Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	D. De Frenne and A. Negret	NDS 109,943 (2008)	1-May-2007

Q(β^-)=39.40 *22*; S(n)=8461 *6*; S(p)=1.132×10^4 *4*; Q(α)=−5177 *10* 2012Wa38
Note: Current evaluation has used the following Q record 39.40 218466 7 *11320* 60-5190 22 2003Au03.

^{106}Ru Levels

Cross Reference (XREF) Flags

A	^{106}Tc β^- decay (35.6 s)	D	^{104}Ru(^{18}O,^{16}Oγ)
B	^{104}Ru(t,p)	E	(HI,xnγ)
C	^{104}Ru(t,pγ)	F	^{252}Cf SF decay

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$	XREF	Comments
0.0[#]	0$^+$	371.8 d *18*	ABCDEF	%β^-=100 T$_{1/2}$: From the evaluation of 2004Wo02. Others: 373.59 d (1980Ho17) *15*, 371.63 d *17* (1977DeYO), 371.7 d *15* (1983Wa26), 366.5 d *8* (1956Sc87), 372 d *4* (1957Me47), 365.8 d *17* (1960Ea02), 371 d 1 (1961Wy01), 368.0 d *18* (1965Fl02).
270.07[#] *4*	2$^+$	0.20 ns *3*	ABCDEF	g=+0.3 *1* J$^\pi$: L=2 (t,p). T$_{1/2}$: From time-integral perturbed angular correlations with Gammasphere in connection with a ^{252}Cf SF source (2004Sm04,2005Sm08). T$_{1/2}$ calculated assuming the same transition quadrupole moment as ^{108}Ru. Other: 0.26 ns *7* (1995Sc24). g: From ^{252}Cf SF decay (2004Sm04,2005Sm08).
714.69[#] *10*	(4$^+$)		AB DE	J$^\pi$: L=(4) in (t,p) and (444γ)(270γ)(θ) data consistent with 4-2-0 cascade.
792.31[@] *4*	2$^+$		AB DE	J$^\pi$: L=2 (t,p).
990.62 *5*	0$^+$		ABC	J$^\pi$: L(t,p)=0.
1091.55[@] *7*	(3$^+$)		A DE	J$^\pi$: suggested by 1980Su01 from similar decay properties of this level compared to the 3$^+$ levels in neighboring nuclei: ^{102}Ru, ^{104}Ru, ^{108}Ru. Consistent with (821γ)(270γ)(θ) data.
1295.8[#] *2*	(6$^+$)		DE	J$^\pi$: suggested from DWBA calculations in (^{18}O,^{16}O).
1306.8[@]	(4$^+$)		E	
1392.21 *7*	2$^+$		A	J$^\pi$: deexcites to 0$^+$ and 4$^+$ states. (1122γ)(270γ)(θ) data consistent with 2-2-0 cascade.
1641.1[@]	(5$^+$)		E	
1688.41 *21*			A	
1774.37 *8*	(2$^+$)		AB	J$^\pi$: from L=(2) in (t,p). Consistent with J=2,3,4 suggestion from (1504γ)(270γ)(θ).
1885.61 *9*	(2$^+$)		AB	J$^\pi$: from L=(2) in (t,p). Consistent with (1615γ)(270γ)(θ) data suggesting J=1,2,3.
1907.8[@]	(6$^+$)		B E	
1973.4[#] *4*	(8$^+$)		DE	XREF: E(1975). J$^\pi$: from agreement with DWBA calculations in (^{18}O,^{16}O).
2151 *8*			B	
2239.40 *7*	(1)		A	J$^\pi$: (1969γ)(270γ)(θ) suggests J=1. Consistent with predominant deexcitation to 0$^+$,2$^+$ states.
2284.1[@]	(7$^+$)		E	
2367 *5*	(4$^+$)		B	L(t,p)=(4).
2467 *10*			B	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{106}Ru Levels (continued)

E(level)[†]	J^{π}[‡]	XREF	Comments
2485.5[a]	(6$^-$)	E	
2544.3[&]	(7$^-$)	E	
2568.7		B E	
2632.82 *9*	(0$^+$)	AB	J$^\pi$: from L=(0) in (t,p). γ decay only to J^π=2$^+$ states consistent with J^π=(0$^+$).
2701.43 *8*	(1)	A	J$^\pi$: (2431γ)(270γ)(θ) suggests J=1. Consistent with predominant deexcitation to 0$^+$,2$^+$ states.
2705.0[#]	10$^+$	E	
2728.7		E	
2771 *5*	(2$^+$)	B	J$^\pi$: L(t,p)=(2).
2871.2[a]	(8$^-$)	E	
2876 *10*		B	J$^\pi$: possible doublet in (t,p).
2931 *10*		B	J$^\pi$: possible doublet in (t,p).
2945.94 *15*	(1,2)	A	J$^\pi$: γ to 0$^+$.
2960.1[@]	(8$^+$)	E	
2999.4		E	
3015.9		E	
3047.13 *15*	(1)	A	J$^\pi$: (2776γ)(270γ)(θ) suggests J=1. Consistent with predominant deexcitation to 0$^+$,2$^+$ states.
3059.53 *10*	(1)	A	J$^\pi$: (2789γ)(270γ)(θ) suggests J=1. Consistent with predominant deexcitation to 0$^+$,2$^+$ states.
3068.0[&]	(9$^-$)	E	
3186.43 *15*	(1)	A	J$^\pi$: (2916γ)(270γ)(θ) suggests J=1. Consistent with predominant deexcitation to 0$^+$,2$^+$ states.
3209.7		E	
3259.43 *15*	(1)	A	J$^\pi$: (2989γ)(270γ)(θ) suggests J=1. Consistent with predominant deexcitation to 0$^+$,2$^+$ states.
3364.13 *9*	(1)	A	J$^\pi$: (3093γ)(270γ)(θ) suggests J=1. Consistent with predominant deexcitation to 0$^+$,2$^+$ states.
3423.2[a]	(10$^-$)	E	
3450.0[#]	(12$^+$)	E	
3550.98 *16*	(1)	A	J$^\pi$: (3281γ)(270γ)(θ) suggests J=1. Consistent with predominant deexcitation to 0$^+$,2$^+$ states.
3704.7[&]	(11$^-$)	E	
3930.4 *3*	(1,2)	A	J$^\pi$: γ to 0$^+$.
4119.2[a]	(12$^-$)	E	
4241.0[#]	(14$^+$)	E	
4445.7[&]	(13$^-$)	E	

† Calculated with a least-squares fit from gammas in ^{106}Tc β^- decay and (HI,xnγ) reaction. For gammas in (HI,xnγ) reaction ΔE=1 keV was assumed by the evaluators.

‡ Based on measured γ mult and observed band structure, unless noted otherwise.

Band(A): g.s. band.

@ Band(B): K^π=2$^+$ band.

& Band(C): Band based on (7$^-$).

a Band(D): Band based on (6$^-$).

$\gamma(^{106}Ru)$

E_i(level)	J^π_i	E_γ†	I_γ	E_f	J^π_f	Mult.‡	δ‡	α#	$I_{(\gamma+ce)}$	Comments
270.07	2^+	270.096 *9*	100	0.0	0^+	[E2]				B(E2)(W.u.)=66 *10* E_γ: from 1979Bo26. Others: 270.3 *2* (1970HeZH), 269.8 *4* (1969WiZX).
714.69	(4^+)	444.60 *20*	100	270.07	2^+	(E2)				Mult.: from δ=infinity in (444γ)(270γ)(θ). These values are consistent with pure Q but not precise enough to exclude a small D fraction.
		714.7@ *7*		0.0	0^+					E_γ: Observed only in (^{18}O,^{16}O). Impossible if J^π 714 kev level is 4^+.
792.31	2^+	522.22 *5*	100 *7*	270.07	2^+	M1+E2	7.1 *+16−11*	0.0045		Mult.: $\Delta\pi$=no from decay scheme.
		792.31 *5*	69 *5*	0.0	0^+					
990.62	0^+	720.55 *5*	100	270.07	2^+	(E2)				Mult.: from J^π assignment. Consistent with δ=infinity from (720γ)(270γ)(θ). These values are consistent with pure Q but not precise enough to exclude a small D fraction.
		990.62 *5*		0.0	0^+	[E0]			33×10^{-4} *13*	Mult.: from I(ce(K) 990γ)=30×10^{-4} *12* in (t,pγ). E_γ: taken by the evaluators from level energies.
1091.55	(3^+)	299.20 *10*	17 *6*	792.31	2^+					
		376.90 *20*	11 *6*	714.69	(4^+)					
		821.50 *10*	100 *11*	270.07	2^+	D+Q	−3.8 *+9−16*			δ: δ=−0.5 also consistent with $\gamma\gamma(\theta)$.
1295.8	(6^+)	581.1 *2*	100	714.69	(4^+)					
1306.8	(4^+)	515		792.31	2^+					
		592		714.69	(4^+)					
1392.21	2^+	401.50 *20*	7 *3*	990.62	0^+					
		677.50 *10*	23 *3*	714.69	(4^+)					
		1122.20 *10*	100 *10*	270.07	2^+	M1+E2	0.24 *+13−12*			Mult.: $\Delta\pi$=no from decay scheme.
		1392.20 *10*	23 *3*	0.0	0^+					
1641.1	(5^+)	549 *1*		1091.55	(3^+)					
		927 *1*		714.69	(4^+)					
1688.41		896.10 *20*	100	792.31	2^+					
1774.37	(2^+)	682.80 *10*	33 *5*	1091.55	(3^+)					
		1504.30 *10*	100 *10*	270.07	2^+					
1885.61	(2^+)	1615.50 *10*	100	270.07	2^+					
1907.8	(6^+)	601 *1*		1306.8	(4^+)					
1973.4	(8^+)	677.6 *4*	100	1295.8	(6^+)					E_γ: From (^{18}O,^{16}O).
2239.40	(1)	353.70 *20*	2.9 *8*	1885.61	(2^+)					
		1248.80 *10*	4.1 *8*	990.62	0^+					
		1969.40 *10*	65 *7*	270.07	2^+	D+Q	0.29 *7*			
		2239.30 *10*	100 *9*	0.0	0^+					
2284.1	(7^+)	643 *1*		1641.1	(5^+)					
2485.5	(6^-)	1189 *1*		1295.8	(6^+)					
2544.3	(7^-)	1247 *1*		1295.8	(6^+)					

$^{106}_{44}Ru_{62}$-3

$\gamma(^{106}Ru)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ	E_f	J^π_f	Mult.‡	δ‡
2568.7		1272 *1*		1295.8	(6^+)		
2632.82	(0^+)	1240.50 *20*	8.8 *18*	1392.21	2^+		
		1840.50 *10*	100 *12*	792.31	2^+		
		2362.80 *20*	24 *6*	270.07	2^+		
2701.43	(1)	1710.80 *10*	10.0 *10*	990.62	0^+		
		2431.30 *20*	45 *5*	270.07	2^+	D+Q	−0.003 *91*
		2701.40 *10*	100 *10*	0.0	0^+		
2705.0	10^+	730 *1*		1973.4	(8^+)		
2728.7		1432		1295.8	(6^+)		
2871.2	(8^-)	386 *1*		2485.5	(6^-)		
		896 *1*		1973.4	(8^+)		
2945.94	(1,2)	2153.60 *20*	9.8 *16*	792.31	2^+		
		2945.90 *20*	100 *8*	0.0	0^+		
2960.1	(8^+)	676 *1*		2284.1	(7^+)		
2999.4		1024 *1*		1973.4	(8^+)		
3015.9		1040 *1*		1973.4	(8^+)		
		1720 *1*		1295.8	(6^+)		
3047.13	(1)	2777.00 *20*	86 *6*	270.07	2^+	D+Q	0.15 *5*
		3047.10 *20*	100 *10*	0.0	0^+		
3059.53	(1)	1667.50 *20*	3.5 *14*	1392.21	2^+		
		2068.90 *20*	2.8 *7*	990.62	0^+		
		2267.20 *20*	18 *4*	792.31	2^+		
		2789.30 *20*	100 *8*	270.07	2^+	D+Q	−0.5 *6*
		3059.40 *20*	7.8 *7*	0.0	0^+		
3068.0	(9^-)	523 *1*		2544.3	(7^-)		
		1094 *1*		1973.4	(8^+)		
3186.43	(1)	2916.30 *20*	64 *6*	270.07	2^+	D+Q	0.03 *8*
		3186.40 *20*	100 *10*	0.0	0^+		
3209.7		481 *1*		2728.7			
3259.43	(1)	2989.20 *20*	22.4 *20*	270.07	2^+	D+Q	0.14 *14*
		3259.50 *20*	100 *10*	0.0	0^+		
3364.13	(1)	1478.50 *10*	40 *5*	1885.61	(2^+)		
		1589.70 *20*	25 *10*	1774.37	(2^+)		
		2571.90 *20*	100 *10*	792.31	2^+		
		3093.90 *20*	55 *5*	270.07	2^+	D+Q	0.20 *+15−14*
		3364.20 *30*	90 *10*	0.0	0^+		
3423.2	(10^-)	552 *1*		2871.2	(8^-)		
3450.0	(12^+)	745 *1*		2705.0	10^+		
3550.98	(1)	2758.50 *20*	77 *9*	792.31	2^+		
		3281.10 *30*	41 *5*	270.07	2^+	D+Q	0.25 *+13−12*
		3551.0 *4*	100 *9*	0.0	0^+		
3704.7	(11^-)	637 *1*		3068.0	(9^-)		

$^{106}_{44}Ru_{62}$-4

$\gamma(^{106}Ru)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ	E_f	J_f^π
3704.7	(11^-)	705 *1*		2999.4	
3930.4	(1,2)	3660.4 *4*	100 *14*	270.07	2^+
		3930.2 *4*	86 *14*	0.0	0^+
4119.2	(12^-)	696 *1*		3423.2	(10^-)
4241.0	(14^+)	791 *1*		3450.0	(12^+)
4445.7	(13^-)	741 *1*		3704.7	(11^-)

† Taken from ^{106}Tc β^- decay, except for those γ's only observed in (HI,xnγ) reactions.

‡ Unless noted otherwise, from $\gamma\gamma(\theta)$ in ^{106}Tc β^- decay.

\# Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

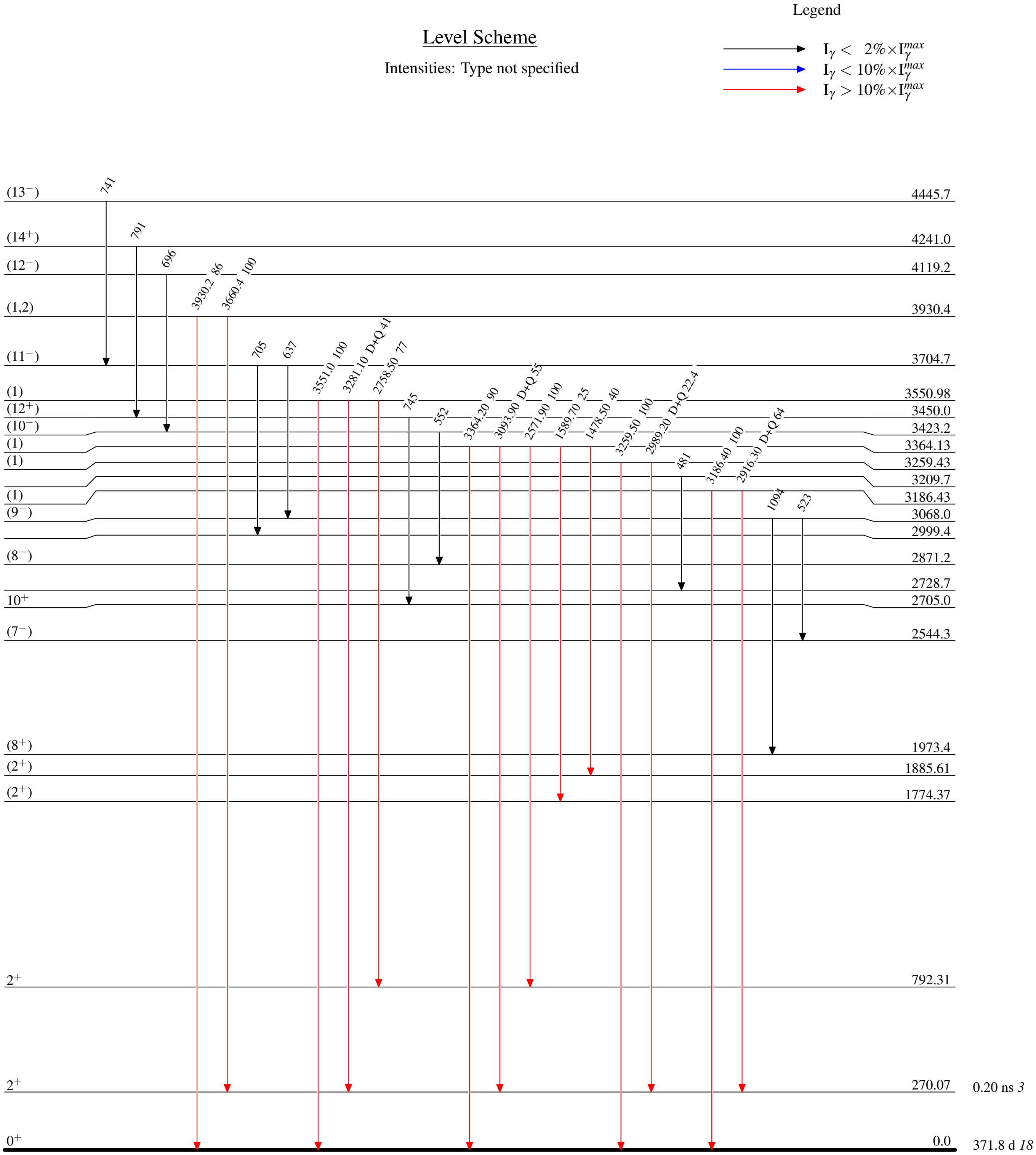
@ Placement of transition in the level scheme is uncertain.

$^{106}_{44}Ru_{62}$-5

Adopted Levels, Gammas

Level Scheme

Intensities: Type not specified

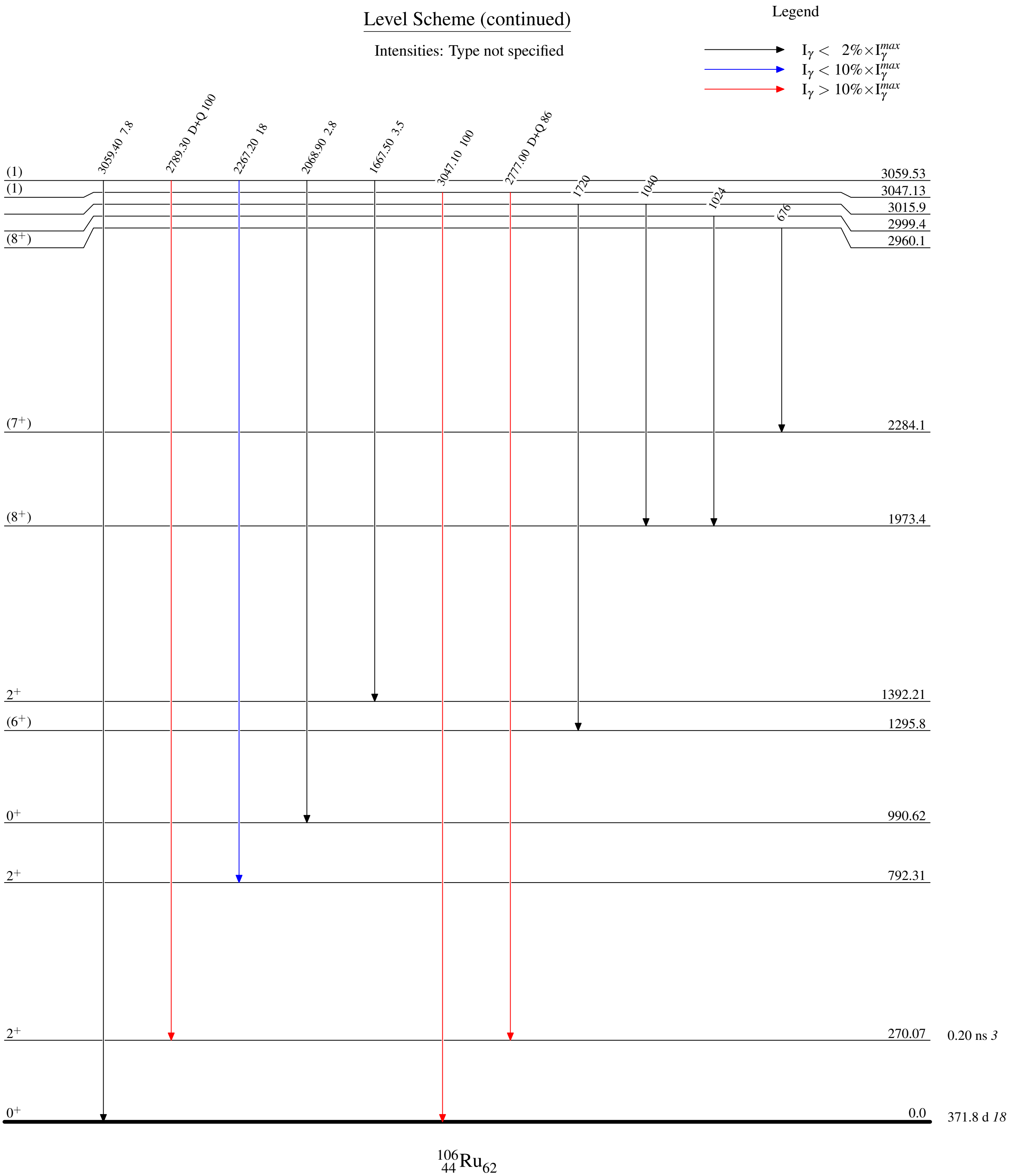


$^{106}_{44}Ru_{62}$

Adopted Levels, Gammas

Level Scheme (continued)

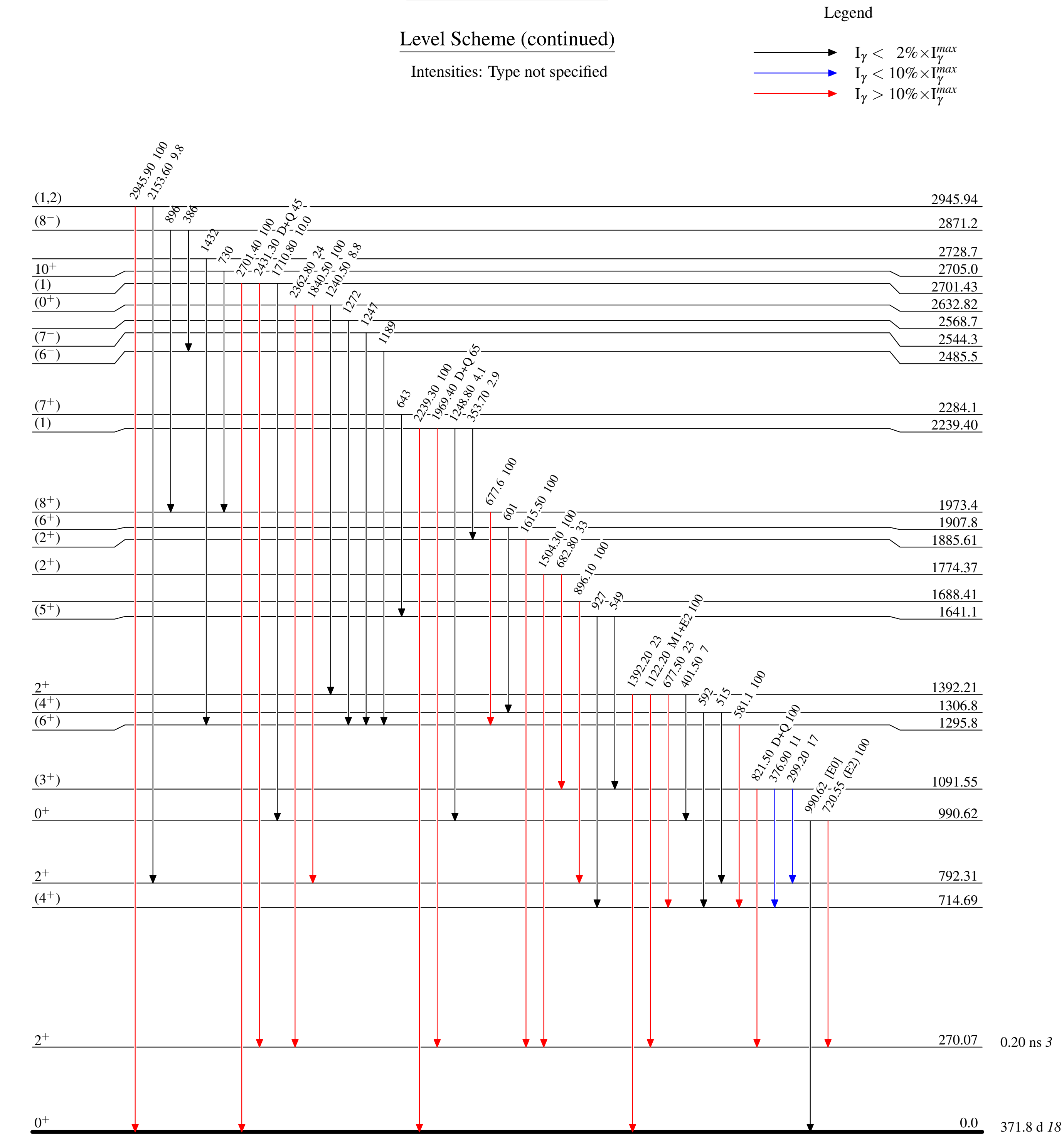
Intensities: Type not specified



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified



$^{106}_{44}Ru_{62}$

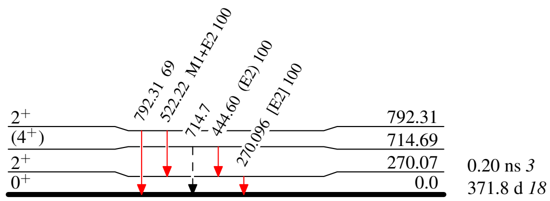
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

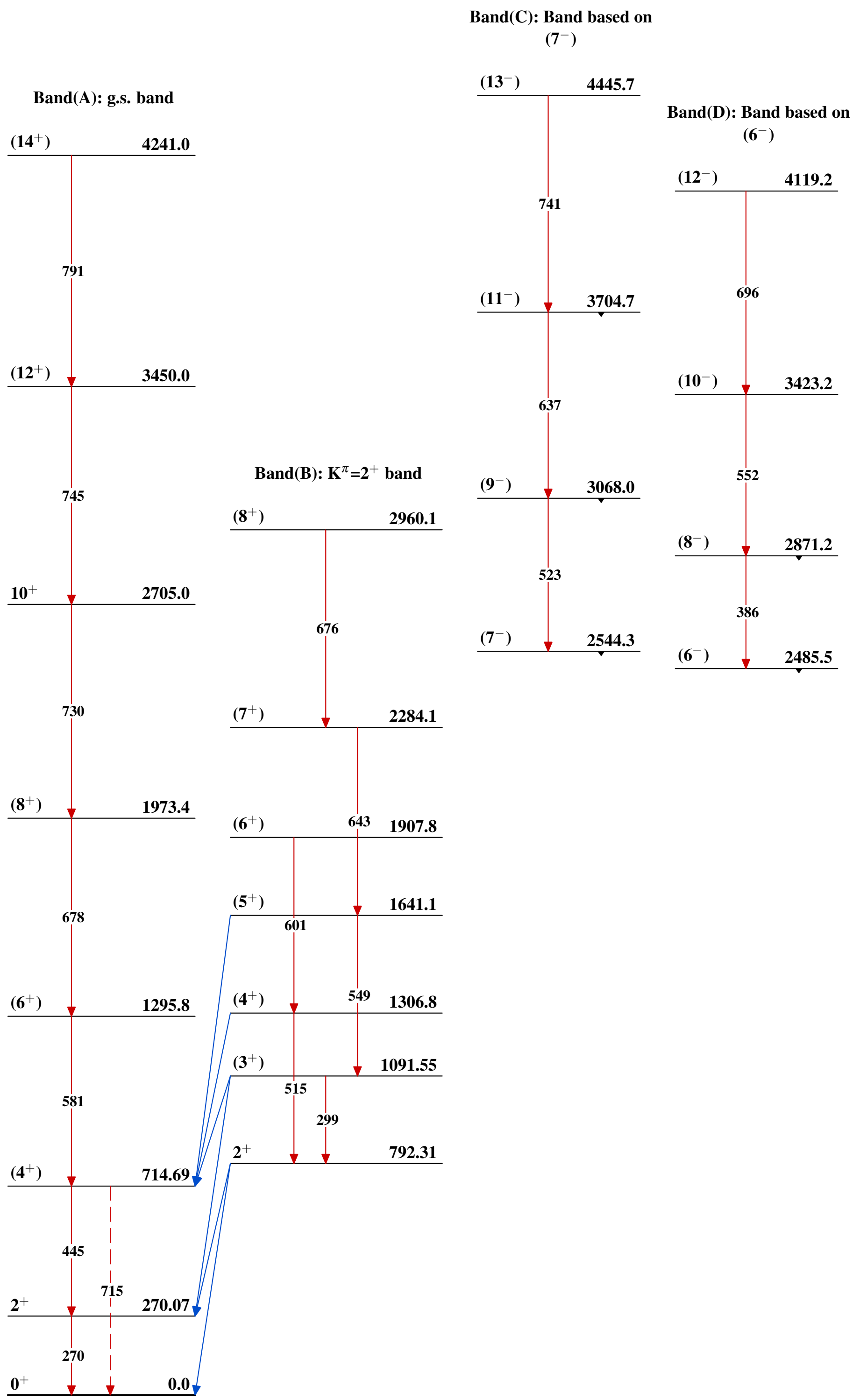
Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)



$^{106}_{44}Ru_{62}$

Adopted Levels, Gammas



$^{106}_{44}Ru_{62}$