^{93}Tc ε decay (2.75 h) 1974Ch12,1974An24,1977Po13

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 112, 1163 (2011)	15-Dec-2010

Parent: ^{93}Tc: E=0.0; $J^\pi=9/2^+$; $T_{1/2}$=2.75 h *5*; Q(ε)=3201.0 *10*; %ε+%$β^+$ decay=100.0

Others: 1966Al17, 1968Ka25, 1977Be19.

1974Ch12: Ge(Li) and Si(Li) detectors; measured Eγ, Iγ, α(K)exp (renormalized here so α(K)exp(263)=0.51).

1974An24: Ge(Li) detectors, electron spectrometer; measured Eγ, Iγ, I_{ce}.

1977Po13: Ge(Li) detectors; measured Eγ, Iγ.

^{93}Mo Levels

E(level)[†]	J^π[‡]
0.0	$5/2^+$
1362.96 *6*	$7/2^+$[#]
1477.16 *6*	$9/2^+$
1520.28 *9*	$7/2^+$
2409.08 *19*	$9/2^+$
2479.0 *3*	$(7/2^+)$
2730.8 *4*	$(9/2^+)$
2821.8 *4*	$(7/2,9/2^+)$
2901.87 *12*	$(9/2)^+$
3025.9 *4*	7/2,9/2,11/2

[†] From least-squares fit to Eγ.
[‡] From Adopted Levels, except As noted.
[#] From γ(θ,H,T) (1977Be19).

ε,$β^+$ radiations

E(decay)	E(level)	I$β^+$ [‡]	Iε[‡]	Log *ft*	I(ε+$β^+$)[†‡]	Comments
(175.1 *11*)	3025.9		0.016 *4*	6.33 *11*	0.016 *4*	εK=0.8459 *2*; εL=0.12473 *15*; εM+=0.02942 *4*
(299.1 *10*)	2901.87		1.68 *7*	4.815 *20*	1.68 *7*	εK=0.8575; εL=0.11552 *5*; εM+=0.02694 *2*
(379.2 *11*)	2821.8		0.030 *5*	6.78 *8*	0.030 *5*	εK=0.8608; εL=0.11298 *3*; εM+=0.026261 *8*
(470.2 *11*)	2730.8		0.35 *3*	5.91 *4*	0.35 *3*	εK=0.8630; εL=0.11120 *2*; εM+=0.025784 *5*
(722.0 *11*)	2479.0		0.045 *6*	7.18 *6*	0.045 *6*	εK=0.8662; εL=0.1087; εM+=0.02511
(791.9 *10*)	2409.08		0.316 *17*	6.419 *25*	0.316 *17*	εK=0.8667; εL=0.1083; εM+=0.02501
(1680.7 *10*)	1520.28	1.59 *6*	22.2 *8*	5.236 *19*	23.8 *9*	av Eβ=292.49 *44*; εK=0.8113 *3*; εL=0.09902 *4*; εM+=0.022795 *9*
(1723.8 *10*)	1477.16	0.70 *4*	7.8 *5*	5.71 *3*	8.5 *5*	av Eβ=311.13 *44*; εK=0.7979 *4*; εL=0.09733 *5*; εM+=0.02240 *1*
(1838.0 *10*)	1362.96	8.64 *11*	56.7 *5*	4.908 *9*	65.3 *6*	av Eβ=360.72 *44*; εK=0.7547 *5*; εL=0.09194 *6*; εM+=0.02116 *2*

[†] From I(γ+ce) imbalance At level.
[‡] Absolute intensity per 100 decays.

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γ(^{93}Mo)

Iγ normalization: Calculated under the assumption of no 5/2$^+$ g.s. feeding from 9/2$^+$ parent, so Σ(I(γ+ce) to g.s.)=100%.
The Eγ=2739.0 *10*, Iγ=0.11 *2* line reported in 1974Ch12 is attributed by 1977Po13 to ^{94}Tc and has, consequently, been omitted here.

E_γ[†]	I_γ[‡a]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[b]	Comments
114.20 *5*	0.11 *2*	1477.16	9/2$^+$	1362.96	7/2$^+$	M1(+E2)	<0.11	0.177 *5*	α(K)=0.155 *4*; α(L)=0.0185 *6*; α(M)=0.00332 *11*; α(N+..)=0.000531 *17* α(N)=0.000503 *16*; α(O)=2.74×10^{-5} *6* Eγ,Iγ: from 1974Ch12; also observed by 1966Al17.
[x]171 *2*	≤0.2								Eγ: observed by 1968Ka25 only. Iγ: limit from 1974An24.
1362.94 *7*	100	1362.96	7/2$^+$	0.0	5/2$^+$	M1+E2[&]	+0.48[&] −8+6	0.000449 *7*	α(K)exp=0.00036 *7* α=0.000449 *7*; α(K)=0.000365 *6*; α(L)=4.05×10^{-5} *6*; α(M)=7.22×10^{-6} *11*; α(N+..)=3.64×10^{-5} *7* α(N)=1.102×10^{-6} *16*; α(O)=6.33×10^{-8} *10*; α(IPF)=3.53×10^{-5} *6* α(K)exp: weighted average of 0.00039 *10* (1974Ch12) and 0.00032 *10* (1974An24). K/(L+M)=7.4 *14* (1974An24).
1381.64 *19*	0.86 *7*	2901.87	(9/2)$^+$	1520.28	7/2$^+$				
1424.6 *3*	0.39 *3*	2901.87	(9/2)$^+$	1477.16	9/2$^+$				
1477.14 *8*	13.1 *7*	1477.16	9/2$^+$	0.0	5/2$^+$	E2		0.000411 *6*	α(K)exp=0.0034 *10* (1974Ch12) α=0.000411 *6*; α(K)=0.000296 *5*; α(L)=3.30×10^{-5} *5*; α(M)=5.88×10^{-6} *9*; α(N+..)=7.61×10^{-5} *11* α(N)=8.95×10^{-7} *13*; α(O)=5.09×10^{-8} *8*; α(IPF)=7.51×10^{-5} *11*
1520.28 *9*	36.8 *12*	1520.28	7/2$^+$	0.0	5/2$^+$	M1+E2[&]	+1.3[&] *6*	0.000409 *6*	α(K)exp=0.00029 *6* α=0.000409 *6*; α(K)=0.000285 *7*; α(L)=3.17×10^{-5} *7*; α(M)=5.65×10^{-6} *12*; α(N+..)=8.7×10^{-5} *5* α(N)=8.61×10^{-7} *18*; α(O)=4.93×10^{-8} *12*; α(IPF)=8.6×10^{-5} *5* %Iγ=24.3 *6* based on recommended decay scheme normalization. α(K)exp: weighted average of 0.00027 *10* (1974Ch12) and 0.00030 *8* (1974An24).
1538.80 *19*	1.15 *6*	2901.87	(9/2)$^+$	1362.96	7/2$^+$				
2409.05 *19*	0.478 *24*	2409.08	9/2$^+$	0.0	5/2$^+$	(E2)		0.000639 *9*	α=0.000639 *9*; α(K)=0.0001189 *17*; α(L)=1.306×10^{-5} *19*; α(M)=2.33×10^{-6} *4*; α(N+..)=0.000504 α(N)=3.55×10^{-7} *5*; α(O)=2.05×10^{-8} *3*; α(IPF)=0.000504 *7*

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$\gamma(^{93}Mo)$ (continued)

E_γ [†]	I_γ [‡a]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[b]	Comments
2479.0 *3*	0.068[@] *9*	2479.0	(7/2$^+$)	0.0	5/2$^+$			
2730.8 *4*	0.53 *4*	2730.8	(9/2$^+$)	0.0	5/2$^+$	[E2]	0.000763 *11*	α=0.000763 *11*; α(K)=9.58×10^{-5} *14*; α(L)=1.050×10^{-5} *15*; α(M)=1.87×10^{-6} *3*; α(N+..)=0.000654 *1* α(N)=2.85×10^{-7} *4*; α(O)=1.647×10^{-8} *23*; α(IPF)=0.000654 *10*
2821.8 *4*	0.045[@] *7*	2821.8	(7/2,9/2$^+$)	0.0	5/2$^+$			
2902.0 *3*	0.132 *11*	2901.87	(9/2)$^+$	0.0	5/2$^+$			
3025.8 *4*	0.024[@] *5*	3025.9	7/2,9/2,11/2	0.0	5/2$^+$			

† Weighted average from 1974Ch12 and 1977Po13, if not indicated otherwise.
‡ Weighted average from 1974Ch12, 1974An24, 1977Po13, 1968Ka25, if not indicated otherwise.
# From Adopted Gammas, except As noted.
@ Weighted average from 1974Ch12 and 1977Po13.
& From 1977Be19, low temperature nuclear orientation in iron, hyperfine structure, γ angular distribution fitted for δ and $\mu(^{93}Tc$ g.s.) simultaneously. Stated uncertainty is maximum value corresponding to two-parameter fit.
a For absolute intensity per 100 decays, multiply by 0.662 *6*.
b 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.

$^{93}_{42}Mo_{51}$-3

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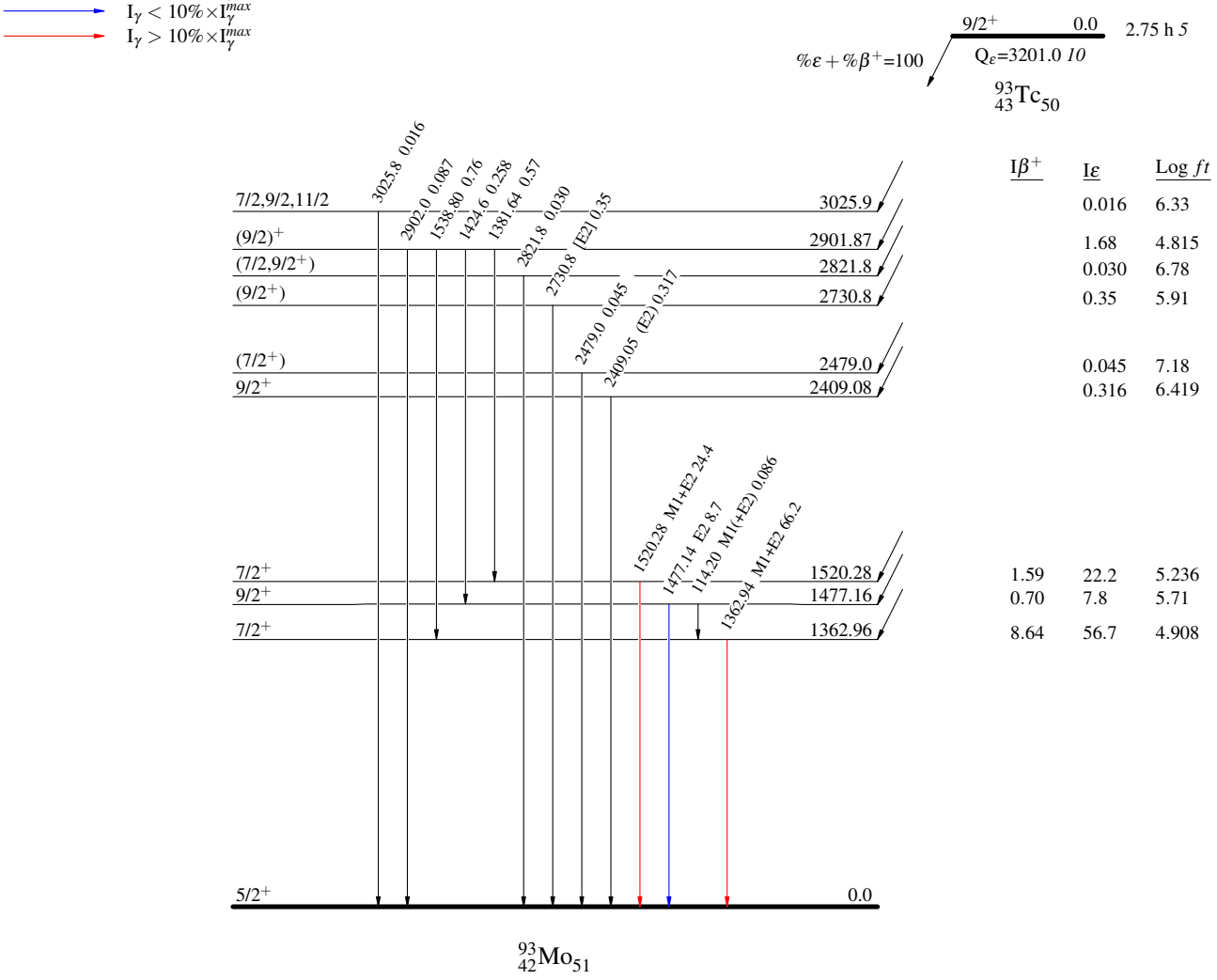
Decay Scheme

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

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$



	Iβ+	Iε	Log *ft*
3025.9		0.016	6.33
2901.87		1.68	4.815
2821.8		0.030	6.78
2730.8		0.35	5.91
2479.0		0.045	7.18
2409.08		0.316	6.419
1520.28	1.59	22.2	5.236
1477.16	0.70	7.8	5.71
1362.96	8.64	56.7	4.908