^{90}Tc ε decay (50.7 s) 1981Ox01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	S. K. Basu, E. A. Mccutchan	NDS 165, 1 (2020)	1-Mar-2020

Parent: ^{90}Tc: E=0.0; $J^\pi=(8^+)$; $T_{1/2}$=50.7 s *63*; Q(ε)=9448 *4*; %ε+%$β^+$ decay=100.0

^{90}Tc-J^π,$T_{1/2}$: From the Adopted Levels.

1981Ox01: Produced by ^{92}Mo(p,3n) reaction at E(p)=43 MeV; measured γ(t) with Ge(Li) and Ge detectors, γγ and βγ coincidences with Ge(Li) and magnetic spectrometer. The decay scheme is established from γγ coincidence data.

Other: 1974Ia01.

^{90}Mo Levels

E(level)	J^π	$T_{1/2}$	E(level)	J^π	E(level)
0	0^+	5.56 h *9*	2859.7 *9*	5^-	3539.9 *10*
948.1 *2*	2^+		2947.0 *5*	(6^+)	4094.8 *7*
2002.4 *4*	4^+		3037.9 *11*		4175.9 *9*
2549.4 *7*	5^-		3150.3 *7*		4357.7 *11*
2812.2 *5*	6^+		3293.8 *5*		

ε,$β^+$ radiations

ε+$β^+$ branches are obtained from I(γ+ce) imbalance at each level.

E(decay)	E(level)	I$β^+$ †	Iε†	Log *ft*	I(ε+$β^+$)†	Comments
(5090 *4*)	4357.7	0.7 *3*	0.03 *1*	6.82 *20*	0.7 *3*	av Eβ=1864.1 *20*; εK=0.03410 *10*; εL=0.004105 *12*; εM+=0.000943 *3*
(5272 *4*)	4175.9	3.5 *5*	0.12 *2*	6.20 *8*	3.6 *5*	av Eβ=1951.2 *20*; εK=0.03009 *9*; εL=0.003622 *10*; εM+=0.0008322 *2*
(5353 *4*)	4094.8	4.5 *6*	0.15 *2*	6.12 *8*	4.7 *6*	av Eβ=1990.1 *20*; εK=0.02851 *8*; εL=0.003431 *10*; εM+=0.0007882 *2*
(5908 *4*)	3539.9	1.2 *4*	0.028 *9*	6.95 *16*	1.2 *4*	av Eβ=2257.1 *20*; εK=0.02015 *5*; εL=0.002424 *6*; εM+=0.0005568 *1*
(6154 *4*)	3293.8	17.7 *12*	0.363 *24*	5.87 *7*	18.1 *12*	av Eβ=2375.9 *20*; εK=0.01749 *4*; εL=0.002103 *5*; εM+=0.0004830 *1*
(6298 *4*)	3150.3	1.7 *3*	0.032 *6*	6.95 *10*	1.7 *3*	av Eβ=2445.3 *20*; εK=0.01615 *4*; εL=0.001941 *5*; εM+=0.0004459 *1*
(6410 *4*)	3037.9	1.1 *4*	0.019 *7*	7.18 *17*	1.1 *4*	av Eβ=2499.7 *21*; εK=0.01519 *4*; εL=0.001826 *4*; εM+=0.0004195 *1*
(6501 *4*)	2947.0	39.9 *22*	0.67 *4*	5.65 *6*	40.6 *22*	av Eβ=2543.8 *20*; εK=0.01447 *3*; εL=0.001739 *4*; εM+=0.0003996 *9* Log *ft*: value is too small for a ΔJ=2 transition suggesting the decay scheme is incomplete.
(6588 *4*)	2859.7	2.6 *6*	0.041 *10*	6.87 *12*	2.6 *6*	av Eβ=2586.1 *20*; εK=0.01382 *3*; εL=0.001661 *4*; εM+=0.0003817 *9* Log *ft*: value is too small for a ΔJ=3 transition suggesting the decay scheme is incomplete.
(6636 *4*)	2812.2	13.0 *21*	0.20 *3*	6.18 *9*	13.2 *21*	av Eβ=2609.2 *20*; εK=0.01349 *3*; εL=0.001621 *4*; εM+=0.0003724 *8* Log *ft*: value is too small for a ΔJ=2 transition suggesting the decay scheme is incomplete.
(6899 *4*)	2549.4	5.3 *10*	0.073 *14*	6.66 *10*	5.4 *10*	av Eβ=2736.8 *20*; εK=0.011809 *24*; εL=0.001419 *3*; εM+=0.0003260 *7* Log *ft*: value is too small for a ΔJ=3 transition suggesting the decay scheme is incomplete.

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^{90}Tc ε decay (50.7 s) 1981Ox01 (continued)

ε,β+ radiations (continued)

E(decay)	E(level)	Iβ+ †	Iε†	Log *ft*	I(ε+β+)†	Comments
(7446 *4*)	2002.4	<7	<0.07	>6.7	<7	av Eβ=3003.1 *20*; εK=0.009116 *17*; εL=0.0010951 *2*; εM+=0.0002515 *5*

† Absolute intensity per 100 decays.

γ(^{90}Mo)

Iγ normalization: From the assumption of no ε feeding to the g.s. (ΔJ=8).

E_γ	I_γ‡	E_i(level)	J_i^π	E_f	J_f^π	Mult.†
134.6 *5*	5.2 *8*	2947.0	(6+)	2812.2	6+	
x231.2 *8*	2.68 *4*					
262.5 *8*	1.3 *4*	2812.2	6+	2549.4	5−	E1
310.3 *6*	2.6 *6*	2859.7	5−	2549.4	5−	
481.7 *3*	13.6 *9*	3293.8		2812.2	6+	
x543.4 *5*	4.2 *4*					
546.8 *8*	9.3 *6*	2549.4	5−	2002.4	4+	E1
592.9 *8*	1.2 *4*	3539.9		2947.0	(6+)	
801.2 *5*	2.8 *4*	4094.8		3293.8		
809.8 *3*	34.3 *15*	2812.2	6+	2002.4	4+	E2
944.7 *4*	36.6 *20*	2947.0	(6+)	2002.4	4+	E2
948.1 *2*	100	948.1	2+	0	0+	E2
x983.5 *5*	5.4 *5*					
1035.5 *10*	1.1 *4*	3037.9		2002.4	4+	
1054.3 *3*	100 *6*	2002.4	4+	948.1	2+	E2
1147.9 *5*	1.7 *3*	3150.3		2002.4	4+	
1291.4 *5*	7.3 *6*	3293.8		2002.4	4+	
1363.7 *8*	3.6 *5*	4175.9		2812.2	6+	
2091.7 *9*	1.9 *4*	4094.8		2002.4	4+	
2355.3 *10*	0.7 *3*	4357.7		2002.4	4+	

† From the Adopted Gammas.
‡ Absolute intensity per 100 decays.
x γ ray not placed in level scheme.

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Decay Scheme

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