^{108}Ru β^- decay 1969WiZX,1978Fr16

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	ENSDF	1-Jul-2008

Parent: ^{108}Ru: E=0.0; $J^\pi=0^+$; $T_{1/2}$=4.55 min *5*; Q(β^-)=1350 *50*; %β^- decay=100.0

Source: ^{235}U, ^{239}Pu, ^{249}Cf(n,f) E=th, rapid ruthenium chemistry.

Q(β^-)=1320 *100* from $\beta\gamma$ coin (1962Pi02) was used for log *ft* calculations. See ^{108}Ru Adopted Levels for discussion on g.s. to g.s. Q(β^-) value.

Others: 1955Ba19, 1958Ba02, 1962Pi02, 1971Ri02, 1975Fe12.

The decay scheme is based on energy fits only. 1978Fr16 suggest that the 14.6 transition deexcites a 2^- level to the 1^+ ground state; however, they give no arguments for the 2^- assignment. It is possibly based partly on the fact that α(14.6γ)=5.0(E1), 2617(E2) and 13.0(M1) so observation of the 14.6 transition in the photon spectrum suggests mult.=E1. Note that the order of the 73 and 91 γ's is not established. Even with this uncertain placement, if one assumes that the observed transitions have mult.=E1, M1 or E2, the β^- feeding to the 165 level can be determined accurately enough to establish that $J^\pi=1^+$. Similarly one can determine I(β^- to 73.6 level)<3.4% (log *ft*>5.5) and I(β^- to alternate 91.3 level)<5.0% (log *ft*>5.3). Feeding to the 14.6 level cannot be determined since I(14.6γ) is not known, and thus Iβ(g.s.) cannot be determined. However, g.s. feeding is probably large since J^π(g.s.)=1^+.

^{108}Rh Levels

E(level)	J^π	$T_{1/2}$	Comments
0.0	1^+	16.8 s *5*	
14.6			
73.65?			E(level): order of 73.65 and 91.33 transitions not established. The level could be at 91.33.
164.95	1^+		

β^- radiations

E(decay)	E(level)	Iβ^-[†][‡]	Log *ft*	Comments
(1.19×10^3 *5*)	164.95	46 *10*	4.43 *13*	av Eβ=433 *26* E(decay): Eβ= 1150 *10* (1962Pi02), Eβ= 1255 *150* (1989Gr23).
(1.34×10$^{3\#}$ *5*)	14.6			
(1.35×10^3 *5*)	0.0	<64	>4.5	av Eβ=505 *26*

† From intensity balance at each level.
‡ Absolute intensity per 100 decays.
# Existence of this branch is questionable.

γ(^{108}Rh)

Iγ normalization: I(165γ)=28% *6* relative to I(303γ+312γ+322γ, ^{107}Pd)=73% *6* measured by 1962Pi02. Other: 32% (1975Fe12) relative to I(434γ, ^{108}Pd)=43%.

E$_\gamma$[‡]	I$_\gamma$[‡#]	E$_i$(level)	J_i^π	E$_f$	J_f^π	Mult.	α[†]
14.6 *3*		14.6		0.0	1^+		
73.65[@] *20*	4.1	73.65?		0.0	1^+	[D,E2]	2.2 *18*
91.33[@] *7*	8.5 *2*	164.95	1^+	73.65?		[D,E2]	1.0 *8*
150.46 *15*	28 *1*	164.95	1^+	14.6		[D,E2]	0.18 *13*
164.95 *22*	100 *3*	164.95	1^+	0.0	1^+	[M1,E2]	0.16 *7*

Continued on next page (footnotes at end of table)

^{108}Ru β^- decay 1969WiZX,1978Fr16 (continued)

$\gamma(^{108}Rh)$ (continued)

† Value covers all multipolarities shown.
‡ From 1969WiZX, except for the 14.6γ which is from 1978Fr16.
# For absolute intensity per 100 decays, multiply by 0.28 *6*.
@ Placement of transition in the level scheme is uncertain.

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Decay Scheme

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