

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Wang Jimin and Huang Xiaolong		NDS 144,1 (2017)	1-Mar-2016

$Q(\beta^-)=2471.0$ 6; $S(n)=6372.5$ 5; $S(p)=12475$ 15; $Q(\alpha)=-9813.3$ 23 [2017Wa10](#)

Other Reactions:

$^{51}\text{V}(n,p)$: measured σ for this reaction, see [1983MeZR](#), [1983Kh05](#), [1982Wa15](#), [1982Ko16](#), [1979Va16](#).

 ^{51}Ti LevelsCross Reference (XREF) Flags

A	$^{51}\text{Sc} \beta^-$ decay	E	$^{49}\text{Ti}(t,p)$	I	$^{50}\text{Ti}(d,p\gamma)$
B	$^{48}\text{Ca}(\alpha,n\gamma)$	F	$^{50}\text{Ti}(n,\gamma)$ E=thermal	J	$^{51}\text{V}(d,^2\text{He})$
C	$^{48}\text{Ca}(^6\text{Li},2n\text{p}\gamma), (^7\text{Li},3n\text{p}\gamma)$	G	$^{50}\text{Ti}(d,p), (\text{pol } d,p)$	K	$^9\text{Be}(^{46}\text{Ar},4n\gamma)$
D	$^{48}\text{Ca}(^{16}\text{O},^{13}\text{C})$	H	$^{50}\text{Ti}(^{13}\text{C},^{12}\text{C})$		

E(level) [†]	J ^π	T _{1/2}	XREF	Comments
0.0 [@]	3/2 ⁻	5.76 min 1	ABCDEFGHIJK	%β ⁻ =100 T _{1/2} : from weighted av of 5.752 min 7 (1969IsZZ), 5.80 min 3 (1955Bu01), and 5.79 min 3 (1953Sa11). J ^π : L(d,p)=1 from 0 ⁺ ; L(t,p)=2 from 7/2 ⁻ .
1166.7 3	1/2 ⁻	34 [#] fs 4	A DEFGHIJ	J ^π : L(d,p)=1 from 0 ⁺ ; L(t,p)=4 from 7/2 ⁻ .
1437.3 [@] 3	7/2 ⁻	0.42 [#] ps +37-15	ABCDE G IJK	XREF: D(1500)J(1460). J ^π : L(d,p)=3 from 0 ⁺ ; L(t,p)=0 from 7/2 ⁻ ; J=7/2 ⁻ from shell-model prediction (1968Gl04).
1567.5 3	5/2 ⁻	86 [#] fs +26-21	AB DE G IJ	XREF: D(1500)J(1570). J ^π : L(d,p)=3 from 0 ⁺ ; L(t,p)=2 from 7/2 ⁻ ; J=5/2 ⁻ from shell-model prediction (1968Gl04).
2144.0 3	5/2 ⁻	0.11 [#] ps 2	A DE GHIJ	XREF: D(2150)J(2150). J ^π : L(d,p)=3 from 0 ⁺ ; L(t,p)=2 from 7/2 ⁻ .
2198.1 4	3/2 ⁻	10 [#] fs 3	DEFGHI	XREF: D(2150). J ^π : L(d,p)=1 from 0 ⁺ ; L(t,p)=2 from 7/2 ⁻ .
2344.6 [@] 4	(11/2) ⁻	9.6 ps 16	ABC IJK	XREF: J(2330). J ^π : (11/2) from γ(θ) in (α,nγ). π=- from E2 γ to 5/2 ⁻ . T _{1/2} : From recoil distance in $^{48}\text{Ca}(^6\text{Li},2n\text{p}\gamma), (^7\text{Li},3n\text{p}\gamma)$. J ^π : L(t,p)=0 from 7/2 ⁻ . XREF: J(2720). J ^π : log ft=5.80 4 from (7/2) ⁻ , γ to (11/2) ⁻ .
2691.4 8	7/2 ⁻		A E G I	
2731.2 4	(7/2,9/2) ⁻		A J	XREF: J(2720). J ^π : log ft=5.80 4 from (7/2) ⁻ , γ to (11/2) ⁻ .
2754.2 [@] 7	(15/2) ⁻	0.8 ns 3	BC K	J ^π : (15/2) from γ(θ) in (α,nγ). J=(15/2) ⁻ from shell-model calculation. T _{1/2} : From recoil distance in $^{48}\text{Ca}(^6\text{Li},2n\text{p}\gamma), (^7\text{Li},3n\text{p}\gamma)$. XREF: J(2900). J ^π : L(d,p)=1 from 0 ⁺ ; L(t,p)=4 from 7/2 ⁻ .
2905.8 5	1/2 ⁻	7.6 [#] fs 2	DEFG IJ	J ^π : log ft=5.781 22 from (7/2) ⁻ , γ to 3/2 ⁻ . XREF: J(3040). J ^π : log ft=5.170 18 from (7/2) ⁻ , γ to (11/2) ⁻ .
2919.3 4	(5/2,7/2) ⁻	<14 [#] fs	A I	XREF: D(3160)J(3160). J ^π : L(d,p)=1 from 0 ⁺ .
3062.3 4	(7/2,9/2) ⁻		A J	J ^π : log ft=6.71 9 from (7/2) ⁻ , γ to 7/2 ⁻ . XREF: J(3620). J ^π : log ft=4.838 19 from (7/2) ⁻ .
3173.8 5	3/2 ⁻	11.8 [#] fs 21	D FG IJ	J ^π : (13/2,17/2) from γ(θ) in (α,nγ), (13/2) ⁻ from
3237.4 21	(5/2,7/2,9/2)		A	
3618.5 4	(5/2 to 9/2) ⁻		A J	
3644.1 [@] 12	(13/2) ⁻		B K	

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Adopted Levels, Gammas (continued) ^{51}Ti Levels (continued)

E(level) [†]	J ^π	T _{1/2}	XREF		Comments
3771.3 6	9/2 ⁺	116 [#] fs +21-17	D	G IJ	(⁴⁶ Ar,4nγ) based on shell-model. XREF: D(3760)G(3759)J(3770). J ^π : L(d,p)=4 from 0 ⁺ .
4022 [‡] 10	(5/2 ⁻ ,7/2 ⁻)			G	J ^π : L(d,p)=(3); but L=1 is not definitely excluded.
4095.0 15	(7/2,9/2)		A	J	XREF: J(4090). J ^π : log ft=6.01 9 from (7/2) ⁻ , log f ^{lu} _t <8.5 eliminates ΔJ=2 and Δπ=+; γ to (11/2) ⁻ .
4172 [‡] 10	(3/2 ⁺ ,5/2 ⁺)			G	J ^π : L(d,p)=(2); but L=1 is not definitely excluded.
4186.6 [‡] 21	(5/2,7/2,9/2)		A	G J	XREF: J(4230). J ^π : log ft=6.03 7 from (7/2) ⁻ .
4407.2 [@] 24	(15/2 ⁻)			K	J ^π : assigned by 2009Ni17 based on shell-model calculations.
4470 [‡] 10				G J	XREF: J(4440).
4569 [‡] 10	1/2 ⁻ ,3/2 ⁻			G	J ^π : L(d,p)=1 from 0 ⁺ .
4602 [‡] 10	(3/2 ⁺ ,5/2 ⁺)			G	J ^π : L(d,p)=(2); but L=1 is not definitely excluded.
4757 [‡] 10				G	
4820 [‡] 10	1/2 ⁺			G	J ^π : L(d,p)=0 from 0 ⁺ .
4882 [‡] 10	1/2 ⁺			G	J ^π : L(d,p)=0 from 0 ⁺ .
4882.1 21	(5/2,7/2,9/2) ⁻		A	J	XREF: J(4870). J ^π : log ft=5.67 13 from (7/2) ⁻ .
4998 [‡] 10				G J	XREF: J(4990).
5013 [‡] 10				G	
5102 [‡] 10				G J	XREF: J(5110).
5149 [‡] 10	5/2 ⁻ ,7/2 ⁻			G	J ^π : L(d,p)=3 from 0 ⁺ .
5224 [‡] 10				G J	XREF: J(5240).
5245 [@] 4	(17/2 ⁻)			K	J ^π : assigned by 2009Ni17 based on shell-model calculations.
5420 20				J	
5540 20				J	
5780 30				J	
5950 30				J	
6140 30				J	
6250 30				J	

[†] For states connected by gammas, E(level)'s are from adopted γ-radiations and the level scheme, using least-squares fit to data.

[‡] Values of 1964Ba39 are consistently lower than the adopted values by 7 keV for the 1160 level to 12 keV for the 3759 level.

Where used in Adopted Levels (4012 level and higher), the evaluator has increased the authors values by 10 keV.

[#] From DSA measurements in ⁵⁰Ti(d,py).

[@] Band(A): γ cascade.

γ(⁵¹Ti)

E _i (level)	J _i ^π	E _γ [†]	I _γ ^{&}	E _f	J _f ^π	Mult. ^a	Comments
1166.7	1/2 ⁻	1166.6 [‡] 4	100	0.0	3/2 ⁻	[M1]	B(M1)(W.u.)=0.41 5
1437.3	7/2 ⁻	1437.3 4	100	0.0	3/2 ⁻	[E2]	B(E2)(W.u.)=20 +7-18
1567.5	5/2 ⁻	1567.5 4	100	0.0	3/2 ⁻	[M1,E2]	
2144.0	5/2 ⁻	576.3 4	10.5 4	1567.5	5/2 ⁻	[M1]	B(M1)(W.u.)=0.095 18
		706.6 7	2.97 21	1437.3	7/2 ⁻	[M1,E2]	
		977.2 7	1.98 25	1166.7	1/2 ⁻	[E2]	B(E2)(W.u.)=8.8 20
		2144.1 4	100 3	0.0	3/2 ⁻	[M1,E2]	

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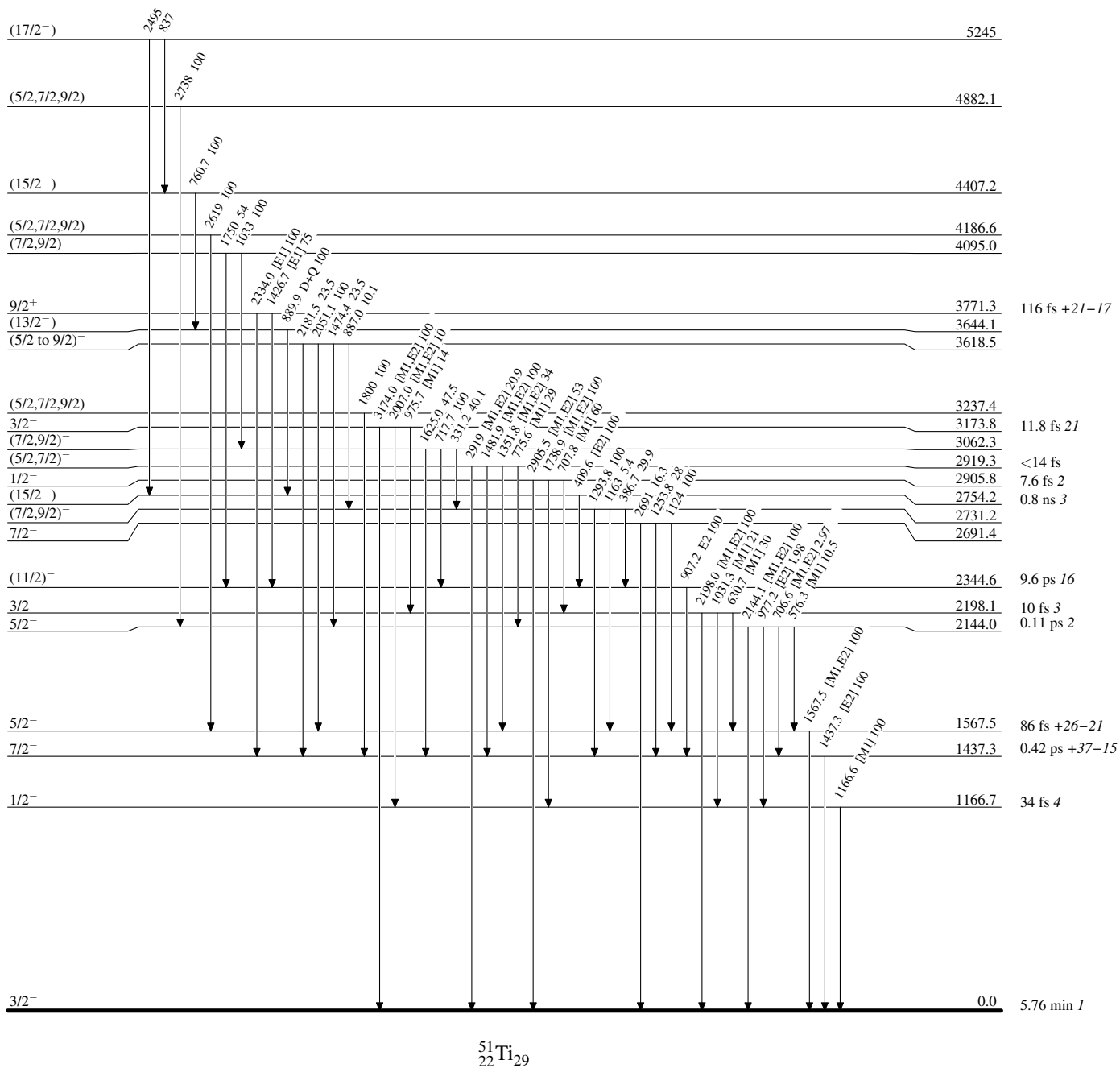
Adopted Levels, Gammas (continued)

$\gamma(^{51}\text{Ti})$ (continued)							
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\&$	E_f	J_f^π	Mult. ^a	Comments
2198.1	3/2 ⁻	630.7 @ 5	30 @	1567.5	5/2 ⁻	[M1]	B(M1)(W.u.)=1.7 6
		1031.3 @ 5	21 @	1166.7	1/2 ⁻	[M1]	B(M1)(W.u.)=0.28 9
		2198.0 @ 10	100 @	0.0	3/2 ⁻	[M1,E2]	
2344.6	(11/2) ⁻	907.2 4	100	1437.3	7/2 ⁻	E2	B(E2)(W.u.)=8.5 15 Mult.: from (α ,n γ).
2691.4	7/2 ⁻	1124 1	100 11	1567.5	5/2 ⁻		
		1253.8 15	28 5	1437.3	7/2 ⁻		
		2691 2	16.3 19	0.0	3/2 ⁻		
2731.2	(7/2,9/2) ⁻	386.7 4	29.9 15	2344.6	(11/2) ⁻		
		1163 1	5.4 8	1567.5	5/2 ⁻		
		1293.8 4	100 4	1437.3	7/2 ⁻		
2754.2	(15/2) ⁻	409.6 # 5	100	2344.6	(11/2) ⁻	[E2]	B(E2)(W.u.)=5.5 21
2905.8	1/2 ⁻	707.8 @ 5	60 @	2198.1	3/2 ⁻	[M1]	B(M1)(W.u.)=2.30 6
		1738.9 @ 5	100 @	1166.7	1/2 ⁻	[M1,E2]	
		2905.5 @ 10	53 @	0.0	3/2 ⁻	[M1,E2]	
2919.3	(5/2,7/2) ⁻	775.6 7	29 3	2144.0	5/2 ⁻	[M1]	B(M1)(W.u.)>0.53
		1351.8 7	34 3	1567.5	5/2 ⁻	[M1,E2]	
		1481.9 4	100 5	1437.3	7/2 ⁻	[M1,E2]	
		2919 2	20.9 17	0.0	3/2 ⁻	[M1,E2]	
3062.3	(7/2,9/2) ⁻	331.2 4	40.1 18	2731.2	(7/2,9/2) ⁻		
		717.7 4	100 4	2344.6	(11/2) ⁻		
		1625.0 4	47.5 22	1437.3	7/2 ⁻		
3173.8	3/2 ⁻	975.7 @ 5	14 @	2198.1	3/2 ⁻	[M1]	B(M1)(W.u.)=0.23 4
		2007.0 @ 10	10 @	1166.7	1/2 ⁻	[M1,E2]	
		3174.0 @ 10	100 @	0.0	3/2 ⁻	[M1,E2]	
3237.4	(5/2,7/2,9/2)	1800 2	100	1437.3	7/2 ⁻		
3618.5	(5/2 to 9/2) ⁻	887.0 7	10.1 11	2731.2	(7/2,9/2) ⁻		
		1474.4 4	23.5 13	2144.0	5/2 ⁻		
		2051.1 4	100 3	1567.5	5/2 ⁻		
		2181.5 7	23.5 10	1437.3	7/2 ⁻		
3644.1	(13/2) ⁻	889.9 # 10	100	2754.2	(15/2) ⁻	D+Q	Mult., δ : $\delta=-5.1 +17-44$ if J=13/2 in $^{48}\text{Ca}(\alpha$,n γ).
3771.3	9/2 ⁺	1426.7 @ 5	75 @	2344.6	(11/2) ⁻	[E1]	B(E1)(W.u.)=0.00030 5
		2334.0 @ 10	100 @	1437.3	7/2 ⁻	[E1]	
4095.0	(7/2,9/2)	1033 2	100 26	3062.3	(7/2,9/2) ⁻		
		1750 2	54 14	2344.6	(11/2) ⁻		
4186.6	(5/2,7/2,9/2)	2619 2	100	1567.5	5/2 ⁻		
4407.2	(15/2) ⁻	760.7 7	100	3644.1	(13/2) ⁻		
4882.1	(5/2,7/2,9/2) ⁻	2738 2	100	2144.0	5/2 ⁻		
5245	(17/2) ⁻	837 3		4407.2	(15/2) ⁻		E_γ : from(^{46}Ar ,4n γ).
		2495 5		2754.2	(15/2) ⁻		E_γ : from(^{46}Ar ,4n γ).

[†] From ^{51}Sc β^- decay, except as noted.[‡] From $^{50}\text{Ti}(\text{n},\gamma)$ E=thermal.# From $^{48}\text{Ca}(\alpha$,n γ).@ From $^{50}\text{Ti}(\text{d},\text{p}\gamma)$. I_γ values are not corrected for $\gamma(\theta)$.& Relative photon branching from each level. Values from ^{51}Sc β^- decay, except as noted.^a Comparison to RUL and ΔJ^π from level scheme, except as noted.

Adopted Levels, GammasLevel Scheme

Intensities: Relative photon branching from each level



Adopted Levels, Gammas

