5.4×10^2 *8* δ: RUL<300 for E2 transitions suggests magnitude of δ<0.8. Note that B(E2)(W.u.) is much larger than RUL=300 for E2.
146.934	5/2$^{(+)}$	146.94 *2*	100	0.0	3/2$^-$	(E1)		0.0308		B(E1)(W.u.)=2.24×10^{-5} *18* δ(Q/D)<0.03.
307.03	(7/2$^+$)	160.10 *3*	100 *4*	146.934	5/2$^{(+)}$	M1+E2	+0.39 *6*	0.058 *5*		B(M1)(W.u.)=0.0094 *10*; B(E2)(W.u.)=74 *21*
		162.11 *12*	20.2 *10*	144.83	5/2$^-$	[E1]		0.0230		B(E1)(W.u.)=3.6×10^{-5} *4*
331.63	9/2$^{(+)}$	24.6		307.03	(7/2$^+$)	[M1]	#	8.15	≈222	B(M1)(W.u.)≈0.16
		184.81 *12*	100 *3*	146.934	5/2$^{(+)}$	E2		0.1017		B(E2)(W.u.)=59 *20*
368.18	7/2$^-$	223.31 *9*	21.1 *10*	144.83	5/2$^-$	E2+M1	−1.8 *7*	0.043 *8*		B(M1)(W.u.)=0.0028 *17*; B(E2)(W.u.)=2.4×10^2 *5*
		368.14 *9*	100 *3*	0.0	3/2$^-$	E2		0.00907		B(E2)(W.u.)=120 *10*
614.75	9/2$^-$	246.51 *9*	7.6 *4*	368.18	7/2$^-$	E2+M1	−1.0 *1*	0.0246 *13*		B(M1)(W.u.)=0.0063 *9*; B(E2)(W.u.)=137 *19*
		307.8 *2*	3.29 *17*	307.03	(7/2$^+$)	[E1]				B(E1)(W.u.)=4.7×10^{-5} *5*
		469.92 *13*	100 *3*	144.83	5/2$^-$	E2				B(E2)(W.u.)=143 *13*
788?		641.2[&] *25*	100	146.934	5/2$^{(+)}$					
804.33	(11/2$^+$)	472.9 *2*	98 *4*	331.63	9/2$^{(+)}$	M1+E2	+0.4 *1*			B(M1)(W.u.)=0.025 *6*; B(E2)(W.u.)=23 *11*
		497.23 *15*	100 *4*	307.03	(7/2$^+$)	E2				B(E2)(W.u.)=1.3×10^2 *3*
833.46	(13/2$^+$)	501.88 *15*	100	331.63	9/2$^{(+)}$	E2				B(E2)(W.u.)=143 *9*
943.93	11/2$^-$	329.3 *3*	4.37 *22*	614.75	9/2$^-$	(M1+E2)		0.010 *4*		B(M1)(W.u.)=0.0044 *6*, B(E2)(W.u.)=53 *7* for δ=1.
		575.7 *2*	100 *3*	368.18	7/2$^-$	E2				B(E2)(W.u.)=148 *17*
		611.9 *5*	2.4 *4*	331.63	9/2$^{(+)}$	[E1]				B(E1)(W.u.)=1.3×10^{-5} *3*
1153.78	(9/2$^+$)	350.4 *7*	11 *3*	804.33	(11/2$^+$)	D+Q				
		822.3 *3*	100 *3*	331.63	9/2$^{(+)}$	D				
		847.0 *4*	21 *5*	307.03	(7/2$^+$)					
		1006[&] *1*	8 *3*	146.934	5/2$^{(+)}$					
1249?		942[&] *3*	100	307.03	(7/2$^+$)					
1280.40	(13/2$^-$)	336.6 *2*	3.13 *17*	943.93	11/2$^-$	(M1+E2)		0.009 *3*		B(M1)(W.u.)=0.0090 *13*, B(E2)(W.u.)=104 *15* for δ=1.
		476.4 *5*	1.91 *17*	804.33	(11/2$^+$)	[E1]				B(E1)(W.u.)=6.5×10^{-5} *11*
		665.4 *2*	100 *3*	614.75	9/2$^-$	(E2)				B(E2)(W.u.)=2.2×10^2 *3*
1541.2		1234.2 *5*	100	307.03	(7/2$^+$)					
1575.98	(17/2$^+$)	742.6 *2*	100	833.46	(13/2$^+$)	(E2)				B(E2)(W.u.)=198 *10*
1590.40	(15/2$^+$)	757.0 *2*	31.7 *13*	833.46	(13/2$^+$)	(M1+E2)				B(M1)(W.u.)=0.0099 *8*, B(E2)(W.u.)=22.7 *19* for δ=1.
		786.1 *2*	100 *3*	804.33	(11/2$^+$)	(E2)				B(E2)(W.u.)=119 *9*
1717.38	(15/2$^-$)	773.4 *2*	100 *5*	943.93	11/2$^-$	(E2)				B(E2)(W.u.)=228 *22*

$^{77}_{37}Rb_{40}$-4

Adopted Levels, Gammas (continued)

γ(^{77}Rb) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.[†]	Comments
1717.38	(15/2$^-$)	884.0 *3*		833.46	(13/2$^+$)		Doublet.
1882.56	(13/2$^+$)	729.0 *2*	63 *4*	1153.78	(9/2$^+$)	Q	
		938.5 *2*	47 *3*	943.93	11/2$^-$	D	
		1049.0 *2*	100 *12*	833.46	(13/2$^+$)	D	
		1078.1 *2*	56 *6*	804.33	(11/2$^+$)	D+Q	
2124.95	(17/2$^-$)	407.6 *3*	1.80 *20*	1717.38	(15/2$^-$)	(M1+E2)	B(M1)(W.u.)=0.0088 *13*, B(E2)(W.u.)=70 *11* for δ=1.
		534.7 *5*	2.00 *20*	1590.40	(15/2$^+$)	[E1]	B(E1)(W.u.)=0.000147 *21*
		844.5 *2*	100 *3*	1280.40	(13/2$^-$)	(E2)	B(E2)(W.u.)=204 *21*
2149.5	(11/2$^-$)	1205 *2*		943.93	11/2$^-$		
		1316.1 *5*	100 *8*	833.46	(13/2$^+$)		
		1346 *1*	52 *12*	804.33	(11/2$^+$)		
		1817.9 *5*	32 *4*	331.63	9/2$^{(+)}$		
2388.1	(13/2$^-$)	238.6 *2*	100 *12*	2149.5	(11/2$^-$)	D+Q	
		1107.5 *5*	53 *24*	1280.40	(13/2$^-$)		
2390.6		1557 *1*	100	833.46	(13/2$^+$)		
2529.38	(21/2$^+$)	953.4 *2*	100	1575.98	(17/2$^+$)	(E2)	B(E2)(W.u.)=147 *9*
2596.81	(17/2$^+$)	714.1 *2*	100 *3*	1882.56	(13/2$^+$)	(E2)	
		879.4 *3*	15.6 *10*	1717.38	(15/2$^-$)	D	
		1006.9 *6*	19.3 *21*	1590.40	(15/2$^+$)	D+Q	
		1020.9 *2*	24.0 *16*	1575.98	(17/2$^+$)	D	
		1762[&] *1*	3.1 *10*	833.46	(13/2$^+$)		
2630.59	(19/2$^+$)	1040.2 *2*	100 *3*	1590.40	(15/2$^+$)	(E2)	B(E2)(W.u.)=146 *25*
		1054.6 *2*	24 *3*	1575.98	(17/2$^+$)		
2668.1	(15/2$^-$)	280.0 *2*	100 *15*	2388.1	(13/2$^-$)	D+Q	
		518 *1*	<50	2149.5	(11/2$^-$)		
		1092.1 *5*	25 *5*	1575.98	(17/2$^+$)		
2680.5	(19/2$^-$)	963.1 *2*	100	1717.38	(15/2$^-$)	(E2)	B(E2)(W.u.)=153 *20*
2991.4	(17/2$^-$)	323.3 *2*	100 *9*	2668.1	(15/2$^-$)	D+Q	
		603 *1*	35 *13*	2388.1	(13/2$^-$)		
		866 *1*	26 *9*	2124.95	(17/2$^-$)		
3134.1	(21/2$^-$)	1009.1 *2*	100	2124.95	(17/2$^-$)	(E2)	B(E2)(W.u.)=1.6×10^2 *3*
3229.8	(19/2$^-$)	1104.9 *4*	100	2124.95	(17/2$^-$)	D+Q	
3343.1	(19/2$^-$)	351.7 *2*	100 *13*	2991.4	(17/2$^-$)	D+Q	
		675.2 *5*	79 *8*	2668.1	(15/2$^-$)	Q	
		813.7 *5*	8 *4*	2529.38	(21/2$^+$)		
3353.7		963 *1*	100 *9*	2390.6			
		1777 *1*	100 *9*	1575.98	(17/2$^+$)		
3411.33	(21/2$^+$)	814.5 *2*	100 *4*	2596.81	(17/2$^+$)	(E2)	B(E2)(W.u.)=116 *9*
		881.9[&] *4*	4.9 *16*	2529.38	(21/2$^+$)	[M1+E2]	B(M1)(W.u.)=0.0011 *4*, B(E2)(W.u.)=1.9 *7* for δ=1.
		1838 *2*	4.5 *4*	1575.98	(17/2$^+$)	[E2]	B(E2)(W.u.)=0.089 *10*
3674.41	(25/2$^+$)	1145.2 *2*	100	2529.38	(21/2$^+$)	(E2)	B(E2)(W.u.)=1.5×10^2 *3*
3701.2	(21/2$^-$)	1021 *1*	100	2680.5	(19/2$^-$)	D+Q	
3776.2	(21/2$^-$)	433.4 *3*	100 *13*	3343.1	(19/2$^-$)	D+Q	

$^{77}_{37}Rb_{40}$-5

Adopted Levels, Gammas (continued)

γ(^{77}Rb) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.[†]	α[@]	Comments
3776.2	(21/2⁻)	784.4 *5*	79 *8*	2991.4	(17/2⁻)			
		1651 *1*	88 *13*	2124.95	(17/2⁻)			
3823.4	(23/2⁻)	1142.9 *2*	100	2680.5	(19/2⁻)	(E2)		B(E2)(W.u.)=126 *23*
3894.58	(23/2⁺)	220.8 *3*	1.3 *6*	3674.41	(25/2⁺)	(M1+E2)	0.035 *18*	B(M1)(W.u.)=0.16 *8*, B(E2)(W.u.)=4.3×10^3 *22* for δ=1. RUL(E2)<300 suggests δ<0.3.
		1264.0 *2*	100 *3*	2630.59	(19/2⁺)	(E2)		B(E2)(W.u.)=107 *23*
		1364.7 *3*	20.9 *13*	2529.38	(21/2⁺)			
4122.9	(23/2⁻)	893.4 *7*	100	3229.8	(19/2⁻)			
4216.7	(23/2⁻)	440.6 *2*	77 *9*	3776.2	(21/2⁻)	D+Q		
		515.4 *5*	41 *5*	3701.2	(21/2⁻)			
		873.2 *5*	100 *14*	3343.1	(19/2⁻)			
4303.5	(25/2⁻)	1169.4 *2*	100	3134.1	(21/2⁻)	(E2)		B(E2)(W.u.)=120 *8*
4329.7	(25/2⁺)	918.4 *2*	100 *10*	3411.33	(21/2⁺)	(E2)		B(E2)(W.u.)=114 *17*
		1801 *2*	4.6 *5*	2529.38	(21/2⁺)			
4417.5		1063 *1*	100 *47*	3353.7				
		1889 *1*	42 *21*	2529.38	(21/2⁺)			
4711.6	(25/2⁻)	494.9 *2*	100 *21*	4216.7	(23/2⁻)	D+Q		
		935.4 *5*	100 *21*	3776.2	(21/2⁻)			
4758.6	(25/2⁻)	542 *1*	35 *12*	4216.7	(23/2⁻)			
		982 *1*	100 *24*	3776.2	(21/2⁻)			
		1058 *1*	65 *6*	3701.2	(21/2⁻)			
5006.1	(29/2⁺)	1331.7 *2*	100	3674.41	(25/2⁺)	(E2)		B(E2)(W.u.)=142 *21*
5103.9	(27/2⁻)	980 *1*	13.8 *22*	4122.9	(23/2⁻)	[E2]		B(E2)(W.u.)=27 *6*
		1280.5 *2*	100 *5*	3823.4	(23/2⁻)	(E2)		B(E2)(W.u.)=51 *6*
5176.5	(27/2⁻)	1055 *1*	17 *3*	4122.9	(23/2⁻)			
		1352.5 *5*	100 *5*	3823.4	(23/2⁻)	Q		
5317.6	(27/2⁻)	606 *1*	45 *14*	4711.6	(25/2⁻)			
		1101 *1*	100 *23*	4216.7	(23/2⁻)			
5345.4	(27/2⁺)	1451.3 *5*	100 *6*	3894.58	(23/2⁺)	(E2)		B(E2)(W.u.)>20
		1669 *1*	9.9 *10*	3674.41	(25/2⁺)			
5441.3	(29/2⁺)	1111.6 *2*	100 *4*	4329.7	(25/2⁺)	(E2)		B(E2)(W.u.)=78 *7*
		1766.9 *5*	9.3 *14*	3674.41	(25/2⁺)	[E2]		B(E2)(W.u.)=0.71 *13*
5478.5		1061 *1*	100 *17*	4417.5				
		1804[&] *2*	<42	3674.41	(25/2⁺)			
5639.1	(29/2⁻)	1335.6 *2*	100	4303.5	(25/2⁻)	(E2)		B(E2)(W.u.)>40
5681.5		1264 *1*	100 *22*	4417.5				
		2007 *2*	<110	3674.41	(25/2⁺)			
5851.6	(29/2⁻)	534 *1*	88 *13*	5317.6	(27/2⁻)			
		1140 *1*	100 *25*	4711.6	(25/2⁻)			
5956.4	(29/2⁻)	1198 *1*	100 *17*	4758.6	(25/2⁻)			
		1244 *2*	22 *9*	4711.6	(25/2⁻)			
6299.5	(31/2⁻)	1123.0 *2*	31.8 *19*	5176.5	(27/2⁻)	(E2)		B(E2)(W.u.)>16
		1195.6 *2*	100 *6*	5103.9	(27/2⁻)	(E2)		B(E2)(W.u.)>38

$^{77}_{37}Rb_{40}$-6

γ(^{77}Rb) (continued)

E_i(level)	J^π_i	E_γ	I_γ	E_f	J^π_f	Mult.†	Comments
6525.5	(33/2+)	1519.4 *2*	100	5006.1	(29/2+)	(E2)	B(E2)(W.u.)=1.3×10^2 *4*
6615.6	(31/2−)	1298 *1*	100	5317.6	(27/2−)		
6642.5	(31/2−)	1465.9 *5*	100 *4*	5176.5	(27/2−)	Q	
		1539 *1*	31.9 *21*	5103.9	(27/2−)		
6752.3	(33/2+)	1311.0 *2*	100 *7*	5441.3	(29/2+)	(E2)	B(E2)(W.u.)=45 *7*
		1745.8 *4*	43 *4*	5006.1	(29/2+)	(E2)	B(E2)(W.u.)=4.6 *8*
6806.6		1125 *1*	100 *17*	5681.5			
		1328 *1*	67 *17*	5478.5			
6927.5	(31/2+)	1582.1 *5*	100	5345.4	(27/2+)	Q	
7087.1	(33/2−)	1448.0 *4*	100	5639.1	(29/2−)	Q	
7198.1	(33/2−)	1559 *1*	100	5639.1	(29/2−)	Q	
7358.4	(33/2−)	1402 *1*	100	5956.4	(29/2−)		
7506		2500 *3*	100	5006.1	(29/2+)		
7635.0	(35/2−)	1335.5 *4*	100	6299.5	(31/2−)	Q	
8079.7	(35/2−)	1464 *2*	100	6615.6	(31/2−)		
8168.4	(37/2+)	1416.1 *3*	56.0 *22*	6752.3	(33/2+)	(E2)	B(E2)(W.u.)>14
		1643 *1*	100 *18*	6525.5	(33/2+)	(E2)	B(E2)(W.u.)>12
8263.6		1457 *1*	100	6806.6			
8300.5	(35/2−)	1658 *1*	100	6642.5	(31/2−)	Q	
8316.8	(37/2+)	1563 *1*	11.3 *16*	6752.3	(33/2+)	[E2]	B(E2)(W.u.)=8 *+4−2*
		1791.3 *2*	100 *5*	6525.5	(33/2+)	(E2)	B(E2)(W.u.)=34 *+17−8*
8519.8	(37/2−)	1432.7 *5*	100	7087.1	(33/2−)	Q	
8627.5	(35/2+)	1700 *1*	100	6927.5	(31/2+)		
8832.1	(37/2−)	1634 *1*	100	7198.1	(33/2−)		
8892.1	(37/2−)	1694 *1*	100	7198.1	(33/2−)	Q	
8954.5	(37/2−)	1596 *2*	100	7358.4	(33/2−)		
9146.0	(39/2−)	1511 *1*	100	7635.0	(35/2−)	Q	
9794		1530 *2*	100	8263.6			
9817.3	(41/2+)	1649 *1*	100	8168.4	(37/2+)	(Q)	
10096.8	(41/2−)	1577 *1*	100	8519.8	(37/2−)	Q	
10103.5	(39/2−)	1803 *2*	100	8300.5	(35/2−)		
10209.6	(41/2+)	1892.8 *3*	100 *5*	8316.8	(37/2+)	(E2)	B(E2)(W.u.)>12
		2041 *1*	35.0 *25*	8168.4	(37/2+)	[E2]	B(E2)(W.u.)>2.8
10365.1	(41/2−)	1533 *1*	100	8832.1	(37/2−)		
10774.1	(41/2−)	1882 *2*	100	8892.1	(37/2−)		
10860.0	(43/2−)	1714 *1*	100	9146.0	(39/2−)	Q	
11476		1682 *2*	100	9794			
11582.3	(45/2+)	1765 *1*	100	9817.3	(41/2+)	Q	
11869.8	(45/2−)	1773 *1*	100	10096.8	(41/2−)	Q	
12264.8	(45/2+)	2055 *1*	100 *17*	10209.6	(41/2+)		
		2448 *2*	67 *17*	9817.3	(41/2+)		
12558.6		2349 *1*	100	10209.6	(41/2+)		
12807.0	(47/2−)	1947 *1*	100	10860.0	(43/2−)		

$^{77}_{37}Rb_{40}$-7

Adopted Levels, Gammas (continued)

$\gamma(^{77}Rb)$ (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π
13551.3	$(49/2^+)$	1969 *1*	100	11582.3	$(45/2^+)$
13888	$(49/2^-)$	2018 *2*	100	11869.8	$(45/2^-)$
15013	$(51/2^-)$	2206 *2*	100	12807.0	$(47/2^-)$
15797	$(53/2^+)$	2246 *2*	100	13551.3	$(49/2^+)$
17485	$(55/2^-)$	2472 *3*	100	15013	$(51/2^-)$
18376	$(57/2^+)$	2579 *3*	100	15797	$(53/2^+)$

† From $\gamma(\theta)$ (1983Li11), $\gamma\gamma(\theta)$ (DCO) and asymmetry ratios (1997Ha08). R(DCO) or R(Iγ)=1.0 indicates ΔJ=2, quadrupole (E2 from RUL when $T_{1/2}$ is known); this value is also consistent with (less likely choice of) ΔJ=0, dipole as for 822.3γ, 1020.9γ and 1049.0γ. R(DCO) or R(Iγ)=0.5 indicates ΔJ=1, dipole or dipole with some quadrupole admixture. The D+Q type transitions are assigned (M1+E2) here based on Weisskopf estimates and ΔJ^π.

‡ From $\gamma(\theta)$ (1983Li11).

From RUL, one expects δ<0.04.

@ 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.

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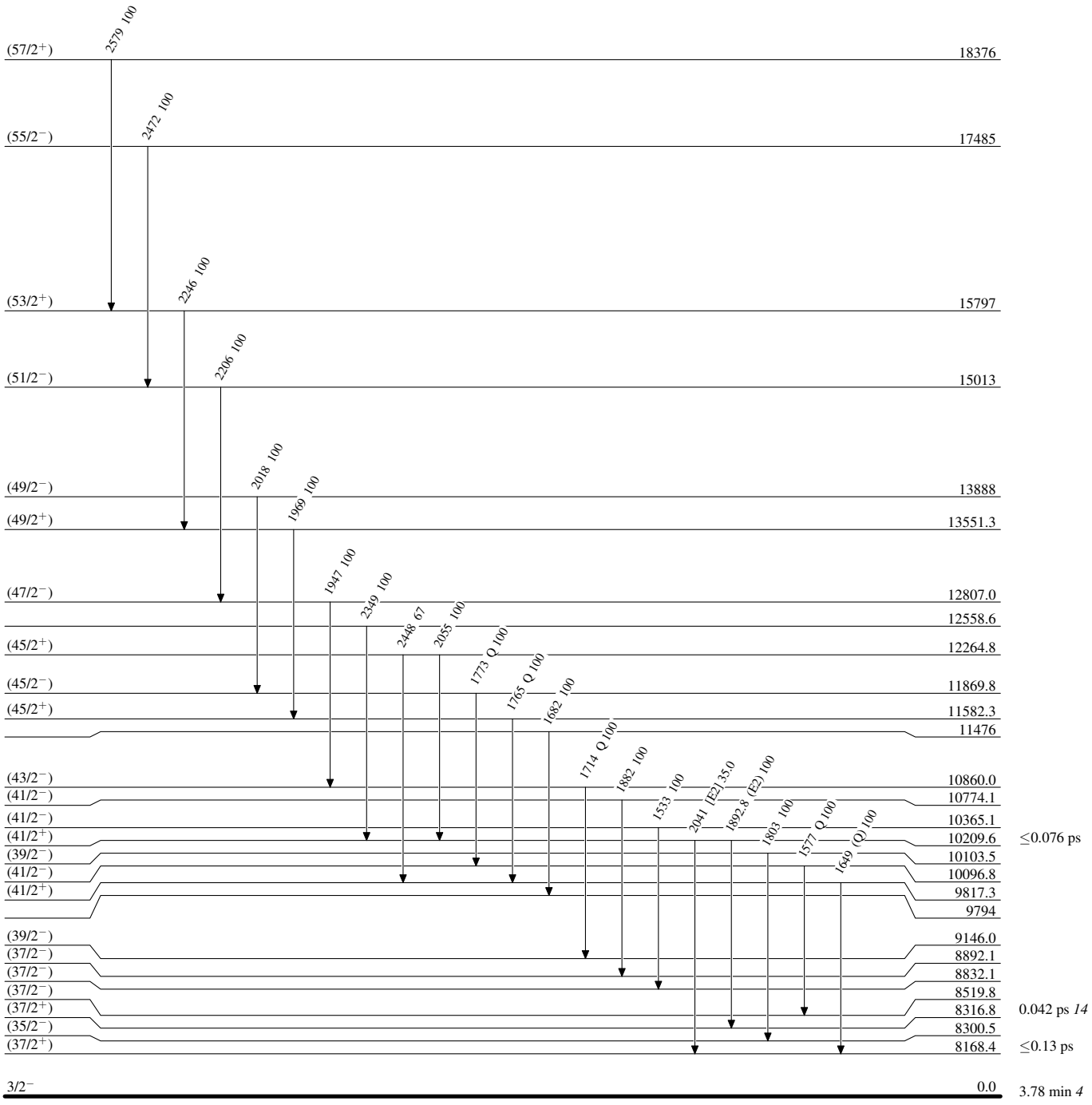
Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

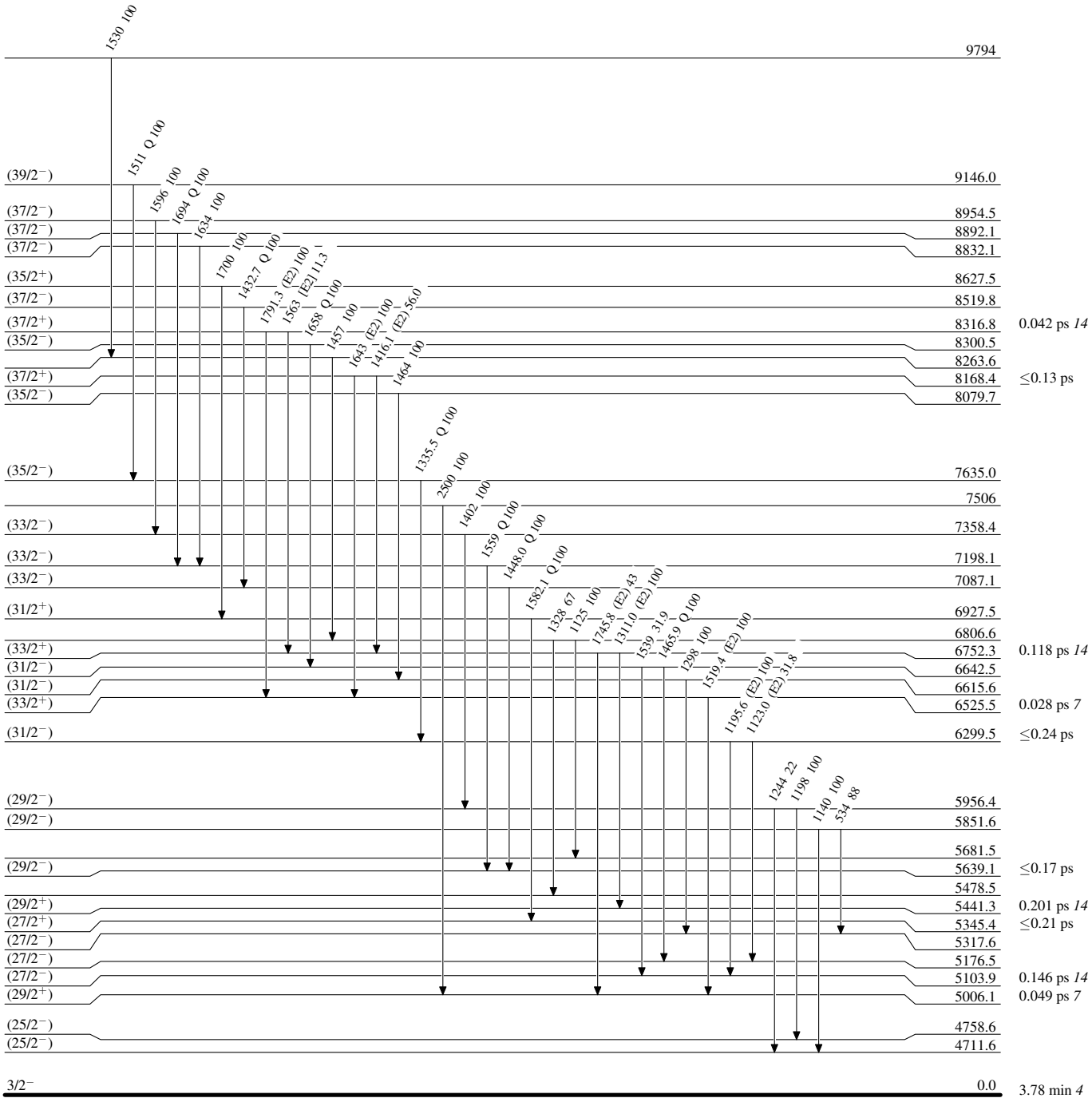


$^{77}_{37}Rb_{40}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{77}_{37}Rb_{40}$

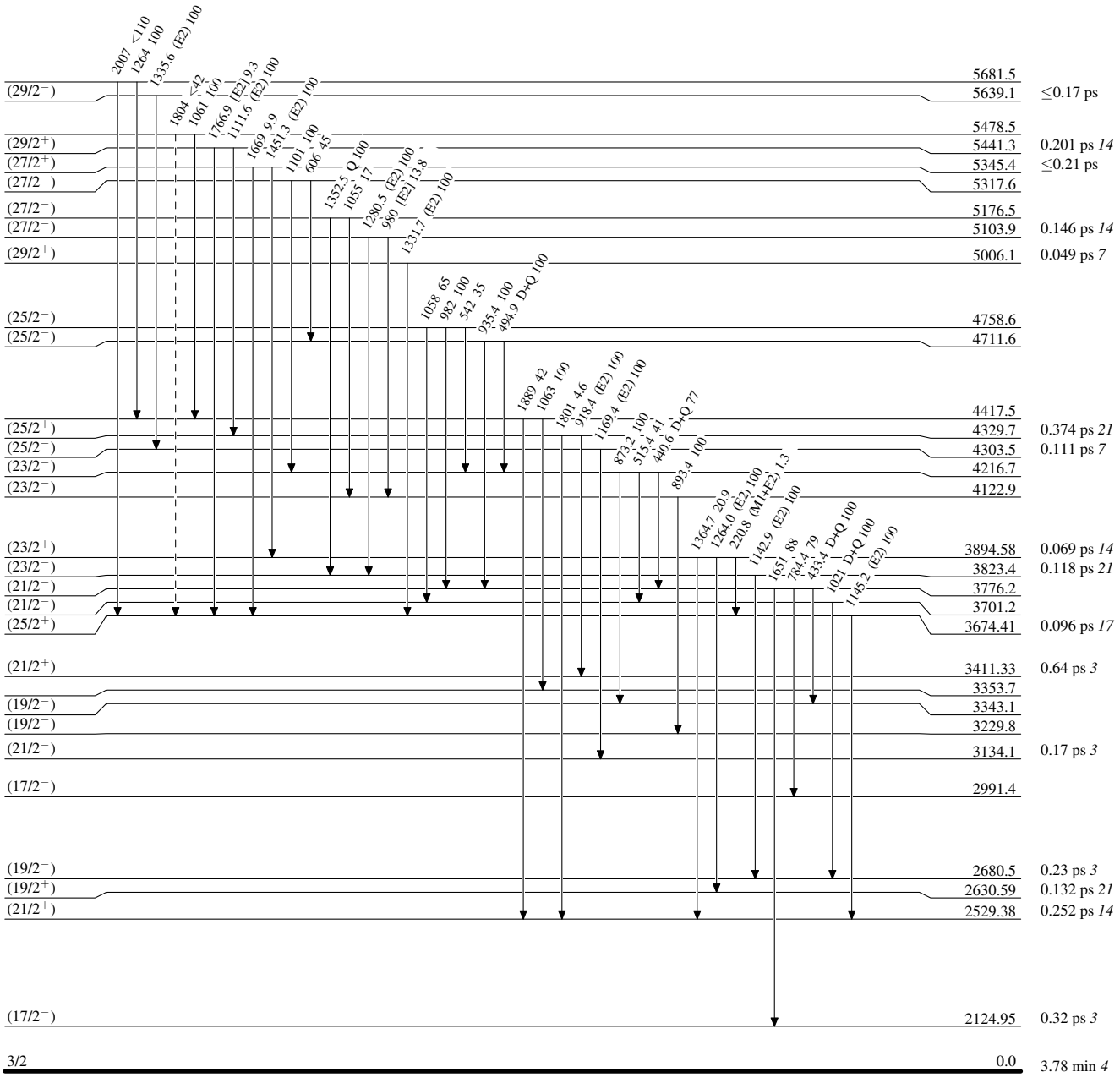
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{77}_{37}Rb_{40}$

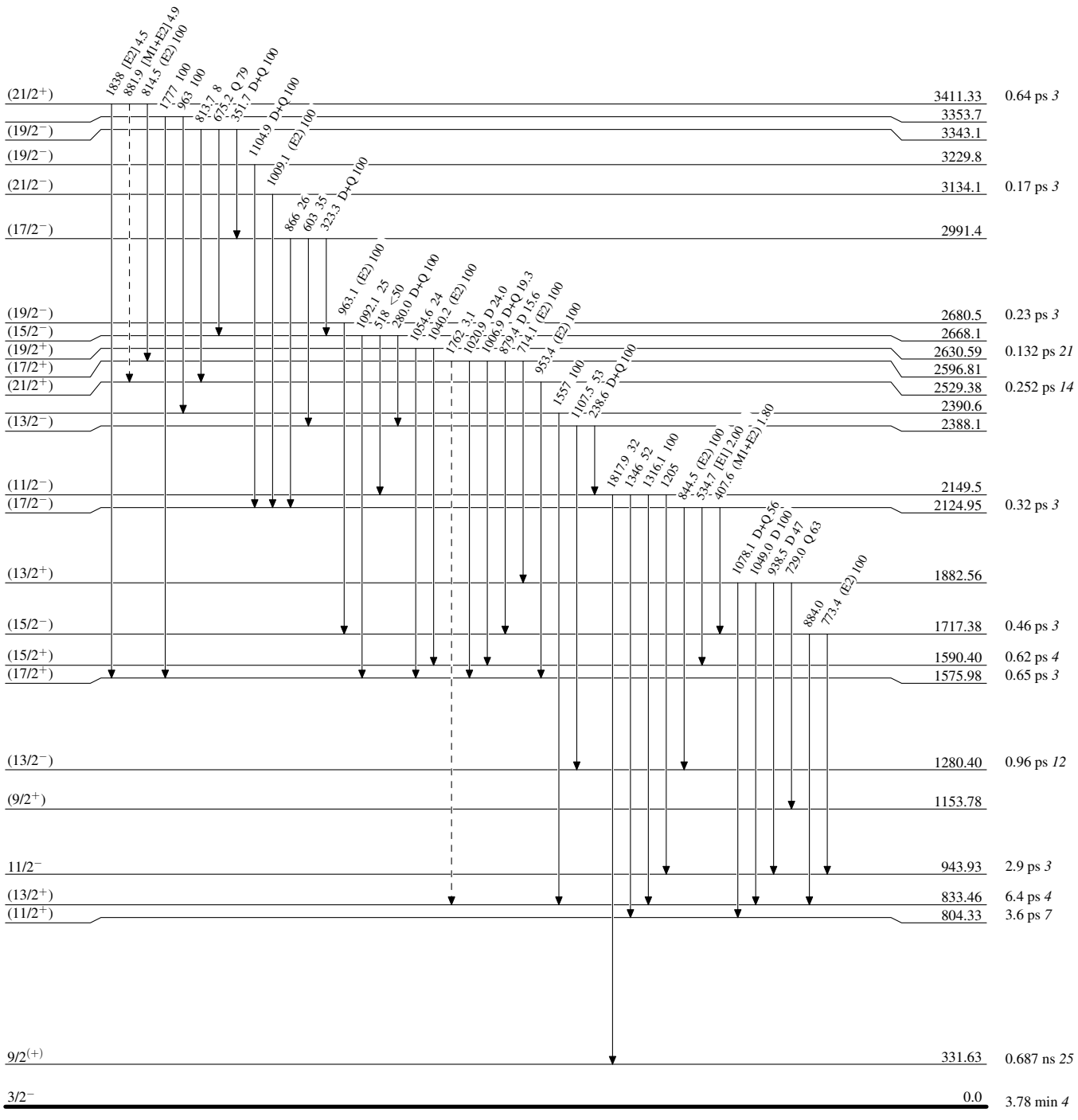
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



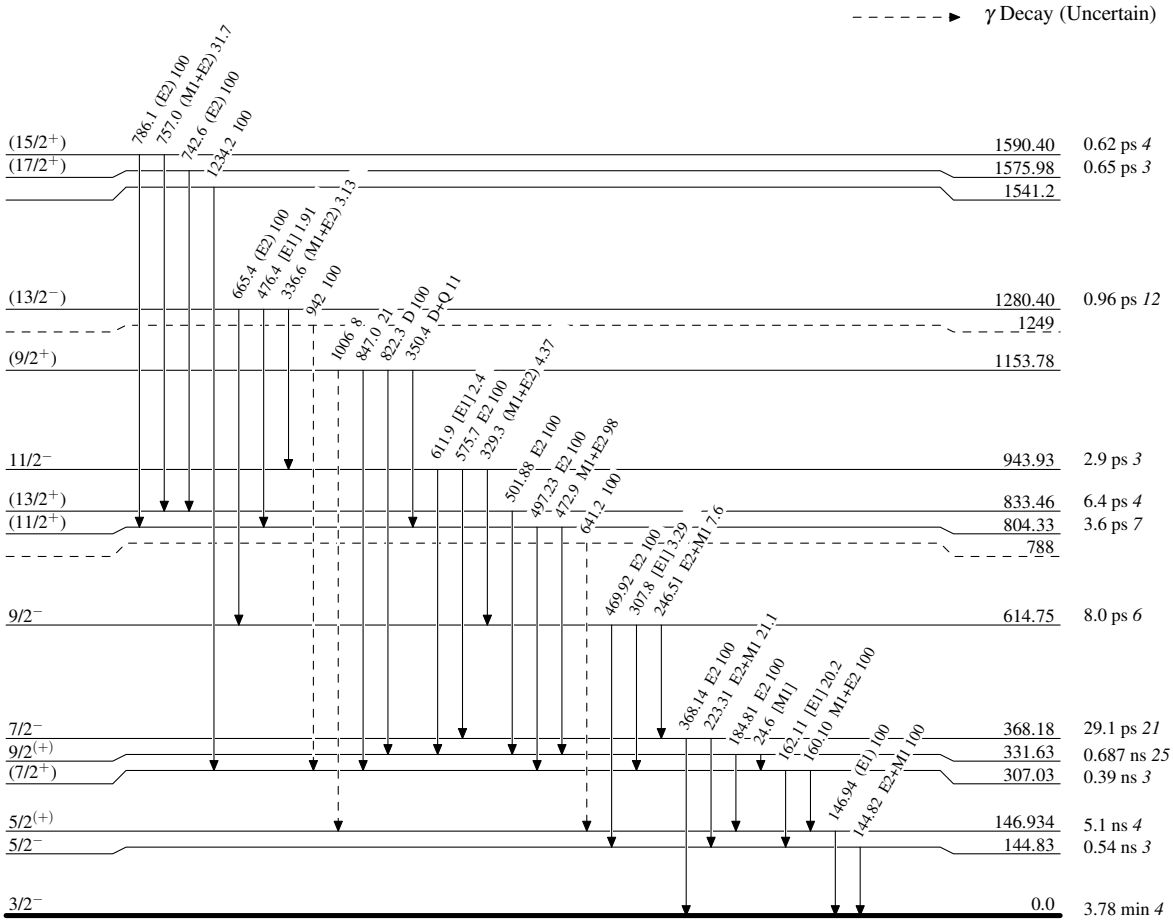
$^{77}_{37}Rb_{40}$

Adopted Levels, Gammas

Legend

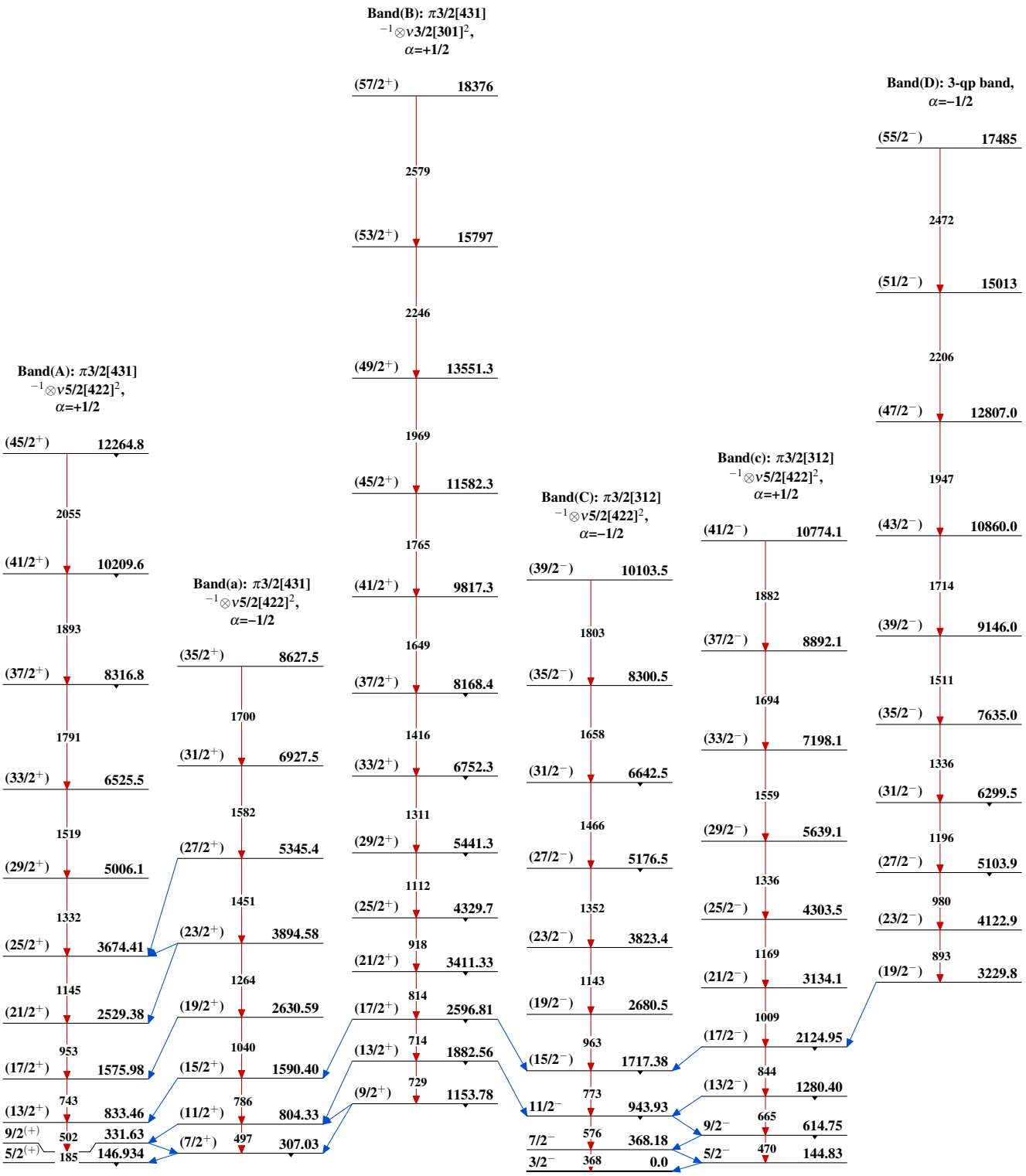
Level Scheme (continued)

Intensities: Relative photon branching from each level



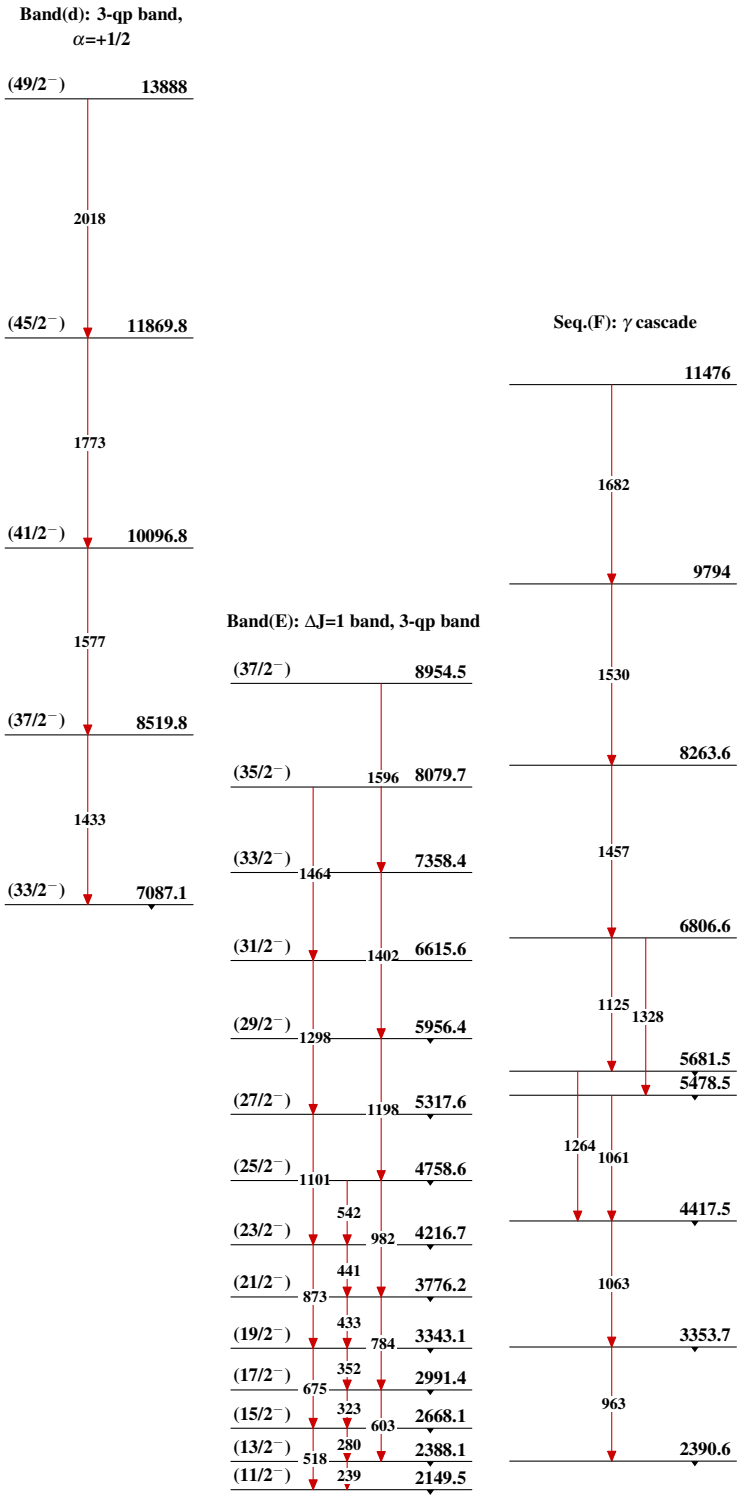
$^{77}_{37}Rb_{40}$

Adopted Levels, Gammas



$^{77}_{37}Rb_{40}$

Adopted Levels, Gammas (continued)



$^{77}_{37}Rb_{40}$