Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	D. De Frenne	NDS 110, 2081 (2009)	1-Mar-2009

Q(β^-)=−543.0 *8*; S(n)=9319 *5*; S(p)=6214.1 *22*; Q(α)=−3126.2 *25* 2012Wa38
Note: Current evaluation has used the following Q record.
Q(β^-)=−543.1 *8*; S(n)=9318 *5*; S(p)=6213.1 *21*; Q(α)=−3124 *3* 2003Au03

^{103}Rh Levels

Adopted B(E2) values are taken from Coul. ex.
For the π=+ levels the band interpretation is from ^{96}Zr(^{11}B,4nγ), unless noted otherwise For the π=− states the band interpretation is from ^{100}Mo(^{6}Li,3nγ), (^{7}Li,4nγ).

Cross Reference (XREF) Flags

A	^{103}Ru β^- decay (39.247 d)	F	^{102}Ru(p,p),(p,n) IAR	K	Coulomb excitation
B	^{103}Rh IT decay (56.114 min)	G	^{103}Rh(n,n′γ)	L	^{103}Rh(γ,γ')
C	^{103}Pd ε decay (16.991 d)	H	^{103}Rh(p,p′)	M	^{96}Zr(^{11}B,4nγ)
D	^{94}Zr(^{12}C,p2nγ)	I	^{103}Rh(p,p′γ)		
E	^{100}Mo(^{6}Li,3nγ), (^{7}Li,4nγ)	J	^{103}Rh(d,d′)		

E(level)†	J$^\pi$‡	T$_{1/2}$	XREF	Comments
0.0[f]	1/2$^-$	stable	ABCDE GHIJK	μ=−0.08840 *2* (1989Ra17,2005St24) <r^2>$^{1/2}$=4.4942 fm *23* (2004An14, evaluation). J=1/2 (optical spectroscopy) (1976Fu06). π: − from μ (exp vs theory).
39.753[@] *6*	7/2$^+$	56.114 min *9*	ABC E GHI	%IT=100 μ=+4.540 *11* (1989Ra17,2005St24) T$_{1/2}$: weighted av: 56.12 min *1* (1973Gu06), 56.114 min *20* (1981Va11); others: 1944Fl01, 1945Wi03, 1947Fl03, 1950Me26, 1957Jo19, 1967VuZZ, 1969KoZW, 1972Pa10, 1974Sa15, 1978La21. J$^\pi$: E3 transition to g.s.
93.036[#] *9*	9/2$^+$	1.11 ns *3*	A C E GH	μ=+4.9 *8* (1989Ra17,1973Ba52,2005St24) T$_{1/2}$: From ^{103}Rh β^- decay.Weighted av: 1.06 ns *5* (1973Ba52), 1.13 ns *3* (1972Ja01) and 1.13 ns *7* (1972Ja01). J$^\pi$: M1 decay to 7/2$^+$ state, and μ (exp vs calc) (1973Ba52).
294.965 *8*	3/2$^-$	6.61 ps *18*	A C E GHI K	B(E2)↑=0.216 *6* μ=+0.81 *8* (1989Ra17,2005St24); Q=−0.3 *2* (2005St24) T$_{1/2}$: From B(E2) in Coul. ex. Q: other: −0.32 *20* (1989Ra17). μ: other: +0.69 *12* (1988Be45). J$^\pi$: M1+E2 γ decay to g.s.
357.396[f] *17*	5/2$^-$	73 ps *2*	A CDE GHIJK	B(E2)↑=0.346 *9* μ=+1.09 *5* (2005St24,1989Ra17); Q= −0.4 *2* (2005St24) T$_{1/2}$: From B(E2) in Coul. ex. Q: Other −0.41 *18* (1989Ra17). μ: others: +1.08 *8*, +0.93 *20* (1989Ra17,1988Be45). J$^\pi$: from 357$\gamma(\theta)$; γ decays: E2 to 1/2$^-$, M1 to 3/2$^-$.
536.840 *7*	5/2$^+$	39 ps *12*	A C E GH	T$_{1/2}$: from centroid-shift analysis of (225β)(497γ)(t) calibrated with ^{60}Co,^{198}Au sources (1968Ra06); others: 1953En06, 1969Be81, 1970Be10. J$^\pi$: E1 γ to 3/2$^-$, M1+E2 γ to 7/2$^+$.

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Adopted Levels, Gammas (continued)

^{103}Rh Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
607.409 *14*	(5/2+,7/2,9/2)		A G	Jπ: γ's to 7/2+ and 9/2+.
650.064 *18*	5/2+	≤0.1 ns	A GHI	XREF: H(650)I(650). $T_{1/2}$: via βγ(t) (1970Be10). Jπ: log *ft*=4.95 from 3/2+, M1+E2 γ to 7/2+.
651.716 *14*	(3/2)+		A GHI	XREF: H(650)I(650). Jπ: from M1(+E2) γ to 5/2+ state and branching to 7/2+ and 1/2− states.
657.76[@] *15*	11/2+		E I	Jπ: from 564γ excit and γ(θ) in ^{100}Mo(^{6}Li,3nγ) and 564γ(θ) and linear pol measurements in ^{100}Mo(^{7}Li,4nγ).
781.15 *22*	(9/2+)		G	Jπ: from γ to 7/2+ and 9/2+ levels and (n,n′γ) cross sections (exp vs theory).
803.16 *9*	1/2−	0.120 ps *19*	GH KL	XREF: H(798). $T_{1/2}$: from ^{103}Rh(γ,γ′) if J=1/2 and adopted branching (1981Ca10). Jπ: J=1/2 from γ(θ) γ to 5/2− gives π=−.
821.45[#] *15*	13/2+		E	Jπ: from γ excit and γ(θ) in ^{100}Mo(^{6}Li,3nγ) and γ(θ) and pol measurements in ^{100}Mo(^{7}Li,4nγ). ΔJ=1 transition to 11/2+ and E2 to 9/2+ states.
847.59 *8*	7/2−	1.9 ps *2*	E GH K	μ= +2.0 *6* (1989Ra17,2005St24) XREF: H(843). Jπ: based on γ(θ), excit, γ decay to 3/2− and 5/2− states. $T_{1/2}$: from 1972SiZO (DSA method). Other: 1.7 ps (1972SiZO) via (B(E2); 3/2− to 7/2−)=0.29, I(553γ) branching=22%.
880.46 *6*	5/2−	2.2 ps *3*	GHIJK	B(E2)↑=0.0131 *10* XREF: H(877). B(E2)↑: Others: 0.0117 *15* (1972SiZO), 0.0133 (1969Bl04). $T_{1/2}$: via B(E2)=0.0131 (1972Sa03) and Iγ(880)-branching=9%. Jπ: based on 585γ(θ) Coul. ex.
903.2[a] *6*	(11/2+)		M	
920.09[f] *7*	9/2−	5.6 ps *3*	DE GH K	μ=+2.8 *5* (1989Ra17,2005St24) XREF: H(915). B(E2)(From (9/2− to 5/2−)=0.178 *9*. $T_{1/2}$: From B(E2)(9/2− to 5/2−) in Coul. ex. Jπ: based on 562γ(θ) Coul. ex., and excit, band member.
1078.31 *20*	(5/2+,7/2+)		G	Jπ: γ's to 9/2+ and (3/2+).
1106.86 *13*	5/2−		GH K	B(E2)↑=0.0031 *4* XREF: H(1102). Jπ: γ(θ) and excit in Coul. ex.
1135.8 *4*	(1/2,3/2,5/2−)		G	Jπ: γ's to 1/2− and 3/2−.
1252.1 *3*			GH J	XREF: H(1247)J(1260).
1256.5 *3*			GH J	XREF: H(1247)J(1260).
1277.17 *9*	3/2−	0.53 ps *36*	GHI KL	XREF: H(1270)I(1275). $T_{1/2}$: From BE2=0.0132 12 in Coul. ex. Other: 0.60 ps 10 from ^{103}Rh(γ,γ′) (1981Ca10). Jπ: from M1+E2 to 1/2−.
1293.99 *24*	(1/2−,3/2,5/2−)		G	Jπ: γ's to 1/2− and 5/2−.
1327.0 *5*			G	
1344.7 *5*	(7/2+,9/2+)		G	Jπ: γ's to 5/2+ and 11/2+.
1349.5[&] *5*	(13/2+)		M	
1404 *7*			GH	XREF: H(1400).
1410.93 *13*	(3/2−,5/2−)			Jπ: γ's to 1/2− and 7/2−.
1411.06 *16*	(3/2−,5/2−)		GH	XREF: H(1400).
1420.5 *10*			I	

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Adopted Levels, Gammas (continued)

^{103}Rh Levels (continued)

E(level)[†]	Jπ[‡]	XREF	Comments
1428.7 *6*		G	
1438.4 *4*		GH	
1443.63 *24*		GH	XREF: H(1438).
1466.4 *4*		G	
1470		J	
1480.1 *7*		G	
1482.36 *14*		GH	XREF: H(1483).
1491.6 *4*		GH	XREF: H(1483).
1515.6 *7*		G	
1524.7[@] *3*	15/2$^+$	E M	Jπ: based on 703γ(θ) in ^{100}Mo(^{7}Li,4nγ). M1+E2 transition to 13/2$^+$ level and band structure.
1530.5 *5*		G	
1579.9 *4*		G	
1599.7 *6*		G	
1605.0 *5*		GH	XREF: H(1598).
1611.1 *8*		G	
1614 *1*		L	
1626 *1*		L	
1637.67[f] *20*	13/2$^-$	DE	Jπ: from 717γ(θ) in ^{100}Mo(^{6}Li,3n) and ^{100}Mo(^{7}Li,4n). E2 transition to 9/2$^-$ state and band structure.
1650? *10*		H J	
1685.2 *4*		G	
1706.11 *20*		G	
1707.02 *18*		GH	
1717.4[#] *3*	17/2$^+$	E	Jπ: from 895γ(θ) in ^{100}Mo(^{6}Li,3nγ) and ^{100}Mo(^{7}Li,4nγ). E2 transition to 13/2$^+$ level and band structure.
1731.5 *5*		G	
1774 *10*		H	
1778.0 *8*		G L	
1812 *1*		L	
1842.2 *8*		GH	
1851.6[a] *5*	(15/2$^+$)	M	
1861 *1*		L	
1901 *10*		H	
1923 *1*		L	
1943 *1*		L	
1968.2 *8*		G	
1969 *1*		L	
1969.8 *10*		G	
1986 *10*		H J	XREF: J(1990).
1997 *1*		L	
1999.3 *6*		G	
2001 *1*		L	
2008.7 *5*		G	
2034 *1*		L	
2040.5 *10*		I	
2049 *1*		L	
2058.8 *9*		G	
2059 *1*		L	
2071 *1*		L	
2075 *1*		L	
2089 *1*		L	
2103.5 *13*		GH	
2128 *1*		L	
2136.4 *11*		G	
2137 *1*		L	

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Adopted Levels, Gammas (continued)

^{103}Rh Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	XREF	Comments
2155 *1*		L	
2163 *1*		L	
2196 *1*		L	
2221.2 *3*	(15/2$^-$)	E	J$^{\pi}$: from γ to 13/2$^-$ and 13/2$^+$ levels in ^{100}Mo(^{7}Li,4nγ).
2234.6 *7*		G	
2290		J	
2306 *1*		L	
2319 *1*		L	
2345.4[g] *3*	17/2$^-$	DE	J$^{\pi}$: 707γ is E2 to 13/2$^-$ from 707$\gamma(\theta)$ and lin. pol in ^{100}Mo(^{7}Li,4nγ).
2352 *1*		L	
2362 *1*		L	
2418.4[f] *5*	17/2$^-$	E	J$^{\pi}$: from 781$\gamma(\theta)$ in ^{100}Mo(^{7}Li,nγ). E2 transition to 13/2$^-$ state. Band member.
2419.1[&] *6*	(17/2$^+$)	M	
2434 *1*		J L	XREF: J(2430).
2468 *1*		L	
2478 *1*		L	
2516 *1*		L	
2522.6[h] *3*	(17/2$^-$)	E	J$^{\pi}$: D(300γ) to 15/2$^-$ and Q(884γ) to 13/2$^-$. Bandhead of ΔJ=1 band.
2526.0[@] *4*	19/2$^+$	DE	J$^{\pi}$: from 808$\gamma(\theta)$ and 1000$\gamma(\theta)$ in ^{100}Mo(^{7}Li,4nγ). (M1+E2) transition to 17/2$^+$ state.
2540.6[g] *3*	19/2$^-$	DE	J$^{\pi}$: D from 195γ in ^{94}Zr(^{12}C,p2nγ) to 17/2$^-$ state. M1 from ΔJ=1 band structure.
2544 *1*		L	
2585 *1*		L	
2594 *1*		L	
2604 *1*		L	
2620		J	
2645 *1*		L	
2666 *1*		L	
2680 *1*		L	
2695 *1*		L	
2698 *1*		L	
2702.7[h] *3*	(19/2$^-$)	E	J$^{\pi}$: band member.
2706 *1*		L	
2739.8[#] *4*	21/2$^+$	E	J$^{\pi}$: from 1022$\gamma(\theta)$ in ^{100}Mo(^{7}Li,4nγ). Band member.
2747 *1*		L	
2753.4[g] *4*	21/2$^-$	DE	J$^{\pi}$: 213γ is D from 213$\gamma(\theta)$ in ^{94}Zr(^{12}C,p2nγ). M1 from observed ΔJ=1 band structure.
2762 *1*		L	
2801 *1*		L	
2854 *1*		L	
2866 *1*		L	
2883.3[a] *7*	(19/2$^+$)	M	
2911 *1*		L	
2919 *1*		L	
2919.2[h] *5*	(21/2$^-$)	E	J$^{\pi}$: band member.
2923 *1*		L	
2936.8[i] *5*	21/2	E	J$^{\pi}$: from $\gamma(\theta)$ and band member.
2944 *1*		L	
2956 *1*		L	
2960 *1*		L	
2966 *1*		L	
2991 *1*		L	
3014.1[g] *4*	23/2$^-$	DE	J$^{\pi}$: 260γ is D from 260$\gamma(\theta)$ in ^{94}Zr(^{12}C,p2nγ). M1 from observed ΔJ=1 band structure transition to 21/2$^-$ state.
3028 *1*		L	

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Adopted Levels, Gammas (continued)

^{103}Rh Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	XREF	Comments
3056 *1*		L	
3082 *1*		L	
3108 *1*		L	
3114 *1*		L	
3138 *1*		L	
3153 *1*		L	
3165 *1*		L	
3201 *1*		L	
3214.2[f] *7*	21/2^{-}	E	
3219.0 *4*	(21/2^{+})	E	J$^{\pi}$: from $\gamma(\theta)$ and band member. Interpreted in ^{100}Mo(^{6}Li,3nγ), (^{7}Li,4nγ) as member of a band based on the 21/2^{+} state with ΔI=1.
3223 *1*		L	
3231.0[h] *7*	(23/2^{-})	E	J$^{\pi}$: from $\gamma(\theta)$ and band member.
3242 *1*		L	
3276.7[i] *7*	23/2	E	J$^{\pi}$: from $\gamma(\theta)$ and band member.
3288 *1*		L	
3296 *1*		L	
3315 *1*		L	
3329.9[g] *5*	25/2^{-}	DE	J$^{\pi}$: from $\gamma(\theta)$ and band member. J$^{\pi}$: D from 315$\gamma(\theta)$ in ^{94}Zr(^{12}C,p2nγ). M1 from observed ΔJ=1 band structure to (23/2)$^{-}$.
3330.2 *8*		L	
3339 *1*		L	
3345 *1*		L	
3358 *1*		L	
3399.1[c] *4*	(23/2^{+})	E M	J$^{\pi}$: from $\gamma(\theta)$ and band member.
3401 *1*		L	
3411 *1*		L	
3435 *1*		L	
3440 *1*		L	
3449 *1*		L	
3462 *1*		L	
3488.2[&] *9*	(21/2^{+})	M	
3521 *1*		L	
3531 *1*		L	
3535 *1*		L	
3557 *1*		L	
3573 *1*		L	
3589 *1*		L	
3600 *1*		L	
3613 *1*		L	
3617 *1*		L	
3618.5[i] *9*	25/2	E	J$^{\pi}$: from $\gamma(\theta)$ and band member.
3633.2[b] *5*	(25/2^{+})	E	J$^{\pi}$: from $\gamma(\theta)$ and band member.
3652 *1*		L	
3660 *1*		L	
3672.8[h] *9*	(25/2)	E	J$^{\pi}$: from $\gamma(\theta)$ and band member.
3691 *1*		L	
3708 *1*		L	
3728 *1*		L	
3770.9[g] *6*	27/2^{-}	E	J$^{\pi}$: from $\gamma(\theta)$ and band member.
3773 *1*		L	
3790 *1*		L	
3798 *1*		L	

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Adopted Levels, Gammas (continued)

^{103}Rh Levels (continued)

E(level)[†]	Jπ[‡]	XREF	Comments
3820 *1*		L	
3831 *1*		L	
3870.7[#] *5*	25/2+	E	Jπ: from γ(θ) and band member.
3890 *1*		L	
3904 *1*		L	
3916 *1*		L	
3936 *1*		L	
3941.8[c] *5*	(27/2+)	E M	Jπ: from γ(θ) and band member.
3944 *1*		L	
3977 *1*		L	
4039.1[f] *9*	(25/2−)	E	
4324.0[b] *6*	(29/2+)	E M	Jπ: from γ(θ) and band member.
4338.8[g] *8*	(29/2−)	E	Jπ: from γ(θ) and band member.
4487.7[e] *7*	(27/2+)	M	
4709.1[c] *6*	(31/2+)	E	Jπ: from γ(θ) and band member.
4831.9[d] *6*	(29/2+)	M	
5052.5[#] *7*	29/2+	E	Jπ: from γ(θ) and band member. Based on ^{100}Mo(^{6}Li,3nγ), (^{7}Li,4nγ) results evaluator interpret this level as being member of the πg$_{9/2}$, α=+1/2 band.
5200.3[b] *6*	(33/2+)	E	Jπ: from γ(θ) and band member.
5208.7[e] *7*	(31/2+)	E	
5659.3[d] *8*	(33/2+)	M	
5667.3[c] *6*	(35/2+)	E	Jπ: from γ(θ) and band member.
6104.5[e] *10*	(35/2+)	M	
6208.7[b] *9*	(37/2+)	E M	Jπ: from γ(θ) and band member.
6571.4[d] *11*	(37/2+)	M	
6753.4[c] *9*	(39/2+)	M	
7116.4[e] *12*	(39/2+)	M	
7363.4[b] *11*	(41/2+)	M	
7998.9[c] *12*	(43/2+)	M	

[†] Unless noted otherwise, calculated with a least-squares procedure using data from ^{103}Ru β$^-$ decay; ^{103}Rh IT decay; ^{103}Pd ε ^{94}Zr(^{12}C,p2nγ); ^{100}Mo(^{6}Li,3nγ), (^{7}Li,4nγ); decay; ^{103}Rh(n,n′γ) and ^{103}Rh Coulomb excitation.

[‡] Unless noted otherwise, based on γ(θ), linear pol data and proposed band structure in the different (HI,xnγ) reactions.

[#] Band(A): πg$_{9/2}$, α=+1/2 (2006Ti01).

[@] Band(a): πg$_{9/2}$, α=−1/2 (2006Ti01).

[&] Band(B): πg$_{9/2}$+γ vib, α=+1/2 (2006Ti01).

[a] Band(b): πg$_{9/2}$+γ vib, α=−1/2 (2006Ti01).

[b] Band(C): πg$_{9/2}$νh$^2_{11/2}$, α=+1/2 (2006Ti01).

[c] Band(c): πg$_{9/2}$νh$^2_{11/2}$, α=−1/2 (2006Ti01).

[d] Band(D): πg$_{9/2}$νh$^2_{11/2}$, α=+1/2 (2006Ti01).

[e] Band(d): πg$_{9/2}$νh$^2_{11/2}$, α=−1/2 (2006Ti01).

[f] Band(E): g.s. band with ΔJ=2 (1988De04).

[g] Band(F): Band on the 17/2− level with ΔĴ=1 (1988De04).

[h] Band(G): side band 1 (1988De04).

[i] Band(H): side band 2 (1988De04).

Adopted Levels, Gammas (continued)

$\gamma(^{103}Rh)$

α(K)exp, α(L)exp from ^{103}Ru β^- or ^{103}Rh IT decay.

E_i(level)	J_i^π	E_γ[‡]	I_γ[#]	E_f	J_f^π	Mult.[†]	δ[†]	α[&]	Comments
39.753	7/2$^+$	39.755 *6*	100	0.0	1/2$^-$	E3		1403 *20*	B(E3)(W.u.)=0.00249 *8* α(K)exp: ^{103}Ru β^- decay: 143 *20*, ^{103}Rh IT decay: 127 *6* (1975Cz03), 148 *18* (1979VaZE). α(L)exp: ^{103}Ru β^- decay: 1060 *72*. Mult.: from electron conversion coefficients in ^{103}Ru β^- decay and ^{103}Rh IT decay.
93.036	9/2$^+$	53.282 *7*	100	39.753	7/2$^+$	M1		2.08 *3*	B(M1)(W.u.)=0.043 *12* α(K)exp=1.74 *17*; α(L)exp=0.18 *2* L1/L2=12 *4*; L1/L3=41 *20*; L2/L3=3.4 *20* (1970Pe04) Mult.: from electron conversion coefficients in ^{103}Ru β^- decay.
294.965	3/2$^-$	294.964 *10*	100	0.0	1/2$^-$	M1+E2	−0.17 *1*	0.0191 *3*	α(K)exp=0.0186 *16* B(E2)(W.u.)=36 *4*; B(M1)(W.u.)=0.12 *1* E_γ: From 2008KrZX. δ: from 1977Kr13, 295$\gamma(\theta)$ in Coul. ex. Others: −0.18 *1* (1955Mc51), −0.17 *1* (1958Mc02), −0.189 *10* (1970RoZS), −0.15 *1* (1972Sa03).
357.396	5/2$^-$	62.41 *3*	4.69 *15*	294.965	3/2$^-$	M1		1.314 *9*	
		317.72 *5*	0.068 *3*	39.753	7/2$^+$	[E1]			B(E1)(W.u.)=7.9×10^{-8} *7*
		357.382 *23*	100 *3*	0.0	1/2$^-$	E2		0.01588 *23*	α(K)exp=0.019 *11* B(E2)(W.u.)=44 *3* E_γ: From 2008KrZX. Mult.: based on α(K)exp in ^{103}Ru β^- decay.
536.840	5/2$^+$	241.875 *10*	0.0166 *17*	294.965	3/2$^-$	E1		0.0118 *2*	α(K)exp=0.0116 *30* B(E1)(W.u.)=9.E−8 *3* E_γ: From 2008KrZX. Mult.: based on α(K)exp in ^{103}Ru β^- decay.
		443.80 *2*	0.367 *9*	93.036	9/2$^+$	E2			α(K)exp=0.0072 *7* B(E2)(W.u.)=0.107 *33* Mult.: based on α(K)exp in ^{103}Ru β^- decay.
		497.083 *6*	100.0 *21*	39.753	7/2$^+$	M1+E2	−0.368 *11*		α(K)exp=0.0048 *5* B(E2)(W.u.)=2.0 *6*; B(M1)(W.u.)=0.0040 *12* δ: from low temperature nuclear orientation and $\gamma(\theta)$ in ^{103}Ru β^- decay.
607.409	(5/2$^+$,7/2,9/2)	514.365 *12*	100.0 *15*	93.036	9/2$^+$				E_γ: From 2008KrZX.
		567.69 *3*	33 *15*	39.753	7/2$^+$				E_γ: From 2008KrZX.

$^{103}_{45}Rh_{58}$-7

Adopted Levels, Gammas (continued)

γ(^{103}Rh) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[#]	E_f	J_f^π	Mult.[†]	δ[†]	Comments
650.064	5/2$^+$	42.63 *4*	0.019 *3*	607.409	(5/2$^+$,7/2,9/2)			
		113.19 *4*	0.063 *13*	536.840	5/2$^+$			E_γ: From 2008KrZX.
		292.7 *2*	0.02 *2*	357.396	5/2$^-$			
		557.039 *20*	14.60 *14*	93.036	9/2$^+$			
		610.33 *20*	100.0 *8*	39.753	7/2$^+$	M1+E2	0.09 *14*	α(K)exp=0.0026 *2* δ: from low temperature nuclear orientation and γ(θ) in ^{103}Ru β$^-$ decay.
651.716	(3/2)$^+$	114.870 *13*	7.0 *4*	536.840	5/2$^+$	M1(+E2)		α(K)exp=0.28 *8* Mult.: from α(K)exp. No δ given.
		612.09 *5*	100 *5*	39.753	7/2$^+$	[E2]		
		651.69 *4*	0.17 *3*	0.0	1/2$^-$			
657.76	11/2$^+$	564.60 *20*	100	93.036	9/2$^+$	M1+E2	+0.15 *2*	Mult.: from 564γ(θ) and linear pol.
		618.5 *5*	14	39.753	7/2$^+$			
781.15	(9/2$^+$)	688.2 *3*	100	93.036	9/2$^+$			
		741.3 *3*	64	39.753	7/2$^+$			
803.16	1/2$^-$	445.70 *14*	7	357.396	5/2$^-$	[E2]		B(E2)(W.u.)=486 *90*
		508.30 *14*	44	294.965	3/2$^-$	[M1,E2]		
		803.2 *3*	100	0.0	1/2$^-$	[M1]		B(M1)(W.u.)=0.263 *19*
821.45	13/2$^+$	163.60 *20*	6	657.76	11/2$^+$	D		
		728.50 *20*	100	93.036	9/2$^+$	E2		
847.59	7/2$^-$	490.12 *9*	100[@] *10*	357.396	5/2$^-$			
		552.70 *13*	29[@] *3*	294.965	3/2$^-$	[E2]		B(E2)(W.u.)=34 *11*
880.46	5/2$^-$	523.11 *9*	100[@] *6*	357.396	5/2$^-$	M1+E2	−0.25 *3*	B(M1)(W.u.)=0.020 *3*; B(E2)(W.u.)=4.0 *6* δ: from γ(θ) in Coul. ex.
		585.51 *9*	77[@] *4*	294.965	3/2$^-$	M1+E2	−0.27 *2*	B(M1)(W.u.)=0.014 *2*; B(E2)(W.u.)=2.7 *4* δ: from γ(θ) in Coul. ex.
		880.38 *9*	24[@] *3*	0.0	1/2$^-$	E2		B(E2)(W.u.)=1.4 *2* Mult.: from A_2 coef 880 γ(θ) in Coul. ex.
903.2	(11/2$^+$)	810 *1*		93.036	9/2$^+$	D		
		863 *1*		39.753	7/2$^+$	Q		
920.09	9/2$^-$	72.6 *5*	8	847.59	7/2$^-$			
		562.69 *7*	100 *10*	357.396	5/2$^-$	E2		B(E2)(W.u.)=46 *7*
1078.31	(5/2$^+$,7/2$^+$)	428.5 *4*	100[@]	650.064	5/2$^+$			
		541.6 *4*	48[@]	536.840	5/2$^+$			
		720.3 *4*	43[@]	357.396	5/2$^-$			
		985.5 *4*	36[@]	93.036	9/2$^+$			
1106.86	5/2$^-$	500.6 *4*	28	607.409	(5/2$^+$,7/2,9/2)			E_γ: if energy is correct no final level within 1.3 keV.
		749.35 *19*	100[@]	357.396	5/2$^-$	D+Q	−0.8 *+17−6*	δ: from 1977Kr13.
		811.75 *19*	67[@]	294.965	3/2$^-$			
1135.8	(1/2,3/2,5/2$^-$)	840.3 *5*	100	294.965	3/2$^-$			
		1136.3 *5*	11	0.0	1/2$^-$			

Adopted Levels, Gammas (continued)

γ(^{103}Rh) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[#]	E_f	J_f^π	Mult.[†]	δ[†]	Comments
1252.1		601.9 *4*	49[@]	650.064	$5/2^+$			
		1212.5 *4*	100[@]	39.753	$7/2^+$			
1256.5		604.7 *4*	100[@]	651.716	$(3/2)^+$			
		961.6 *4*	19[@]	294.965	$3/2^-$			
1277.17	$3/2^-$	474.0 *5*	9 *2*	803.16	$1/2^-$	D+Q	0.53 *+37−21*	δ: From Coul. ex.
		919.83 *14*	10	357.396	$5/2^-$			
		982.38 *24*	18	294.965	$3/2^-$			
		1277.04 *14*	100[@]	0.0	$1/2^-$	M1+E2	−0.6 *3*	B(M1)(W.u.)=0.010 *5*; B(E2)(W.u.)= 1.71 *14* δ: from 1277γ(θ) in Coul. ex. and $J^\pi=1/2^-$ for g.s.
1293.99	$(1/2^-,3/2,5/2^-)$	936.5 *4*	40[@]	357.396	$5/2^-$			
		999.2 *4*	100[@]	294.965	$3/2^-$			
		1293.9 *4*	82[@]	0.0	$1/2^-$			
1327.0		1287.2 *5*	100	39.753	$7/2^+$			
1344.7	$(7/2^+,9/2^+)$	686.8 *6*	49	657.76	$11/2^+$			
		807.9 *6*	100	536.840	$5/2^+$			
1349.5	$(13/2^+)$	446		903.2	$(11/2^+)$	D		
		528		821.45	$13/2^+$			
		692		657.76	$11/2^+$	D		
		1256		93.036	$9/2^+$			
1404		1046.1 *6*	100[@] *15*	357.396	$5/2^-$			
1411.06	$(3/2^-,5/2^-)$	563.0 *3*	66	847.59	$7/2^-$			
		760.6 *3*	32	650.064	$5/2^+$			
		1116.6 *3*	30	294.965	$3/2^-$			
		1411.4 *3*	100	0.0	$1/2^-$			
1420.5		540		880.46	$5/2^-$			
1428.7		1071.3 *6*	100[@]	357.396	$5/2^-$			
1438.4		786.9 *5*	54[@]	651.716	$(3/2)^+$			
		1398.5 *5*	100[@]	39.753	$7/2^+$			
1443.63		1086.1 *4*	41[@]	357.396	$5/2^-$			
		1148.5 *4*	100[@] *15*	294.965	$3/2^-$			
		1443.9 *4*	16	0.0	$1/2^-$			
1466.4		1108.7 *5*	100	357.396	$5/2^-$			
		1171.8 *5*	21	294.965	$3/2^-$			
1480.1		1440.3 *7*	100	39.753	$7/2^+$			
1482.36		679.4 *3*	31[@]	803.16	$1/2^-$			
		945.2 *3*	33[@]	536.840	$5/2^+$			
		1124.7 *3*	100[@]	357.396	$5/2^-$			
		1187.5 *3*	31[@]	294.965	$3/2^-$			
		1482.6 *3*	33[@]	0.0	$1/2^-$			

$^{103}_{45}Rh_{58}$-9

Adopted Levels, Gammas (continued)

γ(^{103}Rh) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[#]	E_f	J_f^π	Mult.[†]	δ[†]	Comments
1491.6		1134.0 *5*	33[@]	357.396	5/2$^-$			
		1196.9 *5*	100[@]	294.965	3/2$^-$			
1515.6		1158.2 *7*	100	357.396	5/2$^-$			
1524.7	15/2$^+$	703.6 *5*	100	821.45	13/2$^+$	M1+E2	+0.10 *2*	
		867.3 *5*	55	657.76	11/2$^+$	E2		
1530.5		993.6 *5*	100[@]	536.840	5/2$^+$			
		1491.3 *50*	67[@]	39.753	7/2$^+$			
1579.9		928.5 *5*	30[@]	651.716	(3/2)$^+$			
		1539.9 *5*	100[@]	39.753	7/2$^+$			
1599.7		949.6 *6*	100[@]	650.064	5/2$^+$			
1605.0		1247.5 *7*	82	357.396	5/2$^-$			
		1310.1 *7*	100[@]	294.965	3/2$^-$			
1611.1		763.5 *8*	100	847.59	7/2$^-$			
1637.67	13/2$^-$	717.56 *20*	100	920.09	9/2$^-$	E2		
1685.2		1328.0 *5*	100[@] *15*	357.396	5/2$^-$			
		1390.1 *5*	79[@] *14*	294.965	3/2$^-$			
1706.11		1348.7 *2*	100	357.396	5/2$^-$			
1707.02		1614.3 *2*	100[@]	93.036	9/2$^+$			E_γ: if energy is correct no final level within 1.3 keV.
		1705.7 *4*	85[@]	0.0	1/2$^-$			
1717.4	17/2$^+$	192.80 *20*	7	1524.7	15/2$^+$			
		895.9 *3*	100	821.45	13/2$^+$	E2		
1731.5		1080.9 *7*	96[@]	650.064	5/2$^+$			
		1692.2 *7*	100	39.753	7/2$^+$			
1778.0		1126.3 *8*	100	651.716	(3/2)$^+$			
1842.2		1547.2 *8*	100	294.965	3/2$^-$			
1851.6	(15/2$^+$)	327 *1*		1524.7	15/2$^+$			
		502 *1*		1349.5	(13/2$^+$)	D		
		948 *1*		903.2	(11/2$^+$)	Q		
		1030 *1*		821.45	13/2$^+$			
1968.2		1968.2 *8*	100	0.0	1/2$^-$			
1969.8		1674.8 *10*	100	294.965	3/2$^-$			
1999.3		1641.1 *8*	100	357.396	5/2$^-$			
		2000.0 *8*	79	0.0	1/2$^-$			
2008.7		1713.1 *7*	100	294.965	3/2$^-$			
		2009.2 *7*	47	0.0	1/2$^-$			
2040.5		1160		880.46	5/2$^-$			
2058.8		1408.7 *9*	100	650.064	5/2$^+$			
2103.5		2103.5 *13*	100	0.0	1/2$^-$			
2136.4		1779.0 *11*	100	357.396	5/2$^-$			
2221.2	(15/2$^-$)	583.6 *5*	100	1637.67	13/2$^-$			

$^{103}_{45}Rh_{58}$-10

Adopted Levels, Gammas (continued)

γ(^{103}Rh) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[#]	E_f	J_f^π	Mult.[†]	δ[†]	α[&]	Comments
2221.2	(15/2$^-$)	1399.6 *5*	94	821.45	13/2$^+$				
2234.6		1582.9 *9*	67	651.716	(3/2)$^+$				
		1697.8 *9*	100	536.840	5/2$^+$				
2345.4	17/2$^-$	124.4 *3*	46	2221.2	(15/2$^-$)	D			
		707.9 *3*	100	1637.67	13/2$^-$	E2			
		821.0 *5*	15	1524.7	15/2$^+$				
2418.4	17/2$^-$	780.9 *5*	100	1637.67	13/2$^-$	E2			
2419.1	(17/2$^+$)	567 *1*		1851.6	(15/2$^+$)	D			
		702 *1*		1717.4	17/2$^+$				
		895 *1*		1524.7	15/2$^+$				
		1069 *1*		1349.5	(13/2$^+$)				
2522.6	(17/2$^-$)	301.0 *3*	100	2221.2	(15/2$^-$)	D			
		884.2 *5*	27	1637.67	13/2$^-$	Q			
2526.0	19/2$^+$	808.9 *5*	100	1717.4	17/2$^+$	(M1+E2)	+0.06 *2*		
		1000.8 *5*	52	1524.7	15/2$^+$				
2540.6	19/2$^-$	122.3 *5*	10	2418.4	17/2$^-$	D			
		195.26 *17*	100 *12*	2345.4	17/2$^-$	M1		0.0550 *8*	
		319.7 *5*	3	2221.2	(15/2$^-$)				
2702.7	(19/2$^-$)	179.4 *3*	20	2522.6	(17/2$^-$)	D			
		357.60 *20*	100	2345.4	17/2$^-$				
2739.8	21/2$^+$	214.0 *5*	14	2526.0	19/2$^+$				
		1022.5 *3*	100	1717.4	17/2$^+$	E2			
2753.4	21/2$^-$	212.95 *14*	100	2540.6	19/2$^-$	M1		0.0437 *7*	
		406.5 *5*	1.3	2345.4	17/2$^-$				
2883.3	(19/2$^+$)	464 *1*		2419.1	(17/2$^+$)				
		1032 *1*		1851.6	(15/2$^+$)				
		1166 *1*		1717.4	17/2$^+$				
2919.2	(21/2$^-$)	216.5 *3*	100	2702.7	(19/2$^-$)	D			
2936.8	21/2	234.1 *3*	100	2702.7	(19/2$^-$)				
3014.1	23/2$^-$	260.80 *17*	100 *11*	2753.4	21/2$^-$	M1		0.0258 *4*	
		473.2 *5*	16	2540.6	19/2$^-$				
3214.2	21/2$^-$	795.8 *5*	100	2418.4	17/2$^-$				
3219.0	(21/2$^+$)	479.8 *3*	21	2739.8	21/2$^+$	D			
		692.6 *3*	100	2526.0	19/2$^+$	D			
3231.0	(23/2$^-$)	311.8 *5*	100	2919.2	(21/2$^-$)	D			
3276.7	23/2	339.9 *5*	100	2936.8	21/2				
3329.9	25/2$^-$	315.8 *3*	100	3014.1	23/2$^-$	M1		0.01580 *23*	
3399.1	(23/2$^+$)	180.5 *3*	100	3219.0	(21/2$^+$)	D			
		659.2 *3*	59	2739.8	21/2$^+$				
		873.2 *3*	38	2526.0	19/2$^+$				

$^{103}_{45}Rh_{58}$-11

Adopted Levels, Gammas (continued)

γ(^{103}Rh) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[#]	E_f	J_f^π	Mult.[†]	Comments
3488.2	(21/2$^+$)	605 *1*		2883.3	(19/2$^+$)		
		1069 *1*		2419.1	(17/2$^+$)		
3618.5	25/2	341.8 *5*	100	3276.7	23/2		E_γ: if energy is correct no final level within 1.4 keV.
3633.2	(25/2$^+$)	235.0 *5*	100	3399.1	(23/2$^+$)	D	
		892.9 *3*	49	2739.8	21/2$^+$		
3672.8	(25/2)	441.8 *5*	100	3231.0	(23/2$^-$)	D	
3770.9	27/2$^-$	440.7 *5*	100	3329.9	25/2$^-$	D	
		756.8 *5*	26	3014.1	23/2$^-$		
3870.7	25/2$^+$	1131.0 *3*	100	2739.8	21/2$^+$		
3941.8	(27/2$^+$)	308.6 *3*	100	3633.2	(25/2$^+$)	D	
		543		3399.1	(23/2$^+$)		
4039.1	(25/2$^-$)	824.9 *5*	100	3214.2	21/2$^-$		
4324.0	(29/2$^+$)	382.3 *3*	100	3941.8	(27/2$^+$)	D	
		691		3633.2	(25/2$^+$)		
4338.8	(29/2$^-$)	567.9 *5*	100	3770.9	27/2$^-$	D	
4487.7	(27/2$^+$)	618 *1*		3870.7	25/2$^+$		
		854 *1*		3633.2	(25/2$^+$)		
		1088 *1*		3399.1	(23/2$^+$)	Q	
4709.1	(31/2$^+$)	384.9 *5*	100	4324.0	(29/2$^+$)	D	
		767.1 *5*	22	3941.8	(27/2$^+$)		
4831.9	(29/2$^+$)	344 *1*		4487.7	(27/2$^+$)	D	
		890 *1*		3941.8	(27/2$^+$)		
		962 *1*		3870.7	25/2$^+$	Q	
		1198 *1*		3633.2	(25/2$^+$)		
5052.5	29/2$^+$	1181.8 *5*	100	3870.7	25/2$^+$		
5200.3	(33/2$^+$)	490.8 *3*	100	4709.1	(31/2$^+$)	D	
		876.5 *3*	11	4324.0	(29/2$^+$)		
5208.7	(31/2$^+$)	377 *1*		4831.9	(29/2$^+$)	D	
		721 *1*		4487.7	(27/2$^+$)		
		884 *1*		4324.0	(29/2$^+$)		
5659.3	(33/2$^+$)	450 *1*		5208.7	(31/2$^+$)	D	
		827 *1*		4831.9	(29/2$^+$)		
		951 *1*		4709.1	(31/2$^+$)		
5667.3	(35/2$^+$)	466.8 *3*	100	5200.3	(33/2$^+$)	D	
		958.3 *3*	29	4709.1	(31/2$^+$)		
6104.5	(35/2$^+$)	445 *1*		5659.3	(33/2$^+$)	D	
		896 *1*		5208.7	(31/2$^+$)		
6208.7	(37/2$^+$)	542		5667.3	(35/2$^+$)	D	
		1009		5200.3	(33/2$^+$)		
6571.4	(37/2$^+$)	467 *1*		6104.5	(35/2$^+$)		
		905[a] *1*					
		912 *1*		5659.3	(33/2$^+$)		
6753.4	(39/2$^+$)	545.4 *5*		6208.7	(37/2$^+$)		

$^{103}_{45}Rh_{58}$-12

Adopted Levels, Gammas (continued)

$\gamma(^{103}Rh)$ (continued)

E_i(level)	J_i^π	E_γ ‡	E_f	J_f^π	E_i(level)	J_i^π	E_γ ‡	E_f	J_f^π
6753.4	$(39/2^+)$	1085 *1*	5659.3	$(33/2^+)$	7363.4	$(41/2^+)$	611 *1*	6753.4	$(39/2^+)$
7116.4	$(39/2^+)$	545 *1*	6571.4	$(37/2^+)$			1153 *1*	6208.7	$(37/2^+)$
		1012 *1*	6104.5	$(35/2^+)$	7998.9	$(43/2^+)$	635 *1*	7363.4	$(41/2^+)$
							1246 *1*	6753.4	$(39/2^+)$

† From $\gamma(\theta)$ and linear polarization measurements in ^{100}Mo(^{7}Li,4n), unless noted otherwise.

‡ Weighted averages of data from ^{103}Ru β^- decay; ^{103}Rh IT decay; ^{103}Pd ε decay; ^{94}Zr(^{12}C,p2nγ); ^{100}Mo(^{6}Li,3nγ), (^{7}Li,4nγ); ^{103}Rh(n,n$'\gamma$) and ^{103}Rh Coulomb excitation if available with comparable precision.

Relative photon branchings from each level were calculated with least-squares procedure, using data from ^{103}Ru β^- decay; ^{103}Rh IT decay; ^{103}Pd ε decay; ^{94}Zr(^{12}C,p2nγ); ^{100}Mo(^{6}Li,3nγ), (^{7}Li,4nγ); ^{103}Rh(n,n$'\gamma$) and ^{103}Rh Coulomb excitation if available with comparable precision.

@ Relative photon branching for this level from (n,n$'\gamma$).

& 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.

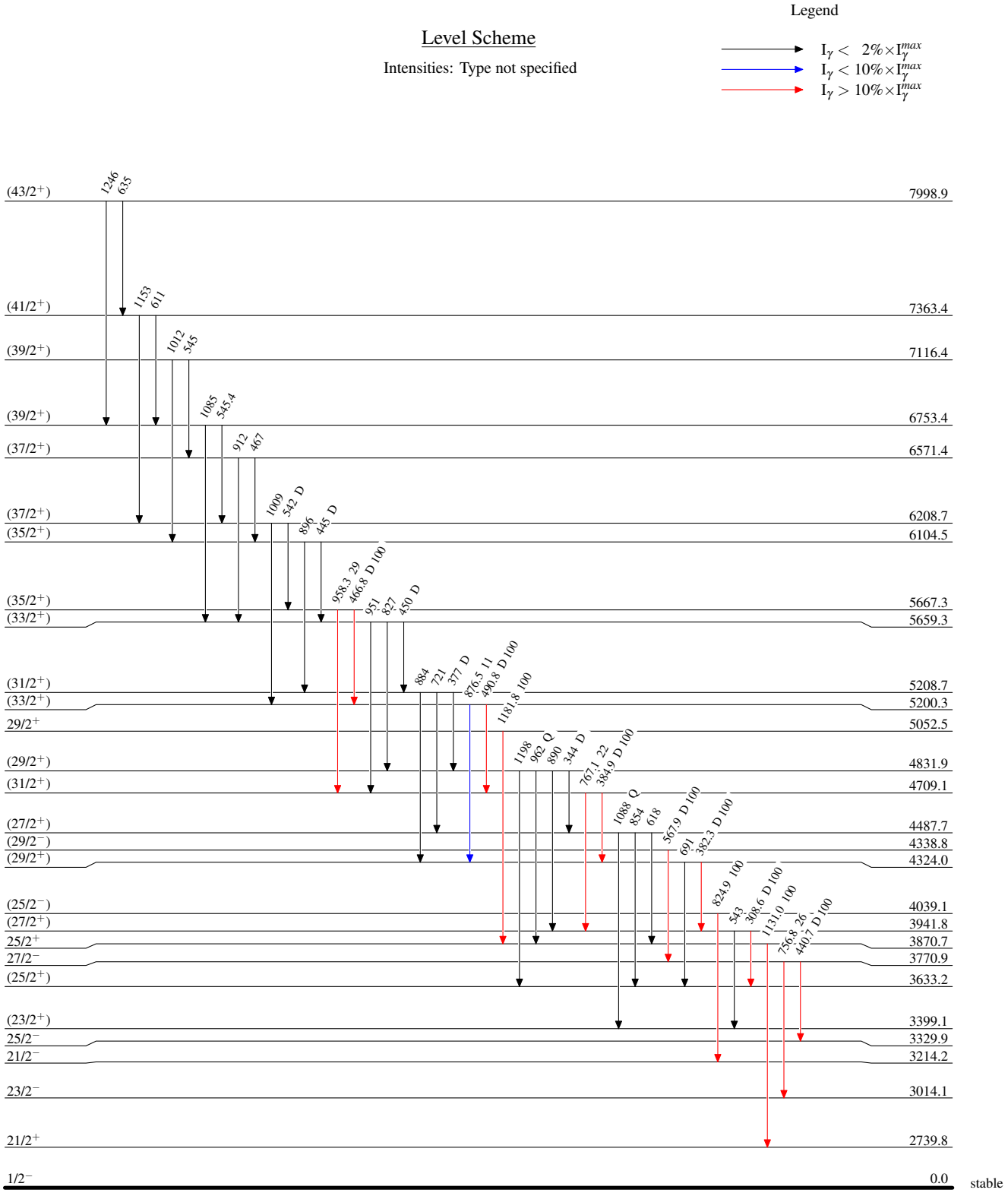
a Placement of transition in the level scheme is uncertain.

$^{103}_{45}Rh_{58}$-13

Adopted Levels, Gammas

Level Scheme

Intensities: Type not specified

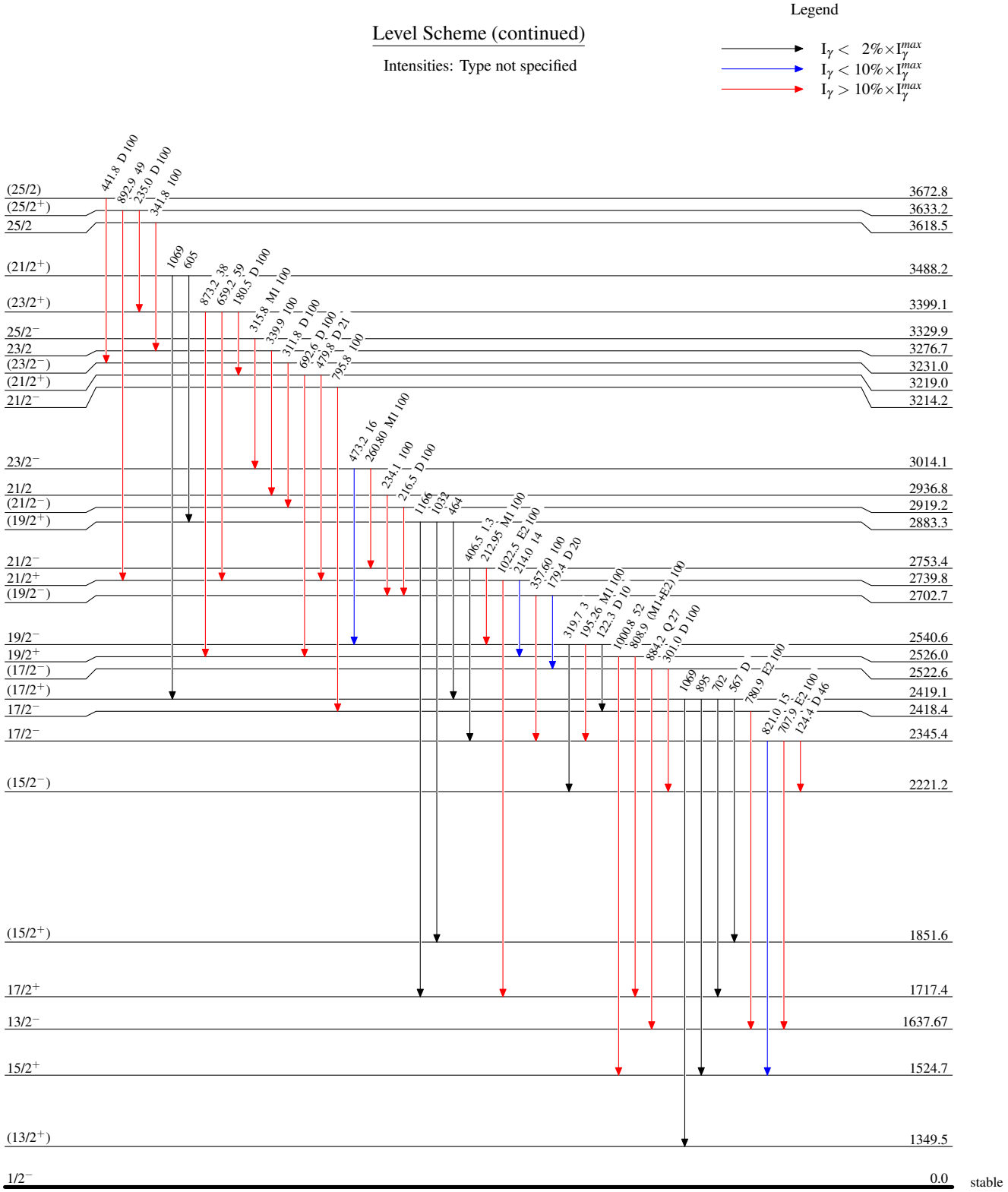


$^{103}_{45}Rh_{58}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

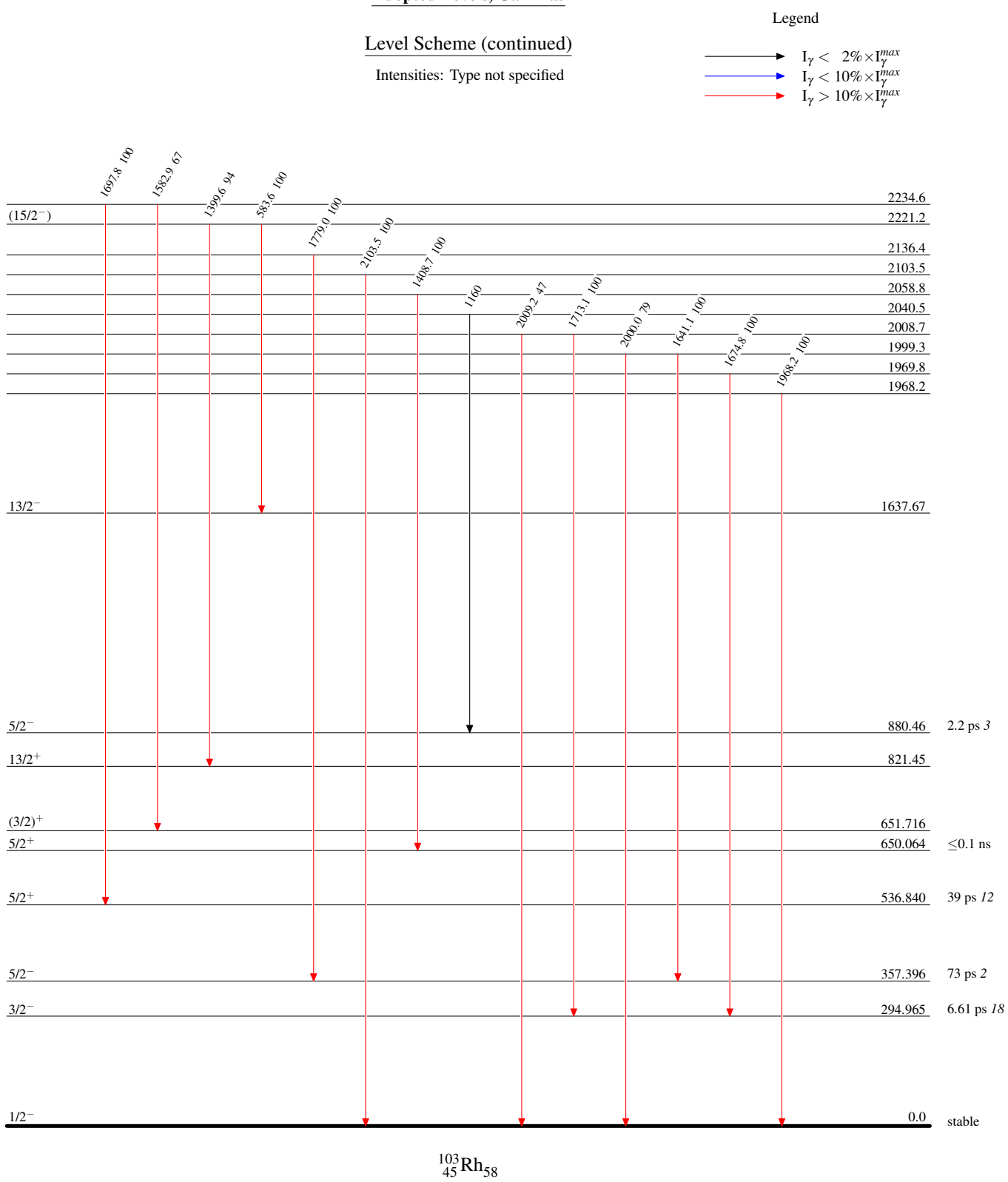


$^{103}_{45}Rh_{58}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

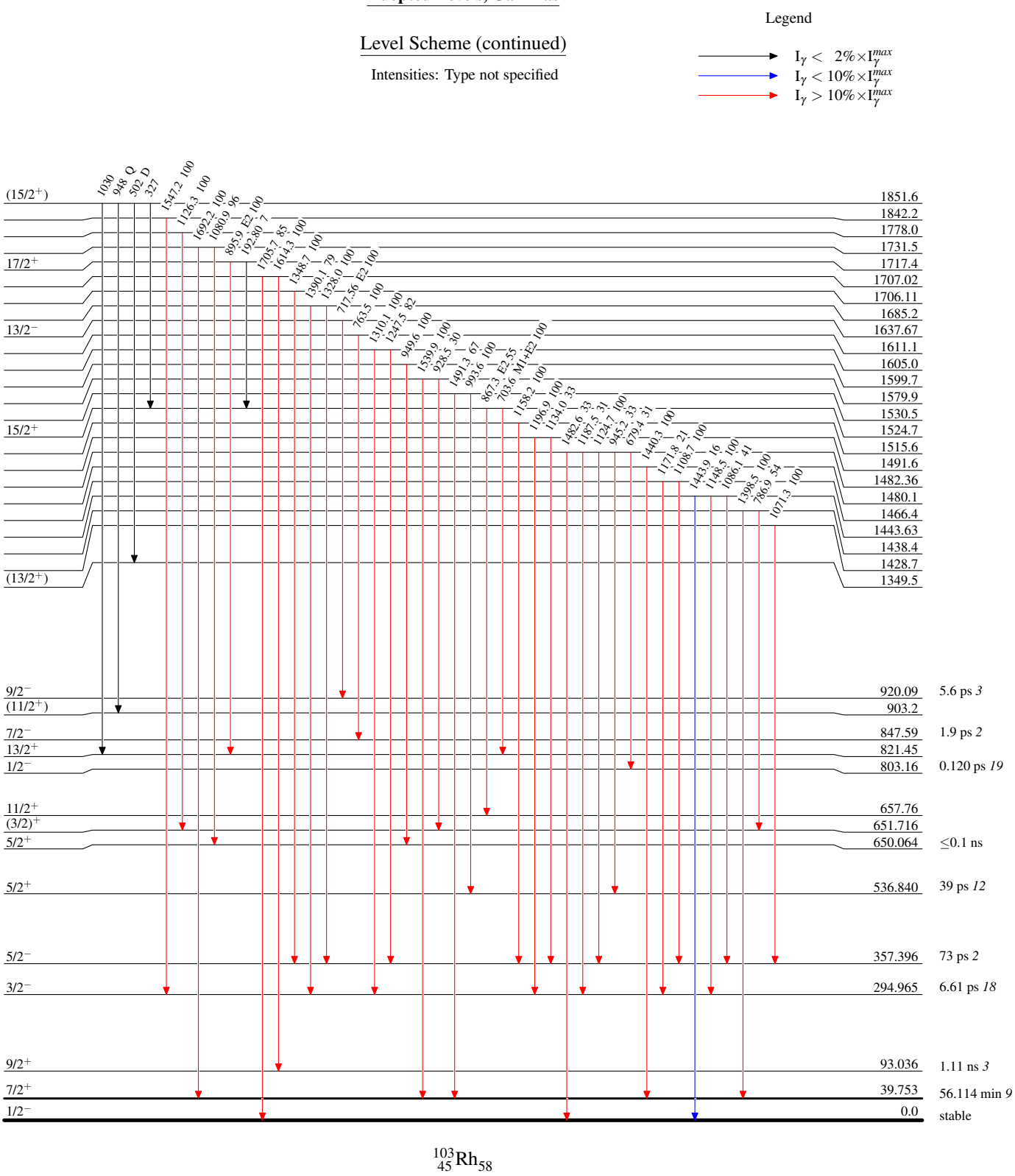


$^{103}_{45}Rh_{58}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

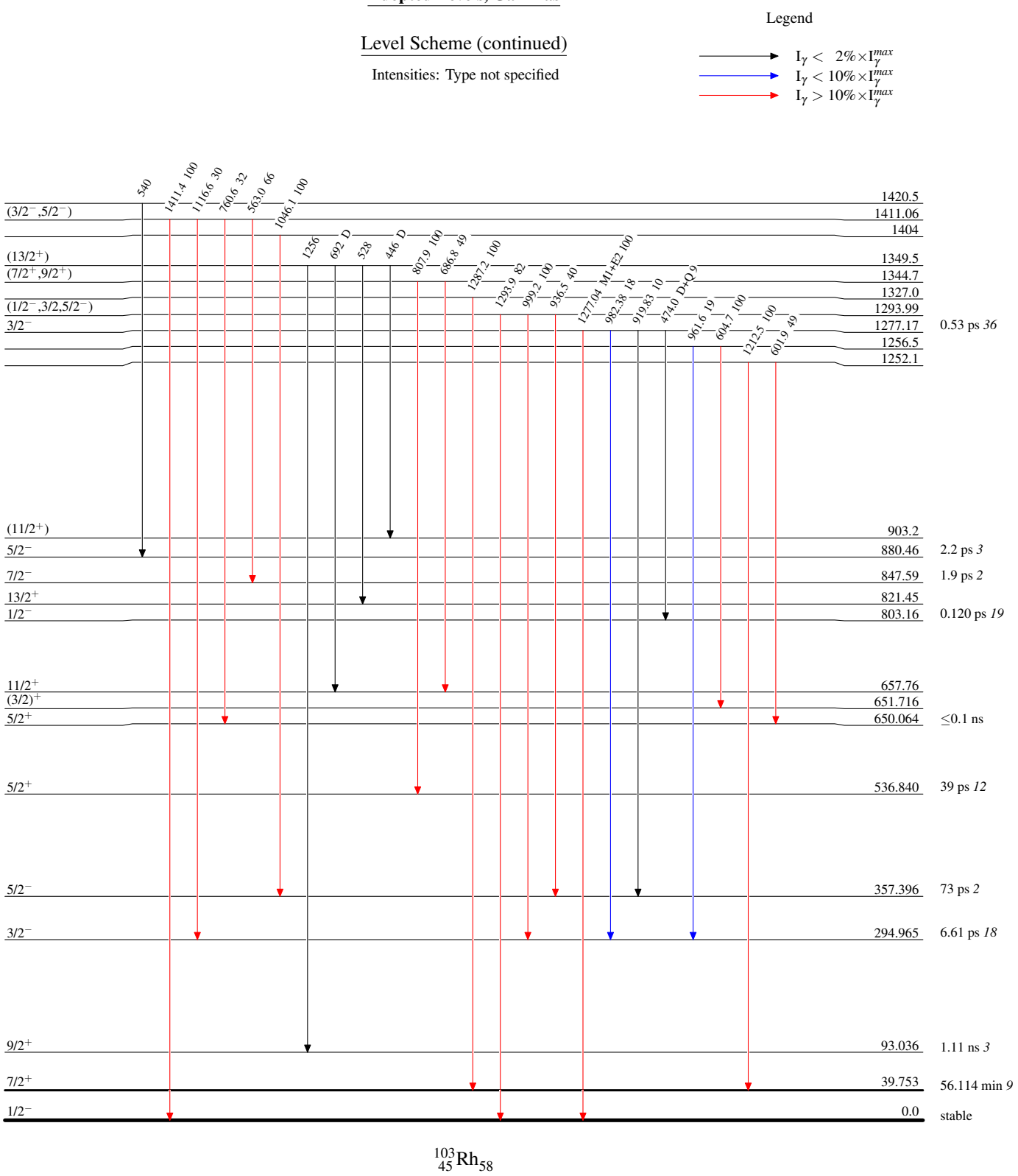


$^{103}_{45}Rh_{58}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

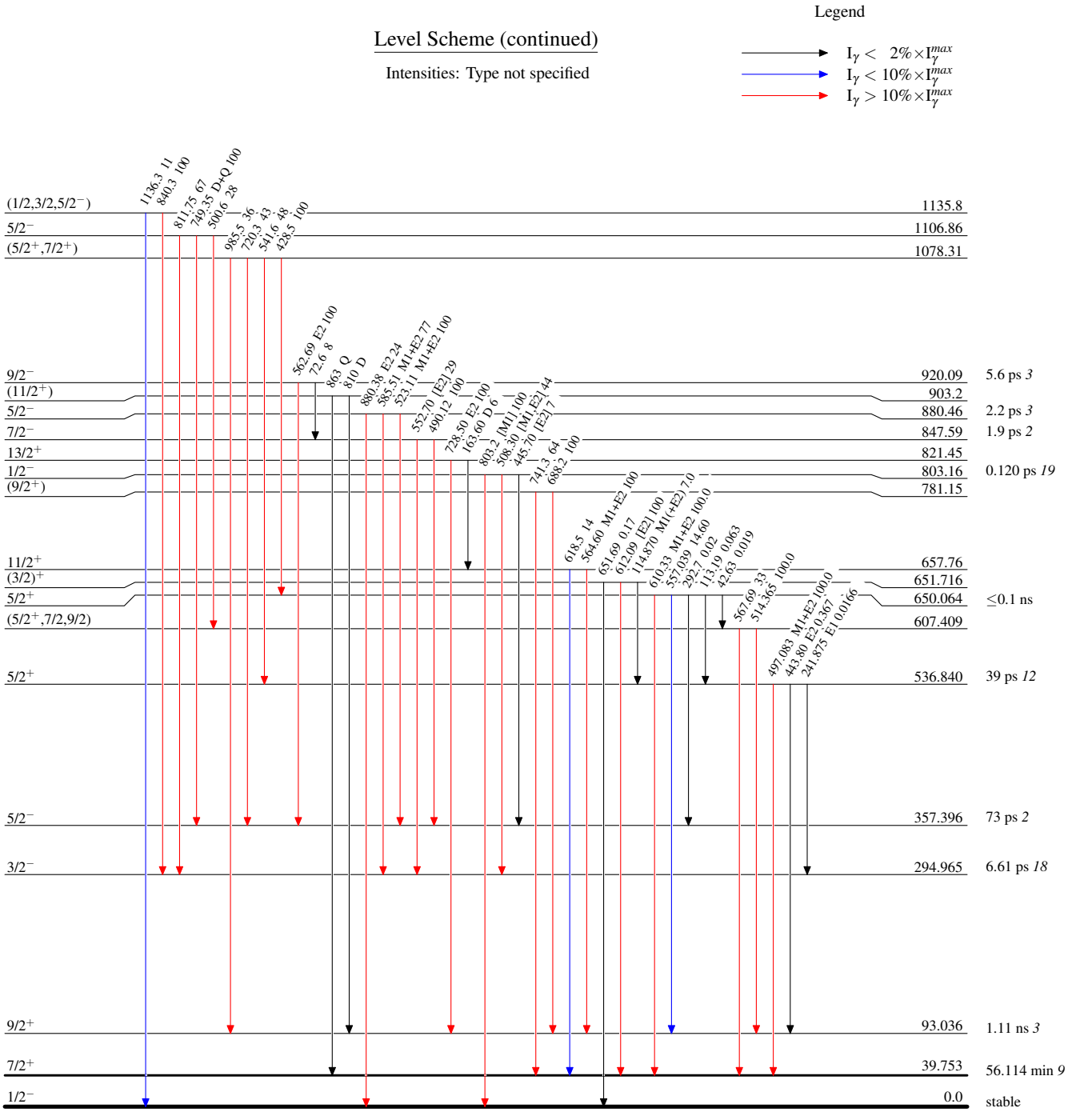


$^{103}_{45}Rh_{58}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

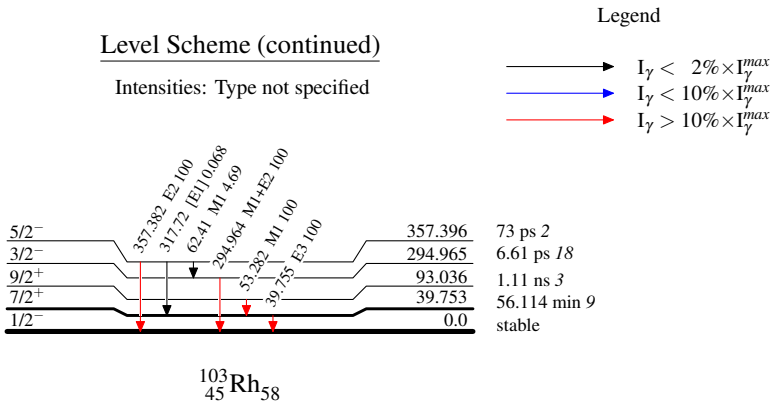


$^{103}_{45}Rh_{58}$

Adopted Levels, Gammas

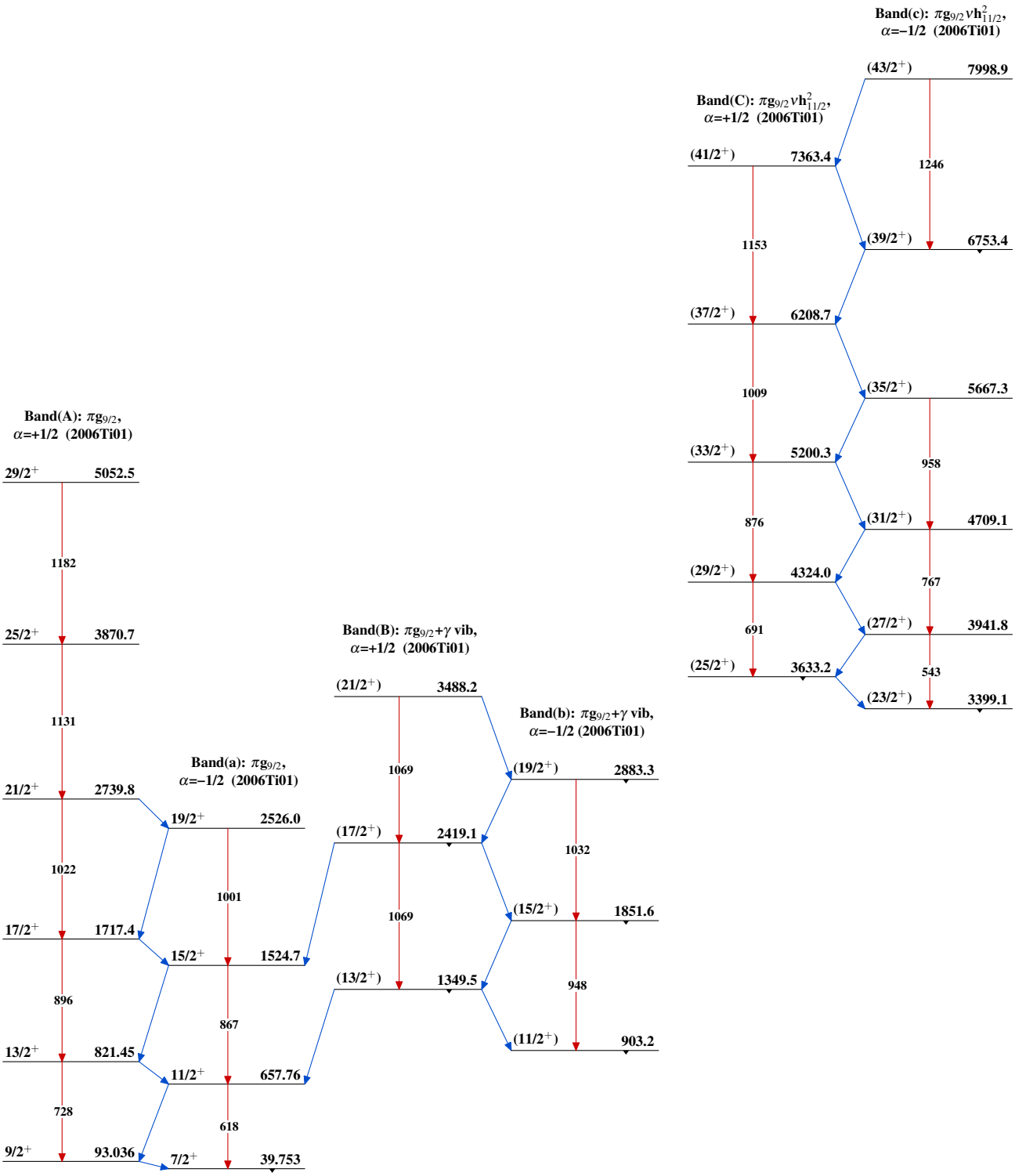
Level Scheme (continued)

Intensities: Type not specified



$^{103}_{45}Rh_{58}$

Adopted Levels, Gammas



$^{103}_{45}Rh_{58}$

Adopted Levels, Gammas (continued)