^{98}Rh ε decay (3.6 min) 1978Ki17,1974Si18

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen, Balraj Singh	NDS 164, 1 (2020)	15-Feb-2020

Parent: ^{98}Rh: E=56.3 *10*; J^π=(5$^+$); $T_{1/2}$=3.6 min *2*; Q(ε)=5050 *10*; %ε+%β^+ decay=11 *5*

^{98}Rh-E,J^π,$T_{1/2}$: From ^{98}Rh Adopted Levels.

^{98}Rh-Q(ε): From 2017Wa10.

^{98}Rh-%ε+%β^+ decay: From %IT=89 *5* for ^{98}Rh decay (1978Ki17).

1978Ki17: ^{98}Rh source was produced via ^{96}Ru(p,2n) at the Institute for Nuclear Physics of the Academy of Sciences of Kazach SSR. γ rays were detected with a Ge(Li) detector. Deduced level, J, π, decay branching ratios, log *ft*,

Others:

1966At02, measured $T_{1/2}$ and reported 652γ.

1972Ba37: 745γ assigned to g.s. decay most likely is from the decay of the 3.6-min isomer.

1994Ba06: measured time decay of 745γ.

The decay scheme is not considered as well established and complete (evaluators).

^{98}Ru Levels

E(level)[‡]	J^π[†]	Comments
0.0	0$^+$	
652.3 *4*	2$^+$	
1397.5 *5*	4$^+$	
1413.7 *4*	2$^+$	
1796.6 *5*	3$^+$	J^π: 1978Ki17 suggest 4$^+$.
1816.4? *9*	2$^+$	J^π: 1978Ki17 suggest 2$^+$.
2013.0 *4*	3$^+$	J^π: 1978Ki17 suggest 4$^+$.
2221.9 *6*	6$^+$	
3069.3 *11*		
3441.1? *7*		

[†] From Adopted Levels.

[‡] From least-squares fit to γ-ray energies.

ε,β^+ radiations

E(decay)	E(level)	Iβ^+ [‡]	Iε[‡]	Log *ft*[†]	I($\varepsilon+\beta^+$)[†‡]	Comments
(1665[#] *10*)	3441.1?	0.05	0.9	5.1	0.9	av Eβ=287.3 *44*; εK=0.8235 *24*; εL=0.1022 *3*; εM+=0.02407 *8*
(2037 *10*)	3069.3	0.029	0.11	6.1	0.14	av Eβ=449.5 *45*; εK=0.689 *5*; εL=0.0851 *6*; εM+=0.02003 *15*
(2884 *10*)	2221.9	0.15	0.080	6.6	0.23	av Eβ=829.9 *46*; εK=0.303 *4*; εL=0.0373 *5*; εM+=0.00877 *10*
(3093[#] *10*)	2013.0	1.4	0.56	5.8	2.0	av Eβ=925.6 *47*; εK=0.242 *3*; εL=0.0297 *4*; εM+=0.00698 *8*
(3310[#] *10*)	1796.6	0.7	0.2	6.3	0.9	av Eβ=1025.3 *47*; εK=0.1920 *21*; εL=0.0236 *3*; εM+=0.00554 *6*
(3709 *10*)	1397.5	7	1	5.6	8	av Eβ=1210.8 *47*; εK=0.1286 *13*; εL=0.01576 *16*; εM+=0.00370 *4*

[†] All values are considered as approximate, due to poor knowledge of the decay scheme. I($\varepsilon+\beta^+$) values are deduced from γ+ce intensity imbalance at each level.

[‡] Absolute intensity per 100 decays.

[#] Existence of this branch is questionable.

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γ(^{98}Ru)

Iγ normalization: Σ(I(γ+ce) of γ rays to g.s.)=100, considered as approximate, due to poor knowledge of the decay scheme.

E_γ[†]	I_γ[†@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[&]	Comments
383.0 *5*	3.1 *6*	1796.6	3+	1413.7	2+	M1+E2	+0.8 *+8−3*	0.0101 *11*	α(K)=0.0088 *9*; α(L)=0.00108 *15*; α(M)=0.00020 *3* α(N)=3.2×10^{-5} *4*; α(O)=1.57×10^{-6} *13*
599.0 *4*	12.3 *12*	2013.0	3+	1413.7	2+	E2+M1	+0.14 *+6−10*	0.00304	α(K)=0.00267 *4*; α(L)=0.000307 *5*; α(M)=5.62×10^{-5} *8* α(N)=9.10×10^{-6} *13*; α(O)=4.85×10^{-7} *7*
615.7 *4*	12.0 *12*	2013.0	3+	1397.5	4+	(M1+E2)	−0.35 *5*	0.00286	α(K)=0.00251 *4*; α(L)=0.000289 *5*; α(M)=5.30×10^{-5} *8* α(N)=8.59×10^{-6} *13*; α(O)=4.55×10^{-7} *7*
652.6 *4*	115 *20*	652.3	2+	0.0	0+	E2		0.00253	α(K)=0.00221 *4*; α(L)=0.000264 *4*; α(M)=4.85×10^{-5} *7* α(N)=7.79×10^{-6} *11*; α(O)=3.89×10^{-7} *6*
745.4 *4*	100	1397.5	4+	652.3	2+	E2		0.00179	α(K)=0.001565 *22*; α(L)=0.000185 *3*; α(M)=3.39×10^{-5} *5* α(N)=5.46×10^{-6} *8*; α(O)=2.77×10^{-7} *4*
761.5 *4*	9.2 *11*	1413.7	2+	652.3	2+	E2+M1	+13 *+4−2*	1.70×10^{-3}	α(K)=0.001483 *21*; α(L)=0.0001750 *25*; α(M)=3.21×10^{-5} *5* α(N)=5.16×10^{-6} *8*; α(O)=2.63×10^{-7} *4*
824.4 *4*	2.6 *3*	2221.9	6+	1397.5	4+	E2		1.39×10^{-3}	α(K)=0.001219 *18*; α(L)=0.0001429 *20*; α(M)=2.62×10^{-5} *4* α(N)=4.22×10^{-6} *6*; α(O)=2.16×10^{-7} *3*
[x]1121.1 *5*	4.3 *5*								
1144.2 *4*	7.3 *8*	1796.6	3+	652.3	2+	M1+E2	<−0.2	7.14×10^{-4}	α(K)=0.000626 *9*; α(L)=7.08×10^{-5} *10*; α(M)=1.295×10^{-5} *19* α(N)=2.10×10^{-6} *3*; α(O)=1.133×10^{-7} *16*; α(IPF)=1.78×10^{-6} *4*
1164.1[‡]	4.1[‡]	1816.4?	2+	652.3	2+	M1+E2	−0.27 *6*	6.87×10^{-4}	α(K)=0.000601 *9*; α(L)=6.80×10^{-5} *10*; α(M)=1.244×10^{-5} *18* α(N)=2.02×10^{-6} *3*; α(O)=1.087×10^{-7} *16*; α(IPF)=2.97×10^{-6} *5*
1360.9 *5*	2.0 *3*	2013.0	3+	652.3	2+				

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^{98}Rh ε decay (3.6 min) 1978Ki17,1974Si18 (continued)

γ(^{98}Ru) (continued)

E_γ [†]	I_γ [†@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[&]	Comments
1413.4 *4*	6.4 *6*	1413.7	2^+	0.0	0^+	E2	4.76×10^{-4}	α(K)=0.000371 *6*; α(L)=4.21×10^{-5} *6*; α(M)=7.70×10^{-6} *11* α(N)=1.246×10^{-6} *18*; α(O)=6.62×10^{-8} *10*; α(IPF)=5.42×10^{-5} *8*
1428.1 *5*	4.4 *4*	3441.1?		2013.0	3^+			
1624.7 *6*	5.6 *6*	3441.1?		1816.4?	2^+			
1816.4‡	1.5‡	1816.4?	2^+	0.0	0^+	[E2]	4.76×10^{-4}	α(K)=0.000228 *4*; α(L)=2.56×10^{-5} *4*; α(M)=4.68×10^{-6} *7* α(N)=7.59×10^{-7} *11*; α(O)=4.07×10^{-8} *6*; α(IPF)=0.000217 *3*
2417 *1*	1.6 *2*	3069.3		652.3	2^+			

† From 1978Ki17. Selected values from 1974Si18 are in agreement.
‡ Transitions are shown in Fig 4 in 1978Ki17 but no values are given. Quoted energies are from level-energy difference and intensities deduced from intensity balance and adopted branching.
# From Adopted Gammas.
@ For absolute intensity per 100 decays, multiply by 0.09 *4*.
& 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.
x γ ray not placed in level scheme.

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Decay Scheme

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

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$