^{105}Ru β^- decay 2010Kr05,1975Ar03,1967Sc01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	S. Lalkovski, J. Timar and Z. Elekes	NDS 161, 1 (2019)	1-Apr-2019

Parent: ^{105}Ru: E=0.0; $J^\pi=3/2^+$; $T_{1/2}$=4.439 h *11*; Q(β^-)=1917 *3*; %β^- decay=100.0

2010Kr05: Facility: Oregon State University TRIGA reactor; Source: ^{nat}Ru or RuO_2 irradiated with 6.4x10^{10} and 1.8x10^8 n/(cm^{2}sec); Detectors: one Ge; Measured: γ, Eγ, Iγ; Deduced: ^{105}Rh levels, log *ft*.

1975Ar03: Facility: Department of Chemistry, Maryland; Source: chemically separated from 10 mg samples enriched to 96% in ^{104}Ru and irradiated with n-flux of 3x10^{13} n/(cm^{2}sec); Detectors: two coaxial Ge(Li), one x-ray Ge; Measured: γ, γ-γ coinc, Eγ, Iγ; Deduced: ^{105}Rh level scheme; J^π, log *ft*.

α(K)exp, α(L)exp and α(M)exp values are taken from 1967Sc01, unless noted otherwise. Other: 1960Ri03.

$\gamma\gamma(\theta)$ results are reported by 1979Sa23, 1977Kr09, 1976Sc07, and 1976Gu09. Other: 1970Be79; $\gamma(\theta)$ from oriented nuclei is studied by 1976Ba39.

^{105}Rh Levels

E(level)[†]	J^π[‡]	$T_{1/2}$[#]	Comments
0.0	$7/2^+$	35.33 h *2*	$T_{1/2}$: From 2009Go29. Average of two measurements at different temperatures.
129.742 *4*	$1/2^-$	42.8 s *3*	%IT=100
149.124 *6*	$9/2^+$	≤0.3 ns	
392.526 *6*	$3/2^-$		
455.870 *8*	$5/2^-$		
469.369 *5*	$3/2^+$	≤0.4 ns	$T_{1/2}$: from (875.8γ)(469.4γ)(t); (316.5γ)(469.4)(t) (1970Be79).
499.236 *5*	$5/2^+$		
638.620 *6*	$7/2^+$		
724.244 *6*	$5/2^+$	≤0.2 ns	$T_{1/2}$: from (1192β)(724.5γ)(t) (1970Be79).
762.062 *9*	$3/2^-$		
785.887 *6*	$1/2^+$	≤0.4 ns	$T_{1/2}$: from (1130β)(316.5γ)(t) (1970Be79).
806.045 *6*	$3/2^+$	≤0.2 ns	$T_{1/2}$: from (1110β)(676.4γ)(t) (1970Be79). J^π: J=3/2 as (350γ)(326γ)(θ) is consistent with 3/2(D)5/2(Q)1/2 and (413γ)(263γ)(θ) is consistent with 3/2(D)3/2(D,Q)1/2 (1979Sa23).
842.55 *3*			
969.484 *5*	$5/2^+$		
1316.27 *20*			
1321.293 *7*	$5/2^+$		
1345.135 *6*	$3/2^+$		
1377.024 *5*	$3/2^+$		
1441.43 *4*	$(3/2^+,5/2,7/2^+)$		
1486.839 *11*	$(3/2^+)$		
1698.196 *10*	$(3/2^+,5/2)$		
1708.53 *5*	$(3/2^+,5/2)$		
1721.203 *10*	$(5/2^+)$		
1765.4 *3*	$(5/2^+,3/2^+)$		
1809.78 *6*	$(5/2,3/2^+)$		
1829.6 *3*	$(5/2^+)$		

[†] From a least-squares fit to Eγ.
[‡] From the Adopted Levels.
[#] From the Adopted Levels, unless noted otherwise.

^{105}Ru β^- decay 2010Kr05,1975Ar03,1967Sc01 (continued)

β^- radiations

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(87[‡] *3*)	1829.6	0.00024 *12*	7.68 *23*	av Eβ=22.81 *83*
(107 *3*)	1809.78	0.0059 *5*	6.57 *6*	av Eβ=28.27 *84* 2010Kr05 list Iβ=0.0063 *7*, log *ft*=6.54 *6*.
(152 *3*)	1765.4	0.00024 *12*	8.42 *22*	av Eβ=40.87 *88* 2010Kr05 list Iβ<0.0003, log *ft*>8.3.
(196 *3*)	1721.203	0.0785 *11*	6.260 *23*	av Eβ=53.94 *91* 2010Kr05 list Iβ=0.0786 *8*, log *ft*=6.267 *22*.
(208 *3*)	1708.53	0.0072 *7*	7.38 *5*	av Eβ=57.77 *92* 2010Kr05 list Iβ=0.0072 *7*, log *ft*=7.39 *5*.
(219 *3*)	1698.196	0.1076 *15*	6.277 *21*	av Eβ=60.92 *92* 2010Kr05 list Iβ=0.107 *1*, log *ft*=6.286 *20*.
428 *16*	1486.839	0.369 *5*	6.704 *12*	av Eβ=130.5 *11* 2010Kr05 list Iβ=0.368 *4*, log *ft*=6.709 *12*.
(476 *3*)	1441.43	0.0115 *6*	8.358 *25*	av Eβ=146.5 *11* 2010Kr05 list Iβ=0.0115 *5*, log *ft*=8.361 *10*.
(540 *3*)	1377.024	1.764 *18*	6.361 *10*	av Eβ=169.8 *11* 2010Kr05 list Iβ=1.75 *2*, log *ft*=6.368 *10*. E(decay): other:547 *15* (1967Sc01).
(572 *3*)	1345.135	3.84 *5*	6.110 *10*	av Eβ=181.5 *12* 2010Kr05 list Iβ=3.83 *6*, log *ft*=6.114 *11*. E(decay): other:567 *8* (1967Sc01).
(596 *3*)	1321.293	0.617 *7*	6.966 *10*	av Eβ=190.4 *12* 2010Kr05 list Iβ=0.615 *6*, log *ft*=6.970 *9*. E(decay): other: 560 *20* (1967Sc01), weighted average of 552 *15* and 612 *39*.
(601 *3*)	1316.27	0.029 *5*	8.31 *8*	av Eβ=192.3 *12* 2010Kr05 list Iβ=0.029 *5*, log *ft*=8.31 *8*.
(948 *3*)	969.484	4.47 *9*	6.829 *11*	av Eβ=329.1 *13* 2010Kr05 list Iβ=4.41 *10*. E(decay): other:952 *5* (1967Sc01).
(1074 *3*)	842.55	0.0339 *15*	9.152 *20*	av Eβ=381.8 *13* 2010Kr05 list Iβ=0.034 *2*, log *ft*=9.15 *3*.
(1111 *3*)	806.045	19.22 *25*	6.453 *8*	av Eβ=397.2 *13* 2010Kr05 list Iβ=19.2 *2*, log *ft*=6.455 *7*. E(decay): other:1109 *5* (1967Sc01).
(1131 *3*)	785.887	17.15 *18*	6.532 *7*	av Eβ=405.7 *13* 2010Kr05 list Iβ=17.1 *2*, log *ft*=6.535 *7*. E(decay): other:1134 *4* (1967Sc01).
(1155 *3*)	762.062	0.234 *3*	8.432 *8*	av Eβ=415.8 *13* 2010Kr05 list Iβ=0.232 *5*, log *ft*=8.44 *1*.
(1193 *3*)	724.244	48.4 *7*	6.169 *8*	av Eβ=431.9 *13* 2010Kr05 list Iβ=48.3 *5*, log *ft*=6.171 *7*. E(decay): other:1187 *2* (1967Sc01).
(1278[‡] *3*)	638.620	<0.015	>9.8	av Eβ=468.7 *13* 2010Kr05 list Iβ<0.02, log *ft*>9.7.
(1418 *3*)	499.236	0.20 *13*	8.8 *3*	av Eβ=529.4 *14* 2010Kr05 list Iβ=0.20 *4*, log *ft*=8.84 *9*.
(1448 *3*)	469.369	3.06 *18*	7.69 *3*	av Eβ=542.5 *14* 2010Kr05 list Iβ=3.05 *20*. E(decay): other:1457 *5* (1967Sc01).
(1461[‡] *3*)	455.870	<0.42	>8.6	av Eβ=548.4 *14*
(1524 *3*)	392.526	<0.21	>8.9	av Eβ=576.4 *14* E(decay): other:1553 *17* (1967Sc01).
(1768[‡] *3*)	149.124	<0.08	>9.6	av Eβ=685.2 *14* 2010Kr05 list Iβ<0.05, log *ft*>9.8.
(1787[‡] *3*)	129.742	<1	>8.5	av Eβ=694.0 *14*

Continued on next page (footnotes at end of table)

^{105}Ru β^- decay 2010Kr05,1975Ar03,1967Sc01 (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
				2010Kr05 list Iβ=0.5 *5*, log *ft*=8.8 *5*. E(decay): other:1780 *20* (1967Sc01).
(1917[‡] *3*)	0.0	<1	>8.7	av Eβ=752.8 *14* Iβ^-: β branch was not observed. Upper limit was obtained from β- singles spectrum by 1967Sc01. For normalization, Iβ=0 was assumed. For a 2nd forbidden transition, log *ft*>12.8 leads to Iβ(g.s.)<8×10^{-5}%.

[†] Absolute intensity per 100 decays.
[‡] Existence of this branch is questionable.

^{105}Ru β^- decay 2010Kr05,1975Ar03,1967Sc01 (continued)

$\gamma(^{105}Rh)$

Iγ normalization: from ΣI(γ+ce) to g.s.=100%.

E_γ[‡]	I_γ[‡c]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	δ[b]	α[†]	Comments
63.24 *4*	0.123 *10*	455.870	5/2$^-$	392.526	3/2$^-$	M1+E2		4 *3*	α(K)=2.9 *19*; α(L)=1.0 *9*; α(M)=0.18 *16*; α(N+..)=0.028 *24* α(N)=0.028 *24*; α(O)=0.00043 *22*
81.67 *4*	0.083 *4*	806.045	3/2$^+$	724.244	5/2$^+$	[M1+E2]		1.7 *11*	α(K)=1.3 *8*; α(L)=0.3 *3*; α(M)=0.06 *5*; α(N+..)=0.010 *8* α(N)=0.009 *8*; α(O)=0.00020 *10*
129.782 *4*	11.4 *2*	129.742	1/2$^-$	0.0	7/2$^+$	E3		3.94	α(K)exp=2.752 *42* (1980ViZV); α(L)exp=1.10 *11*; α(M)exp=0.250 *25* (1967Sc01) B(E3)(W.u.)=0.01415 *19* α(K)=2.55 *4*; α(L)=1.140 *16*; α(M)=0.223 *4*; α(N+..)=0.0340 *5* α(N)=0.0336 *5*; α(O)=0.000358 *5* E_γ: from curved crystal spectrometer in 1979Bo26; Other: 129.624 *10* (2010Kr05).
139.397 *14*	0.076 *4*	638.620	7/2$^+$	499.236	5/2$^+$	[M1+E2]		0.27 *14*	α(K)=0.23 *11*; α(L)=0.038 *24*; α(M)=0.007 *5*; α(N+..)=0.0012 *7* α(N)=0.0011 *7*; α(O)=3.7×10^{-5} *15*
149.115 *10*	3.58 *7*	149.124	9/2$^+$	0.0	7/2$^+$	M1+E2	+0.34 *1*	0.1352 *23*	α(K)=0.1163 *19*; α(L)=0.0155 *3*; α(M)=0.00290 *6*; α(N+..)=0.000495 *9* α(N)=0.000474 *9*; α(O)=2.09×10^{-5} *4*
163.473 *10*	0.357 *7*	969.484	5/2$^+$	806.045	3/2$^+$	(M1)		0.0885	α(K)exp=0.08 *3* α(K)=0.0772 *11*; α(L)=0.00931 *13*; α(M)=0.001732 *25*; α(N+..)=0.000302 *5* α(N)=0.000287 *4*; α(O)=1.442×10^{-5} *21* α(K)exp: weighted average of 0.14 6 (1967Sc01) and 0.067 30 (1980ViZV).
183.628 *10*	0.245 *5*	969.484	5/2$^+$	785.887	1/2$^+$	[E2]		0.1536	α(K)exp=0.180 *63* (1980ViZV) α(K)=0.1287 *18*; α(L)=0.0205 *3*; α(M)=0.00385 *6*; α(N+..)=0.000631 *9* α(N)=0.000610 *9*; α(O)=2.05×10^{-5} *3*
225.013 *15*	0.257 *5*	724.244	5/2$^+$	499.236	5/2$^+$	M1		0.0378	α(K)=0.0330 *5*; α(L)=0.00394 *6*; α(M)=0.000733 *11*; α(N+..)=0.0001278 *18* α(N)=0.0001217 *17*; α(O)=6.15×10^{-6} *9*
245.21 *3*	0.057 *3*	969.484	5/2$^+$	724.244	5/2$^+$	[M1+E2]		0.043 *13*	α(K)=0.037 *11*; α(L)=0.0050 *19*; α(M)=0.0009 *4*; α(N+..)=0.00016 *6* α(N)=0.00015 *6*; α(O)=6.4×10^{-6} *15*
254.900 *12*	0.160 *4*	724.244	5/2$^+$	469.369	3/2$^+$	[M1]		0.0273	α(K)=0.0239 *4*; α(L)=0.00284 *4*; α(M)=0.000528 *8*; α(N+..)=9.21×10^{-5} *13* α(N)=8.77×10^{-5} *13*; α(O)=4.44×10^{-6} *7*
262.828 *10*	14.5 *2*	392.526	3/2$^-$	129.742	1/2$^-$	M1+E2	−0.16 *1*	0.0257	α(K)exp=0.016 *2* α(K)=0.0225 *4*; α(L)=0.00269 *4*; α(M)=0.000500 *8*; α(N+..)=8.71×10^{-5} *13*

$^{105}_{45}Rh_{60}$-4

^{105}Ru β^- decay 2010Kr05,1975Ar03,1967Sc01 (continued)

$\gamma(^{105}Rh)$ (continued)

E_γ[‡]	I_γ[‡c]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	δ[b]	α[†]	Comments
									α(N)=8.29×10^{-5} *12*; α(O)=4.15×10^{-6} *6* α(K)exp: weighted average of 0.0156 11 (1967Sc01) and 0.0223 28 (1980ViZV).
286.65 *4*	0.052 *4*	785.887	1/2$^+$	499.236	5/2$^+$	[E2]		0.0328	α(K)=0.0281 *4*; α(L)=0.00389 *6*; α(M)=0.000727 *11*; α(N+..)=0.0001220 *17* α(N)=0.0001173 *17*; α(O)=4.72×10^{-6} *7*
306.79 *3*	0.189 *9*	806.045	3/2$^+$	499.236	5/2$^+$	[M1+E2]		0.022 *5*	α(K)=0.019 *4*; α(L)=0.0024 *7*; α(M)=0.00045 *13*; α(N+..)=7.7×10^{-5} *20* α(N)=7.3×10^{-5} *19*; α(O)=3.3×10^{-6} *6*
316.496 *10*	23.1 *2*	785.887	1/2$^+$	469.369	3/2$^+$	M1+E2	−0.20 *1*	0.01603	α(K)exp=0.0089 *9*; α(L)exp=0.00062 *17* (1967Sc01) α(K)=0.01400 *20*; α(L)=0.001667 *24*; α(M)=0.000310 *5*; α(N+..)=5.39×10^{-5} *8* α(N)=5.14×10^{-5} *8*; α(O)=2.58×10^{-6} *4*
326.154 *10*	2.49 *2*	455.870	5/2$^-$	129.742	1/2$^-$	E2		0.0214	α(K)=0.0184 *3*; α(L)=0.00247 *4*; α(M)=0.000461 *7*; α(N+..)=7.79×10^{-5} *11* α(N)=7.47×10^{-5} *11*; α(O)=3.12×10^{-6} *5* α(K)exp=0.0107 *17* (1967Sc01), α(K)exp=0.0131 *78* (1980ViZV). Mult.: from α(K)exp=0.0107, 1967Sc01 conclude that 326γ is pure M1. This is impossible because J^π=5/2$^-$ for 455 keV state and J^π=1/2$^-$ for 129 keV state. E2 character in agreement with $\gamma\gamma(\theta)$ results of 1979Sa23.
330.859 *10*	1.57 *1*	969.484	5/2$^+$	638.620	7/2$^+$	M1		0.01406	α(K)exp=0.0104 *25* α(K)=0.01229 *18*; α(L)=0.001450 *21*; α(M)=0.000269 *4*; α(N+..)=4.70×10^{-5} *7* α(N)=4.47×10^{-5} *7*; α(O)=2.28×10^{-6} *4*
339.70 *4*	0.039 *2*	469.369	3/2$^+$	129.742	1/2$^-$				
343.314 *25*	0.071 *3*	842.55		499.236	5/2$^+$				
350.099[@] *20*	0.75[@] *20*	499.236	5/2$^+$	149.124	9/2$^+$	[E2]		0.01697	α(K)=0.01461 *21*; α(L)=0.00194 *3*; α(M)=0.000361 *5*; α(N+..)=6.12×10^{-5} *9* α(N)=5.87×10^{-5} *9*; α(O)=2.50×10^{-6} *4*
350.211[@] *20*	2.24[@] *20*	806.045	3/2$^+$	455.870	5/2$^-$	E1		0.00436 *6*	α(K)exp=0.0038 *7* (1967Sc01) α=0.00436 *6*; α(K)=0.00382 *6*; α(L)=0.000441 *7*; α(M)=8.16×10^{-5} *12*; α(N+..)=1.413×10^{-5} *20* α(N)=1.347×10^{-5} *19*; α(O)=6.63×10^{-7} *10* α(K)exp: Other: 0.0036 *20* (1980ViZV).
369.527 *15*	0.125 *3*	762.062	3/2$^-$	392.526	3/2$^-$	[M1+E2]		0.0125 *19*	α(K)=0.0108 *15*; α(L)=0.0014 *3*; α(M)=0.00025 *5*; α(N+..)=4.3×10^{-5} *8* α(N)=4.1×10^{-5} *8*; α(O)=1.92×10^{-6} *20*
393.378 *10*	8.65 *8*	785.887	1/2$^+$	392.526	3/2$^-$	E1		0.00323 *5*	α(K)exp=0.0050 *14* (1967Sc01) α=0.00323 *5*; α(K)=0.00283 *4*; α(L)=0.000326 *5*; α(M)=6.04×10^{-5} *9*; α(N+..)=1.047×10^{-5} *15*

$^{105}_{45}Rh_{60}$-5

^{105}Ru β^- decay 2010Kr05,1975Ar03,1967Sc01 (continued)

$\gamma(^{105}Rh)$ (continued)

E_γ[‡]	I_γ[‡c]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	δ[b]	α[†]	Comments
									α(N)=9.98×10^{-6} *14*; α(O)=4.94×10^{-7} *7* α(K)exp: Other: 0.0037 *29* (1980ViZV). Mult.: pure dipole from $\gamma\gamma(\theta)$ results of 1979Sa23.
407.570 *10*	0.335 *4*	1377.024	3/2$^+$	969.484	5/2$^+$	[M1+E2]		0.0094 *11*	α=0.0094 *11*; α(K)=0.0082 *9*; α(L)=0.00101 *16*; α(M)=0.00019 *3*; α(N+..)=3.2×10^{-5} *5* α(N)=3.1×10^{-5} *5*; α(O)=1.46×10^{-6} *11*
413.538 *10*	5.18 *5*	806.045	3/2$^+$	392.526	3/2$^-$	E1		0.00285 *4*	α(K)exp=0.0016 *12* (1967Sc01) α=0.00285 *4*; α(K)=0.00250 *4*; α(L)=0.000287 *4*; α(M)=5.32×10^{-5} *8*; α(N+..)=9.22×10^{-6} *13* α(N)=8.79×10^{-6} *13*; α(O)=4.36×10^{-7} *7* α(K)exp: Other: 0.0031 *19* (1980ViZV).
469.347[@] *10*	38.3[@] *3*	469.369	3/2$^+$	0.0	7/2$^+$	E2		0.00682 *10*	α(K)exp=0.0051 *5*; α(L)exp=0.00075 *11* (1967Sc01) α=0.00682 *10*; α(K)=0.00591 *9*; α(L)=0.000746 *11*; α(M)=0.0001388 *20*; α(N+..)=2.37×10^{-5} *4* α(N)=2.27×10^{-5} *4*; α(O)=1.032×10^{-6} *15* α(O)=1.032×10^{-6} *15* Mult.: pure quadrupole from $\gamma\gamma(\theta)$ results of 1977Kr09 and 1979Sa23. E2 from α(K)exp.
470.235[@] *20*	1.75[@] *15*	969.484	5/2$^+$	499.236	5/2$^+$	[M1+E2]		0.0063 *5*	α=0.0063 *5*; α(K)=0.0055 *4*; α(L)=0.00067 *7*; α(M)=0.000125 *14*; α(N+..)=2.16×10^{-5} *21* α(N)=2.06×10^{-5} *20*; α(O)=9.9×10^{-7} *4*
[x]478.808 *25*	0.073 *3*								
489.500 *10*	1.25 *1*	638.620	7/2$^+$	149.124	9/2$^+$	M1+E2[a]	+0.25 *2*	0.00540 *8*	α(K)exp=0.0084 *39* (1980ViZV) α=0.00540 *8*; α(K)=0.00473 *7*; α(L)=0.000554 *8*; α(M)=0.0001028 *15*; α(N+..)=1.79×10^{-5} *3* α(N)=1.706×10^{-5} *24*; α(O)=8.69×10^{-7} *13* α(O)=8.69×10^{-7} *13*
499.210[@] *10*	4.91[@] *5*	499.236	5/2$^+$	0.0	7/2$^+$	M1+E2		0.0054 *3*	α=0.0054 *3*; α(K)=0.00470 *24*; α(L)=0.00057 *5*; α(M)=0.000106 *9*; α(N+..)=1.83×10^{-5} *14* α(N)=1.75×10^{-5} *14*; α(O)=8.45×10^{-7} *23*
500.11[@] *3*	0.410[@] *34*	969.484	5/2$^+$	469.369	3/2$^+$	M1+E2[a]	+0.7 *3*	0.00528 *13*	α=0.00528 *13*; α(K)=0.00461 *11*; α(L)=0.000551 *20*; α(M)=0.000102 *4*; α(N+..)=1.77×10^{-5} *6* α(N)=1.69×10^{-5} *6*; α(O)=8.34×10^{-7} *14*
513.623 *10*	0.484 *5*	969.484	5/2$^+$	455.870	5/2$^-$	[E1+M2]		0.009 *7*	α=0.009 *7*; α(K)=0.007 *6*; α(L)=0.0009 *8*; α(M)=0.00017 *14*; α(N+..)=3.0×10^{-5} *25* α(N)=2.8×10^{-5} *24*; α(O)=1.4×10^{-6} *12*
539.094 *12*	0.411 *5*	1345.135	3/2$^+$	806.045	3/2$^+$	[M1+E2]		0.00440 *16*	α=0.00440 *16*; α(K)=0.00384 *13*; α(L)=0.00046 *3*; α(M)=8.6×10^{-5} *6*; α(N+..)=1.48×10^{-5} *9* α(N)=1.42×10^{-5} *9*; α(O)=6.91×10^{-7} *11*
559.245 *12*	0.248 *4*	1345.135	3/2$^+$	785.887	1/2$^+$	[M1+E2]		0.00400 *12*	α=0.00400 *12*; α(K)=0.00349 *9*; α(L)=0.000418 *23*; α(M)=7.8×10^{-5} *5*; α(N+..)=1.35×10^{-5} *7* α(N)=1.28×10^{-5} *7*; α(O)=6.29×10^{-7} *9*

$^{105}_{45}Rh_{60}$-6

^{105}Ru β^- decay 2010Kr05,1975Ar03,1967Sc01 (continued)

$\gamma(^{105}Rh)$ (continued)

E_γ[‡]	I_γ[‡c]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	α[†]	Comments
572	0.02 *1*	1377.024	3/2$^+$	806.045	3/2$^+$	[M1+E2]	0.00378 *10*	α=0.00378 *10*; α(K)=0.00330 *7*; α(L)=0.000394 *19*; α(M)=7.3×10^{-5} *4*; α(N+..)=1.27×10^{-5} *6* α(N)=1.21×10^{-5} *6*; α(O)=5.94×10^{-7} *9* E$_\gamma$,I$_\gamma$: From 1975Ar03.
[x]572.08 *5*	0.045 *3*							
575.106 *10*	2.06 *2*	724.244	5/2$^+$	149.124	9/2$^+$	E2	0.00379 *6*	α(K)exp=0.0028 *9* α=0.00379 *6*; α(K)=0.00330 *5*; α(L)=0.000406 *6*; α(M)=7.54×10^{-5} *11*; α(N+..)=1.297×10^{-5} *19* α(N)=1.238×10^{-5} *18*; α(O)=5.82×10^{-7} *9* Mult.: pure quadrupole from $\gamma\gamma(\theta)$ results of 1979Sa23. E2 from α(K)exp.
577.019 *13*	0.226 *4*	969.484	5/2$^+$	392.526	3/2$^-$	[E1+M2]	0.006 *5*	α=0.006 *5*; α(K)=0.005 *5*; α(L)=0.0007 *6*; α(M)=0.00012 *10*; α(N+..)=2.1×10^{-5} *18* α(N)=2.0×10^{-5} *17*; α(O)=1.0×10^{-6} *9*
591.161 *12*	0.171 *3*	1377.024	3/2$^+$	785.887	1/2$^+$	[M1+E2]	0.00347 *7*	α=0.00347 *7*; α(K)=0.00303 *6*; α(L)=0.000361 *15*; α(M)=6.7×10^{-5} *3*; α(N+..)=1.16×10^{-5} *4* α(N)=1.11×10^{-5} *4*; α(O)=5.46×10^{-7} *10*
597.06 *3*	0.078 *3*	1321.293	5/2$^+$	724.244	5/2$^+$	[M1+E2]	0.00338 *6*	α=0.00338 *6*; α(K)=0.00295 *5*; α(L)=0.000352 *14*; α(M)=6.5×10^{-5} *3*; α(N+..)=1.13×10^{-5} *4* α(N)=1.08×10^{-5} *4*; α(O)=5.33×10^{-7} *10*
620.898 *13*	0.157 *5*	1345.135	3/2$^+$	724.244	5/2$^+$	[M1+E2]	0.00306 *5*	α=0.00306 *5*; α(K)=0.00268 *4*; α(L)=0.000318 *10*; α(M)=5.90×10^{-5} *18*; α(N+..)=1.024×10^{-5} *25* α(N)=9.76×10^{-6} *25*; α(O)=4.83×10^{-7} *12*
632.322 *10*	0.362 *3*	762.062	3/2$^-$	129.742	1/2$^-$	[M1+E2]	0.00293 *4*	α=0.00293 *4*; α(K)=0.00256 *4*; α(L)=0.000303 *8*; α(M)=5.63×10^{-5} *15*; α(N+..)=9.77×10^{-6} *21* α(N)=9.31×10^{-6} *21*; α(O)=4.61×10^{-7} *12*
635.39 *9*	0.013 *1*	1441.43	(3/2$^+$,5/2,7/2$^+$)	806.045	3/2$^+$			
638.589 *10*	0.516 *5*	638.620	7/2$^+$	0.0	7/2$^+$	[M1+E2]	0.00285 *4*	α=0.00285 *4*; α(K)=0.00249 *4*; α(L)=0.000296 *8*; α(M)=5.49×10^{-5} *14*; α(N+..)=9.53×10^{-6} *19* α(N)=9.08×10^{-6} *19*; α(O)=4.50×10^{-7} *12*
652.761 *10*	0.805 *8*	1377.024	3/2$^+$	724.244	5/2$^+$	[M1+E2]	0.00270 *4*	α=0.00270 *4*; α(K)=0.00236 *4*; α(L)=0.000280 *6*; α(M)=5.19×10^{-5} *11*; α(N+..)=9.01×10^{-6} *16* α(N)=8.58×10^{-6} *16*; α(O)=4.27×10^{-7} *13*
656.198 *10*	4.44 *4*	785.887	1/2$^+$	129.742	1/2$^-$	[E1]	0.004 *4*	α(K)exp=0.0028 *6* α=0.004 *4*; α(K)=0.004 *3*; α(L)=0.0005 *4*; α(M)=8.E−5 *7*; α(N+..)=1.5×10^{-5} *12* α(N)=1.4×10^{-5} *12*; α(O)=7.E−7 *6*
676.355 *10*	33.1 *3*	806.045	3/2$^+$	129.742	1/2$^-$	E1	0.000896 *13*	α(K)exp=0.00093 *12* (1967Sc01) α=0.000896 *13*; α(K)=0.000787 *11*; α(L)=8.97×10^{-5} *13*; α(M)=1.658×10^{-5} *24*; α(N+..)=2.89×10^{-6} α(N)=2.75×10^{-6} *4*; α(O)=1.394×10^{-7} *20*

$^{105}_{45}Rh_{60}$-7

^{105}Ru β^- decay 2010Kr05,1975Ar03,1967Sc01 (continued)

$\gamma(^{105}Rh)$ (continued)

E_γ[‡]	I_γ[‡c]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	δ[b]	α[†]	Comments
									α(O)=1.394×10^{-7} *20* α(K)exp: Other: 0.0007 *3* (1980ViZV).
700.98 *4*	0.044 *2*	1486.839	(3/2$^+$)	785.887	1/2$^+$	[M1+E2]		0.00227 *5*	α=0.00227 *5*; α(K)=0.00198 *5*; α(L)=0.000234 *4*; α(M)=4.33×10^{-5} *7*; α(N+..)=7.53×10^{-6} *11* α(N)=7.17×10^{-6} *11*; α(O)=3.58×10^{-7} *14*
706.11 *14*	0.006 *3*	1345.135	3/2$^+$	638.620	7/2$^+$	[E2]		0.00219 *3*	α=0.00219 *3*; α(K)=0.00191 *3*; α(L)=0.000229 *4*; α(M)=4.26×10^{-5} *6*; α(N+..)=7.36×10^{-6} *11* α(N)=7.02×10^{-6} *10*; α(O)=3.40×10^{-7} *5*
724.211 *10*	100.0 *10*	724.244	5/2$^+$	0.0	7/2$^+$	M1+E2	−0.12 *5*	0.00214 *3*	α(K)exp=0.00158 *16* (1967Sc01) α=0.00214 *3*; α(K)=0.00187 *3*; α(L)=0.000216 *3*; α(M)=4.01×10^{-5} *6*; α(N+..)=7.01×10^{-6} *10* α(N)=6.66×10^{-6} *10*; α(O)=3.44×10^{-7} *5* α(K)exp: Other: 0.0017 *3* (1980ViZV). δ: from $\gamma(\theta)$ in oriented ^{105}Ru β^- decay (1976Ba39). Other: δ=−0.17 *+5−15* from I$\gamma(\theta$,H,T,t) by 1981Ha11.
738.379 *10*	0.188 *2*	1377.024	3/2$^+$	638.620	7/2$^+$	[E2]		0.00195 *3*	α=0.00195 *3*; α(K)=0.001703 *24*; α(L)=0.000204 *3*; α(M)=3.78×10^{-5} *6*; α(N+..)=6.55×10^{-6} *10* α(N)=6.24×10^{-6} *9*; α(O)=3.03×10^{-7} *5*
805.973 *14*	0.101 *1*	806.045	3/2$^+$	0.0	7/2$^+$	[E2]		0.001569 *22*	α=0.001569 *22*; α(K)=0.001370 *20*; α(L)=0.0001627 *23*; α(M)=3.02×10^{-5} *5*; α(N+..)=5.23×10^{-6} α(N)=4.99×10^{-6} *7*; α(O)=2.45×10^{-7} *4*
820.23 *5*	0.0259 *16*	969.484	5/2$^+$	149.124	9/2$^+$	[E2]		0.001503 *21*	α=0.001503 *21*; α(K)=0.001313 *19*; α(L)=0.0001557 *22*; α(M)=2.89×10^{-5} *4*; α(N+..)=5.01×10^{-6} α(N)=4.77×10^{-6} *7*; α(O)=2.35×10^{-7} *4*
822.042 *10*	0.445 *4*	1321.293	5/2$^+$	499.236	5/2$^+$	[M1+E2]		0.00155 *6*	α=0.00155 *6*; α(K)=0.00136 *6*; α(L)=0.000158 *4*; α(M)=2.93×10^{-5} *8*; α(N+..)=5.11×10^{-6} *15* α(N)=4.86×10^{-6} *14*; α(O)=2.46×10^{-7} *13*
845.878 *10*	1.43 *2*	1345.135	3/2$^+$	499.236	5/2$^+$	[M1+E2]		0.00145 *6*	α=0.00145 *6*; α(K)=0.00127 *6*; α(L)=0.000148 *5*; α(M)=2.74×10^{-5} *8*; α(N+..)=4.78×10^{-6} *16* α(N)=4.55×10^{-6} *14*; α(O)=2.30×10^{-7} *13*
846.9 *2*	0.06 *1*	1316.27		469.369	3/2$^+$				E_γ,I_γ: from 1975Ar03, γ not reported in 2010Kr05.
851.927 *10*	0.325 *3*	1321.293	5/2$^+$	469.369	3/2$^+$	[M1+E2]		0.00143 *6*	α=0.00143 *6*; α(K)=0.00125 *6*; α(L)=0.000145 *5*; α(M)=2.69×10^{-5} *8*; α(N+..)=4.70×10^{-6} *16* α(N)=4.47×10^{-6} *15*; α(O)=2.26×10^{-7} *13*
875.728 *10*	5.59 *5*	1345.135	3/2$^+$	469.369	3/2$^+$	M1+E2	+1.3 *+4−3*	0.001324 *24*	α(K)exp=0.00141 *4* α=0.001324 *24*; α(K)=0.001159 *21*; α(L)=0.0001353 *22*; α(M)=2.51×10^{-5} *4*; α(N+..)=4.37×10^{-6} α(N)=4.16×10^{-6} *7*; α(O)=2.09×10^{-7} *5*
877.801 *15*	0.887 *9*	1377.024	3/2$^+$	499.236	5/2$^+$	[M1+E2]		0.00133 *6*	α=0.00133 *6*; α(K)=0.00117 *6*; α(L)=0.000135 *5*; α(M)=2.51×10^{-5} *8*; α(N+..)=4.38×10^{-6} *16* α(N)=4.17×10^{-6} *15*; α(O)=2.11×10^{-7} *12*

$^{105}_{45}Rh_{60}$-8

$\gamma(^{105}Rh)$ (continued)

E_γ ‡	I_γ ‡c	E_i(level)	J_i^π	E_f	J_f^π	Mult.&	α†	Comments
907.642 *10*	1.15 *1*	1377.024	3/2$^+$	469.369	3/2$^+$	(M1+E2)[a]	0.00123 *6*	α=0.00123 *6*; α(K)=0.00108 *5*; α(L)=0.000125 *5*; α(M)=2.32×10^{-5} *8*; α(N+..)=4.05×10^{-6} *16* α(N)=3.85×10^{-6} *15*; α(O)=1.96×10^{-7} *12* δ: +0.21 *3* or +21.7 *+80−310* (1979Sa23).
952.568 *22*	0.041 *1*	1345.135	3/2$^+$	392.526	3/2$^-$	[E1+M2]	0.0016 *12*	α=0.0016 *12*; α(K)=0.0014 *11*; α(L)=0.00017 *13*; α(M)=3.1×10^{-5} *24*; α(N+..)=5.E−6 *4* α(N)=5.E−6 *4*; α(O)=2.7×10^{-7} *20*
969.414 *10*	4.46 *4*	969.484	5/2$^+$	0.0	7/2$^+$	[M1+E2]	0.00106 *6*	α(K)exp=0.0012 *4* α=0.00106 *6*; α(K)=0.00093 *5*; α(L)=0.000108 *5*; α(M)=2.00×10^{-5} *8*; α(N+..)=3.48×10^{-6} *15* α(N)=3.31×10^{-6} *14*; α(O)=1.69×10^{-7} *10*
[x]977.88 *4*	0.007 *1*							
984.39 *3*	0.023 *1*	1377.024	3/2$^+$	392.526	3/2$^-$	[E1+M2]	0.0015 *11*	α=0.0015 *11*; α(K)=0.0013 *10*; α(L)=0.00016 *12*; α(M)=2.9×10^{-5} *22*; α(N+..)=5.E−6 *4* α(N)=5.E−6 *4*; α(O)=2.5×10^{-7} *18* E_γ: poor fit to level-energy difference.
987.40 *4*	0.016 *1*	1486.839	(3/2$^+$)	499.236	5/2$^+$	[M1+E2]	0.00102 *5*	α=0.00102 *5*; α(K)=0.00089 *5*; α(L)=0.000103 *5*; α(M)=1.91×10^{-5} *8*; α(N+..)=3.34×10^{-6} *15* α(N)=3.18×10^{-6} *14*; α(O)=1.62×10^{-7} *10* E_γ: poor fit to level-energy difference.
1017.470 *10*	0.702 *7*	1486.839	(3/2$^+$)	469.369	3/2$^+$	(M1+E2)[a]	0.00095 *5*	α=0.00095 *5*; α(K)=0.00084 *5*; α(L)=9.6×10^{-5} *4*; α(M)=1.79×10^{-5} *8*; α(N+..)=3.12×10^{-6} *14* α(N)=2.97×10^{-6} *13*; α(O)=1.51×10^{-7} *10* δ: +1.3 + ∞ −1.4 (1979Sa23).
1059.632 *21*	0.053 *1*	1698.196	(3/2$^+$,5/2)	638.620	7/2$^+$			
1082.52 *6*	0.0125 *8*	1721.203	(5/2$^+$)	638.620	7/2$^+$	[M1+E2]	0.00083 *5*	α=0.00083 *5*; α(K)=0.00073 *4*; α(L)=8.4×10^{-5} *4*; α(M)=1.56×10^{-5} *7*; α(N+..)=2.72×10^{-6} *13* α(N)=2.58×10^{-6} *12*; α(O)=1.32×10^{-7} *8*
1085.53 *6*	0.0118 *9*	1809.78	(5/2,3/2$^+$)	724.244	5/2$^+$			
1094.43 *12*	0.0057 *4*	1486.839	(3/2$^+$)	392.526	3/2$^-$	[E1+M2]	0.0012 *9*	α=0.0012 *9*; α(K)=0.0010 *8*; α(L)=0.00012 *9*; α(M)=2.2×10^{-5} *16*; α(N+..)=4.E−6 *3* α(N)=4.E−6 *3*; α(O)=1.9×10^{-7} *14*
1172.37 *6*	0.0181 *9*	1321.293	5/2$^+$	149.124	9/2$^+$	[E2]	0.000670 *10*	α=0.000670 *10*; α(K)=0.000583 *9*; α(L)=6.74×10^{-5} *10*; α(M)=1.249×10^{-5} *18*; α(N+..)=6.47×10^{-6} *9* α(N)=2.07×10^{-6} *3*; α(O)=1.048×10^{-7} *15*; α(IPF)=4.29×10^{-6} *6* E_γ: poor fit to level-energy difference.
1209.30 *5*	0.0110 *7*	1708.53	(3/2$^+$,5/2)	499.236	5/2$^+$			
1215.463 *12*	0.146 *2*	1345.135	3/2$^+$	129.742	1/2$^-$	[E1+M2]	0.0009 *6*	α=0.0009 *6*; α(K)=0.0008 *6*; α(L)=9.E−5 *7*; α(M)=1.7×10^{-5} *12*; α(N+..)=2.7×10^{-5} *21* α(N)=2.9×10^{-6} *20*; α(O)=1.5×10^{-7} *11*; α(IPF)=2.4×10^{-5} *23*
1221.98 *3*	0.041 *1*	1721.203	(5/2$^+$)	499.236	5/2$^+$	[M1+E2]	0.00065 *4*	α=0.00065 *4*; α(K)=0.00056 *3*; α(L)=6.4×10^{-5} *3*; α(M)=1.19×10^{-5}

$^{105}_{45}Rh_{60}$-9

$\gamma(^{105}Rh)$ (continued)

E_γ[‡]	I_γ[‡c]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	α[†]	Comments
								6; α(N+..)=1.17×10^{-5} 9 α(N)=1.98×10^{-6} 10; α(O)=1.02×10^{-7} 7; α(IPF)=9.7×10^{-6} 10
1228.73 7	0.0101 6	1698.196	(3/2$^+$,5/2)	469.369	3/2$^+$			
1238.2 3	0.003 1	1708.53	(3/2$^+$,5/2)	469.369	3/2$^+$			E$_\gamma$: poor fit to level-energy difference.
1251.907 19	0.047 1	1721.203	(5/2$^+$)	469.369	3/2$^+$	[M1+E2]	0.00062 3	α=0.00062 3; α(K)=0.00053 3; α(L)=6.1×10^{-5} 3; α(M)=1.13×10^{-5} 6; α(N+..)=1.63×10^{-5} 13 α(N)=1.88×10^{-6} 9; α(O)=9.7×10^{-8} 6; α(IPF)=1.43×10^{-5} 14
1321.282 10	0.424 4	1321.293	5/2$^+$	0.0	7/2$^+$	[M1+E2]	0.00057 3	E$_\gamma$: poor fit to level-energy difference. α=0.00057 3; α(K)=0.000478 25; α(L)=5.5×10^{-5} 3; α(M)=1.01×10^{-5} 5; α(N+..)=2.92×10^{-5} 23 α(N)=1.68×10^{-6} 8; α(O)=8.7×10^{-8} 5; α(IPF)=2.74×10^{-5} 24
1340[#]		1809.78	(5/2,3/2$^+$)	469.369	3/2$^+$			
1357.55 10	0.0047 6	1486.839	(3/2$^+$)	129.742	1/2$^-$	[E1+M2]	0.0008 4	α=0.0008 4; α(K)=0.0006 5; α(L)=7.E−5 5; α(M)=1.3×10^{-5} 9; α(N+..)=7.E−5 7 α(N)=2.2×10^{-6} 15; α(O)=1.1×10^{-7} 8; α(IPF)=7.E−5 7
1377.017 10	0.112 2	1377.024	3/2$^+$	0.0	7/2$^+$	[E2]	0.000519 8	E$_\gamma$: poor fit to level-energy difference. α=0.000519 8; α(K)=0.000417 6; α(L)=4.78×10^{-5} 7; α(M)=8.86×10^{-6} 13; α(N+..)=4.51×10^{-5} 7 α(N)=1.471×10^{-6} 21; α(O)=7.51×10^{-8} 11; α(IPF)=4.36×10^{-5} 7
1441.42 4	0.0111 6	1441.43	(3/2$^+$,5/2,7/2$^+$)	0.0	7/2$^+$			E$_\gamma$: poor fit to level-energy difference.
[x]1448.31 4	0.0147 9							
1571[#]	<0.001	1721.203	(5/2$^+$)	149.124	9/2$^+$	[E2]	0.000476 7	α=0.000476 7; α(K)=0.000321 5; α(L)=3.66×10^{-5} 6; α(M)=6.78×10^{-6} 10; α(N+..)=0.0001110 16 α(N)=1.126×10^{-6} 16; α(O)=5.78×10^{-8} 8; α(IPF)=0.0001098 16
1698.167 11	0.162 2	1698.196	(3/2$^+$,5/2)	0.0	7/2$^+$			
1708.7[#] 2	<0.002	1708.53	(3/2$^+$,5/2)	0.0	7/2$^+$			
1721.149 13	0.0633 6	1721.203	(5/2$^+$)	0.0	7/2$^+$	[M1+E2]	0.000483 8	α=0.000483 8; α(K)=0.000280 12; α(L)=3.18×10^{-5} 13; α(M)=5.88×10^{-6} 23; α(N+..)=0.000165 1 α(N)=9.8×10^{-7} 4; α(O)=5.07×10^{-8} 24; α(IPF)=0.000164 10
1765.4[#] 3	<0.001	1765.4	(5/2$^+$,3/2$^+$)	0.0	7/2$^+$			
1809[#]	<0.001	1809.78	(5/2,3/2$^+$)	0.0	7/2$^+$			
1829.6[#] 3	<0.001	1829.6	(5/2$^+$)	0.0	7/2$^+$	[M1+E2]	0.000495 7	α=0.000495 7; α(K)=0.000249 10; α(L)=2.82×10^{-5} 11; α(M)=5.21×10^{-6} 19; α(N+..)=0.000213 1 α(N)=8.7×10^{-7} 4; α(O)=4.50×10^{-8} 20; α(IPF)=0.000212 11

† Additional information 1.
‡ From 2010Kr05, unless noted otherwise.

$^{105}_{45}Rh_{60}$-10

^{105}Ru β^- decay 2010Kr05,1975Ar03,1967Sc01 (continued)

$\gamma(^{105}Rh)$ (continued)

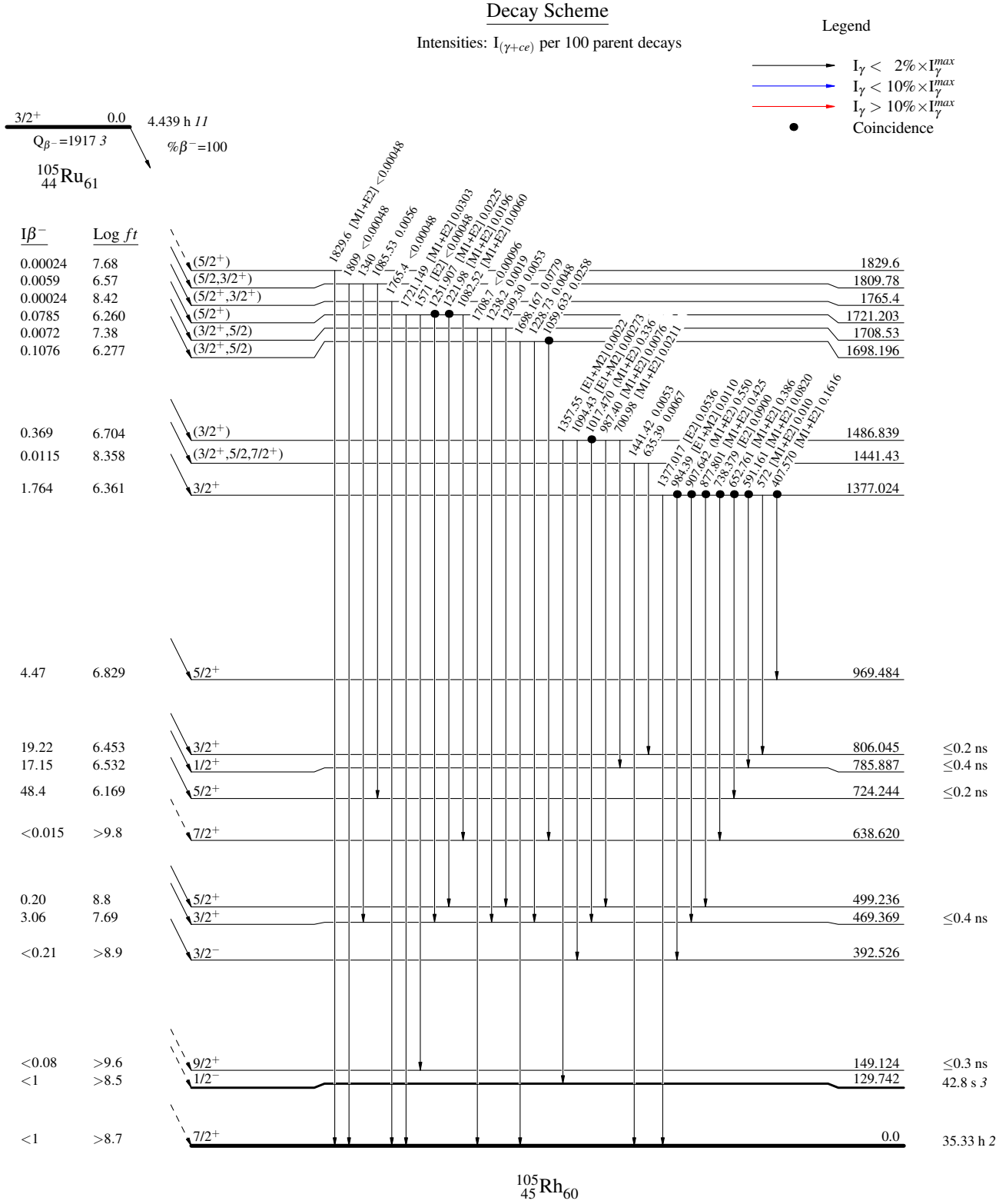
[#] From 1975Ar03.
[@] Unresolved doublets. Energies and intensities are determined in 2010Kr05 by using complex peak analysis procedures combined with information from previous γ-γ coincidence data.
[&] Based on internal conversion coefficients in 1967Sc01, unless noted otherwise.
[a] From $\gamma\gamma(\theta)$. D+Q is assumed to be M1+E2 if considerable mixing is observed.
[b] From $\gamma\gamma(\theta)$ results of 1979Sa23, 1977Kr09, 1976Gu09, and 1976Sc07. Adopted values from 1980Kr22 and 1977Kr13 are given.
[c] For absolute intensity per 100 decays, multiply by 0.478 *4*.
[x] γ ray not placed in level scheme.

$^{105}_{45}Rh_{60}$-11

^{105}Ru β^- decay 2010Kr05,1975Ar03,1967Sc01

Decay Scheme

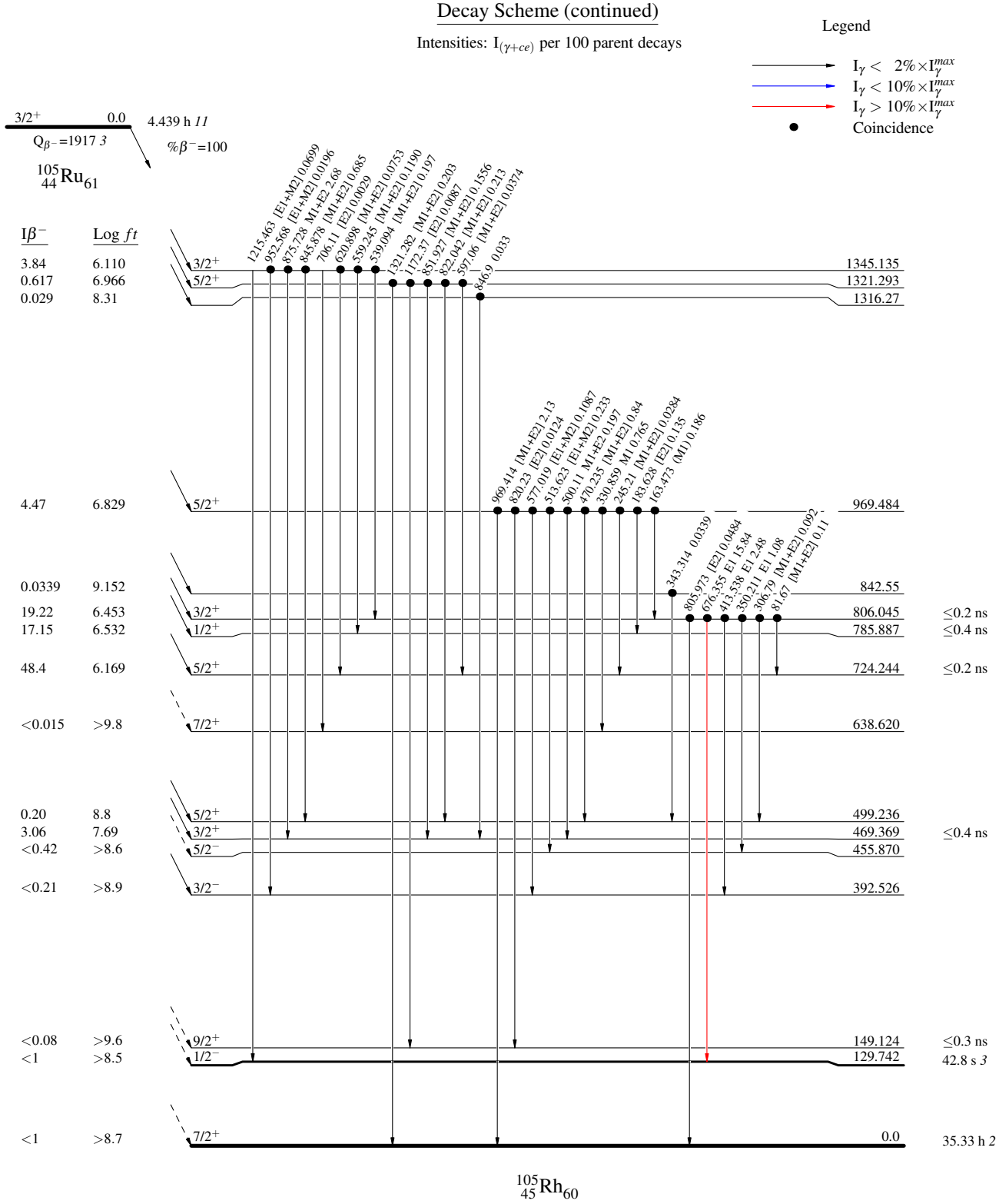
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{105}Ru β^- decay 2010Kr05,1975Ar03,1967Sc01

Decay Scheme (continued)

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



^{105}Ru β^- decay 2010Kr05,1975Ar03,1967Sc01

Decay Scheme (continued)

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