^{91}Mo ε decay (64.6 s) 1976De37

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 114, 1293 (2013)	1-Sep-2013

Parent: ^{91}Mo: E=652.9 *1*; $J^\pi=1/2^-$; $T_{1/2}$=64.6 s *6*; Q(ε)=4430 *7*; %ε+%$β^+$ decay=50.0 *16*

^{91}Mo-%ε+%$β^+$ decay: From I$β^+$(105 level)/I$β^+$(1312+1613 levels)≈0.15 (1956Sm96, scin, uncertainty unstated), the level scheme, and ε/$β^+$(theory), Iγ normalization=0.96 *6* (allowing 50% uncertainty in I$β^+$(105 level)). With this 105(level) feeding and Iγ(652.9, ^{91}Mo)=100 *3* (1976De37), %IT=50.0 *16*; also, Iγ±=182 *12* is expected, cf. measured Iγ±=147 *15* (1976De37), 220 *20* (1965Cr10), 140 *20* (1956Sm96), 86 *31* (1955Ax02, from I$β^+$:I(653γ)=30 *10*:70 *10*).

Others: 1956Sm96, 1970He03, 1970De34, 1973Ni04.

^{91}Nb Levels

E(level)	J^π[†]	$T_{1/2}$[†]
0	$9/2^+$	6.8×10^2 y *13*
104.50 *10*	$1/2^-$	60.86 d *22*
1186.61 *16*	$5/2^-$	
1312.60 *14*	$3/2^-$	
1612.53 *13*	$3/2^-$	
2345.24 *17*	$(3/2)^-$	

[†] From Adopted Levels.

ε,$β^+$ radiations

E(decay)[†]	E(level)	I$β^+$ [‡]	Iε[‡]	Log *ft*	I(ε+$β^+$)[‡]	Comments
(2738 *7*)	2345.24	1.13 *9*	0.57 *4*	5.03 *4*	1.70 *13*	av Eβ=760.9 *32*; εK=0.294 *3*; εL=0.0353 *3*; εM+=0.00803 *7*
3.50×10^3 *10*	1612.53	20.7 *16*	3.5 *3*	4.45 *4*	24.2 *19*	av Eβ=1098.3 *33*; εK=0.1260 *10*; εL=0.01511 *12*; εM+=0.00343 *3*
3.80×10^3 *10*	1312.60	16.2 *13*	1.92 *15*	4.78 *4*	18.1 *14*	av Eβ=1238.3 *33*; εK=0.0927 *7*; εL=0.01110 *8*; εM+=0.002523 *18*
(3896[#] *7*)	1186.61	0.05 *5*	0.005 *5*	7.4 *5*	0.05 *5*	av Eβ=1297.5 *33*; εK=0.0820 *6*; εL=0.00983 *7*; εM+=0.002232 *15*
5012 *50*	104.50	6 *3*	0.2 *1*	5.94 *22*	6 *3*	av Eβ=1810.8 *34*; εK=0.03344 *17*; εL=0.003999 *21*; εM+=0.000908 *5* I(ε+$β^+$): based on I$β^+$(105 level)/I$β^+$(1312+1613 levels)≈0.15 (1956Sm96) with an evaluator-assigned uncertainty of 50%. Based, instead, on measured Iγ±=147 *15* (1976De37) and decay scheme, I(ε+$β^+$)≤7%.

[†] Values given without parentheses are based on $β^+$ endpoint energies of 3990 *50*, 2780 *100* and 2480 *100* reported by 1956Sm96.

[‡] Absolute intensity per 100 decays.

[#] Existence of this branch is questionable.

^{91}Mo ε decay (64.6 s) 1976De37 (continued)

γ(^{91}Nb)

Iγ normalization: From Iβ$^+$(105 level)/Iβ$^+$(1312+1613 levels)≈0.15 (1956Sm96, scin, uncertainty unstated), the level scheme, and ε/β$^+$(theory), Iγ normalization=0.96 *6* (allowing 50% uncertainty in Iβ$^+$(105 level)). With this 105(level) feeding and Iγ(652.9, ^{91}Mo)=100 *3* (1976De37), %IT=50.0 *16*; also, Iγ±=182 *12* is expected, cf. measured Iγ±=147 *15* (1976De37), 220 *20* (1965Cr10), 140 *20* (1956Sm96), 86 *31* (1955Ax02, from Iβ$^+$:I(653γ)=30 *10*:70 *10*).

1976De37:Ge(Li) anti-Compton spectrometer. An extended report of this work is available from 1975DeZX.

1970He03:Ge(Li) detectors; measured Eγ, Iγ.

1956Sm96: scin. Measured γ-spectra, γγ, β singles and coincidence spectra.

E_γ ‡	I_γ #b	E_i(level)	J_i^π	E_f	J_f^π	Mult. @	α †	Comments
104.5& *1*		104.50	1/2$^-$	0	9/2$^+$	M4	168	α(K)=115.4 *17*; α(L)=43.4 *7*; α(M)=8.34 *13*; α(N+..)=1.176 *18* α(N)=1.140 *18*; α(O)=0.0358 *6*
425.9a *2*	0.35 *5*	1612.53	3/2$^-$	1186.61	5/2$^-$			
732.64 *24*	0.35 *5*	2345.24	(3/2)$^-$	1612.53	3/2$^-$			
1032.74 *24*	1.10 *4*	2345.24	(3/2)$^-$	1312.60	3/2$^-$			
1082.18 *18*	1.04 *7*	1186.61	5/2$^-$	104.50	1/2$^-$	E2	0.000603 *9*	α=0.000603 *9*; α(K)=0.000531 *8*; α(L)=5.94×10^{-5} *9*; α(M)=1.045×10^{-5} *15*; α(N+..)=1.616×10^{-6} *23* α(N)=1.528×10^{-6} *22*; α(O)=8.80×10^{-8} *13*
1158.54 *18*	0.58 *4*	2345.24	(3/2)$^-$	1186.61	5/2$^-$			
1208.11 *9*	38.8 *12*	1312.60	3/2$^-$	104.50	1/2$^-$	(M1(+E2))	0.000491 *11*	α=0.000491 *11*; α(K)=0.000427 *11*; α(L)=4.72×10^{-5} *10*; α(M)=8.30×10^{-6} *18*; α(N+..)=9.3×10^{-6} *10* α(N)=1.22×10^{-6} *3*; α(O)=7.12×10^{-8} *22*; α(IPF)=8.0×10^{-6} *10*
1508.00 *9*	50.4 *15*	1612.53	3/2$^-$	104.50	1/2$^-$			
2240.7 *3*	1.51 *6*	2345.24	(3/2)$^-$	104.50	1/2$^-$			

† Additional information 2.

‡ Weighted average from 1976De37 and 1970He03, if not indicated otherwise. The 253.4γ of 1970He03, not seen by 1976De37 (Iγ<0.15), is not adopted. The energies measured by 1970De34 are systematically lower by≈1 keV.

From 1976De37. The values from 1970He03 are less precise but agree with 1976De37 within the uncertainty limits.

@ From Adopted Gammas.

& From 1970He03.

a From 1976De37.

b For absolute intensity per 100 decays, multiply by 0.48 *3*.

^{91}Mo ε decay (64.6 s) 1976De37

Decay Scheme

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