^{100}Ag ε decay (2.24 min) 1983Ra10,1980Ha20

History

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

Parent: ^{100}Ag: E=15.52 *16*; J$^{\pi}$=(2)$^+$; $T_{1/2}$=2.24 min *15*; Q(ε)=7075 *18*; %ε+%β^+ decay=100.0

^{100}Ag-E,J$^{\pi}$: From ^{100}Ag Adopted Levels.

^{100}Ag-$T_{1/2}$: weighted average of 2.30 min *15* (1980Ha20) and 2.06 min *25* (1983Ra10), same value is recommended in the Adopted Levels of ^{100}Ag. 1983Ra10 could not distinguish the g.s. and the isomer on the basis of half-life.

^{100}Ag-Q(ε): From 2017Wa10.

1983Ra10: ^{100}Ag source was produced in ^{92}Mo(^{12}C,p3n) with E≈80 MeV ^{12}C beam from the Manchester University Heavy-Ion Linear Accelerator and in ^{102}Pd(p,3n) with E=39 MeV proton beam from the Harwell Variable Energy Cyclotron. γ rays were detected with Ge(Li) detectors and positrons were detected with a HPGe detector. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma\gamma(\theta)$, xγ-coin, $\beta^+\gamma$-coin, $\gamma\gamma$(t). Deduced levels, J, π, parent $T_{1/2}$, decay branching ratios, log *ft*.

1980Ha20: ^{100}Ag source was produced in ^{92}Mo(^{12}C,p3n) with 40 MeV proton beam from the McGill synchrocyclotron. γ rays were detected with two Ge(Li) detectors and positrons were detected with a plastic ΔE-E counter telescope. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\beta^+\gamma$-coin, γ(t). Deduced levels, J, π, parent $T_{1/2}$, decay branching ratios, log *ft*.

The level scheme is not considered as well established as that for the decay of ^{100}Ag g.s.

Total decay energy deposit of 7415 keV *386* calculated by RADLIST code is consistent with the expected value of 7090 keV *18*.

^{100}Pd Levels

E(level)†	J$^{\pi}$‡
0.0	0$^+$
665.69 *10*	2$^+$
1416.48 *14*	4$^+$
1523.6 *3*	(1,2$^+$)
1587.98 *12*	2$^{(+)}$
2359.7 *4*	(2$^+$)
2532.29 *25*	(2$^+$)
2621.9 *4*	(1$^-$ to 4$^+$)
2784.2 *5*	(1$^+$,2$^+$,3$^+$)
3236.1 *4*	(2$^+$,3$^+$)

† From least-squares fit to Eγ data.
‡ From the Adopted Levels.

ε,β^+ radiations

E(decay)	E(level)	Iβ^+ ‡	Iε‡	Log *ft*†	I($\varepsilon+\beta^+$)†‡	Comments
(3854 *18*)	3236.1	5.5 *11*	0.99 *20*	5.6 *1*	6.5 *13*	av Eβ=1279.5 *85*; εK=0.1325 *22*; εL=0.0165 *3*; εM+=0.00399 *7*
(4306 *18*)	2784.2	8.7 *3*	1.01 *4*	5.69 *4*	9.7 *3*	av Eβ=1491.7 *85*; εK=0.0899 *14*; εL=0.01117 *17*; εM+=0.00270 *4*
(4469# *18*)	2621.9	<3	<0.3	>6.3	<3	av Eβ=1568.3 *86*; εK=0.0789 *12*; εL=0.00980 *14*; εM+=0.00237 *4*
(4558 *18*)	2532.29	8 *3*	0.8 *3*	5.9 *2*	9 *3*	av Eβ=1610.7 *86*; εK=0.0736 *11*; εL=0.00914 *13*; εM+=0.00221 *4*
(4731 *18*)	2359.7	12.9 *17*	1.04 *14*	5.8 *1*	13.9 *18*	av Eβ=1692.5 *86*; εK=0.0646 *9*; εL=0.00802 *11*; εM+=0.00194 *3*
(5503 *18*)	1587.98	14.1 *22*	0.65 *10*	6.1 *1*	14.7 *23*	av Eβ=2060.6 *87*; εK=0.0381 *5*; εL=0.00472 *6*; εM+=0.001143 *14*
(5567 *18*)	1523.6	8.2 *21*	0.36 *9*	6.4 *1*	8.6 *22*	av Eβ=2091.4 *87*; εK=0.0366 *5*; εL=0.00454 *6*; εM+=0.001098 *13*

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^{100}Ag ε decay (2.24 min) 1983Ra10,1980Ha20 (continued)

ϵ,β^+ radiations (continued)

E(decay)	E(level)	Iβ^+ ‡	Iε‡	Log *ft*†	I($\varepsilon+\beta^+$)†‡	Comments
(5674# *18*)	1416.48	<6	<0.2	>6.6	<6	av Eβ=2142.8 *87*; εK=0.0342 *4*; εL=0.00425 *5*; εM+=0.001028 *12* I($\varepsilon+\beta^+$): no direct feeding is expected from (2)$^+$ parent to 1416, 4$^+$ state. Apparent feeding is probably due to missing feeding from γ transitions from higher levels.
(6425 *18*)	665.69	36 *8*	0.95 *21*	6.1 *1*	37 *8*	av Eβ=2504.3 *87*; εK=0.02236 *22*; εL=0.00277 *3*; εM+=0.000670 *7* (β^+)(666γ) data of 1980Ha20 gives β^+(endpoint)=5.3×10^3 *2* and β^+ singles gives β^+(endpoint)=5.4×10^3 *2*, which shows definite β^+ feeding to the 666 level and little feeding to the g.s. as expected from ΔJ^π.

† Consdiered as approximate since the level scheme is not well established. Decay branching ratios are deduced from I(γ+ce) intensity balance at each level.
‡ Absolute intensity per 100 decays.
# Existence of this branch is questionable.

$\gamma(^{100}Pd)$

Iγ normalization: from I(γ+ce)(γ rays to g.s.)=100, assuming no ε, β^+ feeding to g.s. and no isomeric transition from 15.5 level to g.s. of ^{100}Ag.

E_γ †	I_γ †#	E_i(level)	J^π_i	E_f	J^π_f	Mult.‡	δ‡	α@	Comments
614.1 *4*	2.1 *10*	3236.1	(2$^+$,3$^+$)	2621.9	(1$^-$ to 4$^+$)				
665.7 *1*	100	665.69	2$^+$	0.0	0$^+$	E2		0.00271	α(K)=0.00236 *4*; α(L)=0.000288 *4*; α(M)=5.42×10^{-5} *8* α(N)=9.06×10^{-6} *13* E_γ: other: 665.7 *2* (1980Ha20).
750.8 *1*	<30	1416.48	4$^+$	665.69	2$^+$	E2		0.00199	α(K)=0.001733 *25*; α(L)=0.000210 *3*; α(M)=3.93×10^{-5} *6* α(N)=6.59×10^{-6} *10*
922.3 *1*	10.0 *20*	1587.98	2$^{(+)}$	665.69	2$^+$	(E2+M1)	−1.77 *+32−43*	1.24×10^{-3} *2*	α(K)=0.001088 *19*; α(L)=0.0001282 *20*; α(M)=2.40×10^{-5} *4* α(N)=4.04×10^{-6} *7* E_γ: other: 922.2 *2* (1980Ha20). I_γ: weighted average of 8.4 *26* (1983Ra10) and 11.0 *20* (1980Ha20).
1115.8 *2*	11 *3*	2532.29	(2$^+$)	1416.48	4$^+$	(E2)		7.91×10^{-4}	α(K)=0.000691 *10*; α(L)=8.09×10^{-5} *12*; α(M)=1.516×10^{-5} *22* α(N)=2.55×10^{-6} *4*; α(IPF)=9.18×10^{-7} *15*
^{x}1205.5 *3*	5.5 *20*								
1523.6 *3*	10.0 *25*	1523.6	(1,2$^+$)	0.0	0$^+$				
1587.9 *2*	7.2 *17*	1587.98	2$^{(+)}$	0.0	0$^+$				E_γ: other: 1587.7 *3* (1980Ha20). I_γ: weighted average of 6.2 *20* (1983Ra10) and 8.0 *17* (1980Ha20).
^{x}1639.9 *2*	2.8 *15*								
1694.0 *3*	16.1 *20*	2359.7	(2$^+$)	665.69	2$^+$	(M1(+E2))	−0.08 *20*	5.14×10^{-4}	α(K)=0.000324 *5*; α(L)=3.70×10^{-5} *6*; α(M)=6.92×10^{-6} *11* α(N)=1.169×10^{-6} *18*; α(IPF)=0.0001448 *23* E_γ: weighted average of 1693.9 *3* (1983Ra10) and 1694.1 *3* (1980Ha20). I_γ: weighted average of 17.1 *20* (1983Ra10) and 14.0 *30* (1980Ha20).
1819.8 *4*	5.5 *11*	3236.1	(2$^+$,3$^+$)	1416.48	4$^+$				E_γ: weighted average of 1819.7 *3* (1983Ra10) and 1820.8 *8* (1980Ha20). It is unplaced in 1980Ha20. I_γ: weighted average of 4.8 *24* (1983Ra10) and 5.6 *11* (1980Ha20).
1956.0 *4*	4.0 *13*	2621.9	(1$^-$ to 4$^+$)	665.69	2$^+$				E_γ: weighted average of 1956.0 *4* (1983Ra10) and 1956.0 *7* (1980Ha20). It is unplaced in 1980Ha20.

γ(^{100}Pd) (continued)

E_γ [†]	I_γ [†#]	E_i(level)	J^π_i	E_f	J^π_f	Comments
						I_γ: weighted average of 2.3 *15* (1983Ra10) and 4.9 *11* (1980Ha20).
2118.5 *5*	11.3 *15*	2784.2	(1^+,2^+,3^+)	665.69	2^+	E_γ: weighted average of 2118.1 *4* (1983Ra10) and 2119.0 *5* (1980Ha20). It is unplaced in 1980Ha20. I_γ: weighted average of 13.0 *30* (1983Ra10) and 10.9 *15* (1980Ha20).

[†] From 1983Ra10, unless otherwise noted.
[‡] From the Adopted Gammas.
[#] For absolute intensity per 100 decays, multiply by 0.855 *22*.
[@] 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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