Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 199,271 (2025)	1-Sep-2024

Q(β^-)=−3929 *6*; S(n)=11353 *5*; S(p)=4852 *5*; Q(α)=−4647 *6* 2021Wa16
S(2n)=20797 *5*, S(2p)=13967 *5* (2021Wa16).

Other Reactions:

Measured yields of ^{81}Rb for 1000 stopped antiproton on ^{95}Mo and ^{98}Mo: 35 *7* and 22 *6*, respectively. The targets were irradiated at LEAR, CERN with an average proton rate of 10^4 per sec for about six hours. Identified residual ^{81}Rb by γ-spectroscopy (1986Mo20).

2015Al19: Isotopic yield cross section σ(^{81}Rb)=0.780 mb *75*, in spallation of ^{136}Xe-induced reactions on deuterium at 500 MeV/nucleon.

^{81}Rb Levels

Band structure is from 1994Do18 with minor band extensions from 1993LiZR (the structure deduced in 1989Ta09 is basically consistent, but much less extensive). 1994Do18 report four more bands than 1993LiZR, but 1993LiZR extend slightly the bands common to both studies. There are, however, several significant inconsistencies between the schemes of 1993LiZR and 1994Do18. Most involve the 3-quasiparticle structure and its interconnection with the lowest π=− and π=+ bands; 1994Do18 report 13 interconnecting transitions, 1993LiZR report 9, but only 2 transitions are common to both studies. Another difference concerns the parity of the 3056 level (π=− in 1994Do18, π=+ in 1993LiZR and 1989Ta09); see comment on J^π for 3056 level. The published study of 1994Do18 has the better statistical accuracy, the unpublished study of 1993LiZR has the potential for populating bands to higher spin. Therefore, the evaluator tentatively adopts band extensions indicated in 1993LiZR, but does not adopt any other structure from 1993LiZR unless it has been confirmed in 1994Do18. The reader is referred to the ^{53}Cr(^{31}P,2pnγ) data set for details of 1993LiZR data not adopted here.

Cross Reference (XREF) Flags

A	^{81}Sr ε decay (22.3 min)	E	^{55}Mn(^{29}Si,2pnγ),	I	^{80}Kr(^{3}He,d)
B	^{81}Rb IT decay (30.5 min)	F	^{65}Cu(^{19}F,p2nγ)	J	^{68}Zn(^{19}F,α2nγ),
C	^{44}Ca(^{37}Cl,γ):giant res	G	^{78}Kr(α,p)		
D	^{53}Cr(^{31}P,2pnγ)	H	^{79}Br(α,2nγ),^{68}Zn(^{16}O,p2nγ)		

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$ or Γ[@]	XREF	Comments
0.0[d]	3/2$^-$	4.571 h *4*	AB DEFGHIJ	%ε+%β^+=100 μ=+2.0591 *14* Q=+0.48 *10* μ: from 2019StZV (in 1981Th04 +2.0595 *14*, atomic beam laser spectroscopy). Q: from 2021StZZ (in 1981Th04 Q$_s$=+0.398 *23* − laser induced optical pumping; includes anti-shielding correction). <r^2>$^{1/2}$(charge)=4.221 fm *5* (2013An02). J$^\pi$: atomic beam (1956Ho52); L(^{3}He,d)=1. T$_{1/2}$: weighted average of 4.570 h *4* (2004Sc04; decay followed for 15 half-lives), 4.580 h *9* (1970Wa38; authors′ value based on independently determined values of 4.582 h *9*, 4.581 h 9 and 4.575 h *35*) and 4.565 h *9* (1982Gr07; followed for 6-10 half-lives). Other: 4.6 h *5* (1972Va41).
86.31[&] *6*	9/2$^+$	30.5 min *3*	AB DEFGHIJ	%IT=97.9 *4*; %ε+%β^+=2.1 *4* μ=+5.5969 *17* Q=−0.90 *19* %ε+%β^+ deduced by the evaluator using data in 1977Li14. See ^{81}Rb ε decay (30.5 m) dataset. %IT=100 − (2.1 *4*). μ: from 2019StZV (in 1981Th04, +5.5980 *17* − atomic beam laser spectroscopy, 1981Th04). Q includes Sternheimer correction.

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Adopted Levels, Gammas (continued)

^{81}Rb Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$ or Γ[@]	XREF	Comments
				Q: From 2020StZV (in 1981Th04 −0.74 *6* − atomic beam laser spectroscopy, includes Sternheimer correction). Jπ: atomic beam (1956Hu69); E3 γ to 3/2⁻. $T_{1/2}$: weighted average of 31.5 min *20* (1956Do52), 30.25 min *25* (1977Li14), 30.59 min *28* (1980Ho28), and 33.2 min *11* (1981FrZY).
153.484[c] *19*	5/2⁻	0.21 ns *10*	A DEF H J	Jπ: L(^{3}He,d)=3+1 for E=184 keV doublet; this level must correspond to the L=3 component since J(188 level)<5/2; D(+Q) γ to 3/2⁻.
188.232 *17*	1/2⁻,3/2⁻		A G I	Jπ: L(^{3}He,d)=3+1 for E=184 keV doublet, presumably L=1 is the dominant component for this level (see comments for 153.484 keV level.). I(ε+β⁺) from 1/2⁻.
245.273 *25*	5/2⁺		A HI	Jπ: L(^{3}He,d)=2; γ to 9/2⁺ is not M3 from RUL.
301.242[f] *16*	(3/2)⁻		A H J	Jπ: γ to 5/2⁺; stronger I(ε+β⁺) feeding from 1/2⁻.
433.7[a] *4*	(7/2⁺)		DE H J	Jπ: D 347γ to 9/2⁺; γ from (5/2)⁺ 828; stretched Q 553γ from (11/2⁺) 987.
443.393 *19*	1/2(−),3/2(−)		A g i	XREF: g(461)i(454). Jπ: stronger I(ε+β⁺) feeding from 1/2⁻; γ to 5/2⁻. 3/2⁻,5/2⁻ doublet at 461 keV in (α,p); however, the 463 level is also a possible candidate for the 3/2⁻ member.
457	(5/2)⁻		g i	XREF: g(461)i(454). E(level): average of 461 (α,p) and 454 (^{3}He,d). Jπ: L(^{3}He,d)=3+1; 3/2⁻ + 5/2⁻ doublet in (α,p). Levels energetically not resolved from neighboring levels, but none of those is a candidate for J^π=5/2⁻.
463.00 *5*	1/2⁺,3/2,5/2,7/2⁻		A gHi	XREF: g(461)i(454). Jπ: (1/2⁺,3/2,5/2,7/2⁻): γs to 5/2⁺ and 3/2⁻. See also comment on J(443 level).
486.69[g] *5*	(5/2⁻)		A H J	Jπ: γs to 3/2⁻ and 5/2⁻; band assignment.
574.737 *23*	(1/2)⁻		A G I	Jπ: J dependence of (α,p) measurement; L(^{3}He,d)=1.
612.27[d] *23*	7/2⁻	3.7 ps *3*	DEF H J	Jπ: E2, ΔJ=2, 612γ to 3/2⁻ g.s.; D γ from 9/2⁻ 913.6; band structure.
630.59 *6*	(5/2⁺)		A GH	Jπ: γ to 3/2⁻ and if the 545γ to 9/2⁺ placement is correct.
702.165 *35*	(1/2⁻,3/2)		A g i	Jπ: I(ε+β⁺) feeding from 1/2⁻; 549γ to 5/2⁻. L(^{3}He,d)=1 at 701 keV; J=(3/2) from J dependence in (α,p) for 705-keV state. π=− for the 702 and/or the 712 level.
709.18[&] *27*	(13/2)⁺	6.0 ps *3*	DEF H J	Jπ: stretched E2 γ to 9/2⁺; band assignment.
711.933 *31*	(1/2⁻,3/2,5/2⁺)		A g i	Jπ: probably fed from 1/2⁻ in ε decay; γ to 5/2⁻. See also comment on J(702 level).
827.5 *7*	(5/2)⁺		GHI	Jπ: J dependence of (α,p); L(^{3}He,d)=2.
896.25[f] *27*	(7/2⁻)		J	Jπ: gammas to 3/2⁻ and 5/2⁻; band assignment.
909.092 *18*	(3/2)⁻		A i	XREF: i(920). Jπ: γ to 5/2⁺; stronger (ε+β⁺) feeding from 1/2⁻, See also comment on J(913 level).
913	(5/2⁺)		G i	XREF: i(920). Jπ: L(^{3}He,d)=2+1 for E(level)=920; J^π=(5/2⁺) from J dependence in (α,p) for E(level)=913. Evaluator assumes the latter corresponds to L=2 component of the (^{3}He,d) doublet; the L=1 component in (^{3}He,d) could correspond to the 909 and/or the 923 level(s).
913.15[c] *28*	9/2⁻	1.46 ps *21*	DEF H J	Jπ: stretched E2 760γ to 5/2⁻ 153; 300.8γ D to 7/2⁻; band structure.
923.02 *8*	(1/2⁻,3/2)		A Hi	XREF: H(?)i(920).

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Adopted Levels, Gammas (continued)

^{81}Rb Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$ or Γ[@]	XREF	Comments
				Jπ: γ to 5/2⁻. See also comment on J(913 level (5/2⁺)).
987.09[a] *30*	(11/2⁺)		DE H J	Jπ: (M1) γ to (13/2)⁺ and (M1+E2) γ to 9/2⁺.
1035.3 *4*	(11/2⁺)		H J	Jπ: possibly a ΔJ=1 γ to 9/2⁺; γ to (13/2)⁺.
1061.43 *7*	1/2⁺		A I	Jπ: L(^{3}He,d)=0.
1130			G	
1174.28[g] *33*	(9/2⁻)		H J	Jπ: gammas to 7/2⁻ and (5/2⁻); band structure.
1218.9 *5*	1/2⁽⁺⁾,3/2		A	Jπ: γ to (1/2⁻,3/2,5/2⁺).
1243.63 *13*	(1/2⁺,3/2)		A	Jπ: γs to 5/2⁺ and 3/2⁻, presence of (ε+β⁺) feeding from 1/2⁻ in ε decay.
1305.0 *7*	(7/2,9/2⁺)		GH	XREF: G(1284). Jπ: J dependence in (α,p).
1381.907 *28*	(3/2)⁻		A	Jπ: γs to 5/2⁺ and (1/2)⁻, stronger I(ε+β⁺) feeding from 1/2⁻ in ε decay.
1390	(5/2)⁺		G I	E(level): average of 1387 (α,p) and 1392 (^{3}He,d). Jπ: L(^{3}He,d)=2; J dependence in (α,p).
1416.42[d] *31*	11/2⁻	1.04 ps *14*	DEF H J	Jπ: E2, ΔJ=2, γ to 7/2⁻; γ to 9/2⁻; band structure.
1464.1 *11*			H	Jπ: γ to (11/2⁺).
1513.11 *12*	(1/2,3/2)		A	Jπ: presence of (ε+β⁺) feeding from 1/2⁻ in ε decay.
1551	7/2⁺,9/2⁺		G I	XREF: G(1543)I(1559). Jπ: L(^{3}He,d)=1+4 for doublet at E≈1559; L=1 component presumed to correspond to 1554 level.
1553.677 *35*	1/2⁻,3/2⁻		A I	XREF: I(1559). Jπ: presence of (ε+β⁺) feeding from 1/2⁻ in ε decay; presumed to be the L=1 component of 1559-keV doublet in (^{3}He,d).
1584.23[&] *33*	(17/2)⁺	0.84 ps *7*	DEF H J	Jπ: E2, ΔJ=2, γ to (13/2)⁺; band structure. $T_{1/2}$: weighted average of 0.73 ps *14* from DSA in ^{55}Mn(^{29}Si,2pnγ) and 0.87 ps *7* from RDM and DSA in ^{65}Cu(^{19}F,p2nγ).
1596.26[f] *35*	(11/2⁻)		J	Jπ: γs to (7/2⁻) and 9/2⁻; band structure.
1721	(5/2)⁺		G I	XREF: I(1726). E(level): from (α,p). Jπ: 5/2 from J dependence of σ(θ) in (α,p); π=+ from L(^{3}He,d)=0+2 for 1726-keV doublet.
1726	1/2⁺		I	Jπ: assuming this is L=0 component of doublet (see comment on 1721 level).
1738.71[c] *29*	13/2⁻	3.33 ps *35*	DEF H J	Jπ: E2, ΔJ=1, γ to 9/2⁻; D γ to 11/2⁻; band assignment.
1774.8[a] *4*	(15/2⁺)		DE H J	Jπ: Q, ΔJ=2, γ to (11/2⁺); D γ to (13/2)⁺; band assignment.
1804.36 *13*	(1/2,3/2)		A G	Jπ: presence of (ε+β⁺) feeding from 1/2⁻ in ε decay.
1848.16 *17*	(1/2⁺,3/2)		A	Jπ: γ to 5/2⁺; presence of (ε+β⁺) feeding from 1/2⁻ in ε decay.
1919.9 *4*	(15/2⁺)		H J	Jπ: Q, ΔJ=2, 933γ to (11/2⁺) 987; D ΔJ=1 1211γ to (13/2)⁺ 709.
1967.69[g] *35*	(13/2⁻)		J	
2072	(5/2)⁺		G I	XREF: G(2060)I(2083). E(level): average of 2060 (α,p) and 2083 (^{3}He,d). Jπ: J dependence in (α,p); L(^{3}He,d)=2.
2165.4 *4*	(1/2⁺)		A I	Jπ: γ to (5/2⁺); presence of (ε+β⁺) feeding from 1/2⁻ in ε decay; probably L=0 component of L=0+2, E=2195 doublet in (^{3}He,d).
2205	(5/2)⁺		G I	E(level): from (α,p); E=2195 for doublet in (^{3}He,d). Jπ: J dependence in (α,p); probably the L=2 component of the L(^{3}He,d)=0+2 doublet.
2264	⁺		I	E(level): For doublet in (^{3}He,d). Jπ: L(^{3}He,d)=0+2.
2294.50[d] *31*	(15/2⁻)		DE H J	Jπ: (E2) γ to 11/2⁻; band assignment.
2393	(5/2)⁺		G I	E(level): from (α,p); 2406 keV doublet in (^{3}He,d).

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Adopted Levels, Gammas (continued)

^{81}Rb Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$ or Γ@	XREF	Comments
				Jπ: J dependence of (α,p) measurement. Probable L=2 component L(^{3}He,d)=0+2 doublet.
2395.2[f] 6	(15/2$^-$)		J	Jπ: γ to (11/2$^-$), band assignment.
≈2406	1/2$^+$		I	Jπ: L=0 component of 2406−keV, L=0+2 doublet in (^{3}He,d).
2425.68[i] 29	(13/2$^-$)		J	Jπ: tentative candidate in ^{68}Zn(^{19}F,α2nγ) for 13/2 member of a band which includes the (17/2$^-$) 2697 level; in that reaction, the 210.5γ (not the unconfirmed 155γ of ^{53}Cr(^{31}P,2pnγ)) was assigned to the γ cascade following the 61γ which deexcites the J=17/2 band member.
2575.7[c] 4	17/2$^-$	1.4 ps 3	DEF H J	Jπ: E2, ΔJ=2, γ to 13/2$^-$; γ to (15/2$^-$); band structure. $T_{1/2}$: not corrected for feeding.
2598			i	E(level),Jπ: doublet: L(^{3}He,d)=1+2.
2599.7 4			iJ	Jπ: (15/2$^-$) – if the 15/2 member of the 3-quasiparticle band (in place of the 2636 level).
2608.1[&] 4	(21/2)$^+$	0.34 ps 6	DEF H J	Jπ: E2 γ to (17/2)$^+$; band assignment. $T_{1/2}$: weighted average of 0.42 ps 14 from ^{65}Cu(^{19}F,p2nγ) and 0.33 ps 6 ^{55}Mn(^{29}Si,2pnγ), both from DSA; not corrected for feeding.
2636.18[h] 28	(15/2$^-$)		D J	Jπ: D γ to (13/2$^-$) and D+Q γ to (13/2)$^+$ 709, band assignment.
2638	3/2$^+$,5/2$^+$		G I	XREF: G(2620)I(2655). Jπ: L(^{3}He,d)=2.
2656.33[e] 33	17/2$^-$	>1 ps	DE J	Jπ: stretched Q 918γ to 13/2$^-$ 1739, 362γ to (15/2$^-$) 2294.
2697.20[i] 28	17/2$^-$		D J	Jπ: stretched Q 959γ to 13/2$^-$ 1739; D 61γ to (15/2$^-$) 2636.
2710.4[a] 5	(19/2$^+$)		DE J	Jπ: γ to (15/2$^+$); band assignment.
2760.0 4	(17/2$^-$)		J	Jπ: γ to (13/2$^-$); stretched 840.5γ Q from (21/2$^-$) 3496.9.
2801	1/2$^+$		G I	XREF: G(2801)I(2812). E(level): from (α,p). Other: 2812 (^{3}He,d). Jπ: J dependence in (α,p); L=0 component of L(^{3}He,d)=0+2 doublet.
2812	3/2$^+$,5/2$^+$		I	XREF: I(2812). Jπ: L=2 component of L(^{3}He,d)=0+2 doublet.
2907	3/2$^+$,5/2$^+$		I	Jπ: L(^{3}He,d)=2.
2997.73[h] 33	(19/2$^-$)		D J	Jπ: D γ to 17/2$^-$, band assignment.
3031	3/2$^+$,5/2$^+$		I	Jπ: L(^{3}He,d)=2.
3055.84[b] 35	(19/2$^-$)[#]		DE J	Jπ: D 1472γ to (17/2)$^+$; 761γ to (15/2$^-$) 2294; band assignment. Other: (19/2$^+$) in ^{68}Zn(^{19}F,α2nγ).
3069.5 5			J	Jπ: gammas to (17/2)$^+$ and (21/2)$^+$.
3194.5[d] 5	(19/2$^-$)		D	Jπ: intraband γ to 17/2$^-$ 2576 and (15/2$^-$) 2294; band assignment.
3242	(5/2)$^+$		G I	XREF: G(3257)I(3227). E(level): average of 3257 (α,p) and 3227 (^{3}He,d). Jπ: J=5/2 from spin dependence of σ(DWBA) in (α,p); L(^{3}He,d)=2.
3286.9[f] 8	(19/2$^-$)		J	Jπ: γ to (15/2$^-$), band assignment.
3295.2[c] 5	(21/2)$^-$	1.6 ps 7	DE H J	Jπ: stretched Q 720γ to 17/2$^-$ 2576; band assignment.
3302	3/2$^+$,5/2$^+$		I	Jπ: L(^{3}He,d)=2.
3427.6[i] 4	(21/2$^-$)	1.04 ps 35	D J	Jπ: D γ to (19/2$^-$), band assignment. $T_{1/2}$: from Doppler-shifted lineshape in ^{68}Zn(^{19}F,α2nγ).
3496.9[e] 5	21/2$^-$	>1 ps	DE J	Jπ: stretched Q γ to 17/2$^-$ 2656, band assignment.
3665.7 5	(19/2,21/2,23/2)		E J	Jπ: D γ to (21/2)$^+$.

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Adopted Levels, Gammas (continued)

^{81}Rb Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$ or Γ@	XREF	Comments
3765.8& 7	$(25/2)^+$	0.166 ps 35	DE H J	Jπ: E2 γ to $(21/2)^+$; band assignment.
3956.4b 4	$(23/2^-)$	1.11 ps 14	D J	Jπ: D γ to $(21/2)^+$; (Q) intraband γ to $(19/2^-)$. Other: $23/2^+$ in (^{31}P,2pnγ). $T_{1/2}$: From Doppler-shifted lineshape in ^{68}Zn(^{19}F,α2nγ).
3993.3h 5	$(23/2^-)$		D J	Jπ: γ to $(19/2^-)$ and $(21/2^-)$, band assignment.
4317.3c 6	$(25/2)^-$	0.25 ps 5	DE J	Jπ: E2 γ to $(21/2)^-$; band assignment.
4496.5e 6	$(25/2^-)$		DE J	Jπ: (E2) γ to $(21/2^-)$; band assignment.
4591.4i 6	$(25/2^-)$		D J	
5062.2b 6	$(27/2^-)$	0.49 ps 14	D J	$T_{1/2}$: from Doppler-shifted lineshape in ^{68}Zn(^{19}F,α2nγ).
5072.3& 8	$(29/2)^+$	<0.18 ps	DE J	Jπ: E2 γ to $(25/2)^+$; band assignment.
5243.4?h 6	$(27/2^-)$		D	
5497.4c 7	$(29/2)^-$	0.236 ps 55	DE J	Jπ: E2 γ to $(25/2)^-$; band assignment.
5645.2e 7	$(29/2^-)$		DE J	Jπ: (E2) γ to $(25/2^-)$; band assignment.
5932.5?i 8	$(29/2^-)$		D	
6259.4b 8	$(31/2^-)$		D J	
6565.3& 10	$(33/2^+)$		DE J	Jπ: (E2) γ to $(29/2)^+$; band assignment.
6683.5?h 8	$(31/2^-)$		D	
6794.4c 8	$(33/2)^-$	<0.243 ps	DE J	Jπ: E2 γ to $(29/2)^-$; band assignment.
6905.0e 8	$(33/2^-)$		D J	
7521.4?b 9	$(35/2^-)$		D	
8195.1 8	$(37/2^-)$		D J	Possible 5-quasiparticle bandhead (1993LiZR).
8240.3& 11	$(37/2^+)$		DE J	Jπ: (E2) γ to $(33/2^+)$; band assignment.
9741.1? 10	$(41/2^-)$		D	
10027.3?& 12	$(41/2^+)$		D	
16.4×10^3 2		7.0 MeV 2	C	E(level): GDR strength=0.90 5.

† Level energies quoted to the nearest keV are from (α,p) and/or (^{3}He,d), if γ deexcitation has not been observed; ΔE is unstated in both reactions, but probably does not exceed ≈35 keV (see comments in (α,p) and (^{3}He,d) data sets). The other values are from a least-squares fit to Eγ, omitting 978.7γ, 1252.8γ, 1382.4γ and 1554.1γ (each of which is at least 3σ from least-squares adjusted value) and arbitrarily assigning ΔE=1 keV to Eγ values whose uncertainties are unknown.

‡ Values which are assigned without comment are based on band structure deduced in ^{68}Zn(^{19}F,α2nγ) and/or ^{53}Cr(^{31}P,2pnγ), combined with γ multipolarity information (from unenumerated DCO ratios in ^{53}Cr(^{31}P,2pnγ), or mostly unstated γ(θ) and γ asymmetry ratio data from ^{68}Zn(^{19}F,α2nγ)).

π is adopted from ^{68}Zn(^{19}F,α2nγ). Opposite π was suggested in ^{53}Cr(^{31}P,2pnγ) and ^{55}Mn(^{29}Si,2pnγ), neither of which reported the 761.4γ which feeds the $(15/2^-)$ 2294 level of the near-yrast π=−, α=−1/2 band in ^{68}Zn(^{19}F,α2nγ) (that γ could plausibly have been masked by the strong 759.7γ from the $9/2^-$ member of the π=−, α=+1/2 near−yrast band). J=19/2 is based on a definite D component in the 1472γ feeding the $17/2^+$ member of the yrast band and a (Q) 901γ from the $(23/2^-)$ 3957 level (which also feeds the $21/2^-$ and $19/2^-$ members of the 3-quasiparticle band).

@ From RDM in ^{65}Cu(^{19}F,p2nγ) if E<2610, and from DSA in ^{55}Mn(^{29}Si,2pnγ) if E≥2610, except as noted.

& Band(A): π $g_{9/2}$ α=+1/2 yrast band.

a Band(B): π $g_{9/2}$ α=−1/2 yrast band.

b Band(C): π=−, α=−1/2 band. Configuration possibly includes (ν $g^2_{9/2}$) (1993LiZR). Connected (via a 761.4γ to the $15/2^-$ 2294 level) to the near-yrast π=−, α=−1/2 band in (^{19}F,α2nγ), but assigned as an independent π=+ band in (^{31}P,2pnγ). See comment on J^π(3055 level). In (^{31}P,2pnγ), a 900γ (different from the 900γ connecting the 23/2 and 19/2 members of this band) feeds the 2294 level; the evaluator presumes this to be incorrect.

c Band(D): Near-yrast π=− band, α=+1/2. For J≥17/2, configuration possibly includes (ν $g^2_{9/2}$) (1993LiZR).

d Band(E): Near-yrast π=− band, α=−1/2.

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Adopted Levels, Gammas (continued)

^{81}Rb Levels (continued)

[e] Band(F): π=−, α=+1/2 yrare band. configuration possibly includes (π $g^2_{9/2}$) (1993LiZR).

[f] Band(G): π=(−), α=−1/2 band.

[g] Band(H): π=−, α=+1/2 band.

[h] Band(I): 3-quasiparticle band, α=−1/2. Possible configuration is (π $g_{9/2}$)(ν $g_{9/2}$)(ν p,f) (1994Do18); alternatively, K^π=11/2$^-$ band arising from odd p coupled to aligned pair of $g_{9/2}$ neutrons (1993LiZR). A 155γ, appearing in cascade between the 61γ and 210γ in ^{53}Cr(^{31}P,2pnγ) is absent in ^{68}Zn(^{19}F,α2nγ), and the interconnection of this band with other bands differs significantly in the two reactions.

[i] Band(J): 3-quasiparticle band, α=+1/2. See comment on signature partner band.

Adopted Levels, Gammas (continued)

$\gamma(^{81}Rb)$

Additional information 1.
For all but 10 transitions observed in in-beam studies, ΔE is unstated by authors.

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[f]	δ	α[g]	Comments
86.31	$9/2^+$	86.3 *2*	100	0.0	$3/2^-$	E3		17.66 *31*	B(E3)(W.u.)=2.51×10^{-3} *6* α(K)=12.12 *20*; α(L)=4.68 *9*; α(M)=0.790 *15* α(N)=0.0739 *14*; α(O)=0.000825 *14* E_γ: from IT decay. Mult.: from subshell ratio data in ^{81}Rb IT decay.
153.484	$5/2^-$	153.54 *3*	100	0.0	$3/2^-$	(M1(+E2))	<0.5	0.061 *16*	B(M1)(W.u.)=0.026 *+27−11* α(K)=0.053 *13*; α(L)=0.0063 *19*; α(M)=0.00104 *31* α(N)=1.16×10^{-4} *32*; α(O)=4.6×10^{-6} *10* Mult.: D from DCO ratio in ^{55}Mn(^{29}Si,2pnγ); adopted Δπ=no. For B(E2)(W.u.)<300, mult.=M1(+E2) with δ<0.5.
188.232	$1/2^-,3/2^-$	188.27 *3*	100	0.0	$3/2^-$	[M1,E2]		0.061 *34*	α(K)=0.053 *30*; α(L)=0.007 *4*; α(M)=0.0011 *6* α(N)=1.2×10^{-4} *7*; α(O)=4.4×10^{-6} *23*
245.273	$5/2^+$	158.96 *6*	17 *3*	86.31	$9/2^+$	[E2]		0.1764 *25*	α(K)=0.1526 *21*; α(L)=0.02008 *28*; α(M)=0.00331 *5* α(N)=0.000354 *5*; α(O)=1.205×10^{-5} *17* Mult.: if M3, RUL would require $T_{1/2}$(245 level)>1 s.
		245.24 *4*	100 *8*	0.0	$3/2^-$	[E1]		0.00697 *10*	α(K)=0.00618 *9*; α(L)=0.000666 *9*; α(M)=0.0001095 *15* α(N)=1.231×10^{-5} *17*; α(O)=5.17×10^{-7} *7*
301.242	$(3/2)^-$	55.95 *3*	0.308 *23*	245.273	$5/2^+$	[E1]		0.527 *7*	α(K)=0.465 *7*; α(L)=0.0522 *7*; α(M)=0.00851 *12* α(N)=0.000926 *13*; α(O)=3.47×10^{-5} *5*
		113.02 *3*	0.57 *5*	188.232	$1/2^-,3/2^-$	[M1,E2]		0.36 *26*	α(K)=0.31 *22*; α(L)=0.044 *34*; α(M)=0.007 *6* α(N)=8.E−4 *6*; α(O)=2.4×10^{-5} *16*
		147.76 *3*	100 *3*	153.484	$5/2^-$	[M1,E2]		0.14 *9*	α(K)=0.12 *8*; α(L)=0.016 *11*; α(M)=0.0026 *18* α(N)=2.8×10^{-4} *19*; α(O)=1.0×10^{-5} *6*
		301.30[c] *3*	4.83 *23*	0.0	$3/2^-$				
433.7	$(7/2^+)$	347.3[b&]	100	86.31	$9/2^+$	(M1)		0.00565 *8*	α(K)=0.00501 *7*; α(L)=0.000547 *8*; α(M)=9.03×10^{-5} *13* α(N)=1.024×10^{-5} *14*; α(O)=4.42×10^{-7} *6* Mult.: D from γ(θ) in ^{79}Br(α,2nγ); intraband γ.
443.393	$1/2^{(-)},3/2^{(-)}$	142.15 *3*	17.3 *5*	301.242	$(3/2)^-$				
		255.16 *3*	8.9 *4*	188.232	$1/2^-,3/2^-$				
		289.95 *5*	0.57 *26*	153.484	$5/2^-$				
		443.34 *4*	100 *3*	0.0	$3/2^-$				

$^{81}_{37}Rb_{44}$-7

Adopted Levels, Gammas (continued)

γ(^{81}Rb) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[f]	α[g]	Comments
463.00	1/2$^+$,3/2,5/2,7/2$^-$	217.73 *4*	100 *11*	245.273	5/2$^+$			
		463.08 *17*	91 *16*	0.0	3/2$^-$			
486.69	(5/2$^-$)	332.8[&]	26	153.484	5/2$^-$			I_γ: from (α,2nγ); γ is absent in ^{81}Sr ε decay (although it should have been observable).
		486.69 *6*	100	0.0	3/2$^-$			E_γ: for presumed doublet in ε decay; see comment under ^{81}Sr ε decay. Eγ=486.5 from ^{68}Zn(^{19}F,α2nγ).
								I_γ: from (α,xnγ).
574.737	(1/2)$^-$	131.56 *14*	0.34 *21*	443.393	1/2$^{(-)}$,3/2$^{(-)}$			
		386.55 *4*	24.4 *13*	188.232	1/2$^-$,3/2$^-$			
		421.29 *6*	14.0 *10*	153.484	5/2$^-$			
		574.67 *3*	100 *3*	0.0	3/2$^-$			
612.27	7/2$^-$	125.8[&]		486.69	(5/2$^-$)			
		458.7[&]	100[#]	153.484	5/2$^-$	(M1+E2)	0.0037 *8*	α(K)=0.0033 *7*; α(L)=0.00036 *8*; α(M)=6.0×10^{-5} *14* α(N)=6.7×10^{-6} *15*; α(O)=2.8×10^{-7} *5* Mult.: (D+Q) from DCO ratio in ^{55}Mn(^{29}Si,2pnγ) for intraband γ. B(M1)(W.u.)=0.0459 *+48−41* if M1, B(E2)(W.u.)=269 *+28−24* if E2.
		612.2[&]	34[#]	0.0	3/2$^-$	E2	1.89×10^{-3} *3*	B(E2)(W.u.)=21.6 *36* α(K)=0.001674 *23*; α(L)=0.0001851 *26*; α(M)=3.05×10^{-5} *4* α(N)=3.43×10^{-6} *5*; α(O)=1.437×10^{-7} *20* Mult.: Q from (HI,xnγ); not M2 from RUL (assuming negligible 126γ branching from 612 level).
630.59	(5/2$^+$)	329[#h]	<9[#]	301.242	(3/2)$^-$			I_γ: from ^{79}Br(α,2nγ) only; uncertainty 10%−50%.
		477.15 *16*	100 *11*	153.484	5/2$^-$			E_γ: from ^{81}Sr ε decay; in ^{79}Br(α,2nγ), a 477γ is placed from both the 631-keV level and a 1464-keV level, based on γγ-coin data.
		545[#h]		86.31	9/2$^+$			
		630.57 *6*	45 *4*	0.0	3/2$^-$			Reported in ε decay only.
702.165	(1/2$^-$,3/2)	548.65 *5*	55 *3*	153.484	5/2$^-$			
		702.14 *9*	100 *4*	0.0	3/2$^-$			
709.18	(13/2)$^+$	622.8[&]	100	86.31	9/2$^+$	E2	1.80×10^{-3} *3*	B(E2)(W.u.)=48.3 *+25−23* α(K)=0.001595 *22*; α(L)=0.0001762 *25*; α(M)=2.91×10^{-5} *4* α(N)=3.27×10^{-6} *5*; α(O)=1.370×10^{-7} *19* Mult.: Q from γ(θ) in ^{79}Br(α,2nγ); not M2 from RUL.

$^{81}_{37}Rb_{44}$-8

Adopted Levels, Gammas (continued)

γ(^{81}Rb) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[f]	α[g]	Comments
711.933	(1/2$^-$,3/2,5/2$^+$)	410.83 *11*	32 *5*	301.242	(3/2)$^-$			
		523.71 *4*	96 *4*	188.232	1/2$^-$,3/2$^-$			
		558.8 *4*	2.7 *14*	153.484	5/2$^-$			
		711.90 *6*	100 *4*	0.0	3/2$^-$			
827.5	(5/2)$^+$	394[#]	100[#]	433.7	(7/2$^+$)			
		582[#h]	<34[#]	245.273	5/2$^+$			
896.25	(7/2$^-$)	595.1[&]		301.242	(3/2)$^-$			
		742.8[&]		153.484	5/2$^-$			
		896.2[&]		0.0	3/2$^-$			
909.092	(3/2)$^-$	197.32 *8*	2.5 *7*	711.933	(1/2$^-$,3/2,5/2$^+$)	[D,E2]	0.052 *28*	α(K)=0.045 *25*; α(L)=0.0055 *32*; α(M)=9.E−4 *5* α(N)=1.0×10^{-4} *6*; α(O)=3.7×10^{-6} *19*
		206.98 *7*	8.4 *8*	702.165	(1/2$^-$,3/2)	[D,E2]	0.044 *23*	α(K)=0.039 *20*; α(L)=0.0047 *26*; α(M)=8.E−4 *4* α(N)=8.E−5 *5*; α(O)=3.2×10^{-6} *16*
		422.47 *15*	10.4 *15*	486.69	(5/2$^-$)			
		465.80 *5*	34.2 *20*	443.393	1/2$^{(-)}$,3/2$^{(-)}$			
		607.88 *3*	38.6 *14*	301.242	(3/2)$^-$			
		663.6 *3*	2.4 *5*	245.273	5/2$^+$			
		720.81 *3*	100 *3*	188.232	1/2$^-$,3/2$^-$			
		909.03 *3*	76.7 *25*	0.0	3/2$^-$			
913.15	9/2$^-$	300.8[&]	50[#]	612.27	7/2$^-$	(M1)	0.00805 *11*	B(M1)(W.u.)=0.18 *+7−6* α(K)=0.00712 *10*; α(L)=0.000781 *11*; α(M)=0.0001290 *18* α(N)=1.462×10^{-5} *20*; α(O)=6.31×10^{-7} *9* Mult.: D from γ(θ) in ^{79}Br(α,2nγ); Δπ=(no) from band structure.
		759.7[&]	100[#]	153.484	5/2$^-$	E2	1.05×10^{-3} *2*	B(E2)(W.u.)=49 *+11−10* α(K)=0.000933 *13*; α(L)=0.0001020 *14*; α(M)=1.681×10^{-5} *24* α(N)=1.897×10^{-6} *27*; α(O)=8.06×10^{-8} *11* Mult.: Q from γ(θ) in ^{79}Br(α,2nγ); not M2 from RUL.
923.02	(1/2$^-$,3/2)	347.8 *3*	17 *15*	574.737	(1/2)$^-$			E_γ: see also comment on 347γ from 434-keV level.
		769.5 *4*	7 *5*	153.484	5/2$^-$			
		923.05 *8*	100 *6*	0.0	3/2$^-$			
987.09	(11/2$^+$)	278.0[&]	59[#]	709.18	(13/2)$^+$	(M1)	0.00979 *14*	α(K)=0.00867 *12*; α(L)=0.000952 *13*; α(M)=0.0001573 *22* α(N)=1.782×10^{-5} *25*; α(O)=7.68×10^{-7} *11* Mult.: D from γ(θ) in ^{79}Br(α,2nγ); Δπ=(no) from band structure.

$^{81}_{37}Rb_{44}$-9

Adopted Levels, Gammas (continued)

γ(^{81}Rb) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[f]	α[g]	Comments
987.09	(11/2$^+$)	553.4[&]	100[#]	433.7	(7/2$^+$)	(E2)	2.53×10^{-3} *4*	α(K)=0.002238 *31*; α(L)=0.0002491 *35*; α(M)=4.11×10^{-5} *6* α(N)=4.60×10^{-6} *6*; α(O)=1.915×10^{-7} *27* Mult.: stretched Q from DCO ratio in ^{55}Mn(^{29}Si,2pnγ); Δπ=(no) from band structure.
		900.7[&]	6[#]	86.31	9/2$^+$	(M1+E2)	6.62×10^{-4} *27*	α(K)=0.000587 *23*; α(L)=6.32×10^{-5} *30*; α(M)=1.04×10^{-5} *5* α(N)=1.18×10^{-6} *5*; α(O)=5.12×10^{-8} *17* Mult.: D+Q from γ(θ) in ^{79}Br(α,2nγ); Δπ=(no) from band structure.
1035.3	(11/2$^+$)	326.1[&]	34[#]	709.18	(13/2)$^+$			
		948.9[&]	100[#]	86.31	9/2$^+$			Mult=D+Q (ΔJ=1) for apparent 949γ doublet in ^{79}Br(α,2nγ).
1061.43	1/2$^+$	486.69[h] *6*	100	574.737	(1/2)$^-$			E_γ: presumed doublet; see comment on 487γ from 487 level.
1174.28	(9/2$^-$)	562.1[&]		612.27	7/2$^-$			
		687.6[&]		486.69	(5/2$^-$)			
1218.9	1/2$^{(+)}$,3/2	507.0 *5*	100	711.933	(1/2$^-$,3/2,5/2$^+$)			
1243.63	(1/2$^+$,3/2)	541.51 *14*	100 *37*	702.165	(1/2$^-$,3/2)			
		998.6 *4*	28 *10*	245.273	5/2$^+$			
		1243.0 *4*	29 *10*	0.0	3/2$^-$			
1305.0	(7/2,9/2$^+$)	871[#h]	100	433.7	(7/2$^+$)			
		1060[#h]		245.273	5/2$^+$			
1381.907	(3/2)$^-$	670.4 *3*	3.6 *6*	711.933	(1/2$^-$,3/2,5/2$^+$)			
		807.04 *18*	2.8 *5*	574.737	(1/2)$^-$			
		895.10 *25*	4.9 *6*	486.69	(5/2$^-$)			
		938.45 *3*	100 *3*	443.393	1/2$^{(-)}$,3/2$^{(-)}$			
		1080.72 *11*	16.6 *8*	301.242	(3/2)$^-$			
		1136.63 *11*	6.7 *5*	245.273	5/2$^+$			
		1193.76 *5*	20.6 *9*	188.232	1/2$^-$,3/2$^-$			
		1382.44[†] *8*	13.7 *7*	0.0	3/2$^-$			E_γ: uncertainty multiplied by a factor of 2 in the fitting; level-energy difference=1381.894.
1416.42	11/2$^-$	503.2[&]	10[#]	913.15	9/2$^-$			
		804.2[&]	100[#]	612.27	7/2$^-$	E2	9.11×10^{-4} *13*	B(E2)(W.u.)=71 *+11−9* α(K)=0.000807 *11*; α(L)=8.79×10^{-5} *12*; α(M)=1.449×10^{-5} *20* α(N)=1.636×10^{-6} *23*; α(O)=6.97×10^{-8} *10* Mult.: Q from γ(θ) in ^{79}Br(α,2nγ); not M2 from RUL.
1464.1		477[#]	100	987.09	(11/2$^+$)			E_γ: for doublet; see comment on 477γ from 631 level.
1513.11	(1/2,3/2)	811.01 *12*	100 *11*	702.165	(1/2$^-$,3/2)			

$^{81}_{37}Rb_{44}$-10

Adopted Levels, Gammas (continued)

γ(^{81}Rb) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[f]	α[g]	Comments
1513.11	(1/2,3/2)	1211.2[d] *4*	41 *8*	301.242	$(3/2)^-$			
		1324.7 *4*	70 *10*	188.232	$1/2^-,3/2^-$			
1553.677	$1/2^-,3/2^-$	644.56 *17*	34 *4*	909.092	$(3/2)^-$			
		841.34 *15*	36 *3*	711.933	$(1/2^-,3/2,5/2^+)$			
		851.39 *6*	100 *4*	702.165	$(1/2^-,3/2)$			
		978.66[†] *7*	63 *4*	574.737	$(1/2)^-$			E_γ: uncertainty multiplied by a factor of 2 in the fitting; level-energy difference=978.93.
		1066.96 *8*	64 *4*	486.69	$(5/2^-)$			
		1090.75 *17*	26.5 *27*	463.00	$1/2^+,3/2,5/2,7/2^-$			
		1110.26 *10*	48 *3*	443.393	$1/2^{(-)},3/2^{(-)}$			
		1252.82[†] *10*	53 *3*	301.242	$(3/2)^-$			E_γ: uncertainty multiplied by a factor of 2 in the fitting; level-energy difference=1252.42.
		1365.68 *22*	22.1 *24*	188.232	$1/2^-,3/2^-$			
		1400.33 *6*	70 *4*	153.484	$5/2^-$			
		1554.15[†] *11*	46 *3*	0.0	$3/2^-$			E_γ: uncertainty multiplied by a factor of 2 in the fitting; level-energy difference=1553.661.
1584.23	$(17/2)^+$	875.1[&]	100	709.18	$(13/2)^+$	E2	7.37×10^{-4} *10*	B(E2)(W.u.)=63 *+6−5* α(K)=0.000653 *9*; α(L)=7.09×10^{-5} *10*; α(M)=1.169×10^{-5} *16* α(N)=1.322×10^{-6} *19*; α(O)=5.65×10^{-8} *8* Mult.: Q from γ(θ) in ^{79}Br(α,2nγ); not M2 from RUL.
1596.26	$(11/2^-)$	683.1[&]		913.15	$9/2^-$			
		700.1[&]		896.25	$(7/2^-)$			
1738.71	$13/2^-$	322.3[&]	9[#]	1416.42	$11/2^-$	(M1)	0.00679 *10*	B(M1)(W.u.)=0.0163 *+36−33* α(K)=0.00601 *8*; α(L)=0.000658 *9*; α(M)=0.0001086 *15* α(N)=1.231×10^{-5} *17*; α(O)=5.32×10^{-7} *7* Mult.: D from DCO ratio in ^{55}Mn(^{29}Si,2pnγ) for intraband γ.
		825.6[&]	100[#]	913.15	$9/2^-$	E2	8.52×10^{-4} *12*	B(E2)(W.u.)=19.5 *+24−19* α(K)=0.000755 *11*; α(L)=8.22×10^{-5} *12*; α(M)=1.354×10^{-5} *19* α(N)=1.530×10^{-6} *21*; α(O)=6.53×10^{-8} *9* Mult.: Q from γ(θ) in (^{16}O,p2nγ); not M2 from RUL.
1774.8	$(15/2^+)$	787.7[&]	39[#]	987.09	$(11/2^+)$	(E2)	9.60×10^{-4} *13*	α(K)=0.000850 *12*; α(L)=9.27×10^{-5} *13*; α(M)=1.529×10^{-5} *21*

$^{81}_{37}Rb_{44}$-11

Adopted Levels, Gammas (continued)

γ(^{81}Rb) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[f]	α[g]	Comments
								α(N)=1.726×10^{-6} *24*; α(O)=7.34×10^{-8} *10* Mult.: Q from γ(θ) in ^{79}Br(α,2nγ) for intraband γ.
1774.8	(15/2$^+$)	1065.8[&]	100[#]	709.18	(13/2)$^+$	(M1)	4.46×10^{-4} *6*	α(K)=0.000396 *6*; α(L)=4.22×10^{-5} *6*; α(M)=6.96×10^{-6} *10* α(N)=7.93×10^{-7} *11*; α(O)=3.47×10^{-8} *5* Mult.: D from γ(θ) in ^{79}Br(α,2nγ) for intraband γ.
1804.36	(1/2,3/2)	1317.54 *24*	48 *12*	486.69	(5/2$^-$)			
		1360.6 *3*	95 *13*	443.393	1/2$^{(-)}$,3/2$^{(-)}$			
		1502.5 *7*	42 *12*	301.242	(3/2)$^-$			
		1616.31 *17*	100 *13*	188.232	1/2$^-$,3/2$^-$			
1848.16	(1/2$^+$,3/2)	1273.45 *19*	100 *11*	574.737	(1/2)$^-$			
		1603.0 *7*	41 *9*	245.273	5/2$^+$			
		1659.6 *5*	14 *5*	188.232	1/2$^-$,3/2$^-$			
1919.9	(15/2$^+$)	335.6[&h]	8.5	1584.23	(17/2)$^+$			
		932.8[&]	62[#]	987.09	(11/2$^+$)	(E2)	6.32×10^{-4} *9*	α(K)=0.000560 *8*; α(L)=6.06×10^{-5} *8*; α(M)=9.99×10^{-6} *14* α(N)=1.130×10^{-6} *16*; α(O)=4.85×10^{-8} *7* Mult.: Q from γ(θ) in ^{79}Br(α,2nγ); an M2 transition could not compete with the D transition deexciting same level.
		1210.8[&]	100[#]	709.18	(13/2)$^+$	(M1)	3.51×10^{-4} *5*	α(K)=0.000305 *4*; α(L)=3.24×10^{-5} *5*; α(M)=5.34×10^{-6} *7* α(N)=6.08×10^{-7} *9*; α(O)=2.67×10^{-8} *4*; α(IPF)=7.44×10^{-6} *10* E_γ: see comment on 1211γ from 1513 level. Mult.: D from γ(θ) in ^{79}Br(α,2nγ); Δπ=(no) from level scheme.
1967.69	(13/2$^-$)	551.3[&]		1416.42	11/2$^-$			
		793.5[&]		1174.28	(9/2$^-$)			
2165.4	(1/2$^+$)	1533.6 *7*	26 *15*	630.59	(5/2$^+$)			
		1679.6 *7*	98 *15*	486.69	(5/2$^-$)			
		1722.2 *7*	100 *15*	443.393	1/2$^{(-)}$,3/2$^{(-)}$			
2294.50	(15/2$^-$)	878.0[&]		1416.42	11/2$^-$	(E2)	7.31×10^{-4} *10*	α(K)=0.000648 *9*; α(L)=7.03×10^{-5} *10*; α(M)=1.159×10^{-5} *16* α(N)=1.311×10^{-6} *18*; α(O)=5.61×10^{-8} *8* Mult.: Q from DCO ratio in ^{55}Mn(^{29}Si,2pnγ) for intraband γ.
		1585.4[&]		709.18	(13/2)$^+$			Reported only in ^{68}Zn(^{19}F,α2nγ).
2395.2	(15/2$^-$)	798.9[&]	100	1596.26	(11/2$^-$)			
2425.68	(13/2$^-$)	829.5[&]	100	1596.26	(11/2$^-$)			
2575.7	17/2$^-$	281.3[&]		2294.50	(15/2$^-$)			
		655.8[&]		1919.9	(15/2$^+$)	[E1]	5.55×10^{-4} *8*	α(K)=0.000492 *7*; α(L)=5.25×10^{-5} *7*; α(M)=8.64×10^{-6} *12* α(N)=9.80×10^{-7} *14*; α(O)=4.23×10^{-8} *6*
		836.9[&]	[e]	1738.71	13/2$^-$	E2	8.24×10^{-4} *12*	α(K)=0.000730 *10*; α(L)=7.94×10^{-5} *11*; α(M)=1.308×10^{-5} *18* α(N)=1.478×10^{-6} *21*; α(O)=6.31×10^{-8} *9*

$^{81}_{37}Rb_{44}$-12

Adopted Levels, Gammas (continued)

γ(^{81}Rb) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[f]	α[g]	Comments
								Mult.: Q from γ(θ) in ^{79}Br(α,2nγ); M2 ruled out by RUL; apparent band structure.
2599.7		861.1[&]		1738.71	13/2$^-$			
		1890.5[&]		709.18	(13/2)$^+$			
2608.1	(21/2)$^+$	1024.0[&]	100	1584.23	(17/2)$^+$	E2	5.07×10^{-4} *7*	B(E2)(W.u.)=71 *+15−11* α(K)=0.000450 *6*; α(L)=4.85×10^{-5} *7*; α(M)=8.00×10^{-6} *11* α(N)=9.06×10^{-7} *13*; α(O)=3.90×10^{-8} *5* Mult.: Q from γ(θ) in ^{79}Br(α,2nγ); not M2 from RUL.
2636.18	(15/2$^-$)	210.5[&] *1*		2425.68	(13/2$^-$)	D		γ seen in ^{53}Cr(^{31}P,2pnγ) also, but placed differently there. Mult.: from γ(θ) in ^{68}Zn(^{19}F,α2nγ).
		341.6[&]		2294.50	(15/2$^-$)			
		1926.4[&] *5*	*e*	709.18	(13/2)$^+$	D+Q		Mult.: from γ(θ) and γ asymmetry in ^{68}Zn(^{19}F,α2nγ).
2656.33	17/2$^-$	361.8[&]		2294.50	(15/2$^-$)			361.3γ was reported in ^{53}Cr(^{31}P,2pnγ) but placed elsewhere.
		917.6[&] *2*	*e*	1738.71	13/2$^-$	Q		Mult.: from γ(θ) in ^{68}Zn(^{19}F,α2nγ).
2697.20	17/2$^-$	61.0[&] *1*		2636.18	(15/2$^-$)	D		Mult.: from γ(θ) in ^{68}Zn(^{19}F,α2nγ).
		97.5[&]		2599.7				
		402.7[&]		2294.50	(15/2$^-$)			
		729.6[&]		1967.69	(13/2$^-$)			γ was reported in ^{53}Cr(^{31}P,2pnγ), but placed from 3428 level there.
		922.4[&]		1774.8	(15/2$^+$)			
		958.5[&] *2*		1738.71	13/2$^-$	Q		Mult.: from γ(θ) and γ asymmetry in ^{68}Zn(^{19}F,α2nγ).
		1113.1[&]		1584.23	(17/2)$^+$			
2710.4	(19/2$^+$)	935.7[&]		1774.8	(15/2$^+$)			
		1126.0[&]		1584.23	(17/2)$^+$			
2760.0	(17/2$^-$)	792.4[&]		1967.69	(13/2$^-$)			
		1021.3[&]		1738.71	13/2$^-$			
2997.73	(19/2$^-$)	300.5[&] *2*	100	2697.20	17/2$^-$	D		Mult.: from γ asymmetry in ^{68}Zn(^{19}F,α2nγ).
3055.84	(19/2$^-$)	761.4[&]		2294.50	(15/2$^-$)			Reported in ^{68}Zn(^{19}F,α2nγ) only. Possibly masked by strong 760γ in other reaction studies.
		1471.6[&] *3*	*e*	1584.23	(17/2)$^+$	D		Mult.: from DCO ratio in ^{55}Mn(^{29}Si,2pnγ).
3069.5		461.5[&]		2608.1	(21/2)$^+$			
		1485.2[&]		1584.23	(17/2)$^+$			
3194.5	(19/2$^-$)	619[@]		2575.7	17/2$^-$			
		900.0[@]		2294.50	(15/2$^-$)			
3286.9	(19/2$^-$)	891.7[&]	100	2395.2	(15/2$^-$)			

$^{81}_{37}Rb_{44}$-13

Adopted Levels, Gammas (continued)

γ(^{81}Rb) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[f]	α[g]	Comments
3295.2	(21/2)$^-$	239.4[&]		3055.84	(19/2$^-$)			Reported in ^{68}Zn(^{19}F,α2nγ) only.
		719.6[&]	[e]	2575.7	17/2$^-$	E2	1.22×10^{-3} *2*	α(K)=0.001076 *15*; α(L)=0.0001179 *17*; α(M)=1.944×10^{-5} *27* α(N)=2.191×10^{-6} *31*; α(O)=9.28×10^{-8} *13* Mult.: Q from ^{79}Br(α,2nγ) for intraband γ, M2 ruled out by RUL.
3427.6	(21/2$^-$)	429.8[&] *2*	100	2997.73	(19/2$^-$)	(M1)	0.00339 *5*	B(M1)(W.u.)=0.27 *+13−7* α(K)=0.00300 *4*; α(L)=0.000326 *5*; α(M)=5.38×10^{-5} *8* α(N)=6.10×10^{-6} *9*; α(O)=2.65×10^{-7} *4* Mult.: D from γ asymmetry in ^{68}Zn(^{19}F,α2nγ); Δπ=(no) from level scheme.
3496.9	21/2$^-$	736.9[&]		2760.0	(17/2$^-$)	[E2]	1.14×10^{-3} *2*	α(K)=0.001011 *14*; α(L)=0.0001106 *15*; α(M)=1.823×10^{-5} *26* α(N)=2.056×10^{-6} *29*; α(O)=8.72×10^{-8} *12*
		840.5[&]	[e]	2656.33	17/2$^-$	(E2)	8.15×10^{-4} *11*	α(K)=0.000722 *10*; α(L)=7.85×10^{-5} *11*; α(M)=1.294×10^{-5} *18* α(N)=1.462×10^{-6} *20*; α(O)=6.24×10^{-8} *9* Mult.: stretched Q from DCO ratio in ^{55}Mn(^{29}Si,2pnγ) for intraband γ.
3665.7	(19/2,21/2,23/2)	596.2[&]		3069.5				
		1057.6[&]		2608.1	(21/2)$^+$	D		Mult.: from DCO ratio in ^{55}Mn(^{29}Si,2pnγ).
3765.8	(25/2)$^+$	1157.7[&]	100	2608.1	(21/2)$^+$	E2	3.88×10^{-4} *5*	B(E2)(W.u.)=79 *+21−14* α(K)=0.000341 *5*; α(L)=3.66×10^{-5} *5*; α(M)=6.04×10^{-6} *8* α(N)=6.85×10^{-7} *10*; α(O)=2.96×10^{-8} *4*; α(IPF)=3.45×10^{-6} *5* Mult.: Q from DCO ratio in ^{55}Mn(^{29}Si,2pnγ); not M2 from RUL.
3956.4	(23/2$^-$)	528.8[&]		3427.6	(21/2$^-$)			
		900.6[&] *2*		3055.84	(19/2$^-$)	(Q)		Mult.: (Q) from γ asymmetry in ^{68}Zn(^{19}F,α2nγ).
		958.6[&]		2997.73	(19/2$^-$)			Reported in ^{68}Zn(^{19}F,α2nγ) only, where a (presumably different) 958.5γ (also present in ^{53}Cr(^{31}P,2pnγ)) appears in cascade with this γ.
		1348.4[&] *3*	[e]	2608.1	(21/2)$^+$	D		Mult.: from γ asymmetry in ^{68}Zn(^{19}F,α2nγ).
3993.3	(23/2$^-$)	565.6[&]	100	3427.6	(21/2$^-$)			
		995.7[&]		2997.73	(19/2$^-$)			
4317.3	(25/2)$^-$	1022.1[&]	100	3295.2	(21/2)$^-$	E2	5.09×10^{-4} *7*	B(E2)(W.u.)=97 *+25−16* α(K)=0.000452 *6*; α(L)=4.87×10^{-5} *7*; α(M)=8.03×10^{-6} *11* α(N)=9.10×10^{-7} *13*; α(O)=3.92×10^{-8} *5* Mult.: Q from DCO ratio in ^{55}Mn(^{29}Si,2pnγ); not M2 from RUL.

$^{81}_{37}Rb_{44}$-14

Adopted Levels, Gammas (continued)

$\gamma(^{81}Rb)$ (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[f]	α[g]	Comments
4496.5	(25/2$^-$)	999.5[&]	100	3496.9	21/2$^-$	(E2)	5.37×10^{-4} *8*	α(K)=0.000476 *7*; α(L)=5.14×10^{-5} *7*; α(M)=8.46×10^{-6} *12* α(N)=9.59×10^{-7} *13*; α(O)=4.12×10^{-8} *6* Mult.: Q from DCO ratio in ^{55}Mn(^{29}Si,2pnγ); intraband transition.
4591.4	(25/2$^-$)	598.1[@]		3993.3	(23/2$^-$)			
5062.2	(27/2$^-$)	1105.8[&]	100	3956.4	(23/2$^-$)	[E2]	4.27×10^{-4} *6*	B(E2)(W.u.)=34 *+13−8* α(K)=0.000378 *5*; α(L)=4.06×10^{-5} *6*; α(M)=6.70×10^{-6} *9* α(N)=7.59×10^{-7} *11*; α(O)=3.28×10^{-8} *5*; α(IPF)=8.34×10^{-7} *12*
5072.3	(29/2)$^+$	1306.5[&]	100	3765.8	(25/2)$^+$	E2	3.26×10^{-4} *5*	α(K)=0.000263 *4*; α(L)=2.82×10^{-5} *4*; α(M)=4.64×10^{-6} *6* α(N)=5.27×10^{-7} *7*; α(O)=2.287×10^{-8} *32*; α(IPF)=2.90×10^{-5} *4* Mult.: Q from DCO ratio in ^{55}Mn(^{29}Si,2pnγ); not M2 from RUL.
5243.4?	(27/2$^-$)	652.1[ah]		4591.4	(25/2$^-$)			
		1250.1[ah]		3993.3	(23/2$^-$)			
5497.4	(29/2)$^-$	1180.2[&]	100	4317.3	(25/2)$^-$	E2	3.75×10^{-4} *5*	B(E2)(W.u.)=50 *+15−10* α(K)=0.000327 *5*; α(L)=3.51×10^{-5} *5*; α(M)=5.79×10^{-6} *8* α(N)=6.56×10^{-7} *9*; α(O)=2.84×10^{-8} *4*; α(IPF)=5.63×10^{-6} *8* Mult.: Q from DCO ratio in ^{55}Mn(^{29}Si,2pnγ); not M2 from RUL.
5645.2	(29/2$^-$)	1148.6[&]	100	4496.5	(25/2$^-$)	(E2)	3.94×10^{-4} *6*	α(K)=0.000347 *5*; α(L)=3.73×10^{-5} *5*; α(M)=6.15×10^{-6} *9* α(N)=6.97×10^{-7} *10*; α(O)=3.01×10^{-8} *4*; α(IPF)=2.78×10^{-6} *4* Mult.: Q from DCO ratio in ^{55}Mn(^{29}Si,2pnγ); intraband transition.
5932.5?	(29/2$^-$)	689[ah]		5243.4?	(27/2$^-$)			
		1341.1[ah]		4591.4	(25/2$^-$)			
6259.4	(31/2$^-$)	1197.1[&]	100	5062.2	(27/2$^-$)			
6565.3	(33/2$^+$)	1493.0[&]	100	5072.3	(29/2)$^+$	(E2)	3.08×10^{-4} *4*	α(K)=0.0002003 *28*; α(L)=2.134×10^{-5} *30*; α(M)=3.51×10^{-6} *5* α(N)=3.99×10^{-7} *6*; α(O)=1.739×10^{-8} *24*; α(IPF)=8.20×10^{-5} *11* Mult.: (Q) from DCO ratio in ^{55}Mn(^{29}Si,2pnγ) for intraband γ.
6683.5?	(31/2$^-$)	1440.0[ah]	100	5243.4?	(27/2$^-$)			
6794.4	(33/2)$^-$	1297.0[&]	100	5497.4	(29/2)$^-$	E2	3.28×10^{-4} *5*	α(K)=0.000267 *4*; α(L)=2.86×10^{-5} *4*; α(M)=4.71×10^{-6} *7* α(N)=5.35×10^{-7} *7*; α(O)=2.322×10^{-8} *33*; α(IPF)=2.68×10^{-5} *4* Mult.: Q from DCO ratio in ^{55}Mn(^{29}Si,2pnγ); not M2 from RUL.
6905.0	(33/2$^-$)	1259.8[@]	100	5645.2	(29/2$^-$)			
7521.4?	(35/2$^-$)	1262.0[ah]	100	6259.4	(31/2$^-$)			
8195.1	(37/2$^-$)	1290.0[ah]		6905.0	(33/2$^-$)			
		1400.8[@]		6794.4	(33/2)$^-$			E_γ: other: 1397 (^{19}F,α2nγ).
8240.3	(37/2$^+$)	1675.0[@]	100	6565.3	(33/2$^+$)	(E2)	3.37×10^{-4} *5*	α(K)=0.0001597 *22*; α(L)=1.697×10^{-5} *24*; α(M)=2.79×10^{-6} *4* α(N)=3.18×10^{-7} *4*; α(O)=1.387×10^{-8} *19*; α(IPF)=0.0001576 *22*

$^{81}_{37}Rb_{44}$-15

Adopted Levels, Gammas (continued)

γ(^{81}Rb) (continued)

E_i(level)	J_i^π	E_γ ‡	I_γ ‡	E_f	J_f^π	Comments
						E_γ: others: 1677 (^{19}F,α2nγ), 1674 (^{29}Si,2pnγ). Mult.: Q from DCO ratio in ^{55}Mn(^{29}Si,2pnγ) for intraband γ.
9741.1?	(41/2$^-$)	1546.0[ah]	100	8195.1	(37/2$^-$)	
10027.3?	(41/2$^+$)	1787.0[ah]	100	8240.3	(37/2$^+$)	

† Poor fit; uncertainty multiplied by a factor in the fitting.
‡ From ^{81}Sr ε decay, except as noted.
# From ^{79}Br(α,2nγ), ^{68}Zn(^{16}O,p2nγ). For Iγ uncertainty 10%−50% in ^{79}Br(α,2nγ).
@ From ^{53}Cr(^{31}P,2pnγ).
& From ^{68}Zn(^{19}F,α2nγ).
[a] Reported only in preliminary results from ^{53}Cr(^{31}P,2pnγ); consequently, evaluator shows it here as tentative.
[b] 347.3γ deexcites this level in (α,2nγ), based on γγ coin data; a 347.8γ deexcites the 923 level in ^{81}Sr ε decay, but the stronger 923γ deexciting that level is absent in in-beam reaction studies. The evaluator, therefore, assumes that different 347γ lines are observed in the two reactions.
[c] 301.30γ deexcites this level in ε decay; 300.7γ deexcites 913 level in in-beam studies, based on γγ-coin information. Evaluator presumes that these are different γ rays since the 759γ, which also deexcites the 913 level in in-beam studies, is absent in ε decay.
[d] This γ from ^{81}Sr ε decay presumably differs from the 1211γ deexciting the 1920-keV level in (α,2nγ) (placement based on γγ-coin data) since the 932γ, which also deexcites that level in (α,2nγ), is absent in Rb ε decay.
[e] Based on transition line width in level scheme drawing for ^{68}Zn(^{19}F,α2nγ), ^{79}Br(α,2nγ) E=27 MeV (fig. 4 of 1994Do18), this γ is the strongest among several deexciting its parent level.
[f] The transitions designated as "Q", here or in comments, are stretched transitions.
[g] Additional information 2.
[h] Placement of transition in the level scheme is uncertain.

$^{81}_{37}Rb_{44}$-16

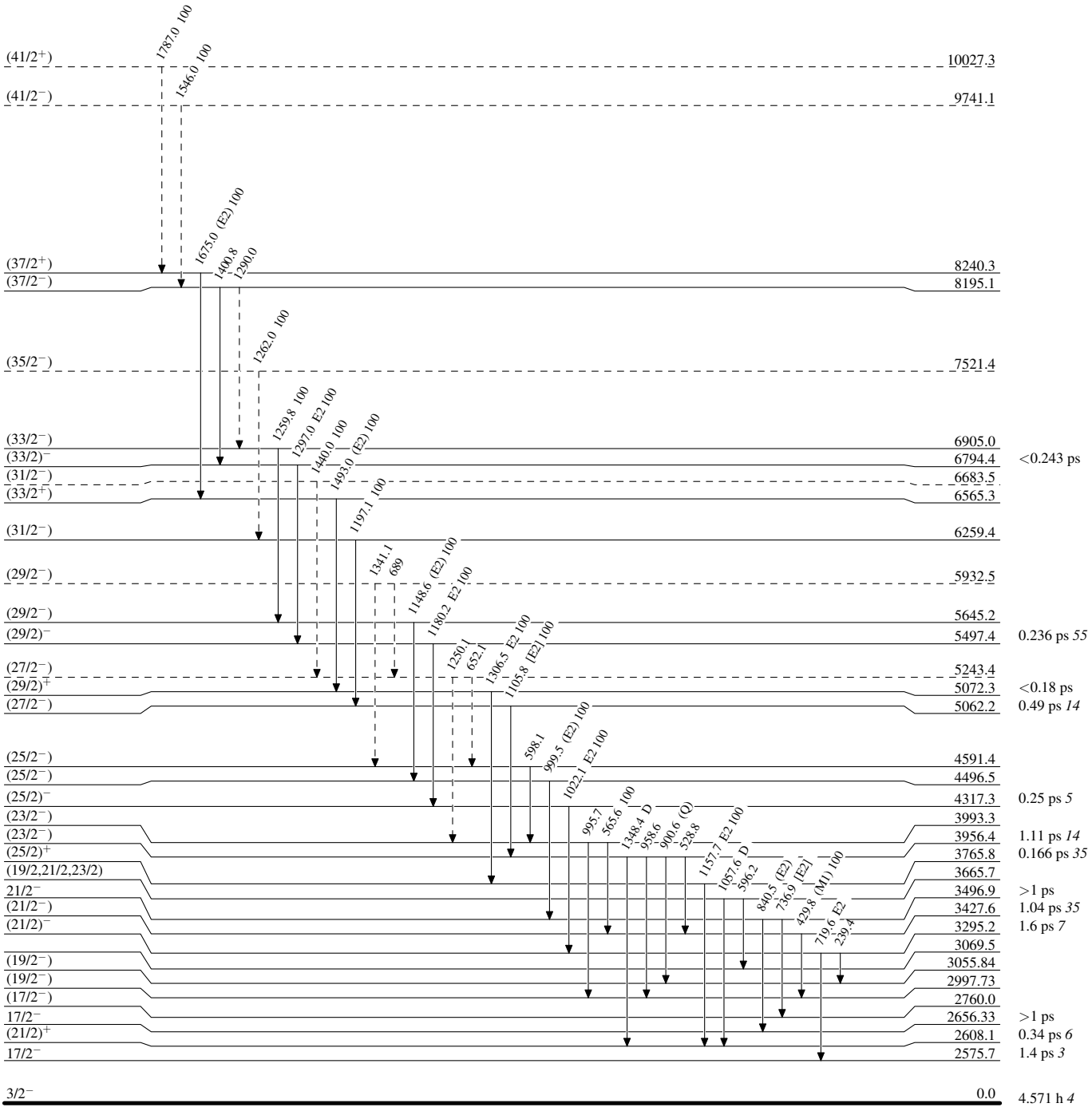
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

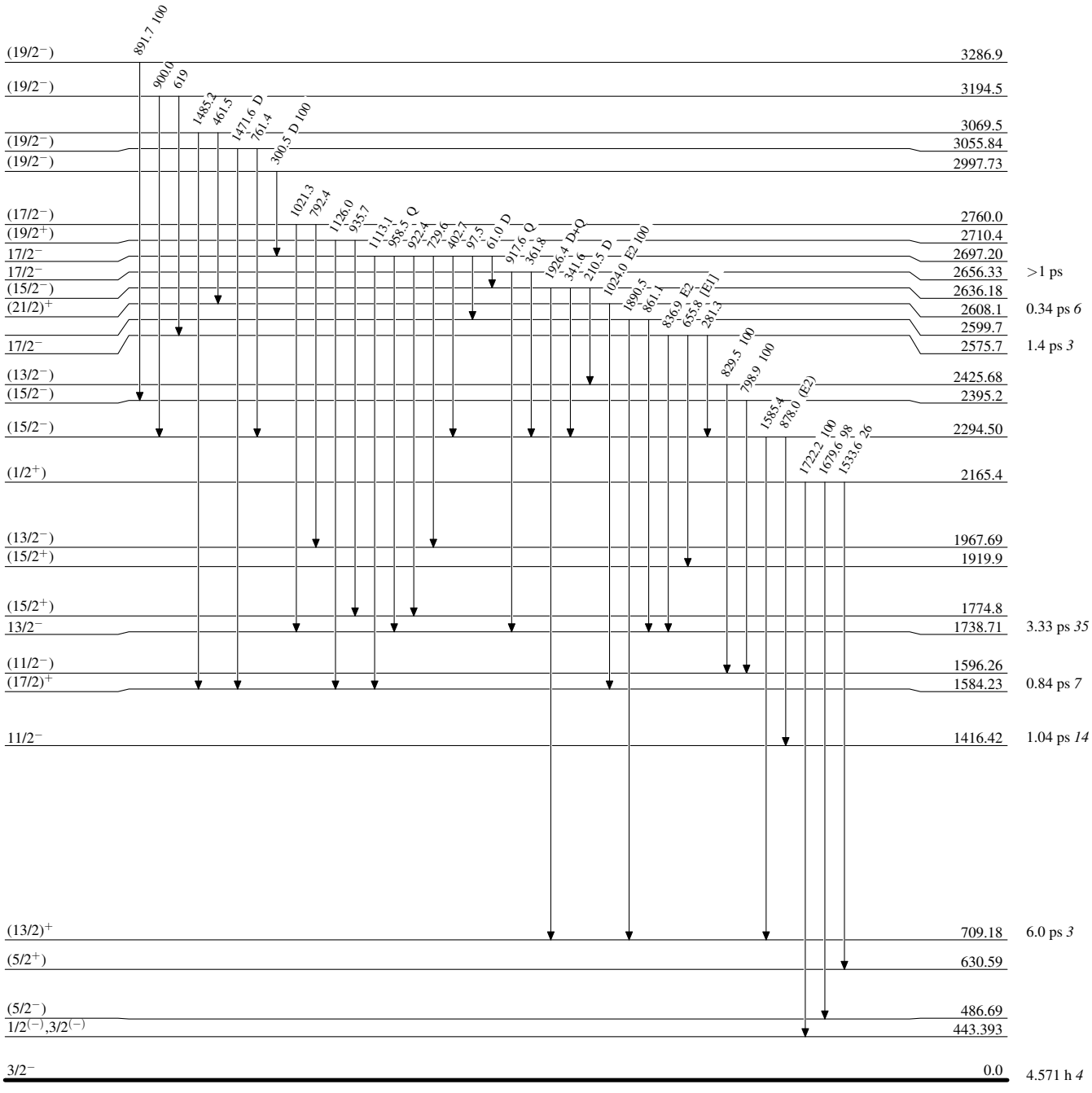


$^{81}_{37}Rb_{44}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{81}_{37}Rb_{44}$

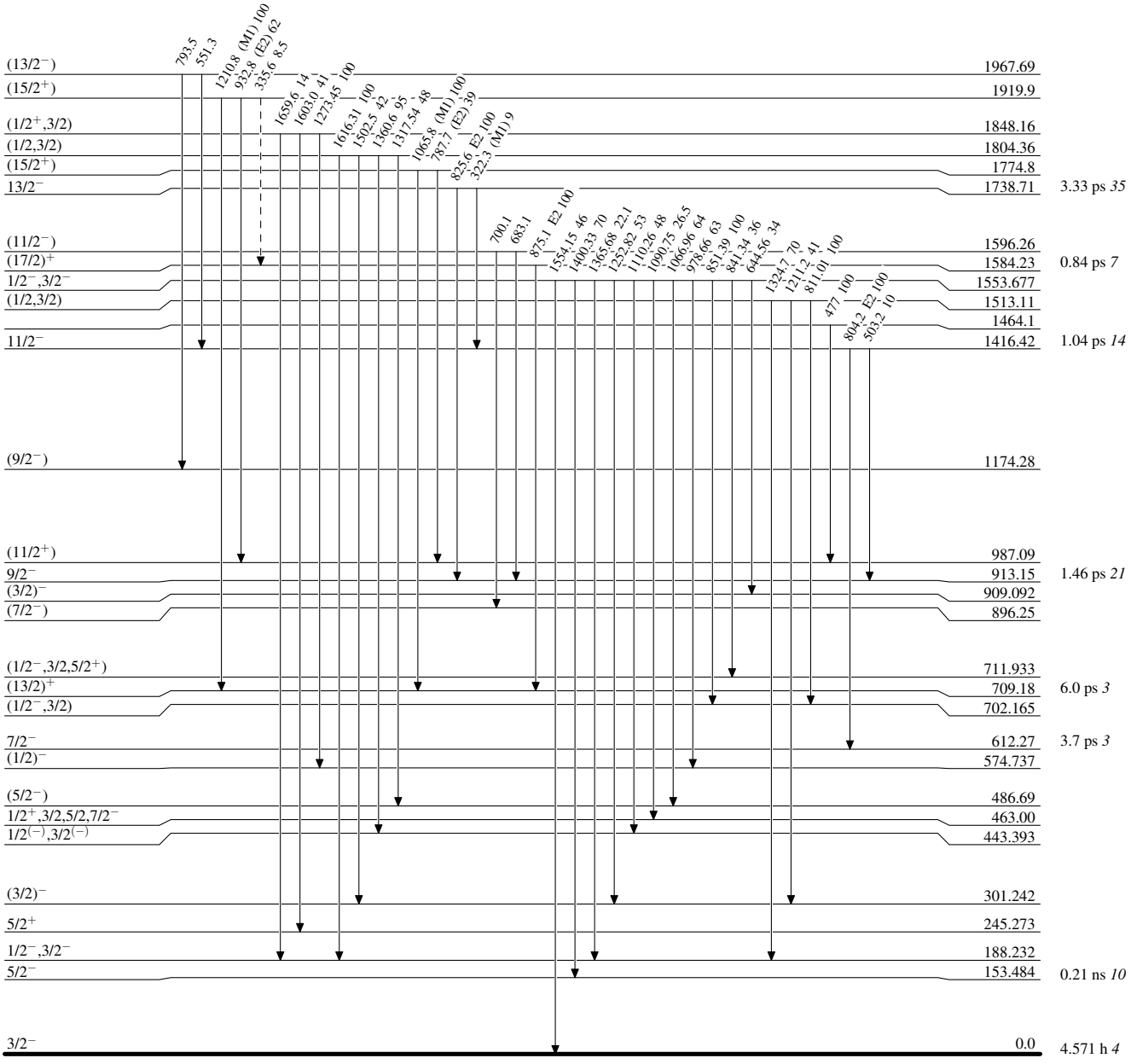
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{81}_{37}Rb_{44}$

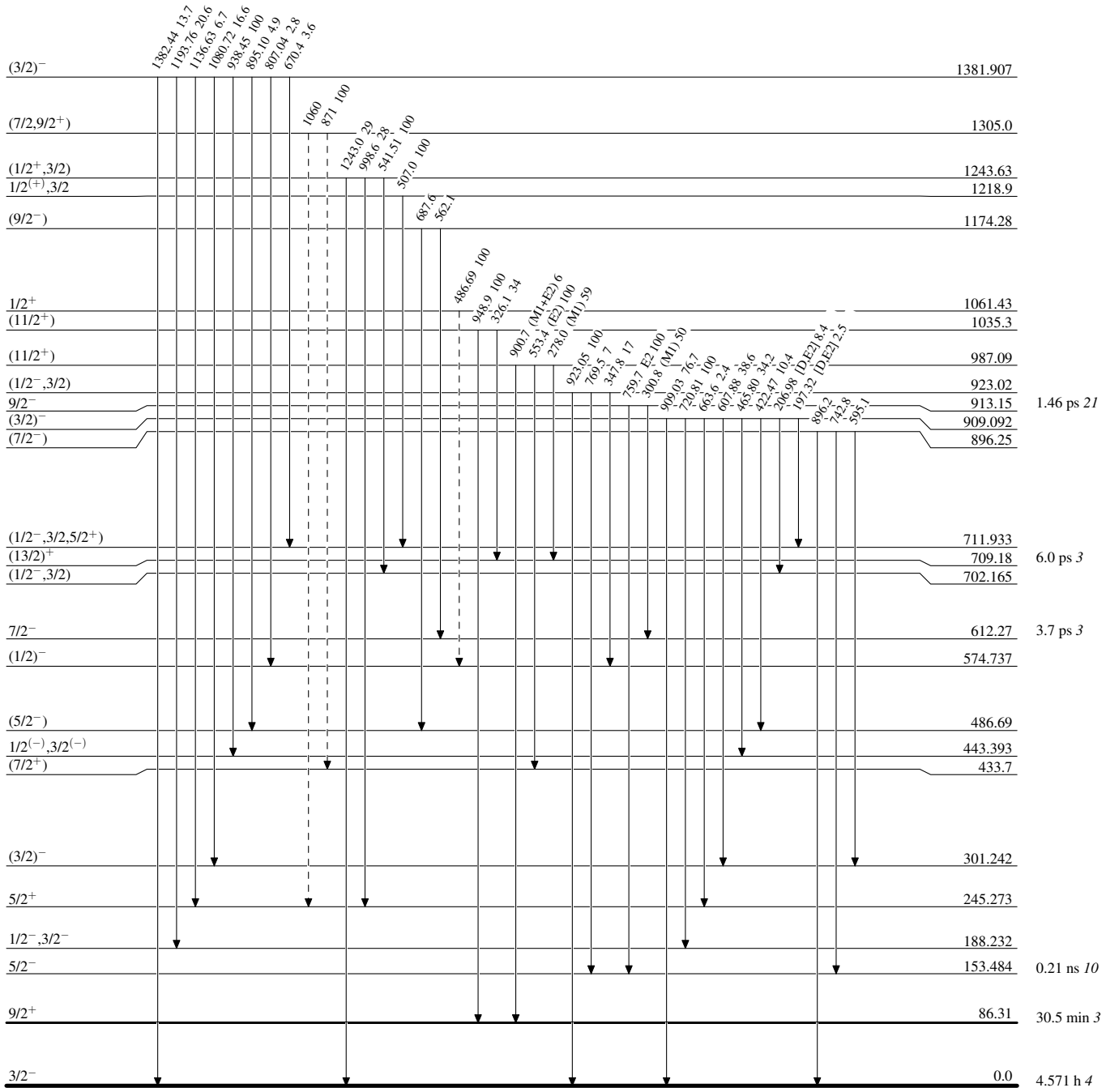
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)



$^{81}_{37}Rb_{44}$

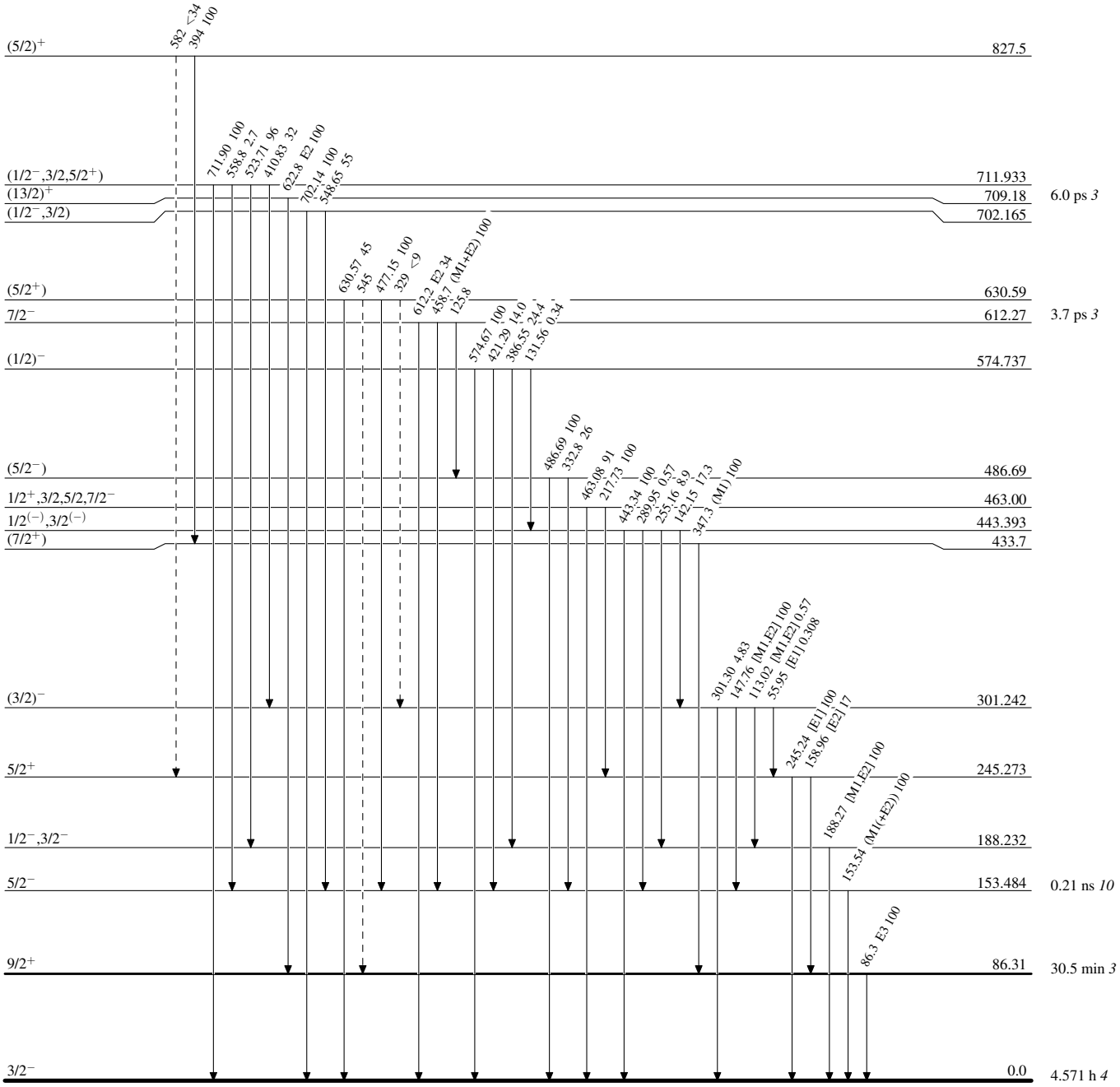
Adopted Levels, Gammas

Legend

Level Scheme (continued)

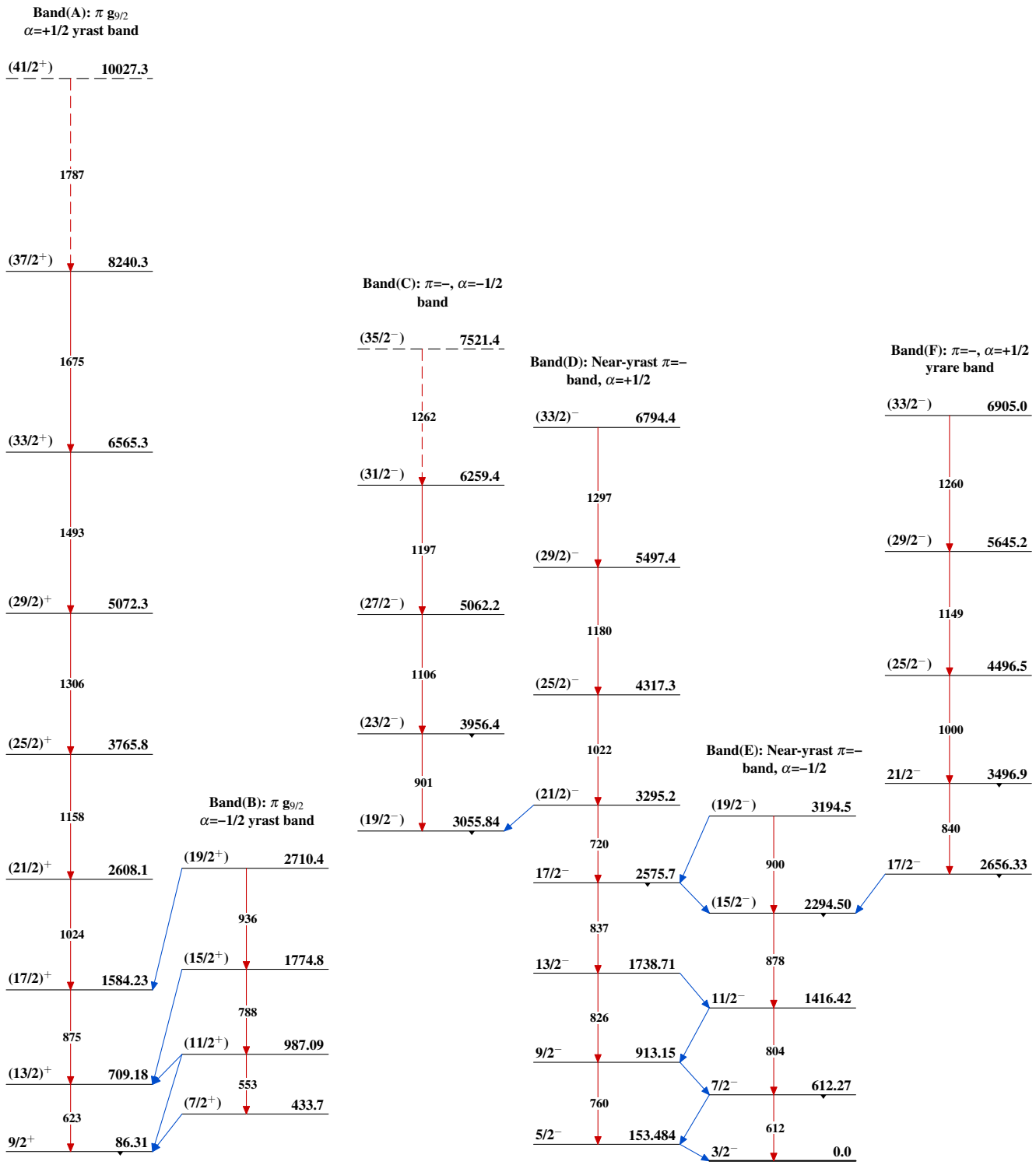
Intensities: Relative photon branching from each level

γ Decay (Uncertain)



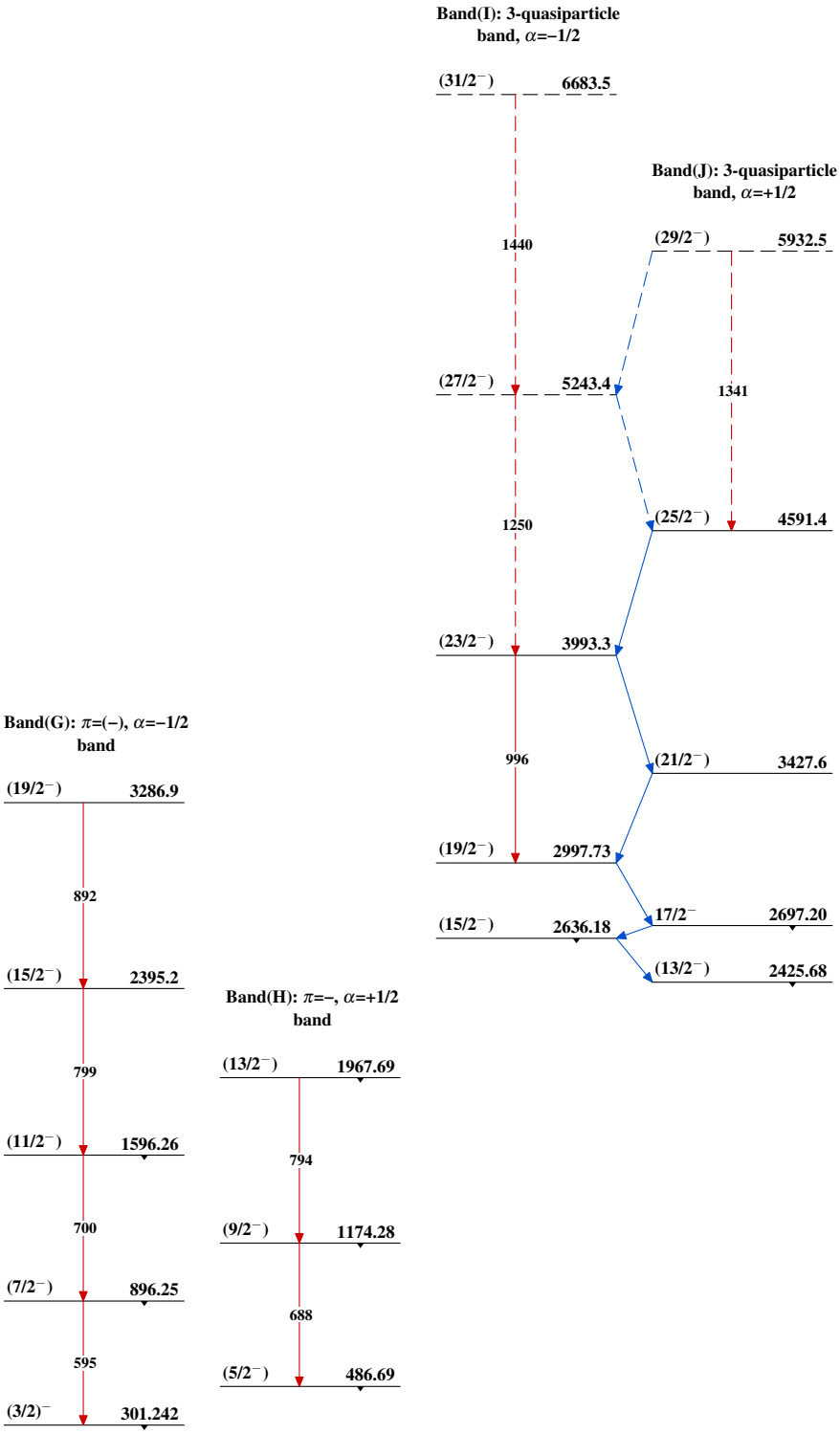
$^{81}_{37}Rb_{44}$

Adopted Levels, Gammas



$^{81}_{37}Rb_{44}$

Adopted Levels, Gammas (continued)



$^{81}_{37}Rb_{44}$