Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Ameenah R. Farhan, Balraj Singh	NDS 110,1917 (2009)	30-Jun-2009

Q(β^-)=−3761 *9*; S(n)=10176 *4*; S(p)=4055 *4*; Q(α)=−4072 *7* 2012Wa38
Note: Current evaluation has used the following Q record −3762 11 *10177* 8 *4056* 8 −4083 *9* 2009AuZZ,2003Au03.
S(2n)=22601 *8*, s(2p)=11225 *12* (2009AuZZ).
Values in 2003Au03: S(n)=10183 *11*, Q(α)=−4055 *17*, s(2n)=22599 *8*; others are the same as in 2009AuZZ.
Mass measurements: 1994Ot01, 1992Bo31, 1982Au01, 1979Ep01.
Additional information 1.
Structure calculations: 2003Pa03, 1997Pe18.
Coulomb excitation: ^{78}Rb beam, ^{58}Ni target: 1998ScZO; no details are available.

^{78}Rb Levels

Cross Reference (XREF) Flags

A	^{78}Rb IT decay (5.74 min)	E	^{54}Fe(^{28}Si,3pnγ),
B	^{78}Sr ε decay (160 s)	F	^{58}Ni(^{23}Na,2pnγ)
C	^{54}Fe(^{28}Si,3pnγ) E=110 MeV	G	^{64}Zn(^{16}O,npγ)
D	^{54}Fe(^{28}Si,3pnγ) E=120 MeV		

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$[#]	XREF	Comments
0.0[e]	0$^{(+)}$	17.66 min *3*	AB D F	%ε+%β^+=100 Δ<r^2> (relative to ^{87}Rb)=0.3060 *23* (1981Th04); isotope shift (relative to ^{87}Rb)=−478.4 *15* (1981Th04). <r^2>$^{1/2}$=4.241 fm *8* (2004An14 evaluation). J$^\pi$: spin from atomic-beam method (1978Ek04,1978Ek05). $\beta\gamma$ coin measurement (1981Ba40) gives negligible feeding of 2$^+$, suggesting π=+; however, π=− is not completely ruled out. Proposed (1978Ek04) configuration= π5/2[422]ν5/2[422] consistent with 0$^+$. T$_{1/2}$: from weighted average of timing of 455γ, 511-keV annihilation radiation, 562γ, 2982γ, 3437γ and 3893γ (1981Ba40,also 1975BaWR thesis). Others: 16.5 min *12* (1979He18), 10.6 min *30* (1974Sa32), 17.5 min *30* (1973Br32), 19 min (1972ArZS), 17.5 min *20* (1972No14).
46.84[c] *14*	(1$^-$)	0.91 μs *4*	AB D F	J$^\pi$: (E1) γ to 0$^{(+)}$. T$_{1/2}$: $\gamma\gamma$(t) (1997Mu02) in ^{78}Sr decay. Other: 0.42 μs *7* from $\gamma\gamma$(t) in ^{58}Ni(^{23}Na,2pnγ) (1996Ka24). Unweighted average of the two values is 0.67 μs *24*.
103.27[e] *9*	1$^{(+)}$		AB D F	J$^\pi$: ΔJ=1, (M1) γ to 0$^{(+)}$.
111.19[&] *22*	4$^{(-)}$	5.74 min *3*	A CDEFG	%ε+%β^+=91 *2*; %IT=9 *2* (1975BaWR) μ=+2.5485 *21* (1981Th04,1989Ra17) Q=+0.81 *4* (1981Th04,1989Ra17) μ,Q: atomic-beam laser spectroscopy (1981Th04). Other: μ=+2.56 *3* (atomic beam method,1978Ek04). See also 2005St24 compilation. %IT decay revised from 10% *2* in 1975BaWR to 9% *2* by the evaluators. See it decay dataset for details. Δ<r^2> (relative to ^{87}Rb)=0.1912 *26*; isotope shift (relative to ^{87}Rb)=−403.8 *17* (1981Th04). T$_{1/2}$: from weighted average of timing of Rb x ray, 46.8γ, 103γ, 455γ, 511-keV annihilation radiation and 664γ (1981Ba40,also 1975BaWR thesis). Others: 5.8 min *2* (1979He18), 4.4 min *8* (1974Sa32), 6.5 min *5* (1973Ba03), 6.0 min *5* (1972No14), 6 min *2* (1972ArZS), 6.0 min *2* (1972De54), 6.55 min *18* (1969Ch18), 6.0 min *10* (1968To05), (1972Bo31). J$^\pi$: spin from atomic-beam method (1978Ek04). (M3) γ to (1$^-$). The measured

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Adopted Levels, Gammas (continued)

^{78}Rb Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
				magnetic moment agrees with proposed (1978Ek04) configuration=π5/2[422]⊗ν3/2[301] of negative parity.
114.9[@] *3*	(4+)		D F	Jπ: possible bandhead of $\pi g_{9/2}\otimes\nu g_{9/2}$ configuration expected from systematics of odd-odd nuclides in this region. A well-developed band is observed up to 19+ with interlocking dipole and quadrupole transitions.
119.70 *22*	(3+)		D F	Jπ: γ from (2+).
134.07[c] *16*	(2−)		B D F	Jπ: ΔJ=1 γ to (1−).
160.73[g] *17*	2(+)		D F	Jπ: ΔJ=2 γ to 0(+); ΔJ=1 γ to 1(+).
232.40[e] *19*	(2+)		D F	Jπ: ΔJ=1 γ to 1(+); γ to (2−).
263.79[&] *23*	(5−)	122 ps *18*	CDEFG	Jπ: ΔJ=1 γ to 4(−).
270.1[@] *3*	(5+)	77 ps *11*	D F	Jπ: ΔJ=1 γ to (4+).
274.39[c] *19*	(3−)		D F	Jπ: ΔJ=1 γ to (2−); γ to (1−).
290.07 *16*	(1)		B D F	Jπ: possible γ to 0(+); possible ε+β+ feeding from 0+.
315.06 *18*	(0−,1,2+)		B D F	Jπ: γ's to 1(+), (1−) and (2−); possible ε+β+ feeding from 0+; (2+) proposed in in-beam γ-ray studies.
327.49[e] *20*	(3+)		D F	Jπ: ΔJ=1 γ to (2+); γ's to (2−) and 4(−).
334.22[f] *20*	(3+)		D F	Jπ: ΔJ=1 γ's to (2+), (2−) and 4(−).
351.03[g] *23*	(3+)		D F	Jπ: ΔJ=1, (M1+E2) γ to 2(+); possible γ to (1+).
395.59[b] *23*	(4−)		D F	Jπ: ΔJ=1 γ to (5−); ΔJ=0 γ to 4(−); γ to (3+).
398.9[a] *4*	(4+)		D F	Jπ: ΔJ=1 γ to (5+); γ to (4+).
422.8[@] *3*	(6+)	67 ps *11*	CDEFG	Jπ: ΔJ=1 γ to (5+); ΔJ=2, E2 γ to (4+).
440.09[c] *21*	(4−)		D F	Jπ: ΔJ=1 γ's to (3+) and (3−); γ to (2−).
475.89[d] *24*	(4−)		D F	Jπ: ΔJ=1 γ's to (3+) and (3−); ΔJ=2 γ to (2−).
488.79[&] *23*	6(−)	26.3 ps *35*	CDEFG	Jπ: ΔJ=2, E2 γ to 4(−); ΔJ=1, M1+E2 γ to (5−); ΔJ=1 γ to (5+).
504.60 *18*	(0−,1)		B D F	Jπ: γ's to 1(+), (1−) and (2−); possible ε+β+ feeding from 0+. No Jπ proposed in in-beam γ-ray studies.
528.83[g] *24*	(4+)		D F	Jπ: ΔJ=1 γ to (3+); ΔJ=2 γ to 2(+).
538.3[f] *3*	(4+)		D F	Jπ: ΔJ=1 γ to (3+).
595.29[b] *23*	(5−)		D F	Jπ: ΔJ=1 γ to (4−); ΔJ=0 γ to (5−).
663.5[c] *3*	(5−)		D F	Jπ: ΔJ=1 γ to (4−); ΔJ=0 γ to (5−); γ to (3−).
667.3[@] *4*	(7+)	9.7 ps *21*	CDEFG	Jπ: ΔJ=2, (E2) γ to (5+); ΔJ=1, M1+E2 γ to (6+).
688.9[a] *4*	(5+)		D F	Jπ: ΔJ=1 γ's to (4+) and (6+).
699.5[d] *3*	(5−)		D F	Jπ: ΔJ=1 γ to (4−); ΔJ=2 γ to (3−).
736.8[a] *4*	(6+)		D F	Jπ: ΔJ=1 γ to (5+); ΔJ=2 γ to (4+); ΔJ=(0) γ to (6+).
767.1[&] *3*	(7−)	9.0 ps *21*	CDEFG	Jπ: ΔJ=2, E2 γ to (5−); ΔJ=1 γ's to 6(−) and (6+).
785.9[f] *4*	(5+)		D F	Jπ: ΔJ=1 γ to (4+).
824.9[g] *5*	(5+)		D F	Jπ: γ's to (3+) and (4+).
852.9[@] *4*	(8+)	20.8 ps *35*	CDEFG	Jπ: ΔJ=1 γ to (7+); ΔJ=2, E2 γ to (6+).
872.19[b] *24*	(6−)		D F	Jπ: ΔJ=1 γ to (5−); ΔJ=0 γ to 6(−); γ to (4−).
896.3? *4*			B	Jπ: γ to 1(+) suggests <4.
949.3[c] *4*	(6−)		D F	Jπ: ΔJ=1 γ to (5−); γ to (4−).
1017.4[d] *4*	(6−)		D F	Jπ: γ's to (4−) and 6(−).
1080.9[g] *5*	(6+)		D F	Jπ: γ's to (4+) and (5+).
1114.4[&] *3*	8(−)	3.5 ps *14*	CDEF	Jπ: ΔJ=1, (M1+E2) γ to (7−); ΔJ=2, E2 γ to 6(−); ΔJ=(0) γ to (6+).
1114.6[a] *4*	(7+)		D F	Jπ: ΔJ=1 γ's to (6+) and (8+); ΔJ=0 γ to (7+).
1165.79[b] *25*	(7−)		D F	Jπ: ΔJ=1 γ to (6−); ΔJ=2 γ to (5−); γ to (7−).
1219.7[@] *4*	(9+)	2.1 ps *7*	CDEFG	Jπ: ΔJ=1, M1+E2 γ to (8+); ΔJ=2, E2 γ to (7+).
1239.8[c] *4*	(7−)		D F	Jπ: ΔJ=1 γ to (6−); γ to (5−).
1350.7[a] *4*	(8+)		D F	Jπ: ΔJ=1 γ to (7+); γ to (6+).

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Adopted Levels, Gammas (continued)

^{78}Rb Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
1357.7[d] *7*	(7^-)		D F	Jπ: γ to (5^-); possible γ to (6^-).
1454.2 *4*	(8^+)		D F	Jπ: ΔJ=(1) γ to (7^+); γ to (6^+).
1474.3[&] *3*	$9^{(-)}$	2.8 ps *14*	CD F	Jπ: ΔJ=1, (M1+E2) γ to (8^-); ΔJ=2, E2 γ to (7^-).
1603.6[b] *4*	(8^-)		D F	Jπ: ΔJ=1 γ to (7^-); γ to (6^-).
1625.5[@] *4*	(10^+)	1.23 ps *+28−21*	CDEFG	Jπ: ΔJ=1, M1+E2 γ to (9^+); ΔJ=2, E2 γ to (8^+).
1678.0[c] *5*	(8^-)		D F	Jπ: γ′s to (6^-) and (7^-).
1744.8[a] *4*	(9^+)		D F	Jπ: ΔJ=1 γ to (8^+); ΔJ=2 γ to (7^+).
1941.6[&] *4*	$10^{(-)}$	0.61 ps *+11−9*	CD F	Jπ: ΔJ=1 γ to $9^{(-)}$; ΔJ=2, E2 γ to $8^{(-)}$.
1984.5[b] *4*	(9^-)		D F	Jπ: γ′s to (7^-) and (8^-).
2023.6[@] *4*	(11^+)	0.63 ps *+12−10*	CDEF	Jπ: ΔJ=1 γ to (10^+); ΔJ=2, E2 γ to (9^+).
2043.6[c] *7*	(9^-)		D F	Jπ: γ′s to (7^-) and (8^-).
2369.2[&] *4*	$11^{(-)}$	0.39 ps *+7−6*	CD F	Jπ: ΔJ=1 γ to $10^{(-)}$; ΔJ=2, E2 γ to $9^{(-)}$.
2651.1[@] *5*	(12^+)		CD F	Jπ: ΔJ=1 γ to (11^+); ΔJ=2 γ to (10^+).
2955.4[&] *7*	$12^{(-)}$	0.28 ps *+7−6*	CD F	Jπ: ΔJ=2, E2 γ to $10^{(-)}$.
3042.0[@] *5*	(13^+)	0.28 ps *+8−6*	CDEF	Jπ: ΔJ=1 γ to (12^+); ΔJ=2, E2 γ to (11^+).
3452.8[&] *8*	(13^-)	0.17 ps *+6−5*	CD F	Jπ: γ to $11^{(-)}$.
3897.1[@] *21*	(14^+)	<0.21 ps	CD F	Jπ: γ to (12^+).
4151.4[&] *13*	(14^-)	<0.24 ps	CD F	Jπ: γ to $12^{(-)}$.
4253.7[@] *10*	(15^+)	0.14 ps *+5−4*	CDEF	Jπ: γ to (13^+).
4730.8[&] *22*	(15^-)	<0.18 ps	CD F	Jπ: γ to (13^-).
5327.1[@] *21*	(16^+)		C	Jπ: γ to (14^+).
5638.7[@] *14*	(17^+)	<0.12 ps	CD F	Jπ: γ to (15^+).
6202.8[&] *24*	(17^-)		C	Jπ: γ to (15^-).
7191.7[@] *25*	(19^+)		CD F	Jπ: γ to (17^+).
7865.9[&] *26*	(19)		C	Jπ: γ to (17^-).
8930.8[@] *27*	(21^+)		C	Jπ: γ to (19^+).
9722.9[&] *28*	(21)		C	Jπ: γ to (19).

[†] From least-squares fit to Eγ′s, assuming Δ(Eγ)=0.3 or 1 keV when not stated.

[‡] From γγ(θ), γ(lin pol) measurements and band assignments, unless stated otherwise. In heavy-ion reactions, ascending spins are assumed as the excitation energy rises.

[#] For levels above 120 keV, values longer than ≈2 ps are from recoil-distance Doppler shift (RDDS) (1998Ka56) and shorted than ≈2 ps are from Doppler-shift attenuation (DSA) method in ^{58}Ni(^{23}Na,2pnγ) reaction (1996Ka24).

[@] Band(A): Yrast πi=+ band. Possible configuration=$\pi g_{9/2}\otimes\nu g_{9/2}$ (1996Ka24) as for neighboring nuclides.

[&] Band(B): Yrast π=− band.

[a] Band(C): Band based on 399, (4^+).

[b] Band(D): Band based on 395, (4^-).

[c] Band(E): Band based on 47, (1^-).

[d] Band(F): Band based on 476, (4^-).

[e] Band(G): g.s. band.

[f] Band(H): Band based on 334, (3^+).

[g] Band(I): Band based on 161, (2^+).

Adopted Levels, Gammas (continued)

γ(^{78}Rb)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[@]	δ[@]	α[&]	Comments
46.84	(1$^-$)	46.8 *2*	100	0.0	0$^{(+)}$	(E1)[‡]		0.882 *17*	α(K)=0.778 *15*; α(L)=0.0886 *17*; α(M)=0.0144 *3*; α(N+..)=0.00161 *3* α(N)=0.00156 *3*; α(O)=5.69×10^{-5} *11* B(E1)(W.u.)=2.11×10^{-6} *11* E_γ: from in-beam γ-ray data and IT decay. 1972LiZL report 47.10 *10* in IT decay.
103.27	1$^{(+)}$	103.30[‡] *10*	100	0.0	0$^{(+)}$	(M1)[‡]		0.1324	α(K)=0.1167 *17*; α(L)=0.01320 *19*; α(M)=0.00218 *4*; α(N+..)=0.000257 *4* α(N)=0.000246 *4*; α(O)=1.043×10^{-5} *15*
111.19	4$^{(-)}$	8.6[‡]		103.27	1$^{(+)}$	[E3]		4.88×10^6	α(L)=4.06×10^6 *6*; α(M)=7.59×10^5 *11*; α(N+..)=6.39×10^4 *9* α(N)=6.39×10^4 *9*; α(O)=6.78 *10*
		64.4[‡]		46.84	(1$^-$)	(M3)[‡]		105.4	α(K)=79.4 *12*; α(L)=21.8 *3*; α(M)=3.81 *6*; α(N+..)=0.408 *6* α(N)=0.397 *6*; α(O)=0.01151 *17*
114.9	(4$^+$)	(4)		111.19	4$^{(-)}$				
119.70	(3$^+$)	(5)		114.9	(4$^+$)				
134.07	(2$^-$)	87.3 *2*	100	46.84	(1$^-$)	D			
160.73	2$^{(+)}$	57.5 *2*	100 *9*	103.27	1$^{(+)}$	D			
		160.7 *3*	72 *22*	0.0	0$^{(+)}$	Q			
232.40	(2$^+$)	98.3 *2*	7 *3*	134.07	(2$^-$)				
		112.7 *2*	8 *4*	119.70	(3$^+$)				
		129.2 *3*	100 *10*	103.27	1$^{(+)}$	D			
263.79	(5$^-$)	148.9 *3*	≈3	114.9	(4$^+$)	D			
		152.6 *1*	≈100	111.19	4$^{(-)}$	D			
270.1	(5$^+$)	155.2 *1*	100	114.9	(4$^+$)	D+Q	+0.11 *5*		
274.39	(3$^-$)	140.3 *2*	100 *8*	134.07	(2$^-$)	D			
		227.6 *3*	15 *4*	46.84	(1$^-$)				
290.07	(1)	156.2	13 *1*	134.07	(2$^-$)				E_γ,I_γ: from ^{78}Sr ε decay. 155γ is a complex line in in-beam γ-ray studies.
		186.7 *3*	34 *2*	103.27	1$^{(+)}$				
		243.1 *3*	100 *5*	46.84	(1$^-$)				
		289.9 *3*	33 *12*	0.0	0$^{(+)}$				E_γ: γ from in-beam γ-ray studies only.
315.06	(0$^-$,1,2$^+$)	24.8	≈8	290.07	(1)				E_γ,I_γ: from ^{78}Sr ε decay only. Expected to Be mostly converted.
		181.3 *4*	42 *2*	134.07	(2$^-$)				I_γ: other: 13 *3* in in-beam γ-ray studies.
		212.2 *3*	92 *5*	103.27	1$^{(+)}$				
		268.1	100 *5*	46.84	(1$^-$)				E_γ: γ from ^{78}Sr ε decay only.
327.49	(3$^+$)	95.1 *3*	100 *8*	232.40	(2$^+$)	D			
		193.4 *3*	6 *3*	134.07	(2$^-$)				
		207.8 *3*	38 *10*	119.70	(3$^+$)				

$^{78}_{37}Rb_{41}$-4

Adopted Levels, Gammas (continued)

γ(^{78}Rb) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[@]	δ[@]	α[&]	Comments
327.49	(3$^+$)	216.3 *3*	31 *8*	111.19	4$^{(-)}$				
334.22	(3$^+$)	173.5 *2*	88 *10*	160.73	2$^{(+)}$	D			
		214.5 *3*	100 *14*	119.70	(3$^+$)	D			Mult.: ΔJ=0 transition.
		223.0 *4*	26 *10*	111.19	4$^{(-)}$	D			
351.03	(3$^+$)	190.3 *2*	100 *7*	160.73	2$^{(+)}$	(M1+E2)	+0.30 *20*	0.031 *8*	α(K)=0.027 *7*; α(L)=0.0031 *9*; α(M)=0.00052 *15*; α(N+..)=6.1×10^{-5} *16* α(N)=5.8×10^{-5} *16*; α(O)=2.4×10^{-6} *6*
		247.8[a] *3*	<7	103.27	1$^{(+)}$				
395.59	(4$^-$)	68.1 *3*	5.4 *25*	327.49	(3$^+$)				
		131.8 *2*	27 *4*	263.79	(5$^-$)	D			
		284.4 *2*	100 *13*	111.19	4$^{(-)}$	D			Mult.: ΔJ=0 transition.
398.9	(4$^+$)	128.8 *2*	58 *6*	270.1	(5$^+$)	D			
		284.0 *2*	100 *13*	114.9	(4$^+$)	(D)			
422.8	(6$^+$)	152.7 *1*	100.0 *25*	270.1	(5$^+$)	D			
		307.9 *1*	30.4 *13*	114.9	(4$^+$)	E2		0.01657	α(K)=0.01456 *21*; α(L)=0.001704 *24*; α(M)=0.000281 *4*; α(N+..)=3.22×10^{-5} *5* α(N)=3.10×10^{-5} *5*; α(O)=1.211×10^{-6} *17* B(E2)(W.u.)=36 *7*
440.09	(4$^-$)	112.6 *3*	89 *19*	327.49	(3$^+$)	D			
		165.7 *2*	100 *8*	274.39	(3$^-$)	D			
		306.0 *3*	11 *6*	134.07	(2$^-$)				
475.89	(4$^-$)	148.4 *3*	41 *8*	327.49	(3$^+$)	D			
		201.5 *3*	100 *16*	274.39	(3$^-$)	D			
		341.8 *4*	72 *16*	134.07	(2$^-$)	Q			
488.79	6$^{(-)}$	218.7 *4*	4.0 *11*	270.1	(5$^+$)	D			
		225.0 *1*	100 *4*	263.79	(5$^-$)	M1+E2	+0.38 *11*	0.0209 *23*	α(K)=0.0184 *20*; α(L)=0.0021 *3*; α(M)=0.00035 *5*; α(N+..)=4.0×10^{-5} *5* α(N)=3.9×10^{-5} *5*; α(O)=1.59×10^{-6} *16* B(M1)(W.u.)=0.037 *6*; B(E2)(W.u.)=140 *80*
		377.6 *1*	69 *4*	111.19	4$^{(-)}$	E2		0.00834	α(K)=0.00735 *11*; α(L)=0.000842 *12*; α(M)=0.0001388 *20*; α(N+..)=1.604×10^{-5} *23* α(N)=1.542×10^{-5} *22*; α(O)=6.18×10^{-7} *9* B(E2)(W.u.)=56 *9*
504.60	(0$^-$,1)	189.8	50 *3*	315.06	(0$^-$,1,2$^+$)				
		214.5	100 *6*	290.07	(1)				
		370.5	31 *3*	134.07	(2$^-$)				
		401.2[#]	≈50[#]	103.27	1$^{(+)}$				
		457.7	94 *6*	46.84	(1$^-$)				
528.83	(4$^+$)	177.8 *2*	100 *17*	351.03	(3$^+$)	D			
		194.6 *3*	37 *10*	334.22	(3$^+$)	D			

$^{78}_{37}Rb_{41}$-5

Adopted Levels, Gammas (continued)

γ(^{78}Rb) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[@]	δ[@]	α[&]	Comments
528.83	(4$^+$)	368.1 *4*	127 *45*	160.73	2$^{(+)}$	Q			
538.3	(4$^+$)	187.3 *2*	100 *14*	351.03	(3$^+$)	D			
		204.1 *3*	113 *34*	334.22	(3$^+$)	D			
595.29	(5$^-$)	155.2 *2*	72 *18*	440.09	(4$^-$)	D			
		199.7 *2*	74 *11*	395.59	(4$^-$)	D(+Q)	+0.03 *5*		
		331.5 *2*	100 *8*	263.79	(5$^-$)	D			Mult.: ΔJ=0 transition.
		484.1 *3*	19 *6*	111.19	4$^{(-)}$				
663.5	(5$^-$)	223.4 *3*	79 *18*	440.09	(4$^-$)	D			
		389.1 *4*	14 *8*	274.39	(3$^-$)				
		399.7 *3*	100 *25*	263.79	(5$^-$)	D			Mult.: ΔJ=0 transition.
667.3	(7$^+$)	244.5 *1*	100.0 *22*	422.8	(6$^+$)	M1+E2	+0.07 *5*	0.0136 *3*	α(K)=0.0121 *3*; α(L)=0.00133 *3*; α(M)=0.000220 *5*; α(N+..)=2.60×10^{-5} *6* α(N)=2.49×10^{-5} *6*; α(O)=1.069×10^{-6} *22* B(M1)(W.u.)=0.13 *3*; B(E2)(W.u.)=14 *+21−14*
		397.2 *3*	13.8 *22*	270.1	(5$^+$)	(E2)			B(E2)(W.u.)=36 *10*
688.9	(5$^+$)	266.1 *4*	29 *6*	422.8	(6$^+$)	D			
		290.0 *3*	100 *13*	398.9	(4$^+$)	D			
699.5	(5$^-$)	223.6 *3*	97 *22*	475.89	(4$^-$)	D			
		425.1 *3*	100 *22*	274.39	(3$^-$)	Q			
736.8	(6$^+$)	47.9 *3*		688.9	(5$^+$)				
		313.8 *3*	37 *6*	422.8	(6$^+$)	(D)			Mult.: ΔJ=0 transition.
		337.9 *3*	36 *6*	398.9	(4$^+$)	Q			
		466.7 *3*	100 *15*	270.1	(5$^+$)	D			
767.1	(7$^-$)	278.3 *2*	59 *4*	488.79	6$^{(-)}$	D			
		344.3 *4*	2.2 *9*	422.8	(6$^+$)	D			
		503.3 *3*	100 *4*	263.79	(5$^-$)	E2			B(E2)(W.u.)=61 *15*
785.9	(5$^+$)	247.6 *5*	100 *18*	538.3	(4$^+$)	D			
		257.1 *3*	68 *17*	528.83	(4$^+$)				
824.9	(5$^+$)	286.6[a] *3*	<150	538.3	(4$^+$)				
		296.1[a] *4*	<100	528.83	(4$^+$)				
		473.9 *4*	100 *50*	351.03	(3$^+$)				
852.9	(8$^+$)	185.6 *2*	54.9 *20*	667.3	(7$^+$)	D+Q	+0.07 *3*		
		430.1 *2*	100 *4*	422.8	(6$^+$)	E2			B(E2)(W.u.)=60 *11*
872.19	(6$^-$)	276.9 *1*	100 *5*	595.29	(5$^-$)	D			
		383.4 *2*	60 *6*	488.79	6$^{(-)}$	D			Mult.: ΔJ=0 transition.
		476.6 *4*	17.1 *25*	395.59	(4$^-$)				
896.3?		793.0[a]	100	103.27	1$^{(+)}$				
949.3	(6$^-$)	285.8 *4*	100 *24*	663.5	(5$^-$)	D			
		509.2 *5*	36 *18*	440.09	(4$^-$)				
1017.4	(6$^-$)	317.9 *4*	38 *12*	699.5	(5$^-$)				
		528.6 *5*	100 *26*	488.79	6$^{(-)}$				

$^{78}_{37}Rb_{41}$-6

Adopted Levels, Gammas (continued)

γ(^{78}Rb) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[@]	δ[@]	Comments
1017.4	(6$^-$)	541.5 *5*	65 *28*	475.89	(4$^-$)			
1080.9	(6$^+$)	295.0 *4*	100 *19*	785.9	(5$^+$)			
		552.1 *5*	36 *14*	528.83	(4$^+$)			
1114.4	8$^{(-)}$	347.3 *3*	37 *4*	767.1	(7$^-$)	(M1+E2)	+0.16 *7*	B(M1)(W.u.)=0.039 *17*; B(E2)(W.u.)=11 *11*
		625.6 *3*	100 *5*	488.79	6$^{(-)}$	E2		B(E2)(W.u.)=60 *30*
1114.6	(7$^+$)	261.7 *3*	25 *7*	852.9	(8$^+$)	D		
		377.8 *2*	100 *10*	736.8	(6$^+$)	D		
		447.3 *3*	21 *7*	667.3	(7$^+$)	D		Mult.: ΔJ=0 transition.
1165.79	(7$^-$)	293.6 *1*	100 *14*	872.19	(6$^-$)	D		
		398.7 *4*	11 *4*	767.1	(7$^-$)			
		570.5 *3*	58 *14*	595.29	(5$^-$)	Q		
1219.7	(9$^+$)	366.8 *1*	100 *3*	852.9	(8$^+$)	M1+E2	+0.12 *5*	B(M1)(W.u.)=0.17 *6*; B(E2)(W.u.)=24 *21*
		552.4 *2*	22 *3*	667.3	(7$^+$)	E2		B(E2)(W.u.)=48 *18*
1239.8	(7$^-$)	290.5 *3*	100 *27*	949.3	(6$^-$)	D		
		576.3 *5*	60 *14*	663.5	(5$^-$)			
1350.7	(8$^+$)	236.1 *2*	34 *6*	1114.6	(7$^+$)	D		
		613.9 *3*	27 *8*	736.8	(6$^+$)			
		683.4 *3*	100 *15*	667.3	(7$^+$)	D(+Q)	+0.07 *11*	
1357.7	(7$^-$)	340.3[a] *4*	<29	1017.4	(6$^-$)			
		658.2 *6*	100 *36*	699.5	(5$^-$)			
1454.2	(8$^+$)	339.6 *3*	100 *23*	1114.6	(7$^+$)	(D)		
		717.4 *4*	89 *28*	736.8	(6$^+$)			
1474.3	9$^{(-)}$	359.9 *3*	26 *5*	1114.4	8$^{(-)}$	(M1+E2)	+0.23 *7*	B(M1)(W.u.)=0.033 *18*; B(E2)(W.u.)=17 *14*
		707.2 *2*	100 *10*	767.1	(7$^-$)	E2		B(E2)(W.u.)=46 *24*
1603.6	(8$^-$)	437.8 *3*	100 *18*	1165.79	(7$^-$)	D		
		731.4 *6*	85 *27*	872.19	(6$^-$)			
1625.5	(10$^+$)	405.8 *2*	19 *3*	1219.7	(9$^+$)	M1+E2	+0.07 *5*	B(M1)(W.u.)=0.0425 *3*; B(E2)(W.u.)=1.6 *+24−16*
		772.6 *2*	100 *8*	852.9	(8$^+$)	E2		B(E2)(W.u.)=71 *+15−18*
1678.0	(8$^-$)	438.2 *4*	31 *15*	1239.8	(7$^-$)			
		728.7 *6*	100 *38*	949.3	(6$^-$)			
1744.8	(9$^+$)	394.1 *2*	100 *14*	1350.7	(8$^+$)	D		
		891.9 *4*	69 *19*	852.9	(8$^+$)	D		
		1077.5 *3*	76 *32*	667.3	(7$^+$)	Q		
1941.6	10$^{(-)}$	467.3 *3*	28 *6*	1474.3	9$^{(-)}$	D		
		827.2 *2*	100 *14*	1114.4	8$^{(-)}$	E2		B(E2)(W.u.)=95 *+23−25*
1984.5	(9$^-$)	380.9 *4*	24 *8*	1603.6	(8$^-$)			
		818.7 *4*	100 *29*	1165.79	(7$^-$)			
2023.6	(11$^+$)	398.1 *2*	94 *10*	1625.5	(10$^+$)	D		
		803.9 *3*	100 *10*	1219.7	(9$^+$)	E2		B(E2)(W.u.)=70 *+14−16*
2043.6	(9$^-$)	365.6[a] *4*	<45	1678.0	(8$^-$)			
		803.8 *5*	100 *33*	1239.8	(7$^-$)			

$^{78}_{37}Rb_{41}$-7

Adopted Levels, Gammas (continued)

γ(^{78}Rb) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult. @	Comments
2369.2	$11^{(-)}$	427.6 *3*	18 *8*	1941.6	$10^{(-)}$	D	
		894.9 *4*	100 *22*	1474.3	$9^{(-)}$	E2	B(E2)(W.u.)=110 *20*
2651.1	(12^+)	627.5 *3*	17 *5*	2023.6	(11^+)	D	
		1025.6 *6*	100 *27*	1625.5	(10^+)	Q	
2955.4	$12^{(-)}$	1013.8 *6*	100	1941.6	$10^{(-)}$	E2	B(E2)(W.u.)=95 *+21−24*
3042.0	(13^+)	390.9 *3*	23 *8*	2651.1	(12^+)	D	
		1018.4 *5*	100 *23*	2023.6	(11^+)	E2	B(E2)(W.u.)=80 *+30−40*
3452.8	(13^-)	1083.6 *7*	100	2369.2	$11^{(-)}$	[E2]	B(E2)(W.u.)=110 *20*
3897.1	(14^+)	1246 *2*	100	2651.1	(12^+)	[E2]	B(E2)(W.u.)>45
4151.4	(14^-)	1196 *1*	100	2955.4	$12^{(-)}$	[E2]	B(E2)(W.u.)>48
4253.7	(15^+)	1211.7 *8*	100	3042.0	(13^+)	[E2]	B(E2)(W.u.)=78 *+23−28*
4730.8	(15^-)	1278 *2*	100	3452.8	(13^-)	[E2]	B(E2)(W.u.)>46
5327.1	(16^+)	1430		3897.1	(14^+)		
5638.7	(17^+)	1385 *1*	100	4253.7	(15^+)	[E2]	B(E2)(W.u.)>47
6202.8	(17^-)	1471		4730.8	(15^-)		
7191.7	(19^+)	1553 *2*	100	5638.7	(17^+)		
7865.9	(19)	1664		6202.8	(17^-)		
8930.8	(21^+)	1739		7191.7	(19^+)		
9722.9	(21)	1857		7865.9	(19)		

† For γ rays from low-spin (J<2) the data are from IT decay and ^{78}Sr ε decay. For levels of higher spins the values are primarily from (^{23}Na,2pnγ) and (^{28}Si,3pnγ) E=120 MeV reactions (1996Ka24).

‡ From ^{78}Rb IT decay, quoted by 1996Ka24 from 1991McZZ.

From ^{78}Sr ε decay.

@ From γ(θ), γγ(θ)(DCO) data, including γ(lin pol) data for selected transitions in the following reactions: (^{28}Si,3pnγ), (^{23}Na,2pnγ) and (^{16}O,npγ) reactions. For gammas from levels of measured lifetimes, RUL for E2 and M2 transitions are also used to discard M2 multipolarity.

& 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.

a Placement of transition in the level scheme is uncertain.

$^{78}_{37}Rb_{41}$-8

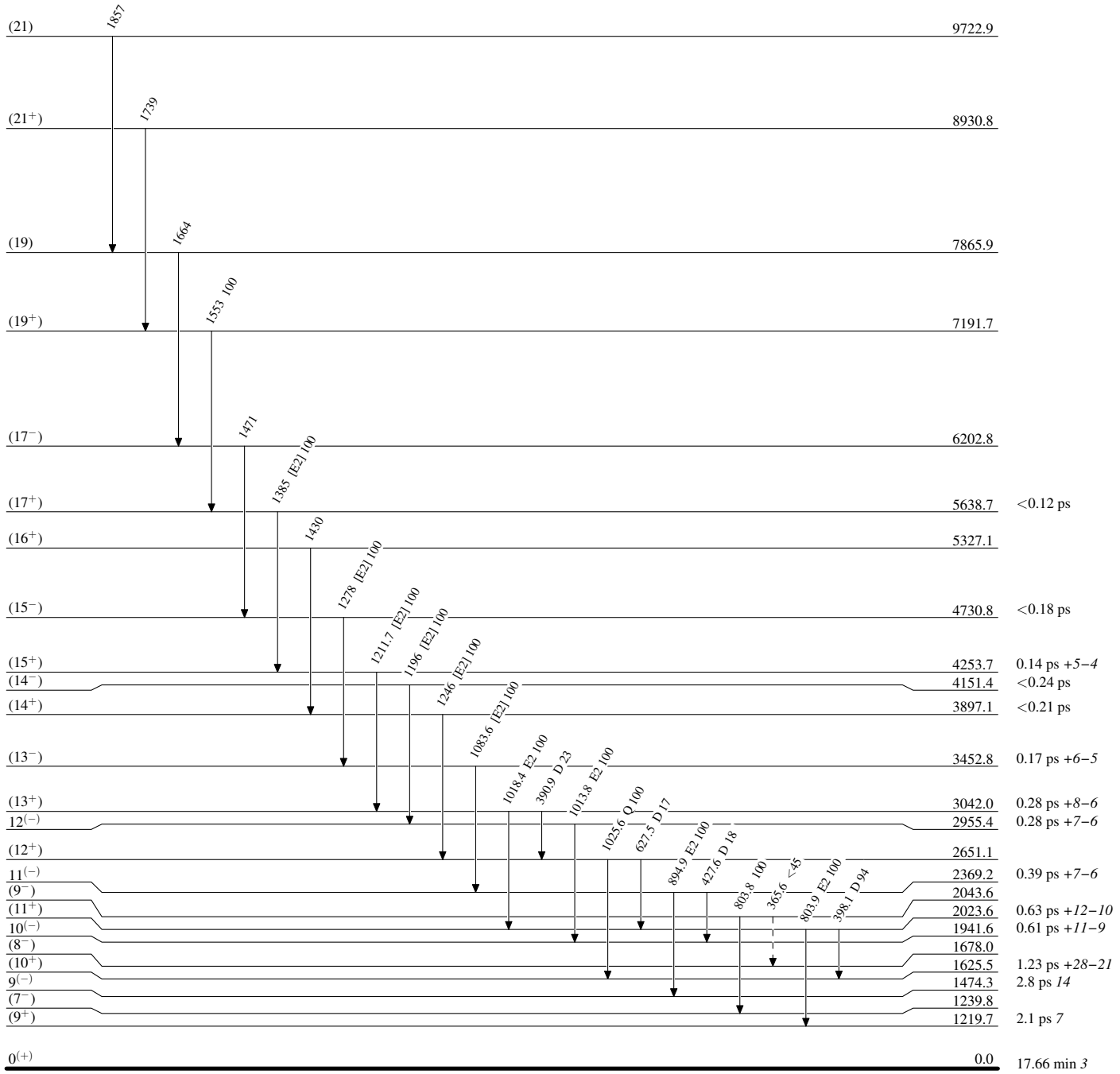
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)



$^{78}_{37}Rb_{41}$

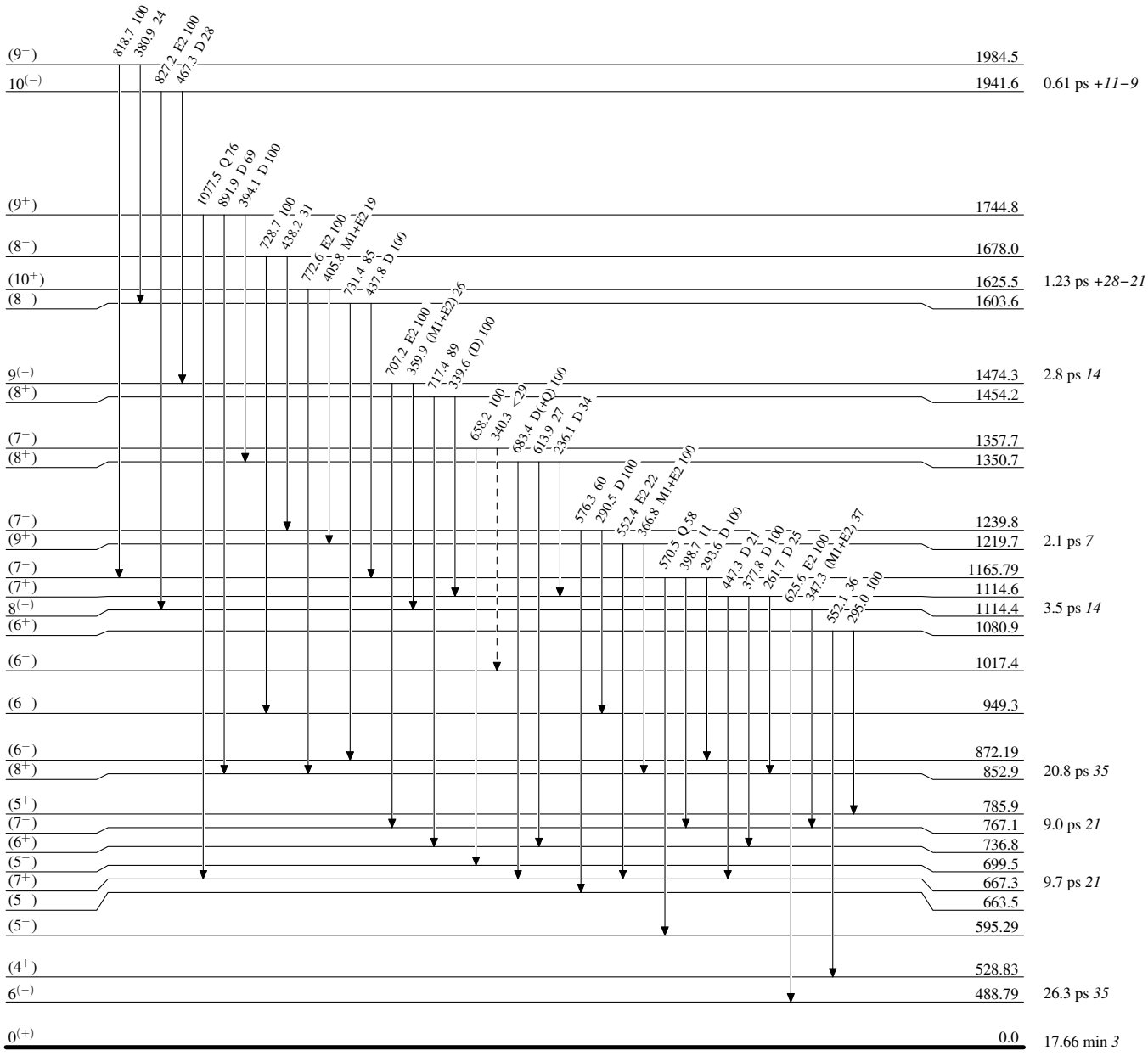
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{78}_{37}Rb_{41}$

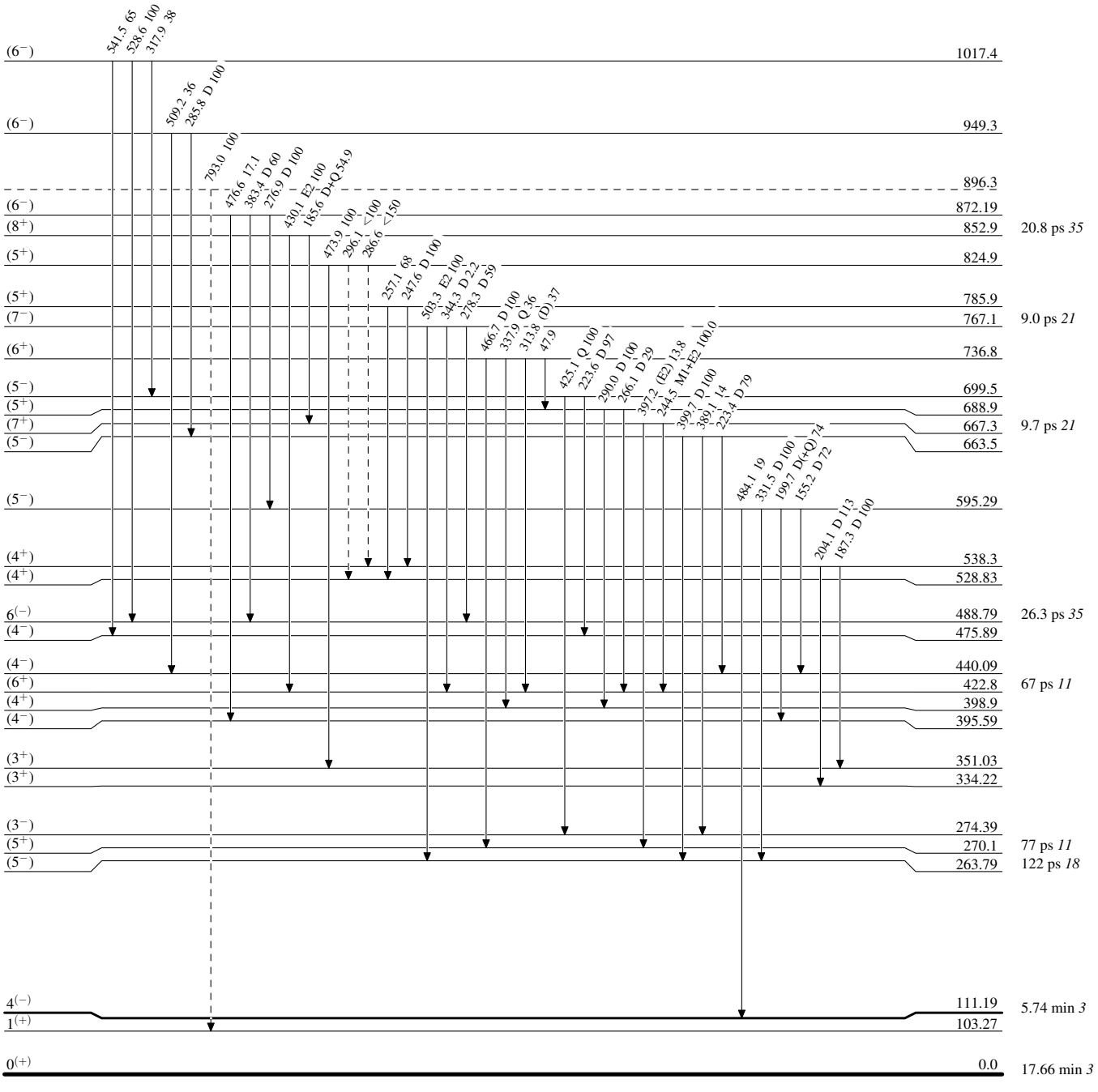
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)



$^{78}_{37}Rb_{41}$

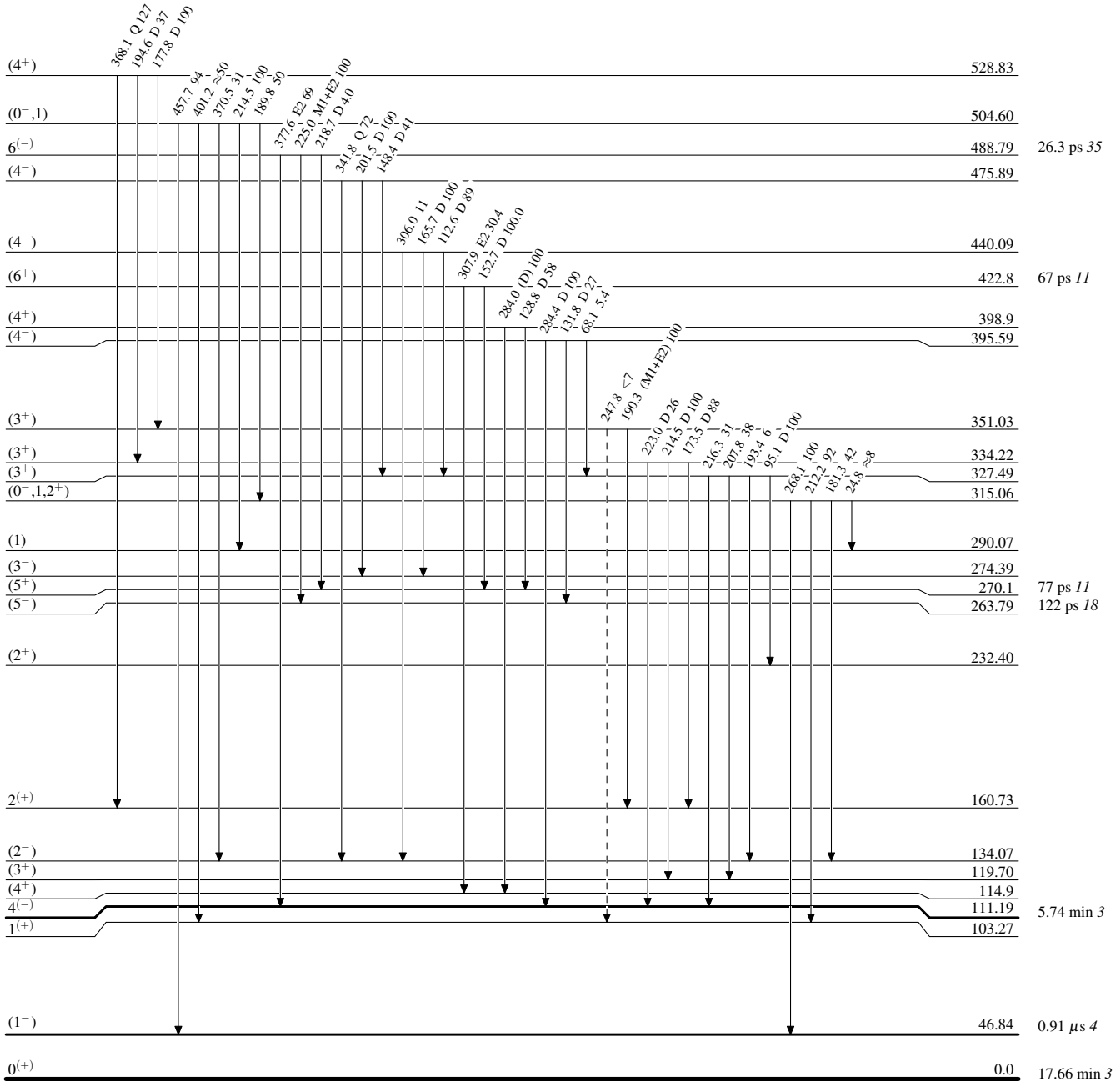
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{78}_{37}Rb_{41}$

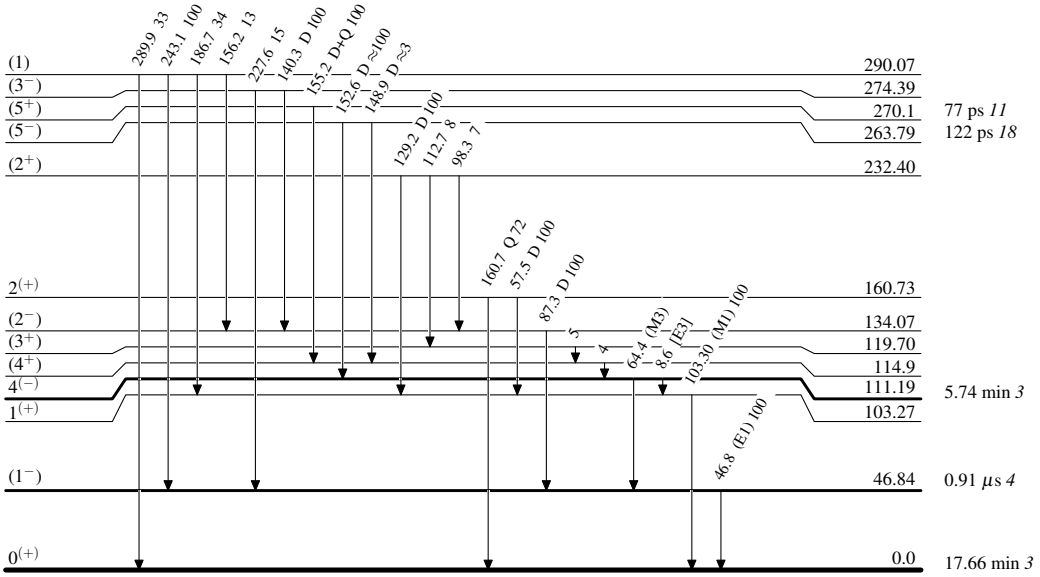
Adopted Levels, Gammas

Legend

Level Scheme (continued)

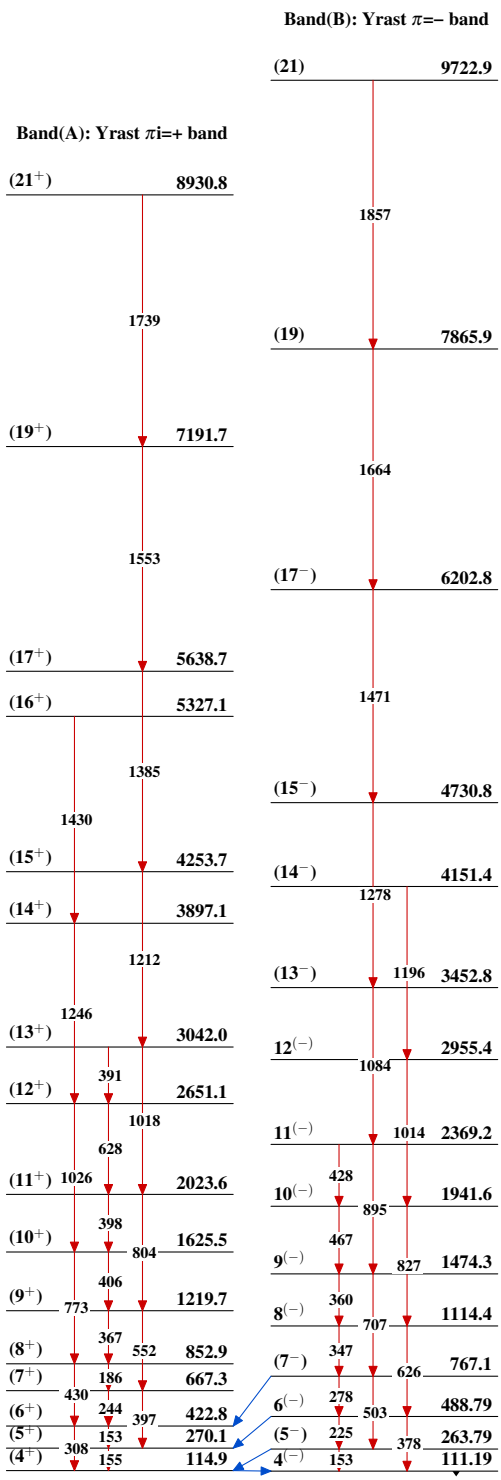
Intensities: Relative photon branching from each level

γ Decay (Uncertain)



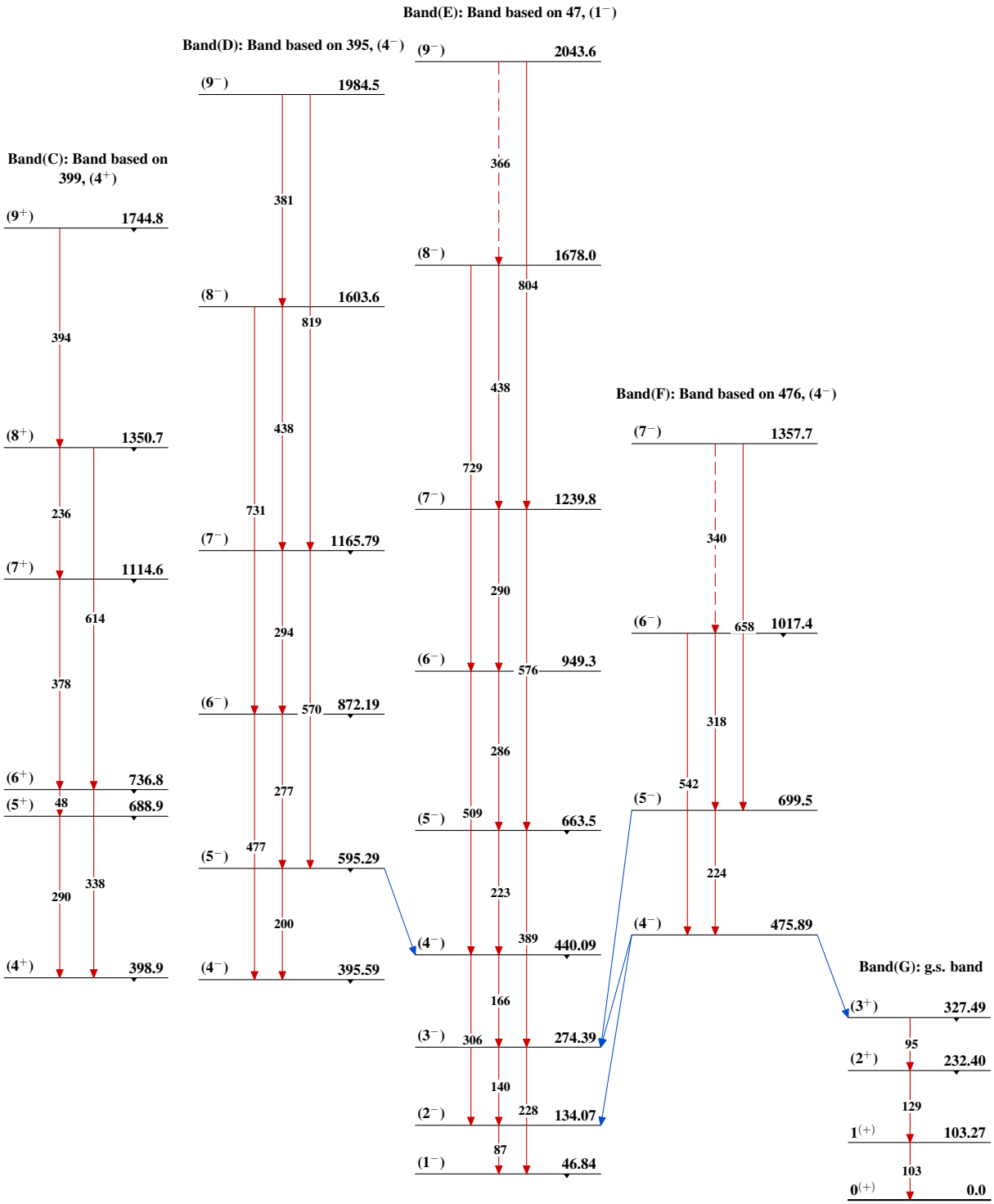
$^{78}_{37}Rb_{41}$

Adopted Levels, Gammas



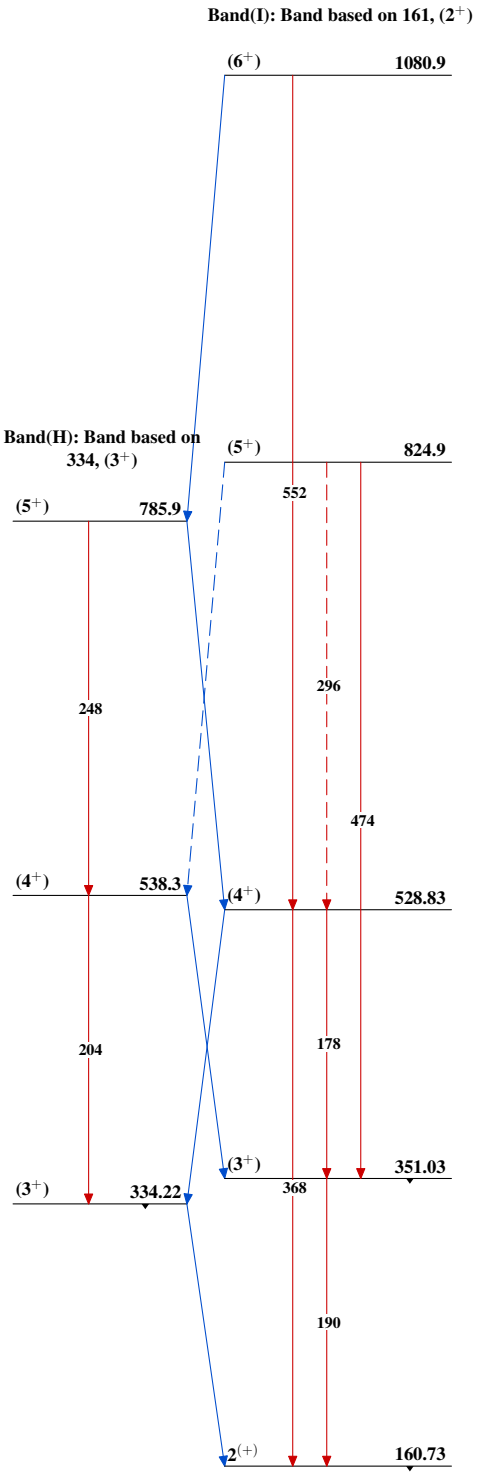
$^{78}_{37}Rb_{41}$

Adopted Levels, Gammas (continued)



$^{78}_{37}Rb_{41}$

Adopted Levels, Gammas (continued)



$^{78}_{37}Rb_{41}$