^{96}Tc $\varepsilon+\beta^+$ decay (51.5 min) 1971Ba59

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	D. Abriola(a), A. A. Sonzogni	NDS 109,2501 (2008)	1-Apr-2008

Parent: ^{96}Tc: E=34.23 *4*; $J^\pi=4^+$; $T_{1/2}$=51.5 min *10*; Q(ε)=2973 *5*; %ε+%β^+ decay=2.0 *5*
Measured: γ (1987AgZZ,1971Ba59).

^{96}Mo Levels

E(level)	J^π[†]	Comments
0	0^+	
778.21 *4*	2^+	
1497.73 *5*	2^+	
1625.85 *12*	2^+	
1628.05 *8*	4^+	
1869.48 *8*	4^+	
1978.41 *6*	3^+	
2095.6 *4*	2^+	
2219.44 *21*	4^+	Depopulating γ's were too weak to be observed in conditions of 1971Ba59 experiment.
2398.8 *10*		
2438.32 *17*	5^+	
2480.8 *5*	$(2^+,3)$	
2594.32 *7*	3^+	
2611.4 *8*		
2624.4 *8*		
2735.55 *15*	4^+	

[†] Adopted values.

ε,β^+ radiations

E(decay)	E(level)	Iβ^+ [‡]	Iε[‡]	Log *ft*	I($\varepsilon+\beta^+$)[†‡]	Comments
(272 *5*)	2735.55		0.023 *7*	6.08 *18*	0.023 *7*	εK=0.8560 *4*; εL=0.1168 *3*; εM+=0.02728 *7*
(383 *5*)	2624.4		0.0045 *17*	7.11 *20*	0.0045 *17*	εK=0.8609 *2*; εL=0.11289 *13*; εM+=0.02624 *4*
(396 *5*)	2611.4		0.0039 *16*	7.20 *21*	0.0039 *16*	εK=0.8613 *2*; εL=0.11259 *12*; εM+=0.02616 *3*
(413 *5*)	2594.32		0.31 *9*	5.34 *17*	0.31 *9*	εK=0.8617 *2*; εL=0.1122 *1*; εM+=0.02606 *3*
(526 *5*)	2480.8		0.007 *3*	7.20 *22*	0.007 *3*	εK=0.8640; εL=0.11042 *7*; εM+=0.02558 *2*
(569 *5*)	2438.32		0.008 *3*	7.21 *20*	0.008 *3*	εK=0.8646; εL=0.10994 *6*; εM+=0.02545 *2*
(608 *5*)	2398.8		0.0011 *7*	8.1 *3*	0.0011 *7*	εK=0.8651; εL=0.10955 *5*; εM+=0.02534 *2*
(912 *5*)	2095.6		0.0017 *10*	8.3 *3*	0.0017 *10*	εK=0.8674; εL=0.10774 *2*; εM+=0.024861 *6*
(1029 *5*)	1978.41		1.4 *5*	5.50 *19*	1.4 *5*	εK=0.8679; εL=0.10733 *2*; εM+=0.024752 *5*
(1138 *5*)	1869.48		0.067 *23*	6.91 *19*	0.067 *23*	εK=0.8682; εL=0.10703 *2*; εM+=0.024670 *4*
(1379 *5*)	1628.05	0.0012 *6*	0.17 *9*	6.7 *3*	0.17 *9*	av Eβ=162.9 *22*; εK=0.8627 *4*; εL=0.10578 *5*; εM+=0.02436 *2*

[†] From intensity imbalance.
[‡] Absolute intensity per 100 decays.

^{96}Tc $\varepsilon+\beta^+$ decay (51.5 min) 1971Ba59 (continued)

$\gamma(^{96}Mo)$

Iγ normalization: ΣIγ(g.s.)=2.0% *5*.

E_γ [†]	I_γ [‡&]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [@]	δ [@]	α [a]	Comments
218.5 [#]	0.03 *2*	2438.32	5^+	2219.44	4^+	M1+E2	−0.44 *4*	0.051 *21*	α(K)=0.044 *18*; α(L)=0.006 *3*; α(M)=0.0010 *5*; α(N)=0.00015 *7*; α(O)=7.E−6 *3* α(N+..)=0.00016 *8* δ: from Adopted Gammas.
241.4 *2*	0.40 *6*	1869.48	4^+	1628.05	4^+	M1+E2	+0.024 *5*	0.037 *14*	α(K)=0.032 *12*; α(L)=0.0041 *18*; α(M)=0.0007 *4*; α(N)=0.00011 *5*; α(O)=5.3×10^{-6} *17* α(N+..)=0.00012 *5*
[x]269.8	0.09 *3*								
350.32 *15*	3.04 *17*	1978.41	3^+	1628.05	4^+	M1+E2		0.012 *3*	α(K)=0.0103 *23*; α(L)=0.0012 *4*; α(M)=0.00022 *6*; α(N)=3.4×10^{-5} *9*; α(O)=1.7×10^{-6} *4* α(N+..)=3.5×10^{-5} *9*
352.50 *15*	3.01 *17*	1978.41	3^+	1625.85	2^+	M1+E2		0.012 *3*	α(K)=0.0101 *22*; α(L)=0.0012 *4*; α(M)=0.00022 *6*; α(N)=3.3×10^{-5} *9*; α(O)=1.7×10^{-6} *4* α(N+..)=3.5×10^{-5} *9*
371.5 *2*	0.14 *3*	1869.48	4^+	1497.73	2^+	E2		0.01192	α(K)=0.01037 *15*; α(L)=0.001290 *19*; α(M)=0.000231 *4*; α(N)=3.45×10^{-5} *5* α(O)=1.712×10^{-6} *25*; α(N+..)=3.62×10^{-5} *6*
374.9 *2*	0.27 *3*	2594.32	3^+	2219.44	4^+				
460.0 *3*	0.15 *4*	2438.32	5^+	1978.41	3^+	E2		0.00610	α(K)=0.00532 *8*; α(L)=0.000644 *10*; α(M)=0.0001151 *17*; α(N)=1.727×10^{-5} *25* α(O)=8.90×10^{-7} *13*; α(N+..)=1.82×10^{-5} *3*
480.70 *5*	16.6 *8*	1978.41	3^+	1497.73	2^+	M1+E2	+0.12 *4*	0.00426	α(K)=0.00374 *6*; α(L)=0.000425 *7*; α(M)=7.60×10^{-5} *11*; α(N)=1.157×10^{-5} *17*; α(O)=6.57×10^{-7} *10* α(N+..)=1.223×10^{-5} *18*
[x]544.4	0.09 *3*								
568.8 *2*	0.14 *4*	2438.32	5^+	1869.48	4^+	M1+E2	−0.24 *3*	0.00285	α(K)=0.00251 *4*; α(L)=0.000284 *4*; α(M)=5.06×10^{-5} *8*; α(N)=7.72×10^{-6} *11*; α(O)=4.40×10^{-7} *7* α(N+..)=8.16×10^{-6} *12*
615.90 *7*	3.59 *24*	2594.32	3^+	1978.41	3^+	M1+E2		0.00249 *13*	α(K)=0.00219 *11*; α(L)=0.000252 *18*; α(M)=4.5×10^{-5} *3*; α(N)=6.8×10^{-6} *5*; α(O)=3.77×10^{-7} *13* α(N+..)=7.2×10^{-6} *5*
[x]647.3	0.30 *8*								
719.55 *5*	15.8 *8*	1497.73	2^+	778.21	2^+	M1+E2	+0.44 *+3−4*	1.67×10^{-3}	α(K)=0.001471 *21*; α(L)=0.0001661 *24*; α(M)=2.96×10^{-5} *5*; α(N)=4.51×10^{-6} *7*; α(O)=2.56×10^{-7} *4* α(N+..)=4.77×10^{-6} *7*

$^{96}_{42}Mo_{54}$-2

^{96}Tc $\varepsilon+\beta^+$ decay (51.5 min) 1971Ba59 (continued)

$\gamma(^{96}Mo)$ (continued)

E_γ [†]	I_γ [‡&]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [@]	δ [@]	α [a]	Comments
778.22 *4*	100	778.21	2^+	0	0^+	E2		1.41×10^{-3}	α(K)=0.001238 *18*; α(L)=0.0001426 *20*; α(M)=2.55×10^{-5} *4*; α(N)=3.86×10^{-6} *6*; α(O)=2.11×10^{-7} *3* α(N+..)=4.07×10^{-6} *6*
810.3 *4*	0.10 *5*	2438.32	5^+	1628.05	4^+	M1+E2		1.27×10^{-3}	α(K)=0.001120 *16*; α(L)=0.0001271 *24*; α(M)=2.27×10^{-5} *5*; α(N)=3.45×10^{-6} *6*; α(O)=1.94×10^{-7} *4* α(N+..)=3.64×10^{-6} *6*
847.6 *3*	6.2 *5*	1625.85	2^+	778.21	2^+	M1+E2	−1.05 *+9−10*	1.15×10^{-3}	α(K)=0.001008 *15*; α(L)=0.0001142 *16*; α(M)=2.04×10^{-5} *3*; α(N)=3.10×10^{-6} *5* α(O)=1.742×10^{-7} *25*; α(N+..)=3.27×10^{-6} *5* I_γ: from 1971Ba59.
849.85 *10*	15.2 *8*	1628.05	4^+	778.21	2^+	E2			
853.0 *10*	0.25 *10*	2480.8	$(2^+,3)$	1628.05	4^+	M1+E2	−0.20 *7*	1.14×10^{-3} *2*	α(K)=0.001000 *15*; α(L)=0.0001120 *16*; α(M)=2.00×10^{-5} *3*; α(N)=3.05×10^{-6} *5* α(O)=1.745×10^{-7} *25*; α(N+..)=3.22×10^{-6} *5* I_γ: from 1971Ba59.
966.4 *2*	2.42 *17*	2594.32	3^+	1628.05	4^+	M1+E2	−0.9 *3*	8.52×10^{-4} *13*	α(K)=0.000750 *12*; α(L)=8.43×10^{-5} *13*; α(M)=1.504×10^{-5} *22*; α(O)=1.298×10^{-7} *22* α(N+..)=2.42×10^{-6} *4*
968.5 *2*	4.30 *29*	2594.32	3^+	1625.85	2^+	M1+E2	−0.86 *23*	8.48×10^{-4} *13*	α(K)=0.000747 *12*; α(L)=8.39×10^{-5} *12*; α(M)=1.497×10^{-5} *22*; α(O)=1.293×10^{-7} *21* α(N+..)=2.41×10^{-6} *4*
983.2[#]	0.11 *4*	2611.4		1628.05	4^+				
985.7[#]	0.10 *4*	2611.4		1625.85	2^+				
1091.30 *8*	3.18 *27*	1869.48	4^+	778.21	2^+	E2+M3	−0.05 *5*	6.35×10^{-4}	α(K)=0.000558 *8*; α(L)=6.30×10^{-5} *9*; α(M)=1.124×10^{-5} *16*; α(N)=1.709×10^{-6} *24* α(O)=9.59×10^{-8} *14*; α(N+..)=1.80×10^{-6} *3*
1096.58 *8*	3.82 *27*	2594.32	3^+	1497.73	2^+				
1107.5 *3*	0.02	2735.55	4^+	1628.05	4^+				
1109.8 *3*	0.02	2735.55	4^+	1625.85	2^+				
[x]1124.0 *5*	0.06 *4*								
[x]1173.3 *5*	0.10 *4*								
1200.15 *8*	57.5 *28*	1978.41	3^+	778.21	2^+	M1+E2	+0.89 *10*	5.39×10^{-4}	α(K)=0.000469 *7*; α(L)=5.23×10^{-5} *8*; α(M)=9.33×10^{-6} *14*; α(N)=1.422×10^{-6} *21*; α(O)=8.11×10^{-8} *12* α(N+..)=8.36×10^{-6} *15*
1237.8 *2*	0.68 *7*	2735.55	4^+	1497.73	2^+				
1317.4 *4*	0.09 *4*	2095.6	2^+	778.21	2^+	M1+E2	−0.09 *2*	4.63×10^{-4} *12*	α(K)=0.000384 *13*; α(L)=4.28×10^{-5} *12*; α(M)=7.63×10^{-6} *22*; α(N)=1.16×10^{-6} *4*; α(O)=6.65×10^{-8} *25* α(N+..)=2.9×10^{-5} *3* I_γ: from 1971Ba59.

$^{96}_{42}Mo_{54}$-3

^{96}Tc $\varepsilon+\beta^+$ decay (51.5 min) 1971Ba59 (continued)

$\gamma(^{96}Mo)$ (continued)

E_γ [†]	I_γ [‡&]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [@]	δ [@]	α [a]	Comments
1497.65 *9*	6.4 *3*	1497.73	2^+	0	0^+	E2		4.09×10^{-4}	α(K)=0.000288 *4*; α(L)=3.21×10^{-5} *5*; α(M)=5.71×10^{-6} *8*; α(N)=8.70×10^{-7} *13*; α(O)=4.95×10^{-8} *7* α(N+..)=8.34×10^{-5} *12*
1620.6 [#]	0.06 *3*	2398.8		778.21	2^+				
1625.8 *4*	0.66 *7*	1625.85	2^+	0	0^+	E2		4.12×10^{-4}	α(K)=0.000245 *4*; α(L)=2.72×10^{-5} *4*; α(M)=4.85×10^{-6} *7*; α(N)=7.39×10^{-7} *11*; α(O)=4.22×10^{-8} *6* α(N+..)=0.0001349 *19*
1702.5 *5*	0.10 *2*	2480.8	$(2^+,3)$	778.21	2^+	E2			Mult.: from Adopted Gammas.
1815.6 *5*	2.10 *18*	2594.32	3^+	778.21	2^+	M1+E2	+1.9 *3*	4.40×10^{-4}	α(K)=0.000201 *3*; α(L)=2.22×10^{-5} *4*; α(M)=3.95×10^{-6} *6*; α(N)=6.02×10^{-7} *9*; α(O)=3.46×10^{-8} *5* α(N+..)=0.000213 *4*
1846.2 *8*	0.24 *3*	2624.4		778.21	2^+	E2		4.50×10^{-4}	α(K)=0.000192 *3*; α(L)=2.13×10^{-5} *3*; α(M)=3.79×10^{-6} *6*; α(N)=5.78×10^{-7} *9*; α(O)=3.31×10^{-8} *5* α(N+..)=0.000233 *4*
1957.1 *5*	0.50 *4*	2735.55	4^+	778.21	2^+				

[†] From 1971Ba59.
[‡] From 1987AgZZ except where noted.
[#] Observed only in 1987AgZZ.
[@] From Adopted Gammas.
[&] For absolute intensity per 100 decays, multiply by 0.019 *5*.
[a] 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.

$^{96}_{42}Mo_{54}$-4

^{96}Tc ε decay (51.5 min) 1971Ba59

Decay Scheme

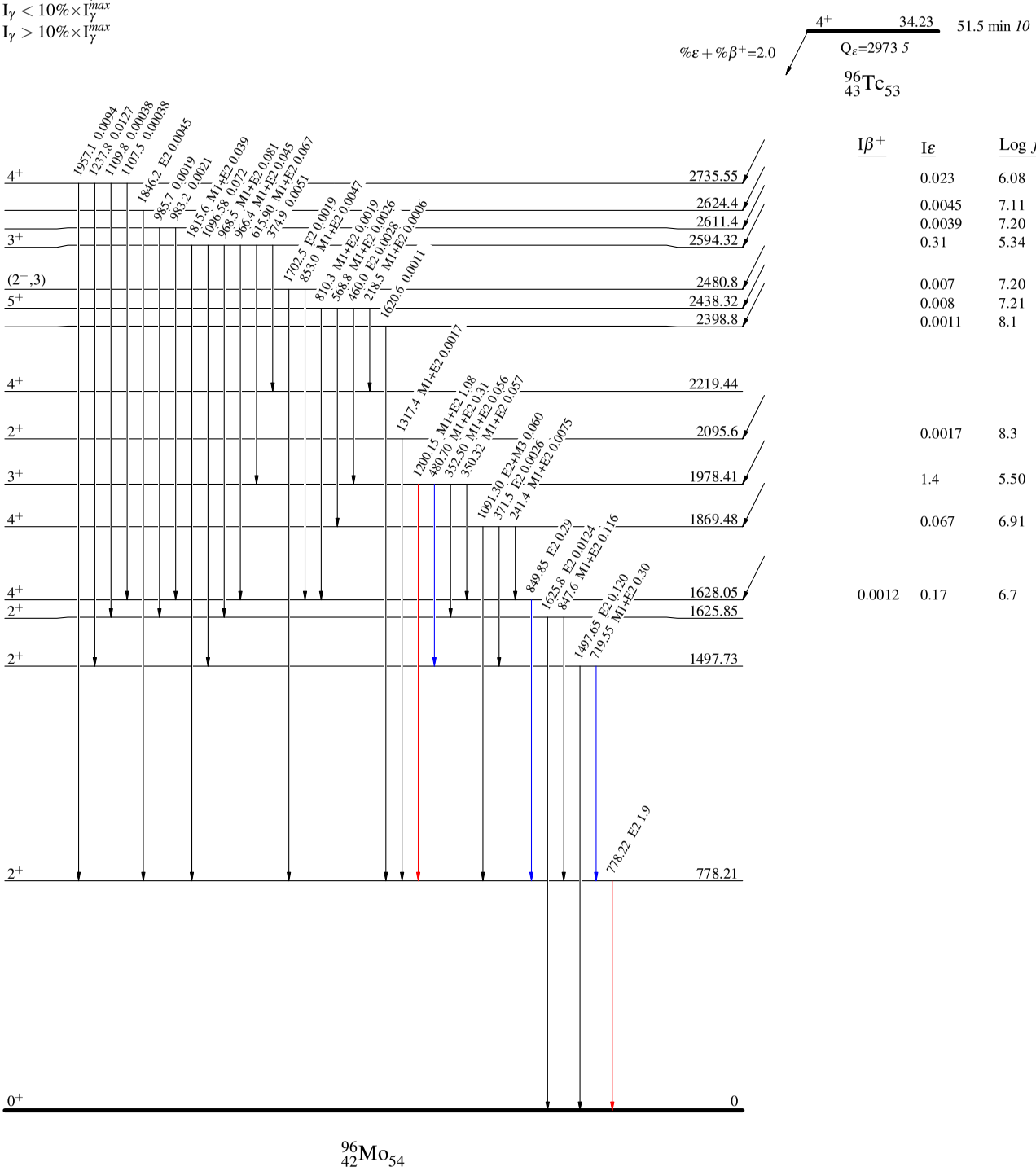
Intensities: I_γ per 100 parent decays

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*
2735.55		0.023	6.08
2624.4		0.0045	7.11
2611.4		0.0039	7.20
2594.32		0.31	5.34
2480.8		0.007	7.20
2438.32		0.008	7.21
2398.8		0.0011	8.1
2095.6		0.0017	8.3
1978.41		1.4	5.50
1869.48		0.067	6.91
1628.05	0.0012	0.17	6.7