^{57}Ti β^- decay (98 ms) 2005Li53

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	12-Apr-2010

Parent: ^{57}Ti: E=0.0; J^π=(5/2$^-$); $T_{1/2}$=98 ms *5*; Q(β^-)=10.64×10^3 *51*; %β^- decay=100.0

^{57}Ti-$T_{1/2}$: Deduced from fit of the fragment-β-decay curve considering the exponential decay of the parent, exponential growth, and decay of the daughter ^{57}V, and a linear background term. The value obtained was compared with that obtained from fragment-β-γ decay curves for each of the transitions assigned to ^{57}Ti (2005Li43). See Adopted Levels of ^{57}Ti for previous half-life measurements.

^{57}Ti-J^π: From ^{57}Ti Adopted Levels.

^{57}Ti-Q(β^-): from 2009AuZZ, 2003Au03.

2005Li53: ^{57}Ti isotope produced in fragmentation of ^{86}Kr^{34+} beam on a ^{9}Be target. Secondary fragments were selected using the A1900 fragment separator. Fragment identification was performed by a combination of multiple energy-loss signals and time of flight method. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\beta$(t), lifetime with 12 Ge detectors from the MSU segmented Ge array and double-sided Si microstrip detector.

^{57}V Levels

E(level)[†]	J^π
0.0	(7/2$^-$)
113.2 *4*	
174.8 *4*	
1731.9 *4*	
1754.3? *5*	
2036.3 *4*	
2475.6 *5*	

[†] from least-squares fit to Eγ's.

β^- radiations

E(decay)	E(level)	Iβ^-[†#]	Log *ft*[‡]	Comments
(8.2×10^3 *5*)	2475.6	7.3 *7*	5.0	av Eβ=3.81×10^3 *25*
(8.6×10^3 *5*)	2036.3	16.6 *21*	4.8	av Eβ=4.03×10^3 *25*
(8.9×10^3[@] *5*)	1754.3?	16 *2*	4.9	av Eβ=4.17×10^3 *25*
(8.9×10^3 *5*)	1731.9	1.1 *7*	6.0	av Eβ=4.18×10^3 *25*
(1.05×10^4 *5*)	174.8	5 *5*	5.7	av Eβ=4.94×10^3 *25*
(1.06×10^4 *5*)	0.0	53.8 *23*	4.7	av Eβ=5.02×10^3 *25*

[†] deduced by the evaluator from γ-ray intensity balances and the ground state feeding deduced by 2005Li53 from the total number of ^{57}Ti nuclei implanted in the Double-sided Si microstrip detector (DSSD). The listed β feedings should be treated as apparent values.

[‡] All values are considered as lower limits.

[#] Absolute intensity per 100 decays.

[@] Existence of this branch is questionable.

^{57}Ti β^- decay (98 ms) 2005Li53 (continued)

$\gamma(^{57}V)$

Iγ normalization: Absolute γ-ray intensities are given in 2005Li43.

E_γ	I_γ[†]	E_i(level)	E_f	J^π_f	Comments
(61.7)	11 *3*	174.8	113.2		E_γ: existence of transition deduced from observed coincidence between the 113 and 175 γ rays. Such a transition is below the detection threshold.
113.1 *4*	14 *1*	113.2	0.0	(7/2$^-$)	
174.8 *4*	31 *2*	174.8	0.0	(7/2$^-$)	
744.0 *4*	2.3 *4*	2475.6	1731.9		
1557.3 *5*	2.2 *5*	1731.9	174.8		
1579.4[‡] *4*	16 *2*	1754.3?	174.8		
1732.2 *6*	1.2 *2*	1731.9	0.0	(7/2$^-$)	
1861.5 *4*	14 *2*	2036.3	174.8		
1922.9 *5*	2.6 *5*	2036.3	113.2		
[x]2003.7 *6*	1.8 *5*				
[x]2114.6 *5*	0.7 *3*				
2300.4 *4*	5.0 *5*	2475.6	174.8		

[†] Absolute intensity per 100 decays.
[‡] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

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Decay Scheme

Intensities: I_γ per 100 parent decays