^{92}Tc ε decay 1985Be12,1976De07,1968KoZY

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 113, 2187 (2012)	15-Sep-2012

Parent: ^{92}Tc: E=0.0; $J^\pi=(8)^+$; $T_{1/2}$=4.25 min *15*; Q(ε)=7885 *5*; %ε+%$β^+$ decay=100.0

Others: 1964Lo02, 1964Va05, 1966Di01, 1971Co08, 1973Gi04, 1974Ia01.

The decay scheme for E(level)<2800 keV is based on that of 1964Va05. It incorporates γγ-coin data of 1964Va05 (148,329,773,1510 γ rays in prompt coin) and accounts for all known lines with Iγ≥2%. No significant ε+$β^+$ branch to the 2612-keV 6^+ level of ^{92}Mo is indicated (I(ε+$β^+$)=3% 6, log *ft*≥6.5), whereas the 2760-keV 8^+ state of ^{92}Mo is strongly fed (I(ε+$β^+$)=89% 6, log *ft*=5.4), so J^π(^{92}Tc g.s.) is probably not 7^+. $β^+$ feeding to some level(s) other than the 190-ns 8^+ level must occur because 1985Be12 observe $γ^\pm$ in prompt coin with 773γ and 1509γ. Also, a number of weak γ′s have been assigned to ^{92}Tc by 1968KoZY, 1976De07 (fig 1) and 1985Be12. 1968KoZY propose several levels with E>2800 keV on the basis of pairs of weak γ rays whose energy difference matches a known level-energy difference but, in the absence of coin data, the evaluator has retained only those levels deexcited by pairs of γ rays whose Eγ and Iγ are confirmed by the data of 1985Be12. Total unplaced Iγ=5%.

^{92}Mo Levels

E(level)	J^π †	$T_{1/2}$	Comments
0.0	0^+		
1509.6 *3*	2^+		
2282.6 *5*	4^+		
2526.6 *6*	5^-		
2611.8 *5*	6^+	1.53‡ ns *4*	Additional information 1.
2760.0 *7*	8^+	192# ns *7*	
4917.4 *7*	7^+		
5462.3 *7*	$(7,8)^+$		

† From Adopted Levels.

‡ From weighted average of 1.51 ns *8* (1973Gi04) and 1.54 ns *5* (1971Co08) from 330γ-148γ(t). Other: 1.50 ns *15* (1968KoZY) from βγ(t).

From (Eβ>300)−773γ(t) data of 1964Lo02. Other: >50 ns, from 1964Va05.

ε,$β^+$ radiations

E(decay)	E(level)	I$β^+$ †#	Iε#	Log *ft*	I(ε+$β^+$)#	Comments
(2423 *5*)	5462.3	0.40 *5*	0.44 *5*	5.67 *6*	0.84 *10*	av Eβ=619.3 *23*; εK=0.452 *3*; εL=0.0548 *3*; εM+=0.01260 *7*
(2968 *5*)	4917.4	1.53 *9*	0.59 *4*	5.72 *3*	2.12 *13*	av Eβ=866.6 *24*; εK=0.2402 *14*; εL=0.02906 *18*; εM+=0.00668 *4*
4.1×10^3‡ *1*	2760.0	87 *6*	3.4 *2*	5.43 *4*	90 *6*	av Eβ=1880.8 *25*; εK=0.03330 *12*; εL=0.004008 *15*; εM+=0.000921 *4*

† 1964Va05 deduce I($β^+$)=92% 12 from I($γ^\pm$)/I(1509γ).

‡ From 1964Va05. Other: 4100 *200* (1974Ia01).

Absolute intensity per 100 decays.

^{92}Tc ε decay 1985Be12,1976De07,1968KoZY (continued)

γ(^{92}Mo)

Iγ normalization: no g.s. or 1510 level feeding by ε+β$^+$ and no crossover γ to g.s. or 1510 level, so Ti(773γ)=100%.
1968KoZY report, but 1985Be12 do not confirm, γ rays with the following Eγ: 1337.1 *13*, 1596.0 *10*, 1785.9 *13*, 2511.5 *13*, 3134.3 *15*, 4085.5 *15*, 4135.9 *15*, and 2873.4 *15*, 3911.9 *15*, 4037.6 *22*, 4577.3 *15*; 1985Be12 report Iγ≤0.02 for the latter four γ rays. The evaluator considers assignment of these lines to ^{92}Tc ε+β$^+$ decay to be doubtful.

E_γ[‡]	I_γ[#b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	δ[@]	α[†]	Comments
85.0 *5*	12.1[a] *8*	2611.8	6$^+$	2526.6	5$^-$	(E1)		0.202 *5*	α(K)=0.177 *4*; α(L)=0.0207 *5*; α(M)=0.00366 *9*; α(N+..)=0.000571 *13* α(N)=0.000544 *13*; α(O)=2.67×10^{-5} *6*
148.0 *6*	71[&] *4*	2760.0	8$^+$	2611.8	6$^+$	E2		0.292 *6*	α(K)=0.245 *5*; α(L)=0.0386 *9*; α(M)=0.00696 *15*; α(N+..)=0.001039 *22* α(N)=0.001002 *22*; α(O)=3.70×10^{-5} *8*
243.7 *6*	13.3[&] *5*	2526.6	5$^-$	2282.6	4$^+$	(E1(+M2))	<0.05	0.00987 *21*	α=0.00987 *21*; α(K)=0.00869 *18*; α(L)=0.000985 *22*; α(M)=0.000175 *4*; α(N+..)=2.79×10^{-5} *7* α(N)=2.65×10^{-5} *6*; α(O)=1.43×10^{-6} *4*
329.3 *3*	79.9[&] *26*	2611.8	6$^+$	2282.6	4$^+$	E2		0.0177	α(K)=0.01535 *22*; α(L)=0.00195 *3*; α(M)=0.000348 *5*; α(N+..)=5.43×10^{-5} *8* α(N)=5.18×10^{-5} *8*; α(O)=2.51×10^{-6} *4*
773.0 *3*	100	2282.6	4$^+$	1509.6	2$^+$	E2		0.001434 *21*	α=0.001434 *21*; α(K)=0.001259 *18*; α(L)=0.0001452 *21*; α(M)=2.59×10^{-5} *4*; α(N+..)=4.14×10^{-6} α(N)=3.92×10^{-6} *6*; α(O)=2.15×10^{-7} *3*
1509.6 *3*	101 *3*	1509.6	2$^+$	0.0	0$^+$	E2		0.000408 *6*	α=0.000408 *6*; α(K)=0.000284 *4*; α(L)=3.15×10^{-5} *5*; α(M)=5.62×10^{-6} *8*; α(N+..)=8.78×10^{-5} *13* α(N)=8.56×10^{-7} *12*; α(O)=4.88×10^{-8} *7*; α(IPF)=8.69×10^{-5} *13* Ti(1510γ)=100% from level scheme.
[x]1567.9 *6*	0.20 *5*								
[x]1590.9 *6*	0.24 *5*								
[x]1702.2 *6*	0.19 *5*								
2157.0 *6*	1.2 *1*	4917.4	7$^+$	2760.0	8$^+$				
2305.8 *6*	0.92 *8*	4917.4	7$^+$	2611.8	6$^+$				
[x]2516.8 *6*	0.10 *3*								
[x]2645.2 *6*	0.3 *2*								
2702.4 *6*	0.44 *7*	5462.3	(7,8)$^+$	2760.0	8$^+$				
2850.3 *6*	0.40 *7*	5462.3	(7,8)$^+$	2611.8	6$^+$				

Continued on next page (footnotes at end of table)

^{92}Tc ε decay 1985Be12,1976De07,1968KoZY (continued)

γ(^{92}Mo) (continued)

E_γ‡	I_γ#b	E_i(level)	E_γ‡	I_γ#b	E_i(level)
x2881.0 *6*	0.07 *3*		x3128.5 *6*	0.48 *6*	
x2899.5 *6*	0.16 *3*		x3218.0 *6*	0.12 *2*	
x3023.4 *6*	0.54 *6*		x4028.0 *6*	0.17 *2*	
			x4370.1 *6*	0.07 *2*	

† Additional information 2.
‡ E(85γ) from 1968KoZY. Other Eγ from 1985Be12 (ΔE=0.3-0.6 keV), unless indicated otherwise; evaluator assigns ΔE=0.3 keV for strongest three γ rays. Except for the 1590.9γ, 2516.8γ and 2645.2γ, all lines with Eγ<3200 reported in 1985Be12 are confirmed in spectrum of fig. 1 from 1976De07.
# From 1985Be12, unless noted otherwise. Relative to I(773γ)=100.
@ From Adopted Gammas.
& Weighted average of data from 1976De07 and 1985Be12.
a From 1976De07. Datum from 1968KoZY inconsistent.
b For absolute intensity per 100 decays, multiply by 0.99857.
x γ ray not placed in level scheme.

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Decay Scheme

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