^{100}Rh ε decay (20.5 h) 1995KeZZ,1996Gi04,1969Be69

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 172, 1 (2021)	31-Jan-2021

Parent: ^{100}Rh: E=0.0; J$^{\pi}$=1^{-}; T$_{1/2}$=20.5 h *3*; Q(ε)=3636 *18*; %ε+%β^{+} decay=100.0

^{100}Rh-J$^{\pi}$,T$_{1/2}$: From the Adopted Levels.

^{100}Rh-Q(ε): From 2017Wa10.

1995KeZZ: ^{100}Rh source was produced via the ^{100}Ru(p,n) reaction with proton beam from the IPEN cyclotron on 15 mg ^{100}Ru target. γ rays were detected with HPGe and Ge(Li) detectors. Measured Eγ, $\gamma\gamma$-coin, γ(t). Deduced levels, decay branching ratios, parent T$_{1/2}$. Comparisons with available data. In an earlier work by the same author as 1995KeZZ, $\gamma\gamma(\theta)$ data using two Ge(Li) detectors were reported in Master′s thesis 1990KeZV, and γ-ray multipolarities and mixing ratios were deduced. See also 1991Pr08.

1996Gi04: ce data, γ data for selected transitions.

1969Be69: γ, $\gamma\gamma$ data.

1974Ko23 (also 1974Ko05 from the same group): ce data for mainly the E0 transitions. γ data for selected transitions.

1978Ba29: $\gamma\gamma(\theta)$ data using germanium and NaI detectors. γ data for selected transitions.

Others: 1977BhZV, 1969An11, 1968Ka04, 1966Au06, 1964Ko04, 1964An13, 1962Ba17, 1953Ma64, 1950Su29, 1948Li03.

All measurements grouped by types of measured data:

γ data: 1995KeZZ, 1969Be69, 1996Gi04, 1978Ba29, 1974Ko23, 1977BhZV, 1969An11, 1968Ka04, 1964Ko04, 1964An13, 1962Ba17.

$\gamma\gamma$ data: 1995KeZZ, 1969Be69, 1978Ba29, 1977BhZV, 1969An11, 1968Ka04, 1964Ko04, 1962Ba17.

$\gamma\gamma(\theta)$ data: 1978Ba29, 1991Pr08, 1968Ka04, 1964Ko04.

ce data: 1996Gi04, 1974Ko23 (also 1974Ko05), 1964Ko04, 1964An13, 1953Ma64.

(ce)(γ): 1968Ka04.

$\gamma\gamma(\theta$,H,t): 1966Au06.

β^{+} data: 1953Ma64, 1964An13, 1948Li03.

T$_{1/2}$(^{100}Rh g.s.): 1995KeZZ, 1953Ma64, 1964An13, 1964Ko04, 1950Su29, 1948Li03.

Total decay energy deposit of 3640 keV *24* calculated by RADLIST code is in agreement with expected value of 3636 keV *18*.

^{100}Ru Levels

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$[‡]	Comments
0.0	0^{+}		
539.511 *5*	2^{+}	12.54 ps *10*	g=+0.55 *7* (1966Au06) g-factor from $\gamma\gamma(\theta$,H,t) for T$_{1/2}$=11.0 ps in 1966Au06.
1130.300 *7*	0^{+}	8.2 ps *+15−11*	
1226.477 *7*	4^{+}		
1362.162 *6*	2^{+}[#]		
1740.993 *11*	0^{+}		
1865.106 *7*	2^{+}		
1881.043 *6*	3^{+}		Branching ratios to 0^{+} states: <0.1% (to g.s.), <0.7% (to 1130) (1996Gi04).
2051.657 *7*	0^{+}		
2099.109 *8*	2^{+}		
2166.873 *6*	3^{-}		
2240.812 *9*	2^{+}		
2387.14 *3*	0^{+}		
2469.388 *6*	2^{-}		
2512.41 *3*	(4)$^{+}$		
2516.824 *6*	1^{-}		
2536.151 *25*	3		
2543.733 *25*	2^{+}		
2569.908 *8*	(3)$^{-}$		
2617.09 *4*	1,2^{+}		

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^{100}Rh ε decay (20.5 h) 1995KeZZ,1996Gi04,1969Be69 (continued)

^{100}Ru Levels (continued)

E(level)[†]	Jπ[‡]	Comments
2660.135 *17*	1,2$^+$	
2666.30 *3*	(2,3)	
2745.59 *5*	(1,2$^+$)	
2774.9 *8*	2$^+$,3$^+$	
2801.41 *6*		
2915.542 *6*	2$^-$	
2933.65 *10*	(1,2)$^+$	
3060.15 *5*	1,2$^+$	
3069.522 *7*	(1,2)$^-$	Jπ: (2530γ)(540γ)(θ) in 1978Ba29 favors J=1 but γγ(θ) in 1990KeZV favors J=2.
3072.248 *18*	2$^+$	
3323.759 *25*	(1,2$^+$)	
3419.13 *17*	(2$^+$)	
3463.79 *4*	(1$^+$,2)	

† From least-squares fit to Eγ data. The uncertainty of the doublet at 1207.50 *3* was assumed as 0.3 keV in the fitting procedure. Normalized χ^2 is 1.8, somewhat larger than the critical value of 1.4.
‡ From the Adopted Levels, unless otherwise stated.
# From γγ(θ).

ε,β$^+$ radiations

Branching to 2167 level <0.07%.

E(decay)	E(level)	Iβ$^+$ [#]	Iε[#]	Log *ft*	I(ε+β$^+$)[‡#]	Comments
(172 *18*)	3463.79		0.012 *3*	7.4 *2*	0.012 *3*	εK=0.840 *5*; εL=0.129 *4*; εM+=0.0313 *10*
(217 *18*)	3419.13		0.0123 *6*	7.6 *1*	0.0123 *6*	εK=0.8467 *24*; εL=0.1236 *19*; εM+=0.0297 *6*
(312 *18*)	3323.759		0.330 *6*	6.51 *6*	0.330 *6*	εK=0.8544 *11*; εL=0.1175 *8*; εM+=0.02807 *23*
(564 *18*)	3072.248		0.433 *11*	6.93 *4*	0.433 *11*	εK=0.8616 *3*; εL=0.11190 *23*; εM+=0.02652 *7*
(566 *18*)	3069.522		3.45 *4*	6.03 *3*	3.45 *4*	εK=0.8616 *3*; εL=0.11187 *22*; εM+=0.02651 *6*
(576 *18*)	3060.15		0.122 *3*	7.50 *4*	0.122 *3*	εK=0.8618 *3*; εL=0.11176 *22*; εM+=0.02648 *6*
(702 *18*)	2933.65		0.0106 *4*	8.74 *3*	0.0106 *4*	εK=0.8633 *2*; εL=0.11058 *14*; εM+=0.02616 *4*
(720 *18*)	2915.542		68.6 *6*	4.95 *3*	68.6 *6*	εK=0.8634 *2*; εL=0.11045 *14*; εM+=0.02612 *4*
(835 *18*)	2801.41		0.0072 *13*	9.1 *1*	0.0072 *13*	εK=0.8643 *2*; εL=0.1097 *1*; εM+=0.02593 *3*
(861 *18*)	2774.9		0.019 *5*	8.7 *1*	0.019 *5*	εK=0.8645 *2*; εL=0.1096 *1*; εM+=0.02590 *3*
(890 *18*)	2745.59		0.049 *3*	8.28 *4*	0.049 *3*	εK=0.8647 *1*; εL=0.10947 *9*; εM+=0.02586 *3*
(970 *18*)	2666.30		0.009 *3*	9.1 *2*	0.009 *3*	εK=0.86510 *9*; εL=0.10914 *8*; εM+=0.02576 *2*
(976 *18*)	2660.135		0.016 *4*	8.9 *1*	0.016 *4*	εK=0.86513 *9*; εL=0.10911 *7*; εM+=0.02576 *2*
(1019 *18*)	2617.09		0.056 *2*	8.35 *2*	0.056 *2*	εK=0.8653; εL=0.10896 *7*; εM+=0.02572 *2*
(1066[@] *18*)	2569.908		<0.03	>8.7	<0.03	εK=0.8655; εL=0.10880 *6*; εM+=0.02567 *2*
(1092 *18*)	2543.733		0.080 *3*	8.25 *2*	0.080 *3*	εK=0.8656; εL=0.10872 *6*; εM+=0.02565 *2*
(1119 *18*)	2516.824		1.313 *13*	7.06 *2*	1.313 *13*	εK=0.8657; εL=0.10863 *6*; εM+=0.02563 *2*
(1124[@] *18*)	2512.41		<0.03	>8.7	<0.03	εK=0.8657; εL=0.10862 *6*; εM+=0.02562 *2*
(1167 *18*)	2469.388	0.0024 *17*	19.9 *2*	5.91 *2*	19.9 *2*	av Eβ=71.1 *82*; εK=0.8658; εL=0.10849 *6*; εM+=0.02559 *2*
(1249 *18*)	2387.14		0.080 *4*	8.37 *3*	0.080 *4*	εK=0.8654 *3*; εL=0.10821 *8*; εM+=0.02551 *2*
(1395 *18*)	2240.812	0.00091 *19*	0.134 *9*	8.24 *4*	0.135 *9*	av Eβ=171.0 *78*; εK=0.8607 *12*; εL=0.10727 *18*; εM+=0.02528 *5*
(1537 *18*)	2099.109	0.0013 *3*	0.055 *9*	8.7 *1*	0.056 *9*	av Eβ=232.0 *78*; εK=0.847 *3*; εL=0.1053 *4*; εM+=0.02481 *9*
(1584 *18*)	2051.657	0.00072 *15*	0.022 *4*	9.1 *1*	0.023 *4*	av Eβ=252.4 *78*; εK=0.840 *4*; εL=0.1043 *5*;

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^{100}Rh ε decay (20.5 h) 1995KeZZ,1996Gi04,1969Be69 (continued)

ϵ,β^+ radiations (continued)

E(decay)	E(level)	Iβ^+ #	Iε#	Log *ft*	I($\varepsilon+\beta^+$)‡#	Comments
						εM+=0.02458 *11*
(1755 *18*)	1881.043	0.009 *3*	0.10 *4*	8.6 *2*	0.11 *4*	av Eβ=326.2 *79*; εK=0.800 *6*; εL=0.0991 *7*; εM+=0.02334 *17*
(1895 *18*)	1740.993	0.0090 *17*	0.058 *10*	8.9 *1*	0.067 *12*	av Eβ=387.2 *79*; εK=0.751 *8*; εL=0.0929 *10*; εM+=0.02187 *22*
(2274 *18*)	1362.162	0.11 *4*	0.20 *9*	8.5 *2*	0.31 *13*	av Eβ=554.4 *81*; εK=0.570 *10*; εL=0.0703 *12*; εM+=0.0166 *3* Iβ^+: 0.16 *3* from ($\gamma^{\pm}$)(823γ) coin (1995KeZZ). This gives Iε+Iβ=0.47 *9*.
(2506 *18*)	1130.300	0.149 *7*	0.165 *8*	8.67 *3*	0.314 *14*	av Eβ=658.2 *81*; εK=0.456 *9*; εL=0.0561 *11*; εM+=0.01320 *25* Iβ^+: 0.13 *2* from ($\gamma^{\pm}$)(591γ) coin (1995KeZZ). This gives Iε+Iβ=0.29 *5*.
3092† *20*	539.511	1.2 *4*	0.47 *14*	8.4 *1*	1.7 *5*	av Eβ=927.0 *83*; εK=0.241 *5*; εL=0.0296 *6*; εM+=0.00696 *14* Iβ^+: 1.7 *5* from ($\gamma^{\pm}$)(539γ) coin (1995KeZZ) and 1.9 from β^+ spectrum (1953Ma64). Iβ=1.7 gives Iε+Iβ=2.4 *7*.
3637† *20*	0.0	2.4 *6*	0.46 *11*	8.6 *1*	2.9 *7*	av Eβ=1176.8 *84*; εK=0.1381 *25*; εL=0.0169 *3*; εM+=0.00398 *8* Iβ^+: from $\gamma^{\pm}$ coin spectra (1995KeZZ). Other: 2.2 (1953Ma64, β^+ data with a magnetic spectrometer).

† From 1953Ma64 from analysis of Fermi plot in five components. The components to g.s. and 540 level seem to agree with γ-ray data whereas three others at Eβ(Iβ)=1260 *10*(0.62%), 540 *25* (0.18%), 150 *30* (0.003%) are probably incorrect. The relative branching to g.s. and 540 level is also not very accurately determined.

‡ From I(γ+ce) intensity balance at each level.

\# Absolute intensity per 100 decays.

@ Existence of this branch is questionable.

$\gamma(^{100}$Ru)

Iγ normalization: from Σ(I(γ+ce) of gammas to g.s.)=97.1 *7*. I($\varepsilon+\beta^+$)(to g.s.)=2.9 *7* based on measured Iβ^+(g.s.)=2.4 *6* (1995KeZZ). The previous measurements: ce(K)(540γ)/Iβ^+=0.062 (1953Ma64), I($\gamma^\pm$)/Iγ(540γ)=0.110 *12* (1968Ka04), 0.150 *16* (1964Ko04) combined with γ-ray intensity balance in the level scheme give Iγ normalization=0.78 *2*.

The 218γ (Iγ=0.03 *1*, 1978Ba29) and 2395.7γ (Iγ=0.13 *8*, 1969Be69) are omitted since these are not confirmed by 1995KeZZ and 1996Gi04. Iγ(218γ)<0.0025 (1996Gi04), Iγ(2396γ)<0.0012 (1995KeZZ).

E_γ [†]	I_γ [†&]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [@]	δ [@]	α [a]	Comments
[x]104.20 *4*	0.0023 *5*								
140.03 *3*	0.0052 *5*	3463.79	(1$^+$,2)	3323.759	(1,2$^+$)	[D,E2]		0.22 *17*	
141.27 *5*	0.0028 *5*	2801.41		2660.135	1,2$^+$	[D,E2]		0.21 *16*	
154.007 *10*	0.0328 *9*	3069.522	(1,2)$^-$	2915.542	2$^-$	[M1,E2]		0.18 *9*	α(K)=0.16 *8*; α(L)=0.024 *14*; α(M)=0.004 *3* α(N)=0.0007 *4*; α(O)=2.5×10^{-5} *11*
228.581 *8*	0.1798[#] *14*	2469.388	2$^-$	2240.812	2$^+$	E1		0.01306	α(K)exp=0.008 *2* (1996Gi04) α(K)=0.01146 *16*; α(L)=0.001322 *19*; α(M)=0.000241 *4* α(N)=3.87×10^{-5} *6*; α(O)=1.94×10^{-6} *3* Mult.: α(K)exp from 1996Gi04 gives mult=E1.
234.0[c] *5*	0.0023 *8*	2099.109	2$^+$	1865.106	2$^+$	[M1,E2]		0.047 *16*	α(K)=0.040 *14*; α(L)=0.0054 *22*; α(M)=0.0010 *4* α(N)=0.00016 *7*; α(O)=6.9×10^{-6} *19* I$_\gamma$: 0.10 *2* (1978Ba29) is in severe disagreement. Iγ(234γ)/Iγ(1559γ)<0.002 (1996Gi04). Placement is from 1978Ba29. Eγ agrees with the level-energy difference.
249.25 *3*	0.0151 *6*	2915.542	2$^-$	2666.30	(2,3)	[D,E2]		0.03 *2*	
255.417 *17*	0.0210 *5*	2915.542	2$^-$	2660.135	1,2$^+$	[D,E2]		0.03 *2*	
298.55 *11*	0.0060 *9*	2915.542	2$^-$	2617.09	1,2$^+$	[D,E2]		0.017 *11*	
301.771 *8*	0.258 *18*	2166.873	3$^-$	1865.106	2$^+$	(E1(+M2))	+0.04 *3*	0.00620 *23*	α(K)=0.00544 *20*; α(L)=0.00063 *3*; α(M)=0.000114 *5* α(N)=1.84×10^{-5} *8*; α(O)=9.4×10^{-7} *4* α(N)=1.80×10^{-5} *3*; α(O)=9.18×10^{-7} *13* I$_\gamma$: 0.10 *5* (1969Be69).
302.507 *6*	0.899 *18*	2469.388	2$^-$	2166.873	3$^-$	M1+E2	1.8 *+12−5*	0.0237 *14*	α(K)exp=0.0194 *11* (1996Gi04) α(K)=0.0205 *12*; α(L)=0.00268 *19*; α(M)=0.00049 *4* α(N)=7.8×10^{-5} *6*; α(O)=3.49×10^{-6} *17* Mult.: α(K)exp from 1996Gi04 gives δ(E2/M1)=1.8 *+12−5*. A_2=−0.25 *10*, A_4=−0.10 *16* for (302γ)(1627γ)(540γ)(θ) and A_2=+0.11 *10*, A_4=+0.21 *19* for (302γ)(1627γ)(θ) (1990KeZV) gives δ(Q/D)=2.7 *9* or 0.16 *10* for J(2469)=2 and J(2167)=3.
345.654 *8*	0.0983 *13*	2915.542	2$^-$	2569.908	(3)$^-$	[M1,E2]		0.014 *3*	α(K)=0.0123 *23*; α(L)=0.0015 *4*; α(M)=0.00028 *7* α(N)=4.5×10^{-5} *11*; α(O)=2.2×10^{-6} *4*

γ(^{100}Ru) (continued)

E_γ[†]	I_γ[†&]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[@]	δ[@]	α[a]	Comments
349.960 *16*	0.0379 *13*	2516.824	1^-	2166.873	3^-	[E2]		0.01614	α(K)=0.01393 *20*; α(L)=0.00181 *3*; α(M)=0.000334 *5* α(N)=5.29×10^{-5} *8*; α(O)=2.37×10^{-6} *4*
370.275 *7*	0.933[#] *4*	2469.388	2^-	2099.109	2^+	E1		0.00355	α(K)=0.00312 *5*; α(L)=0.000357 *5*; α(M)=6.52×10^{-5} *10* α(N)=1.051×10^{-5} *15*; α(O)=5.40×10^{-7} *8* Mult.: α(K)exp=0.0039 *9* from 1996Gi04 gives δ(M2/E1)=0.16 *+8−16*; α(K)exp=0.013 *8* from 1964Ko04 is consistent with mult=D,E2. Other ce data: 1953Ma64. (370γ)(1560γ)(θ): A_2=+0.12 *8*, A_4=−0.11 *12* (1990KeZV) gives δ(Q/D)=−1.3 *13*.
378.79 *5*	0.082 *14*	1740.993	0^+	1362.162	2^+	E2		0.01251	α(K)exp=0.0012 *6* (1974Ko23) α(K)=0.01082 *16*; α(L)=0.001389 *20*; α(M)=0.000256 *4* α(N)=4.06×10^{-5} *6*; α(O)=1.85×10^{-6} *3* E_γ: 378.93 *4* (1974Ko23). Mult.: α(K)exp in 1974Ko23 gives mult=M1,E2, but ΔJ^π requires E2; (378γ)(1362γ)(θ): A_2=−0.1 *5*, A_4=+0.4 *9* (1990KeZV) supports E2.
379.24 *5*	0.065 *14*	2915.542	2^-	2536.151	3				E_γ: level energy difference=379.39.
398.716 *6*	0.1737[#] *12*	2915.542	2^-	2516.824	1^-	[D,E2]		0.007 *4*	
403.07[b] *11*	0.10[b] *2*	2569.908	$(3)^-$	2166.873	3^-	(M1+E2)	+1.58 *7*	0.00958 *15*	α(K)=0.00832 *13*; α(L)=0.001036 *16*; α(M)=0.000191 *3* α(N)=3.04×10^{-5} *5*; α(O)=1.452×10^{-6} *21* Placement from 1995KeZZ. 1969Be69 place this γ from 3464 level. E_γ: level energy difference=403.03 *1*. I_γ: from γγ. Iγ(doublet)=0.232 *24* from singles spectrum.
403.07[b] *11*	0.09[b] *3*	2915.542	2^-	2512.41	$(4)^+$	[M2]		0.0289	α(K)=0.0250 *4*; α(L)=0.00316 *5*; α(M)=0.000586 *9* α(N)=9.45×10^{-5} *14*; α(O)=4.85×10^{-6} *7* Placement from 1995KeZZ. 1969Be69 place from 3464 level. E_γ: level energy difference=403.13 *3*. I_γ: from γγ.
409.18 *8*	0.0082 *8*	3069.522	$(1,2)^-$	2660.135	$1,2^+$	[D,E2]		0.006 *4*	
446.153 *5*	14.86[#] *8*	2915.542	2^-	2469.388	2^-	M1(+E2)	<0.45	0.00624 *15*	α(K)=0.00546 *13*; α(L)=0.000638 *19*; α(M)=0.000117 *4* α(N)=1.89×10^{-5} *6*; α(O)=9.93×10^{-7} *19* α(K)exp=0.0054 *3* (1996Gi04). K/L=8.3 *10*, α(K)exp=0.0064 *6*, α(L)exp=0.00077 *7* (1964Ko04). δ: ce data in 1996Gi04 and 1964Ko04 gives δ(E2/M1)>0.7 is inconsistent with adopted value. Other ce data: 1953Ma64. (446γ)(1930γ)(θ): A_2=+0.067 *11*, A_4=−0.02 *3* (1978Ba29). A_2=+0.046 *12*, A_4=−0.01 *2* for (446γ)(1930γ)(θ) and A_2=+0.10 *3*, A_4=−0.06 *5* for (446γ)(1107γ)(θ) (1990KeZV) gives δ(E2/M1)=−0.11 *3*.

γ(^{100}Ru) (continued)

E_γ [†]	I_γ [†&]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [@]	δ [@]	α [a]	Comments
465.15 *3*	0.1283[#] *10*	2516.824	1⁻	2051.657	0⁺	[E1]		0.010 *9*	α(K)=0.009 *8*; α(L)=0.0011 *10*; α(M)=0.00021 *17* α(N)=3.E−5 *3*; α(O)=1.7×10⁻⁶ *15*
470.98 *17*	0.0037 *8*	2569.908	(3)⁻	2099.109	2⁺	[E1,M2]		0.010 *8*	α(K)=0.009 *7*; α(L)=0.0011 *9*; α(M)=0.00020 *17* α(N)=3.E−5 *3*; α(O)=1.7×10⁻⁶ *14*
ˣ480.33 *14*	0.0040 *8*								
499.599 *7*	0.1401 *20*	3069.522	(1,2)⁻	2569.908	(3)⁻	M1,E2		0.0050 *4*	α(K)exp=0.0044 *7* (1996Gi04) α(K)=0.0044 *3*; α(L)=0.00052 *6*; α(M)=9.6×10⁻⁵ *10* α(N)=1.54×10⁻⁵ *15*; α(O)=7.8×10⁻⁷ *4* Mult.: α(K)exp from 1996Gi04 gives mult=M1,E2. Placement from 1995KeZZ. 1969Be69 and 1996Gi04 place from 2241 level.
ˣ501.79 *6*	0.022 *3*								
502.907 *18*	0.069 *6*	1865.106	2⁺	1362.162	2⁺	M1,E2		0.0049 *4*	α(K)exp=0.004 *1* (1996Gi04) α(K)=0.0043 *3*; α(L)=0.00051 *5*; α(M)=9.4×10⁻⁵ *10* α(N)=1.52×10⁻⁵ *14*; α(O)=7.6×10⁻⁷ *4* Mult.: α(K)exp in 1996Gi04 gives mult=M1,E2. Iγ(503γ)/Iγ(735γ)=0.30 *4* (1996Gi04). Additional information 1.
518.882 *5*	1.131[#] *5*	1881.043	3⁺	1362.162	2⁺	M1+E2	+0.37 *7*	0.00432 *7*	α(K)exp=0.00411 *22* (1996Gi04) α(K)=0.00379 *6*; α(L)=0.000441 *7*; α(M)=8.08×10⁻⁵ *13* α(N)=1.306×10⁻⁵ *21*; α(O)=6.87×10⁻⁷ *10* α(K)exp from 1996Gi04 gives δ(E2/M1)=2.4 +∞−17. (519γ)(1362γ)(θ): A_2=+0.15 *7*, A_4=+0.10 *11* (1978Ba29); A_2=−0.04 *8*, A_4=+0.01 *13* (1990KeZV) gives δ(Q/D)=0.03 *9* or 4.3 *+29−13*.
533.52 *7*	0.110 *19*	3069.522	(1,2)⁻	2536.151	3	[E1]		1.44×10⁻³	α(K)=0.001266 *18*; α(L)=0.0001438 *21*; α(M)=2.63×10⁻⁵ *4* α(N)=4.24×10⁻⁶ *6*; α(O)=2.22×10⁻⁷ *4*
539.512 *5*	100.0 *5*	539.511	2⁺	0.0	0⁺	E2		0.00428	K/L=6.1 *5*; α(L)exp=0.00061 *4* (1964Ko04) α(K)=0.00373 *6*; α(L)=0.000456 *7*; α(M)=8.37×10⁻⁵ *12* α(N)=1.339×10⁻⁵ *19*; α(O)=6.52×10⁻⁷ *10* Mult.: The ce(L) intensity is probably incorrect. K/L(theory)=8.2. γγ(θ) in 1990KeZV also supports E2.
552.706 *8*	0.1370[#] *10*	3069.522	(1,2)⁻	2516.824	1⁻	[M1,E2]		0.00383 *18*	α(K)=0.00335 *15*; α(L)=0.00040 *3*; α(M)=7.3×10⁻⁵ *6*

$^{100}_{44}$Ru$_{56}$-6

^{100}Rh ε decay (20.5 h) 1995KeZZ,1996Gi04,1969Be69 (continued)

γ(^{100}Ru) (continued)

E_γ[†]	I_γ[†&]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[@]	α[a]	$I_{(\gamma+ce)}$[&]	Comments
									α(N)=1.17×10^{-5} *8*; α(O)=5.98×10^{-7} *15* E_γ: 553.6 *3* (1969Be69).
555.42 *4*	0.0179 *8*	3072.248	2^+	2516.824	1^-	[E1]	1.31×10^{-3}		α(K)=0.001153 *17*; α(L)=0.0001308 *19*; α(M)=2.39×10^{-5} *4* α(N)=3.86×10^{-6} *6*; α(O)=2.02×10^{-7} *3*
588.343 *5*	6.21[#] *3*	2469.388	2^-	1881.043	3^+	E1	1.15×10^{-3}		K/L=9.4 *5*; α(K)exp=0.00103 *4*; α(L)exp=0.000109 *6* (1974Ko23) α(K)=0.001010 *15*; α(L)=0.0001145 *16*; α(M)=2.09×10^{-5} *3* α(N)=3.38×10^{-6} *5*; α(O)=1.771×10^{-7} *25* I_γ: from 1974Ko23. 1969Be69 give Iγ=5.3 *3*. Mult.: α(K)exp=0.00104 *5* from 1996Gi04 gives δ(M2/E1)=0.06 *6*. Other ce data: 1964Ko04. (588γ)(1342γ)(θ): A_2=−0.15 *8*, A_4=+0.07 *9* (1978Ba29); A_2=−0.12 *3*, A_4=+0.02 *5* (1990KeZV) gives δ(M2/E1)=−0.03 *3*.
590.792 *6*	1.351 *13*	1130.300	0^+	539.511	2^+	E2	0.00332		K/L=8.5 *6*; α(K)exp=0.0027 *2*; α(L)exp=0.00032 *2* (1974Ko23) α(K)=0.00289 *4*; α(L)=0.000350 *5*; α(M)=6.42×10^{-5} *9* α(N)=1.029×10^{-5} *15*; α(O)=5.07×10^{-7} *8* Mult.: ce data give mult=M1,E2; γγ(θ) support E2. (591γ)(540γ)(θ): A_2=+0.33 *8*, A_4=+1.06 *24* (1991Pr08); A_2=+0.40 *7*, A_4=+1.00 *13* (1990KeZV).
600.124 *6*	0.292 *3*	3069.522	$(1,2)^-$	2469.388	2^-	M1,E2	0.00310 *9*		α(K)exp=0.0028 *4* (1996Gi04) α(K)=0.00271 *7*; α(L)=0.000320 *16*; α(M)=5.9×10^{-5} *3* α(N)=9.4×10^{-6} *5*; α(O)=4.85×10^{-7} *7* α(K)exp from 1996Gi04 gives mult=M1,E2.
602.91 *4*	0.041 *6*	3072.248	2^+	2469.388	2^-	[E1]	1.09×10^{-3}		α(K)=0.000955 *14*; α(L)=0.0001082 *16*; α(M)=1.98×10^{-5} *3* α(N)=3.20×10^{-6} *5*; α(O)=1.676×10^{-7} *24*
604.33 *5*	0.287 *13*	2469.388	2^-	1865.106	2^+	E1	1.08×10^{-3}		α(K)exp=0.0012 *3* (1996Gi04) α(K)=0.000950 *14*; α(L)=0.0001076 *15*; α(M)=1.97×10^{-5} *3* α(N)=3.18×10^{-6} *5*; α(O)=1.667×10^{-7} *24* E_γ,I_γ: other: Eγ=604.9 *3*, Iγ=0.47 *8* (1969Be69). α(K)exp in 1996Gi04 gives δ(M2/E1)=0.19 *+10−19*.
610.48[‡] *10*		1740.993	0^+	1130.300	0^+	E0		0.00009[‡] *5*	$I_{(\gamma+ce)}$: from ce(K)(611γ)/ce(K)(540γ)=0.00020 *10* (1974Ko23). Uncertainty of 0.00001 quoted by 1974Ko23 is probably underestimated since the peak is very weak in the ce spectrum shown by 1974Ko23. Iγ<0.03 (1974Ko23).

From ENSDF

$^{100}_{44}Ru_{56}$-7

$\gamma(^{100}Ru)$ (continued)

E_γ[†]	I_γ[†&]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[@]	δ[@]	α[a]	Comments
631.35 *3*	0.0717 *19*	2512.41	$(4)^+$	1881.043	3^+	M1+E2	+0.41 *5*		
638.619 *14*	0.0610 *20*	1865.106	2^+	1226.477	4^+	E2		0.00268	α(K)exp=0.0023 *5* (1996Gi04) $\alpha(K)=0.00234$ *4*; $\alpha(L)=0.000281$ *4*; $\alpha(M)=5.15\times10^{-5}$ *8* $\alpha(N)=8.27\times10^{-6}$ *12*; $\alpha(O)=4.12\times10^{-7}$ *6* Mult.: α(K)exp from 1996Gi04 gives M1,E2; but only E2 is consistent with transition to 4^+. $I\gamma(639\gamma)/I\gamma(735\gamma)=0.18$ *2* (1996Gi04).
651.707 *6*	0.565[#] *3*	2516.824	1^-	1865.106	2^+	E1		9.13×10^{-4}	$\alpha(K)=0.000803$ *12*; $\alpha(L)=9.08\times10^{-5}$ *13*; $\alpha(M)=1.659\times10^{-5}$ *24* $\alpha(N)=2.68\times10^{-6}$ *4*; $\alpha(O)=1.411\times10^{-7}$ *20* α(K)exp=0.00084 *12* from 1996Gi04 gives δ(M2/E1)=0.08 *8*; α(K)exp=0.0022 *6* from 1964Ko04 is for $652\gamma+654\gamma$.
654.571 *6*	0.686[#] *3*	1881.043	3^+	1226.477	4^+	M1+E2	+2.3 *5*	0.00250	α(K)exp=0.00213 *13* (1996Gi04) $\alpha(K)=0.00219$ *3*; $\alpha(L)=0.000260$ *4*; $\alpha(M)=4.77\times10^{-5}$ *7* $\alpha(N)=7.67\times10^{-6}$ *11*; $\alpha(O)=3.87\times10^{-7}$ *6* Mult.: ce data from 1996Gi04 gives mult=M1,E2.
662.99 *21*	0.0040 *9*	2543.733	2^+	1881.043	3^+				
671.3 *6*	0.0017 *4*	2536.151	3	1865.106	2^+				
678.65 *3*	0.0264 *20*	2543.733	2^+	1865.106	2^+				
686.971 *7*	0.888[#] *4*	1226.477	4^+	539.511	2^+	E2		0.00221	α(K)exp=0.0032 *9* (1964Ko04) $\alpha(K)=0.00193$ *3*; $\alpha(L)=0.000230$ *4*; $\alpha(M)=4.22\times10^{-5}$ *6* $\alpha(N)=6.78\times10^{-6}$ *10*; $\alpha(O)=3.41\times10^{-7}$ *5* Mult.: ce data from 1964Ko04 gives mult=M1,E2; $(687\gamma)(540\gamma)(\theta)$: $A_2=+0.081$ *75*, $A_4=-0.07$ *12* (1990KeZV) favors E2.
689.491 *5*	0.0245 *18*	2051.657	0^+	1362.162	2^+	[E2]		0.00219	$\alpha(K)=0.00191$ *3*; $\alpha(L)=0.000228$ *4*; $\alpha(M)=4.17\times10^{-5}$ *6* $\alpha(N)=6.71\times10^{-6}$ *10*; $\alpha(O)=3.37\times10^{-7}$ *5* E_γ: 689.419 quoted by 1995KeZZ is probably a misprint. Eγ deduced from a least-squares procedure is 689.500 *13* (table 6.4 in 1995KeZZ).
693.89 *14*	0.0040 *10*	2745.59	$(1,2^+)$	2051.657	0^+				
734.806 *7*	0.3312[#] *18*	1865.106	2^+	1130.300	0^+	E2		0.00186	α(K)exp=0.0016 *3* (1996Gi04) $\alpha(K)=0.001623$ *23*; $\alpha(L)=0.000192$ *3*; $\alpha(M)=3.52\times10^{-5}$ *5* $\alpha(N)=5.67\times10^{-6}$ *8*; $\alpha(O)=2.87\times10^{-7}$ *4* Mult.: α(K)exp from 1996Gi04 gives M1,E2; but ΔJ requires L=2.
736.966 *20*	0.1630[#] *14*	2099.109	2^+	1362.162	2^+	(M1,E2)		0.00186 *4*	α(K)exp=0.0010 *6* (1996Gi04) $\alpha(K)=0.00163$ *4*; $\alpha(L)=0.000190$ *3*; $\alpha(M)=3.48\times10^{-5}$ *6* $\alpha(N)=5.62\times10^{-6}$ *8*; $\alpha(O)=2.93\times10^{-7}$ *9*

$^{100}_{44}Ru_{56}$-8

^{100}Rh ε decay (20.5 h) 1995KeZZ,1996Gi04,1969Be69 (continued)

γ(^{100}Ru) (continued)

E_γ[†]	I_γ[†&]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[@]	δ[@]	α[a]	Comments
									Mult.: α(K)exp from 1996Gi04 gives mult=(M1,E2). Iγ(737γ)/Iγ(1559γ)=1.33 *9* (1996Gi04).
748.666 *7*	1.123[#] *4*	2915.542	2^-	2166.873	3^-	M1,E2		0.00179 *4*	α(K)exp=0.0020 *3* (1964Ko04) α(K)=0.00157 *4*; α(L)=0.000183 *3*; α(M)=3.34×10^{-5} *5* α(N)=5.40×10^{-6} *8*; α(O)=2.82×10^{-7} *9* α(K)exp from 1964Ko04 for 749γ+734γ+736γ. Other ce data: 1953Ma64. (749γ)(1627γ)(540γ)(θ): A_2=+0.24 *6*, A_4=−0.10 *10* (1990KeZV) gives δ(E2/M1)=−0.51 *12*.
752.0 *3*	0.0048 *10*	2617.09	$1,2^+$	1865.106	2^+				
775.831 *11*	0.1184 *19*	2516.824	1^-	1740.993	0^+				
804.73 *8*	0.0188 *18*	2166.873	3^-	1362.162	2^+				
806.93 *6*	0.028 *3*	3323.759	$(1,2^+)$	2516.824	1^-				
816.454 *16*	0.4642[#] *19*	2915.542	2^-	2099.109	2^+	(E1+M2)	0.7 *6*		Mult.,δ: (816γ)(1560γ)(540γ)(θ): A_2=−0.06 *8*, A_4=−0.01 *14* (1990KeZV) gives δ(Q/D)=0.7 *6*.
822.654 *7*	26.17[#] *8*	1362.162	2^+	539.511	2^+	E2+M1	+3.7 *3*	1.40×10^{-3}	α(K)=0.001230 *18*; α(L)=0.0001439 *21*; α(M)=2.64×10^{-5} *4* α(N)=4.25×10^{-6} *6*; α(O)=2.19×10^{-7} *3* K/L=5.6 *11*; α(K)exp=0.0015 *2*; α(L)exp=0.00027 *5* (1964Ko04) Mult.: α(K)exp=0.00123 *5* from 1996Gi04 gives δ(E2/M1)=3.3 +∞−29. Other ce data: 1953Ma64. The ce(L) intensity is probably incorrect in 1964Ko04. δ: from (822γ)(540γ)(θ): A_2=−0.215 *8*, A_4=+0.312 *2* (1991Pr08). δ=+3.2 *8* from A_2=−0.25 *3*, A_4=+0.32 *4* (1978Ba29); 3.7 *4* from A_2=−0.230 *7*, A_4=+0.362 *12* (1990KeZV). Others: 1996Gi04, 1968Ka04, 1964Ko04.
828.70 *4*	0.0152 *25*	3069.522	$(1,2)^-$	2240.812	2^+				
831.272[c] *19*	0.0564 *13*	3072.248	2^+	2240.812	2^+				Placement from level energy difference (evaluators).
854.32 *6*	0.0218 *3*	3323.759	$(1,2^+)$	2469.388	2^-				
872.62 *5*	0.026 *3*	2099.109	2^+	1226.477	4^+				Additional information 2. Iγ(873γ)/Iγ(1559γ)=0.018 *2* (1996Gi04).
880.8 *3*	0.0063 *18*	2745.59	$(1,2^+)$	1865.106	2^+				
902.673 *19*	0.119 *5*	3069.522	$(1,2)^-$	2166.873	3^-				
905.60 *21*	0.057 *5*	3072.248	2^+	2166.873	3^-				
968.85 *3*	0.049 *3*	2099.109	2^+	1130.300	0^+				Additional information 3. Iγ(969γ)/Iγ(1559γ)=0.033 *7* (1996Gi04).
973.15 *4*	0.0301 *25*	3072.248	2^+	2099.109	2^+				
1024.98 *3*	0.0490 *17*	2387.14	0^+	1362.162	2^+				

γ(^{100}Ru) (continued)

E_γ[†]	I_γ[†&]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[@]	δ[@]	α[a]	$I_{(\gamma+ce)}$[&]	Comments
1034.510 *8*	1.918[#] *6*	2915.542	2^-	1881.043	3^+	(E1)		3.55×10^{-4}		α(K)exp=0.00048 *17* (1964Ko04) α(K)=0.000312 *5*; α(L)=3.50×10^{-5} *5*; α(M)=6.39×10^{-6} *9* α(N)=1.035×10^{-6} *15*; α(O)=5.52×10^{-8} *8* (1034γ)(1342)(θ): A_2=−0.19 *4*, A_4=+0.02 *4* (1978Ba29); A_2=−0.03 *5*, A_4=0.00 *9* gives δ(M2/E1)=−0.11 *6*.
1107.223 *8*	16.84[#] *5*	2469.388	2^-	1362.162	2^+	E1		3.18×10^{-4}		α(K)exp=0.000032 *2* (1974Ko23) α(K)=0.000275 *4*; α(L)=3.08×10^{-5} *5*; α(M)=5.62×10^{-6} *8* α(N)=9.10×10^{-7} *13*; α(O)=4.86×10^{-8} *7*; α(IPF)=5.87×10^{-6} *9* Mult.: Other ce data: 1964Ko04, 1953Ma64. γγ(θ) in 1990KeZV gives δ(Q/D)=−0.016 *22*. (1107γ)(822γ)(θ): A_2=+0.100 *15*, A_4=−0.03 *3* (1978Ba29); A_2=+0.125 *12*, A_4=−0.03 *2* (1990KeZV). Other: 1968Ka04. (1107γ)(1362γ)(θ): A_2=+0.22 *3*, A_4=−0.02 *3* (1978Ba29); A_2=+0.264 *16*, A_4=0.00 *3* (1990KeZV). Others: 1968Ka04, 1964Ko04.
1110.66 *11*	0.032 *8*	2240.812	2^+	1130.300	0^+					Placement of this γ may be suspect since it is not reported in (n,γ) E=th.
1130.3[‡] *3*		1130.300	0^+	0.0	0^+	E0			0.00051[‡] *4*	$I_{(\gamma+ce)}$: from ce(K)(1130γ)/ce(K)(540γ)=0.00115 *9* (1974Ko23). Iγ<0.05 (1974Ko23).
1154.680 *10*	0.296 *3*	2516.824	1^-	1362.162	2^+	(E1)				Mult.: (1155γ)(1362γ)(θ): A_2=−0.18 *22*, A_4=+0.03 *37* (1990KeZV) gives δ(Q/D)=−0.0 *2* for J=1 and 0.8 *+17−5* for J=2 with latter adopted by 1990KeZV.
1181.49 *5*	0.0338 *18*	2543.733	2^+	1362.162	2^+	M1+E2	−0.12 *9*	6.69×10^{-4}		α(K)=0.000585 *9*; α(L)=6.61×10^{-5} *10*; α(M)=1.209×10^{-5} *17* α(N)=1.96×10^{-6} *3*; α(O)=1.058×10^{-7} *15*; α(IPF)=4.30×10^{-6} *7*
1191.16 *4*	0.0358 *23*	3072.248	2^+	1881.043	3^+					
1201.493 *16*	0.1186 *25*	1740.993	0^+	539.511	2^+	(E2)				Mult.: E2 proposed by 1990KeZV from (1201γ)(540γ)(θ): A_2=+0.73 *43*, A_4=+1.1 *9*.
1204.46 *5*	0.0367 *25*	3069.522	$(1,2)^-$	1865.106	2^+					E_γ: 1969Be69 reported only one line at 1206.0 *10* (Iγ=0.05 *3*). 1995KeZZ report three lines at 1204.46 and 1207.50 (doublet).
1207.50[b] *3*	0.052[b] *7*	2569.908	$(3)^-$	1362.162	2^+					E_γ: level energy difference=1207.74. Iγ(doublet)=0.080 *8*.
1207.50[b] *3*	0.028[b] *7*	3072.248	2^+	1865.106	2^+					E_γ: level energy difference=1207.13.
1224.63 *13*	0.020 *3*	3323.759	$(1,2^+)$	2099.109	2^+					

$\gamma(^{100}Ru)$ (continued)

E_γ [†]	I_γ [†&]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [@]	δ [@]	α [a]	Comments
[x]1232.25 *13*	0.0130 *25*								
1272.01 *11*	0.016 *3*	3323.759	(1,2$^+$)	2051.657	0$^+$				
1309.8 *3*	0.0126 *23*	2536.151	3	1226.477	4$^+$				
1325.583 *13*	0.431[#] *3*	1865.106	2$^+$	539.511	2$^+$	M1+E2	−1.0 *3*	5.30×10^{-4} *10*	α(K)exp=0.00042 *6* (1996Gi04) α(K)=0.000441 *9*; α(L)=4.99×10^{-5} *10*; α(M)=9.14×10^{-6} *18* α(N)=1.48×10^{-6} *3*; α(O)=7.92×10^{-8} *18*; α(IPF)=2.86×10^{-5} *10* I_γ: Iγ(1326γ)/Iγ(735γ)=1.301 *12* (1995KeZZ), 1.46 *6* (1996Gi04), 0.91 *11* in (n,γ) E=th. δ: −1.6 +*14*−*7* from (1326γ)(540γ)(θ): A_2=+0.42 *17*, A_4=+0.24 *29* in 1990KeZV.
1341.515 *9*	6.561[#] *25*	1881.043	3$^+$	539.511	2$^+$	M1+E2	+5.7 *5*	5.05×10^{-4}	α(K)exp=0.00068 *19* (1964Ko04) α(K)=0.000413 *6*; α(L)=4.70×10^{-5} *7*; α(M)=8.60×10^{-6} *12* α(N)=1.392×10^{-6} *20*; α(O)=7.38×10^{-8} *11*; α(IPF)=3.48×10^{-5} *5* α(K)exp=0.000413 *13* from 1996Gi04 gives δ(E2/M1)=4.4 +∞−*31*. Other ce data: 1953Ma64. (1342γ)(540γ)(θ): A_2=+0.20 *8*, A_4=+0.05 *8* (1978Ba29); A_2=−0.089 *20*, A_4=−0.07 *3* (1990KeZV) gives δ(Q/D)=6.8 +*13*−*10*. Others: 1968Ka04, 1964Ko04.
1343.44 *5*	0.060 *12*	2569.908	(3)$^-$	1226.477	4$^+$				Placement may be suspect since with the reported intensity in ^{100}Rh ε decay, this γ should have been seen in (n,γ) E=th.
1362.152 *10*	19.09 *6*	1362.162	2$^+$	0.0	0$^+$	E2		4.95×10^{-4}	α(K)exp=0.00038 *6*; α(L)exp=0.00004 *2* (1964Ko04) α(K)=0.000399 *6*; α(L)=4.54×10^{-5} *7*; α(M)=8.31×10^{-6} *12* α(N)=1.345×10^{-6} *19*; α(O)=7.13×10^{-8} *10*; α(IPF)=4.01×10^{-5} *6* Mult.: Other ce data: 1953Ma64. γγ(θ) in 1990KeZV also supports E2.
1386.521 *10*	0.486 *4*	2516.824	1$^-$	1130.300	0$^+$	(E1)		3.66×10^{-4}	α(K)=0.000185 *3*; α(L)=2.05×10^{-5} *3*; α(M)=3.75×10^{-6} *6* α(N)=6.08×10^{-7} *9*; α(O)=3.26×10^{-8} *5*; α(IPF)=0.0001563 *22*
1512.140 *16*	0.1528 *20*	2051.657	0$^+$	539.511	2$^+$	E2			Mult.: E2 proposed in 1990KeZV from (1512γ)(540γ)(θ): A_2=+0.83 *20*, A_4=+1.8 *16*.
1548.4 *8*	0.024 *6*	2774.9	2$^+$,3$^+$	1226.477	4$^+$				
1553.348 *10*	25.65[#] *10*	2915.542	2$^-$	1362.162	2$^+$	E1		4.53×10^{-4}	α(K)exp=0.00017 *3* (1964Ko04) α(K)=0.0001525 *22*; α(L)=1.695×10^{-5} *24*; α(M)=3.09×10^{-6} *5* α(N)=5.02×10^{-7} *7*; α(O)=2.70×10^{-8} *4*; α(IPF)=0.000280 *4* Mult.: α(K)exp=0.000159 *9* from 1996Gi04 gives δ(M2/E1)=0.10 +*6*−*10*. Other ce data: 1953Ma64. γγ(θ) in 1990KeZV gives δ(Q/D)=−0.003 *20*. (1553γ)(822γ)(θ): A_2=+0.083 *24*, A_4=+0.04 *4* (1978Ba29);

$^{100}_{44}Ru_{56}$-11

$\gamma(^{100}$Ru) (continued)

E_γ[†]	I_γ[†&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	α[a]	$I_{(\gamma+ce)}$[&]	Comments
									A_2=+0.09 *1*, A_4=+0.02 *2*. Other: 1968Ka04. (1553γ)(1362γ)(θ): A_2=+0.21 *3*, A_4=0.00 *4* (1978Ba29); A_2=+0.246 *14*, A_4=+0.020 *25* (1990KeZV). Others: 1968Ka04, 1964Ko04.
1559.554 *21*	1.239[#] *6*	2099.109	2+	539.511	2+	M1	4.65×10^{-4}		α(K)exp=0.00039 *4* (1996Gi04) α(K)=0.000329 *5*; α(L)=3.70×10^{-5} *6*; α(M)=6.76×10^{-6} *10* α(N)=1.098×10^{-6} *16*; α(O)=5.94×10^{-8} *9*; α(IPF)=9.16×10^{-5} *13* α(K)exp from 1996Gi04 is higher by ≈5% than for pure M1. δ(E2/M1)=−0.72 *+25−32* from (1559γ)(540γ)(θ): A_2=+0.62 *8*, A_4=+0.13 *13* (1990KeZV).
1582.9 *5*	0.005 *3*	3463.79	(1+,2)	1881.043	3+				
1615.29 *5*	0.0372 *18*	2745.59	(1,2+)	1130.300	0+				
1627.340 *11*	2.029[#] *10*	2166.873	3−	539.511	2+	E1	4.98×10^{-4}		α(K)exp=0.00014 *3* (1996Gi04) α(K)=0.0001413 *20*; α(L)=1.569×10^{-5} *22*; α(M)=2.86×10^{-6} *4* α(N)=4.65×10^{-7} *7*; α(O)=2.50×10^{-8} *4*; α(IPF)=0.000338 *5* α(K)exp from 1996Gi04 gives δ(M2/E1)=0.06 *+19−6*. δ(M2/E1)=0.09 *6* from (1627γ)(540γ)(θ): A_2=+0.016 *49*, A_4=−0.076 *83* (1990KeZV).
1698.32 *24*	0.021 *3*	3060.15	1,2+	1362.162	2+				
1701.310 *18*	0.384 *6*	2240.812	2+	539.511	2+	(M1)	4.60×10^{-4}		α(K)=0.000276 *4*; α(L)=3.10×10^{-5} *5*; α(M)=5.66×10^{-6} *8* α(N)=9.20×10^{-7} *13*; α(O)=4.98×10^{-8} *7*; α(IPF)=0.0001459 *21* δ: 0.12 *40* from (1701γ)(540γ)(θ): A_2=+0.41 *19*, A_4=−0.71 *31* for J=2 (1990KeZV). But 1990KeZV adopt δ=−6.3 *+39−∞* for J=1.
1707.44 *6*	0.210 *3*	3069.522	(1,2)−	1362.162	2+				E_γ: 1969Be69 reported only one line at 1709.0 *5* (Iγ=0.29 *3*). 1995KeZZ report a close doublet at 1707.44 and 1710.07.
1710.07 *3*	0.237 *5*	3072.248	2+	1362.162	2+				
1740.6[‡] *2*		1740.993	0+	0.0	0+	E0		0.00019[‡] *4*	$I_{(\gamma+ce)}$: from ce(K)(1741γ)/ce(K)(540γ)=0.00035 *7* (1974Ko23). Iγ<0.05 (1974Ko23).
1847.57 *8*	0.050 *4*	2387.14	0+	539.511	2+				
1865.12 *15*	0.273 *25*	1865.106	2+	0.0	0+	E2	4.86×10^{-4}		α(K)=0.000217 *3*; α(L)=2.43×10^{-5} *4*; α(M)=4.45×10^{-6} *7* α(N)=7.22×10^{-7} *11*; α(O)=3.87×10^{-8} *6*; α(IPF)=0.000240 *4* Iγ(1865γ)/Iγ(735γ)=1.8 *3* (1996Gi04) is too high by a factor of ≈2 as compared to the values available from other studies. This may be due to summing contributions. I_γ: 0.50 *13* (1969Be69).
1929.811 *20*	14.41[#] *10*	2469.388	2−	539.511	2+	E1	6.86×10^{-4}		α(K)exp=0.00011 *2* (1964Ko04)

γ(^{100}Ru) (continued)

E_γ [†]	I_γ [†&]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [@]	δ [@]	α [a]	Comments
									α(K)=0.0001078 *15*; α(L)=1.194×10^{-5} *17*; α(M)=2.18×10^{-6} *3* α(N)=3.53×10^{-7} *5*; α(O)=1.91×10^{-8} *3*; α(IPF)=0.000564 *8* Mult.: α(K)exp in 1996Gi04 gives mult=E1. Other ce data: 1953Ma64. (1930γ)(540γ)(θ): A_2=+0.20 *5*, A_4=−0.02 *5* (1978Ba29); A_2=+0.175 *19*, A_4=+0.138 *3* in 1990KeZV gives δ(Q/D)=0.07 *2*. Others: 1968Ka04, 1964Ko04.
[x]1935.24 *8*	0.0291 *25*								
1972.91 *6*	0.045 *3*	2512.41	(4)$^+$	539.511	2$^+$	(E2)		5.13×10^{-4}	α(K)=0.000195 *3*; α(L)=2.19×10^{-5} *3*; α(M)=4.00×10^{-6} *6* α(N)=6.49×10^{-7} *9*; α(O)=3.49×10^{-8} *5*; α(IPF)=0.000291 *4*
1977.24 *4*	0.325 *6*	2516.824	1$^-$	539.511	2$^+$	(E1)			Mult.,δ: δ(Q/D)=0.11 *15* from 1990KeZV based on (1977γ)(540γ)(θ): A_2=−0.13 *25*, A_4=−0.16 *44* for J=1. 1990KeZV adopt δ(E2/M1)=1.3 +*18*−*6* for J=2.
1996.59 *3*	0.0932 *15*	2536.151	3	539.511	2$^+$	D(+Q)	+0.02 *3*		Placement from 1995KeZZ.
2004.30 *13*	0.0180 *14*	2543.733	2$^+$	539.511	2$^+$				
2030.56 *20*	0.011 *3*	2569.908	(3)$^-$	539.511	2$^+$				
2099.16 *7*	0.041 *5*	2099.109	2$^+$	0.0	0$^+$				γ not reported by 1996Gi04.
2120.61 *7*	0.043 *4*	2660.135	1,2$^+$	539.511	2$^+$				
2126.92 *14*	0.026 *3*	2666.30	(2,3)	539.511	2$^+$				
2166.80 *3*	0.101 *5*	2166.873	3$^-$	0.0	0$^+$	(E3)		5.38×10^{-4}	α(K)=0.000273 *4*; α(L)=3.10×10^{-5} *5*; α(M)=5.68×10^{-6} *8* α(N)=9.21×10^{-7} *13*; α(O)=4.91×10^{-8} *7*; α(IPF)=0.000227 *4*
2193.40 *4*	0.0261 *25*	3323.759	(1,2$^+$)	1130.300	0$^+$				I_γ: 0.16 *8* (1969Be69).
2205.96 *14*	0.0131 *22*	2745.59	(1,2$^+$)	539.511	2$^+$				
2240.1 *5*	0.0028 *24*	2240.812	2$^+$	0.0	0$^+$				
2262.1 *5*	0.0061 *15*	2801.41		539.511	2$^+$	D+Q			
2375.976 *16*	40.5[#] *3*	2915.542	2$^-$	539.511	2$^+$	E1		9.55×10^{-4}	α(K)exp=0.00007 *1* (1964Ko04) α(K)=7.88×10^{-5} *11*; α(L)=8.70×10^{-6} *13*; α(M)=1.588×10^{-6} *23* α(N)=2.58×10^{-7} *4*; α(O)=1.393×10^{-8} *20*; α(IPF)=0.000866 *13* Mult.: α(K)exp from 1964Ko04 gives mult=E1. Other ce data: 1953Ma64. (2376γ)(540γ)(θ): A_2=+0.23 *3*, A_4=−0.03 *4* (1978Ba29); A_2=+0.268 *10*, A_4=+0.017 *18* in 1990KeZV gives δ(Q/D)=−0.037 *16*. Others: 1968Ka04, 1964Ko04.
2469.328 *22*	0.182 *13*	2469.388	2$^-$	0.0	0$^+$	M2		5.83×10^{-4}	α(K)exp=0.00021 *4* (1996Gi04) α(K)=0.000245 *4*; α(L)=2.76×10^{-5} *4*; α(M)=5.06×10^{-6} *7* α(N)=8.22×10^{-7} *12*; α(O)=4.45×10^{-8} *7*; α(IPF)=0.000304 *5* Mult.: α(K)exp in 1996Gi04 gives δ(M2/E1)>1.1.
2516.86 *5*	0.0287 *9*	2516.824	1$^-$	0.0	0$^+$				
2520.56 *5*	0.0290 *9*	3060.15	1,2$^+$	539.511	2$^+$				
2529.969 *20*	3.175[#] *25*	3069.522	(1,2)$^-$	539.511	2$^+$	D+Q			(2530γ)(540γ)(θ): A_2=+0.44 *9*, A_4=−0.13 *9* (1978Ba29) gives δ(Q/D)=−0.64 *5* for J=1; A_2=+0.34 *4*, A_4=+0.04 *7* (1990KeZV) gives δ(Q/D)=−0.53 *4* for J=1, −0.14 *6* for J=2 and 0.80 *18* for J=3.

$^{100}_{44}Ru_{56}$-13

γ(^{100}Ru) (continued)

E_γ [†]	I_γ [†&]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [@]	Comments
2543.60 *9*	0.0167 *8*	2543.733	2+	0.0	0+		Placement from 1995KeZZ.
2617.07 *4*	0.0704 *12*	2617.09	1,2+	0.0	0+		
2660.09 *12*	0.0085 *14*	2660.135	1,2+	0.0	0+		
2784.29 *5*	0.288 *3*	3323.759	(1,2+)	539.511	2+	D+Q	(2784γ)(540γ)(θ): A_2=−0.01 *14*, A_4=−0.51 *24* (1990KeZV) gives δ(Q/D)=5.1 +*120*−*25* or −0.05 *20* for J=1, 0.61 +*18*−*3* for J=2, and 0.16 *3* for J=3.
2879.43 *20*	0.0042 *4*	3419.13	(2+)	539.511	2+		
[x]2885.8 *4*	0.0020 *4*						
2915.42 *7*	0.09 *3*	2915.542	2−	0.0	0+		
2933.60 *10*	0.0131 *4*	2933.65	(1,2)+	0.0	0+		
3060.25 *11*	0.1015 *17*	3060.15	1,2+	0.0	0+		
3069.44 *16*	0.003 *3*	3069.522	(1,2)−	0.0	0+		E_γ: 1969Be69 reported only one line at 3071.0 *10* (Iγ=0.05 *3*). 1995KeZZ report a close doublet at 3069.44 and 3071.80.
3071.80 *12*	0.0346 *22*	3072.248	2+	0.0	0+		E_γ: level energy difference=3072.20.
3323.91 *22*	0.0149 *9*	3323.759	(1,2+)	0.0	0+		
3419.4 *3*	0.0110 *6*	3419.13	(2+)	0.0	0+		
3464.8 *5*	0.0051 *8*	3463.79	(1+,2)	0.0	0+		

[†] From 1995KeZZ, unless otherwise noted. Iγ values given by 1995KeZZ are renormalized (by evaluators) so that Iγ(539γ)=100.

[‡] Transition observed in ce data only (1974Ko23).

[#] Uncertainty of <1% quoted by 1995KeZZ seems too low to be realistic. A minimum uncertainty of 1% is assigned (by evaluators) for branching ratio given in the Adopted Gammas.

[@] From the Adopted Gammas. Assignments from decay measurements are consistent, which are from ce data normalized to the 540γ treated as E2 (α(K)=0.00373) and γγ(θ) data. Arguments and assignments if different from decay studies are given under comments.

[&] For absolute intensity per 100 decays, multiply by 0.806 *6*.

[a] 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.

[b] Multiply placed with intensity suitably divided.

[c] Placement of transition in the level scheme is uncertain.

[x] γ ray not placed in level scheme.

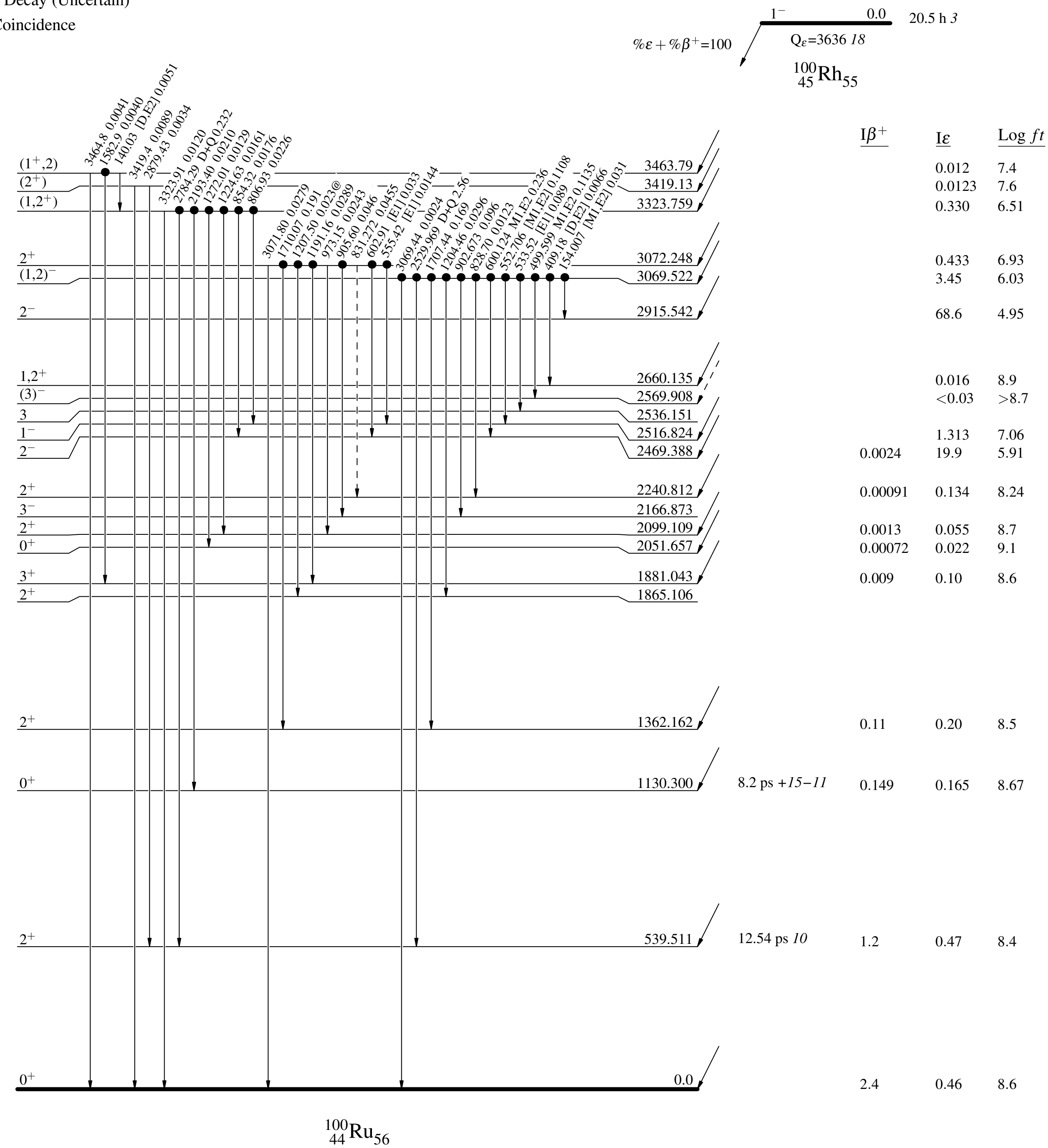
^{100}Rh ε decay (20.5 h) 1995KeZZ,1996Gi04,1969Be69

Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
@ Multiply placed: intensity suitably divided

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)
- ● Coincidence

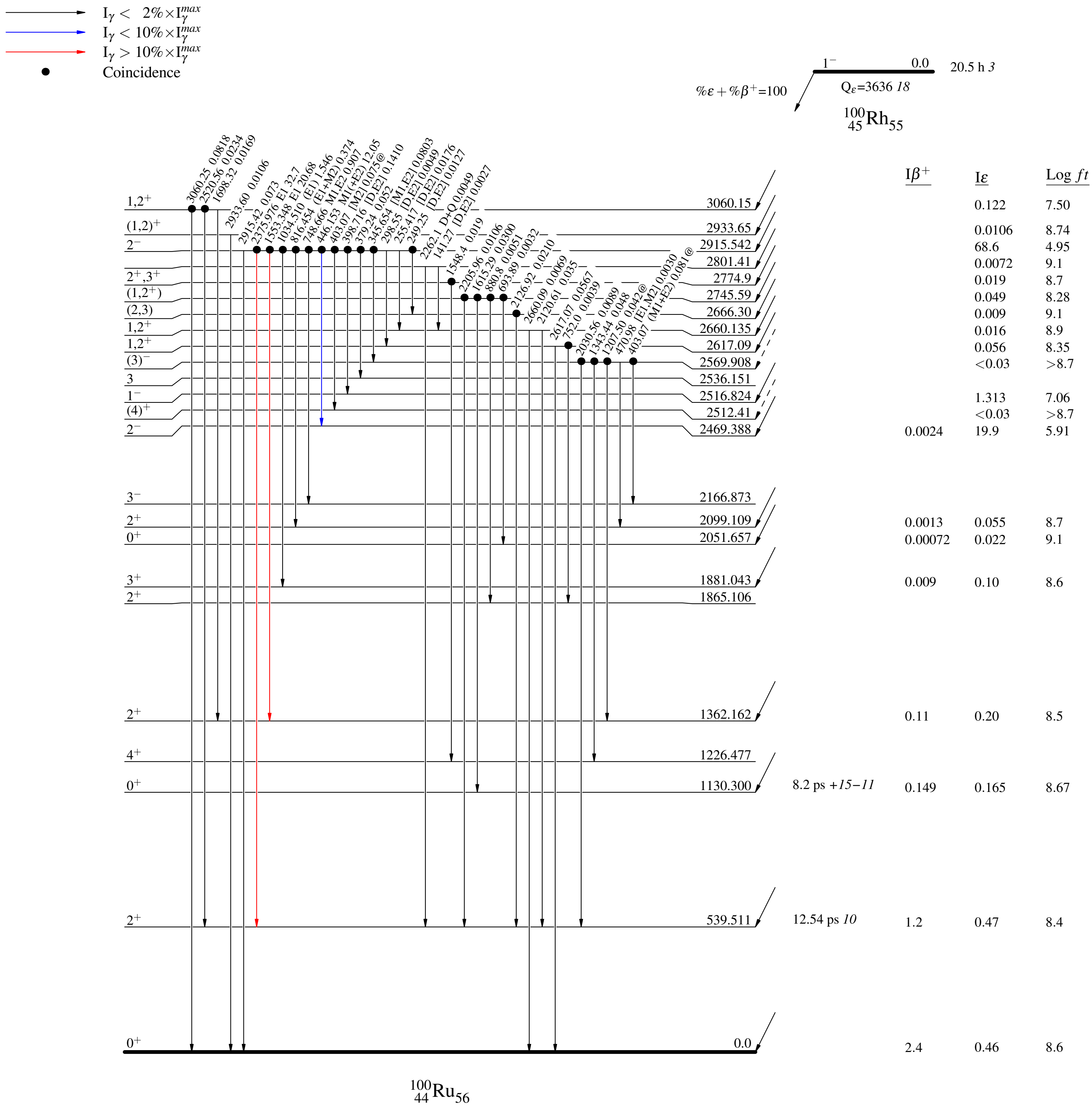


^{100}Rh ε decay (20.5 h) 1995KeZZ,1996Gi04,1969Be69

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays

@ Multiply placed: intensity suitably divided

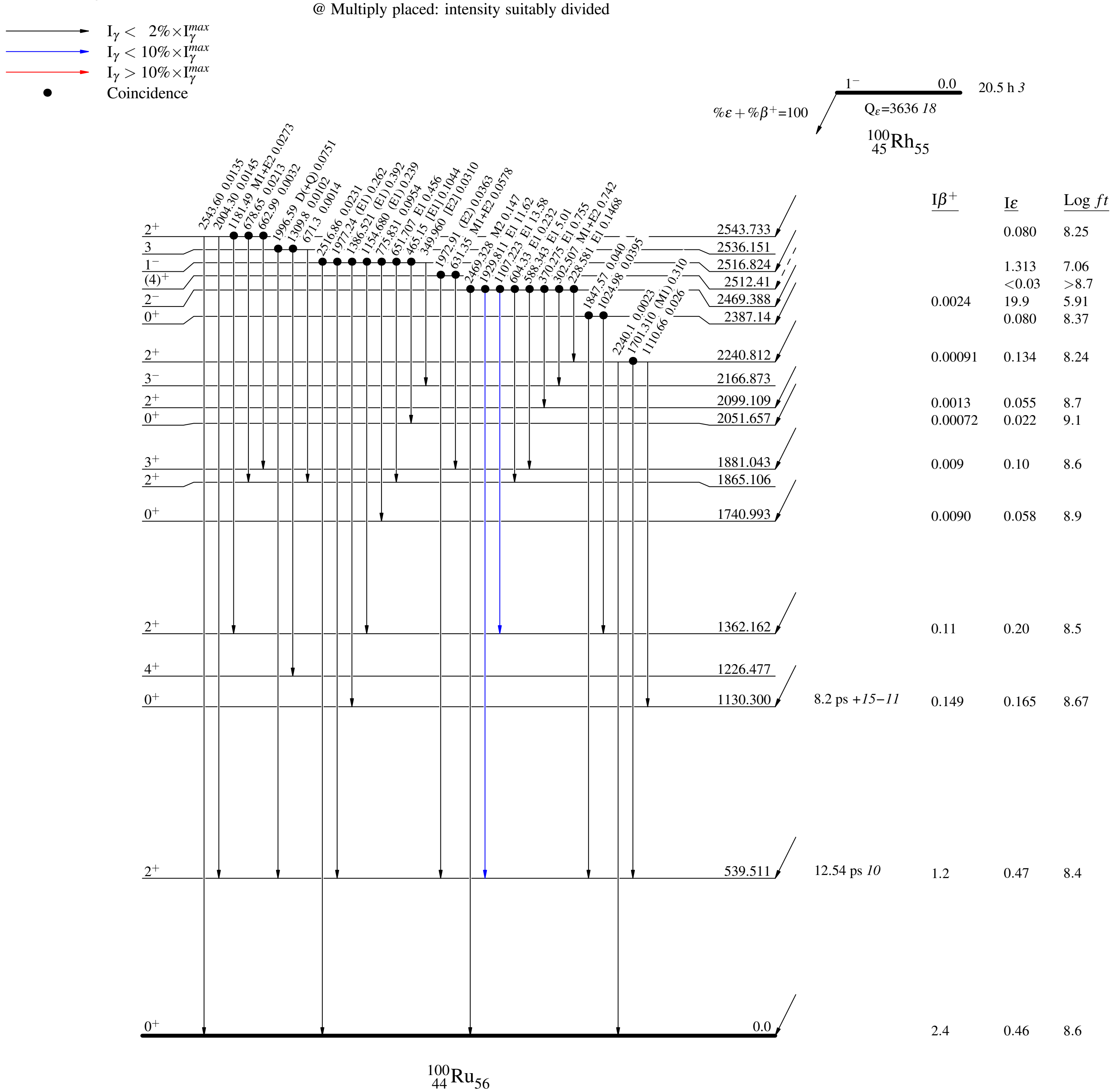


^{100}Rh ε decay (20.5 h) 1995KeZZ,1996Gi04,1969Be69

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays

@ Multiply placed: intensity suitably divided



^{100}Rh ε decay (20.5 h) 1995KeZZ,1996Gi04,1969Be69

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
@ Multiply placed: intensity suitably divided