

^{106}Mo β^- decay (8.73 s) 1995Jo02,1980TiZX

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	D. De Frenne and A. Negret		NDS 109, 943 (2008)	1-May-2007

Parent: ^{106}Mo : $E=0.0$; $J^\pi=0^+$; $T_{1/2}=8.73$ s 12; $Q(\beta^-)=3520$ 12; $\% \beta^-$ decay=100.0

1995Jo02: ^{106}Mo activity from $^{238}\text{U}(\text{p},\text{f})$: $E(\text{p})=20$ MeV. Measured: $T_{1/2}(\beta^-)$, $Q(\beta^-)$, I_γ , $I(\text{ce})$, $\beta\gamma$, $\gamma\gamma$, $\gamma(\text{x})$, $\gamma(\text{ce})$, $\beta^-(\text{CE})$, $\gamma(\text{ce})$ -coin. Deduced: ^{106}Tc levels, $\log ft$, J , π , α , $I(\beta^-)$. Ge, plastic detector Conversion electrons measured with a lens-type conversion-electron spectrometer. $I(\gamma+\text{ce})$ obtained using three different arrangements with coincidences between conversion electrons, gammas, betas and x-rays. Efficiency of lens spectrometer calibrated internally with transitions with known conversion coefficients. For more details, see 1995Jo02. No details given on normalization of conversion electron and gamma intensity scales.

1980TiZX: activity from $^{239}\text{Pu}(\text{th n},\text{f})$; rapid molybdenum chem measured: E_γ , I_γ , $\gamma\gamma$, deduced: ^{106}Tc levels.

Others: 1969WiZX, 1976KaYO, 1977Ki14, 1977Ti02.

Unless stated otherwise, all data taken from 1995Jo02.

$\log ft$: the $\log ft$ values are calculated under the assumption of no g.s. β^- transition. For several levels, due to large uncertainties on the β^- branches only limits could be given. These large uncertainties are partly due to the large uncertainty on $\alpha(\text{exp})$ (23.5 γ): $6.4 < \alpha(\text{exp})(23.5\gamma) < 73.1$.

 ^{106}Tc Levels

E(level) [†]	J^π [#]	$T_{1/2}$ [‡]	Comments
0.0	(1,2)	35.6 s 6	
53.90 6		≈ 0.5 ns	
77.35 6		7 ns 2	
86.98 8			
139.49 6			
150.87 8			
162.80 21			
188.88 7			
196.77 9			
242.82 9			
309.37 10			
326.37 8	1 ⁺		$J^\pi=1^+$ suggested from strong β^- feeding from ^{106}Mo 0 ⁺ g.s. ($\log ft=5.7$).
448.83 12			
465.55 8	1 ⁺		$J^\pi=1^+$ suggested from strong β^- feeding from ^{106}Mo 0 ⁺ g.s. ($\log ft=4.59$).
504.12 7	1 ⁺		$J^\pi=1^+$ suggested from strong β^- feeding from ^{106}Mo 0 ⁺ g.s. ($\log ft=5.18$).
672.58 7	1 ⁺		$J^\pi=1^+$ suggested from strong β^- feeding from ^{106}Mo 0 ⁺ g.s. ($\log ft=4.61$).
736.70 15			

[†] Obtained by evaluators using a least-squares fit from measured gamma.

[‡] From $\beta^- \gamma$ delayed coincidences, for the two excited states.

[#] From Adopted Levels.

 β^- radiations

Decay scheme may be incomplete and I_β suspect as only levels up to 736 keV are observed.

E(decay)	E(level)	I_β [†]	$\log ft$	Comments
(2783 12)	736.70	4.2 9	5.42 1	av $E_\beta=1157.4$ 80
(2847 12)	672.58	28 4	4.61 7	av $E_\beta=1187.5$ 80
(3016 12)	504.12	9.7 16	5.18 8	av $E_\beta=1266.6$ 81
(3054 12)	465.55	40 8	4.59 10	av $E_\beta=1285.1$ 81
(3071 12)	448.83	2.9 6	5.74 10	av $E_\beta=1293.1$ 81

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^{106}Mo β^- decay (8.73 s) [1995Jo02,1980TiZX](#) (continued) β^- radiations (continued)

E(decay)	E(level)	$I\beta^-^\dagger$	Log ft	Comments
(3194 12)	326.37	3.7 8	5.7 1	av $E\beta=1350.7$ 81
(3211 12)	309.37	<0.22	>6.9	av $E\beta=1358.8$ 81
(3277 12)	242.82	2.6 18	5.9 3	av $E\beta=1390.5$ 81
(3323 12)	196.77	<1.1	>6.3	av $E\beta=1412.3$ 81
(3331 12)	188.88	<1.0	>6.4	av $E\beta=1415.6$ 81
(3357 12)	162.80	0.68 22	6.63 15	av $E\beta=1428.4$ 81
(3369 12)	150.87	4.1 7	5.76 8	av $E\beta=1433.7$ 81
(3381 12)	139.49	3.1 7	5.89 15	av $E\beta=1439.3$ 81
(3433 12)	86.98	<1.1	>6.4	av $E\beta=1464.0$ 81
(3443 12)	77.35	<4	>5.8	av $E\beta=1468.6$ 81
(3466 12)	53.90	<8	>5.5	av $E\beta=1479.7$ 81
(3520 12)	0.0	<18	>5.2	av $E\beta=1505.3$ 81

 † Absolute intensity per 100 decays. $\gamma(^{106}\text{Tc})$ $\alpha(\text{exp})$: from conversion electron measurements, unless mentioned otherwise.

E_γ	$E_i(\text{level})$	E_f	J_f^π	Mult. †	$I_{(\gamma+ce)}^\ddagger$	Comments
23.4 2	77.35	53.90			29 4	6.4< $\alpha(\text{exp})$ <73.3.
49.6 3	188.88	139.49		(E1)	0.9 4	$\alpha(\text{K})\text{exp}=13$ 7 $\alpha(\text{L})\text{exp}=6$ 3 K/L=2.2 16
54.0 1	53.90	0.0	(1,2)	M1	100 15	$\alpha(\text{K})\text{exp}$: From fluorescence yields. $\alpha(\text{K})\text{exp}$: From fluorescence yields. $\alpha(\text{L})\text{exp}=0.12$ 2; K/L=8 4 $\alpha(\text{K})\text{exp}=1.1$ 4 from fluorescence yields or $\alpha(\text{K})\text{exp}=1.0$ 4 from conversion electron measurements (1995Jo02).
62.1 1	139.49	77.35		E1	2.7 6	
^x 66.3 1					3.5 8	
^x 70.0 2					1.4 4	
73.5 1	150.87	77.35		(M1)	2.2 6	
77.5 1	77.35	0.0	(1,2)	M1,E2	8 2	$\alpha(\text{K})\text{exp}=1.25$ 15
^x 82.1 1					3.0 6	
85.6 1	139.49	53.90		E1	8.1 14	$\alpha(\text{K})\text{exp}=0.17$ 7
87.0 1	86.98	0.0	(1,2)	E1	6.5 14	$\alpha(\text{K})\text{exp}=0.4$ 3 from fluorescence yields or $\alpha(\text{K})\text{exp}=0.18$ 6 from conversion electron measurements (1995Jo02).
97.0 1	150.87	53.90		(M1)	6.0 12	$\alpha(\text{K})\text{exp}=1.1$ 2; $\alpha(\text{L})\text{exp}=0.6$ 2; K/L=1.8 7
108.9 2	162.80	53.90		(M1)	1.8 5	
111.5 1	188.88	77.35		(M1)	3.2 8	
135.0 1	188.88	53.90		M1	4.4 10	$\alpha(\text{K})\text{exp}=0.08$ 2
139.4 1	139.49	0.0	(1,2)	E1	3.5 6	$\alpha(\text{K})\text{exp}<0.08$ 3
139.4 1	448.83	309.37		E1	4.9 8	$\alpha(\text{K})\text{exp}<0.06$ 2
150.8 2	150.87	0.0	(1,2)	(M1)	2.7 7	
^x 156.4 1					2.4 5	
188.8 1	242.82	53.90		(M1)	17 3	
196.7 1	196.77	0.0	(1,2)	M1	6.5 11	
242.6 2	242.82	0.0	(1,2)		1.8 5	
249.1 1	326.37	77.35			5.0 9	
268.5 2	465.55	196.77			5.7 16	
309.3 1	309.37	0.0	(1,2)		5.5 10	

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^{106}Mo β^- decay (8.73 s) [1995Jo02,1980TiZX](#) (continued) $\gamma(^{106}\text{Tc})$ (continued)

E_γ	$E_i(\text{level})$	E_f	J_f^π	$I_{(\gamma+ce)}^\ddagger$	E_γ	$E_i(\text{level})$	E_f	J_f^π	$I_{(\gamma+ce)}^\ddagger$
315.3 1	504.12	188.88		4.5 9	483.5 2	672.58	188.88		3.6 8
326.3 1	326.37	0.0	(1,2)	6.2 11	504.2 1	504.12	0.0	(1,2)	16 3
346.2 2	672.58	326.37	1 ⁺	1.6 5	595.4 1	672.58	77.35		21 3
364.5 1	504.12	139.49		5.2 10	618.7 1	672.58	53.90		30 5
378.6 1	465.55	86.98		5.5 10	^x 634.1 2				12 2
429.6 1	672.58	242.82		12 2	672.7 2	672.58	0.0	(1,2)	5.6 12
449.1 2	448.83	0.0	(1,2)	3.0 7	683.3 2	736.70	53.90		3.3 7
465.6 1	465.55	0.0	(1,2)	94 14	736.2 2	736.70	0.0	(1,2)	7.7 16

[†] From $\alpha(\text{exp})$ and K/L measurements ([1995Jo02](#)).[‡] For absolute intensity per 100 decays, multiply by 0.35 5.^x γ ray not placed in level scheme.

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Decay Scheme

