

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Yang Dong, Huo Junde		NDS 128, 185 (2015)	10-Jul-2015

$Q(\beta^-)=1975.7$; $S(n)=7808.7$; $S(p)=13529.21$; $Q(\alpha)=-7669.7$ [2012Wa38](#)

 ^{52}Ti LevelsCross Reference (XREF) Flags

A	$^{52}\text{Sc} \beta^-$ decay	E	$^{48}\text{Ca}(^{16}\text{O}, ^{12}\text{C})$	I	Coulomb excitation
B	$^{48}\text{Ca}(^6\text{Li}, d)$	F	$^{50}\text{Ti}(t, p)$	J	$^9\text{Be}(^{48}\text{Ca}, X\gamma)$
C	$^{48}\text{Ca}(^7\text{Li}, p2n\gamma)$	G	$^{50}\text{Ti}(t, p\gamma)$	K	$^{12}\text{C}(^{48}\text{Ca}, ^8\text{Be}\gamma)$
D	$^{48}\text{Ca}(^{12}\text{C}, ^8\text{Be})$	H	$^{208}\text{Pb}(^{48}\text{Ca}, X\gamma)$		

E(level) [†]	J ^π [@]	T _{1/2} [‡]	XREF	Comments
0.0	0 ⁺	1.7 min 1	ABCDEFGHIJK	$\% \beta^- = 100$ T _{1/2} : from 1967Mo11 .
1050.06 9	2 ⁺	3.60 ps 14	ABCDEFGHIJK	$\mu = +1.7$ 4 (2006Sp02) XREF: D(1045)E(1045). B(E2) [†] : B(E2)=0.0567 51 (2005Di05). T _{1/2} : from $^{12}\text{C}(^{48}\text{Ca}, 8\text{BEG})$ (2006Sp02). Others: 3.9 ps 4 from B(E2) in Coulomb excitation and 3.3 ps +56-15 DSAM in $^{50}\text{Ti}(t, p\gamma)$. J ^π : L(t,p)=2.
2264.49 11	2 ⁺	39 [#] fs 8	AB eFG IJK	XREF: B(2260)e(2350). J ^π : L(t,p)=2.
2318.19 11	4 ⁺	3.3 ps 4	A CD F H JK	T _{1/2} : Other: 35 Fs +20-13, DSAM in $^{50}\text{Ti}(t, p\gamma)$. $\mu = +1.8$ 6 (2006Sp02) XREF: D(2300). J ^π : L(t,p)=4. T _{1/2} : From $^{12}\text{C}(^{48}\text{Ca}, 8\text{BEG})$ (2006Sp02).
2432.29 11	2 ⁺	119 [#] fs 8	A eFG JK	XREF: e(2350)f(2429). J ^π : L(t,p)=2.
3029.09 15	6 ⁺ ^a	25 ps 4	C H JK	T _{1/2} : Other: < 70 Fs, DSAM in $^{50}\text{Ti}(t, p\gamma)$, 0.15 ps 3 in $^{12}\text{C}(^{48}\text{Ca}, ^8\text{Be}\gamma)$.
3143.02 11	4 ⁺ ^a	96 [#] fs 19	A J	T _{1/2} : RDM in $^{48}\text{Ca}(^7\text{Li}, p2n\gamma)$.
3350.60 13	4 ⁺		A F J	XREF: F(3346). J ^π : L(t,p)=4.
3453.52 13	3 ⁻	41 [#] fs 6	A F JK	XREF: F(3447). J ^π : L(t,p)=3.
3589.30 13	2 ⁺	≤62 fs	A FG J	XREF: F(3583). J ^π : L(t,p)=2.
3872 8	3 ⁻		F	J ^π : L(t,p)=3.
3881.5 10	0 ⁺ ^a		J	
3923.49 13	2 ⁺		A FG J	XREF: F(3916)G(3900). J ^π : L(t,p)=2.
4023.30 12	(4 ⁺) ^a		A J	
4054.5 8	5 ⁺ ^a		F J	
4078.3 6			A	
4098 8	0 ⁺ , 1 ⁻		F	J ^π : L(t,p)=0,1.
4102.2 7	6 ⁺ ^a		J	
4212 6	1 ⁻		FG	XREF: G(4230). J ^π : L(t,p)=0,1. Anisotropic $\gamma(\theta)$ in (t,pγ).
4286.6 9			A	
4287.72 18	(8 ⁺) ^{&}		H J	

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Adopted Levels, Gammas (continued) ^{52}Ti Levels (continued)

E(level) [†]	J ^π @	T _{1/2} [‡]	XREF	Comments
4324 8	1 ⁻ ,0 ⁺		FG	XREF: G(4300). J ^π : L(t,p)=1,0.
4479.22 14			A J	
4535.4 7	7 ⁺ ^a	85 [#] fs 15	J	
4646.58 24	4 ⁺		A J	
4691 8	1 ⁻ ,0 ⁺		F	J ^π : L(t,p)=1,0.
4787.56 14	(2 ⁺)		A F J	XREF: F(4772). J ^π : L(t,p)=(2).
4831.1 6	5 ⁻ ^a		F J	
4839.9 10	5 ⁺ ^a	60 [#] fs 18	J	
4907.1 11	(6 ⁺) ^a	37 [#] fs 13	F J	
5010 8			F	
5103.5 10	5 ⁻ ^a		J	
5142 6	6 ⁺ ^a		J	
5236.5 12	5 ⁺ ^a		J	
5319.23 17			A J	
5818.5 12	(8 ⁺) ^a		J	
6098.5 22	6 ⁽⁺⁾ ^a	60 [#] fs 18	J	
6693.38 21	(10 ⁺) ^{&}		H J	
7520 3	10 ⁺ ^a	41 [#] fs 18	J	
8858.02 23			H J	
9088.7 5			H J	

[†] Energies for levels connected by gammas are from least-squares fit to E γ , others are from $^{50}\text{Ti}(t,p)$.

[‡] From DSAM in $^{50}\text{Ti}(t,p\gamma)$, except as noted.

[#] From $^9\text{Be}(^{48}\text{Ca},X\gamma)$.

@ From L(t,p) values, except as noted.

& From assumption of preferential yrast feeding and the close correspondence between established and calculated levels.

^a From 9BE(48CA,XG) (2009Zh23) based on the measured angular ratios.

 $\gamma(^{52}\text{Ti})$

E _i (level)	J _i ^π	E _{γ} [†]	I _{γ} ^{†&}	E _f	J _f ^π	Mult. [@]	δ [@]	Comments
1050.06	2 ⁺	1050.2 [#] 1	100 [#]	0.0	0 ⁺	[E2]		B(E2)(W.u.)=9.9 11
2264.49	2 ⁺	1214.4 [#] 1 2265.2 13	100 8 13 3	1050.06	2 ⁺	M1(+E2) [E2]	+0.03 10	B(M1)(W.u.)=0.31 +23-14 B(E2)(W.u.)=2.4 8 I _{γ} : <5 in (t,p γ).
2318.19	4 ⁺	1268.2 [#] 1	100 [#]	1050.06	2 ⁺	[E2]		
2432.29	2 ⁺	1382.3 [#] 1	100 [#] 6	1050.06	2 ⁺	M1+E2	-0.39 8	B(M1)(W.u.)=0.056 8; B(E2)(W.u.)=10 4 Mult.: from p- $\gamma(\theta)$ in (t,p γ) and RUL.
		2431.6 [‡] 2	<18 [‡]	0.0	0 ⁺			
3029.09	6 ⁺	710.9 [#] 1	100 [#]	2318.19	4 ⁺	[E2]		B(E2)(W.u.)=10.8 18
3143.02	4 ⁺	710.6 [#] 1 824.9 [#] 1 2093.0 [#] 1	41 [#] 7 100 [#] 7 41 [#] 7	2432.29	2 ⁺			
				2318.19	4 ⁺			
				1050.06	2 ⁺			
3350.60	4 ⁺	1032.3 [#] 1	100 [#]	2318.19	4 ⁺	[M1]		
3453.52	3 ⁻	1135.4 [#] 1	100 [#]	2318.19	4 ⁺	[E1]		

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Adopted Levels, Gammas (continued)

$\gamma(^{52}\text{Ti})$ (continued)								
$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult. @	$\delta^@$	Comments
3589.30	2 ⁺	1157.1 [#] 1	33 [#] 5	2432.29	2 ⁺			
		1324.7 [#] 1	100 [#] 17	2264.49	2 ⁺	[M1]		
		2539.0 [‡] 20	45 [‡] 12	1050.06	2 ⁺			
		3588.8 [‡] 20	≤14 [‡]	0.0	0 ⁺			
3881.5	0 ⁺	1617 [#] 1	100 [#] 11	2264.49	2 ⁺	[E2]		
		2831 [#] 3	67 [#] 11	1050.06	2 ⁺			
3923.49	2 ⁺	1491.2 [#] 1	77 15	2432.29	2 ⁺			
		1659.0 ^{#‡} 1	82 [‡] 9	2264.49	2 ⁺	M1+E2	-0.31 22	
		2872.0 5	100 18	1050.06	2 ⁺	E2(+M1)	≤-0.46	
		3923 3	23 8	0.0	0 ⁺			
4023.30	(4 ⁺)	672.6 [#] 1	100 [#] 17	3350.60	4 ⁺			
		880.4 [#] 2		3143.02	4 ⁺			
		1590.5 [#] 3		2432.29	2 ⁺			
		1705.2 [#] 1		2318.19	4 ⁺			
		1758.8 [#] 1	47 [#] 8	2264.49	2 ⁺			
		2972.2 5	30 5	1050.06	2 ⁺			
								I_γ : From $I_\gamma(1758.8)=4.1$ 7 and $I_\gamma(2972.2)=2.6$ 5 in ^{52}Sc β^- decay.
4054.5	5 ⁺	1026 [#] 1	57 [#] 14	3029.09	6 ⁺			
		1738 [#] 2	100 [#] 14	2318.19	4 ⁺	[M1]		
4078.3		1646.0 6	100	2432.29	2 ⁺			
4102.2	6 ⁺	752 [#] 1	63 [#] 21	3350.60	4 ⁺			
		1073 [#] 1	100 [#] 11	3029.09	6 ⁺	[M1]		
		1783 [#] 2	79 [#] 11	2318.19	4 ⁺			
4212	1 ⁻	3162 [‡] 8		1050.06	2 ⁺	M1(+E2)	+0.12 13	
		4212 [‡] 8		0.0	0 ⁺			
4286.6		1968.4 9	100	2318.19	4 ⁺			
4287.72	(8 ⁺)	1258.6 [#] 1	100 [#]	3029.09	6 ⁺	[E2]		
4479.22		1025.7 [#] 1	100 [#] 7	3453.52	3 ⁻			
		1128.6 [#] 1	18 [#] 4	3350.60	4 ⁺			
4535.4	7 ⁺	247 [#] 1	10 [#] 2	4287.72	(8 ⁺)			
		482 [#] 1	0.8 [#] 2	4054.5	5 ⁺			
		1506 [#] 1	100 [#] 5	3029.09	6 ⁺	[M1]		
4646.58	4 ⁺	1617 [#] 1	#	3029.09	6 ⁺	[E2]		
		2328.3 [#] 3		2318.19	4 ⁺			
		2382.1 [#] 3		2264.49	2 ⁺			
4787.56	(2 ⁺)	1334.1 [#] 1		3453.52	3 ⁻			
		1644.5 [#] 3		3143.02	4 ⁺			
		2468.8 4	100 12	2318.19	4 ⁺			
		2524.1 [#] 5		2264.49	2 ⁺			
		3737.2 11	26 6	1050.06	2 ⁺			
4831.1	5 ⁻	1376 [#] 1	31 [#] 6	3453.52	3 ⁻			
		1481 [#] 1	62 [#] 21	3350.60	4 ⁺	[E1]		
		1803 [#] 1	100 [#] 9	3029.09	6 ⁺	[E1]		
4839.9	5 ⁺	1697 [#] 1	100 [#] 18	3143.02	4 ⁺	[M1]		
		2520 [#] 3	24 [#] 6	2318.19	4 ⁺			
4907.1	(6 ⁺)	1878 [#] 1	100 [#]	3029.09	6 ⁺			

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Adopted Levels, Gammas (continued) $\gamma(^{52}\text{Ti})$ (continued)

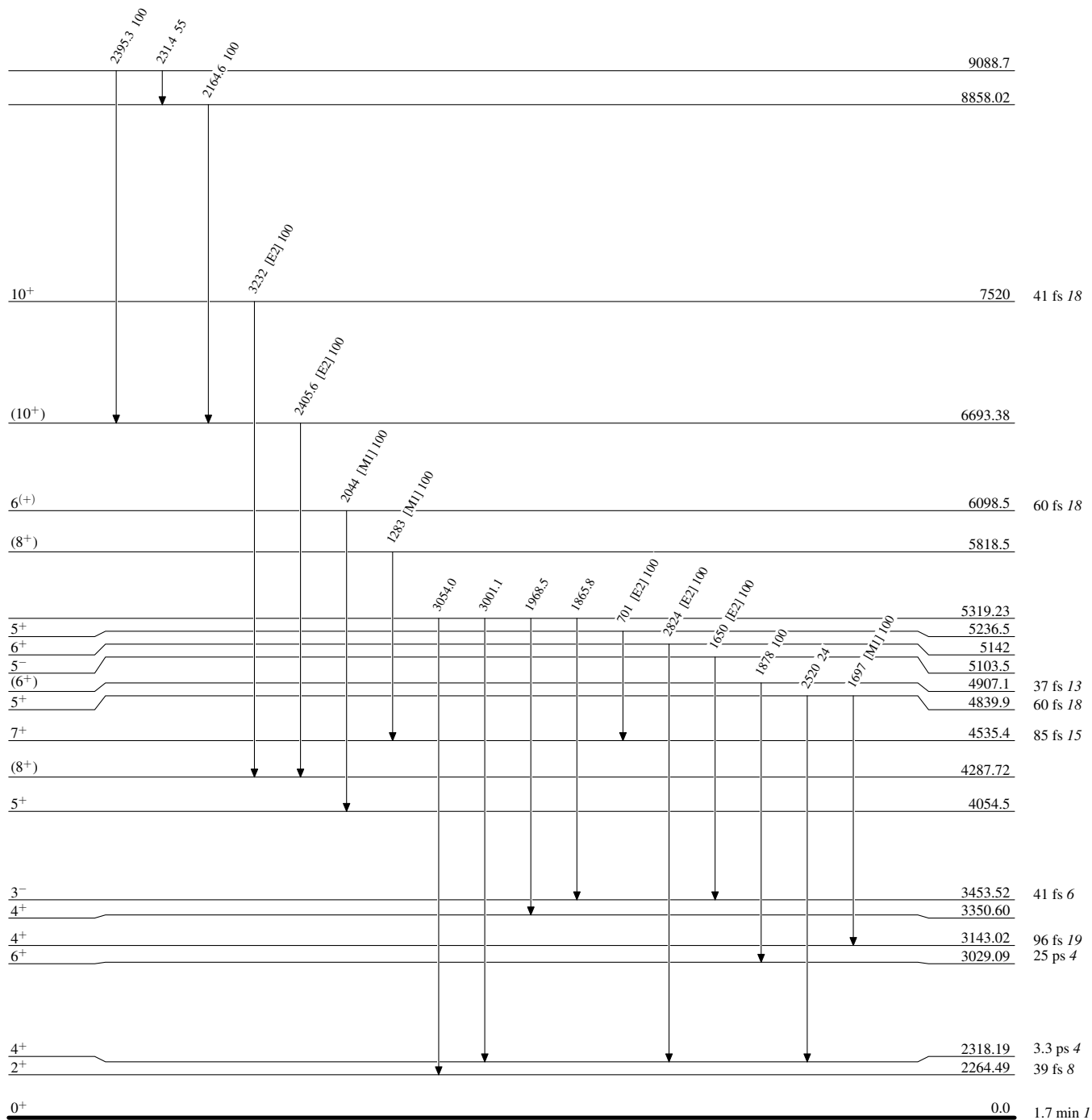
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger \&$	E_f	J_f^π	Mult. @
5103.5	5^-	1650 [#] 1	100 [#]	3453.52	3^-	[E2]
5142	6^+	2824 [#] 6	100 [#]	2318.19	4^+	[E2]
5236.5	5^+	701 [#] 1	100 [#]	4535.4	7^+	[E2]
5319.23		1865.8 [#] 2		3453.52	3^-	
		1968.5 [#] 2		3350.60	4^+	
		3001.1 [#] 3		2318.19	4^+	
		3054.0 [#] 5		2264.49	2^+	
5818.5	(8^+)	1283 [#] 1	100 [#]	4535.4	7^+	[M1]
6098.5	$6^{(+)}$	2044 [#] 2	100 [#]	4054.5	5^+	[M1]
6693.38	(10^+)	2405.6 [#] 1	100 [#]	4287.72	(8^+)	[E2]
7520	10^+	3232 [#] 3	100 [#]	4287.72	(8^+)	[E2]
8858.02		2164.6 [#] 1	100 [#]	6693.38	(10^+)	
9088.7		231.4 [#] 1	55 [#] 23	8858.02		
		2395.3 [#] 1	100 [#] 45	6693.38	(10^+)	

[†] From $^{52}\text{Sc} \beta^-$ decay, except as noted.[‡] From $^{50}\text{Ti}(t, p\gamma)$. E_γ recalculated from level energy differences by evaluator using adopted level energies.[#] From $^9\text{Be}(^{48}\text{Ca}, X\gamma)$.@ From $p\gamma(\theta)$ in $(t, p\gamma)$.

& Relative photon branching from each level.

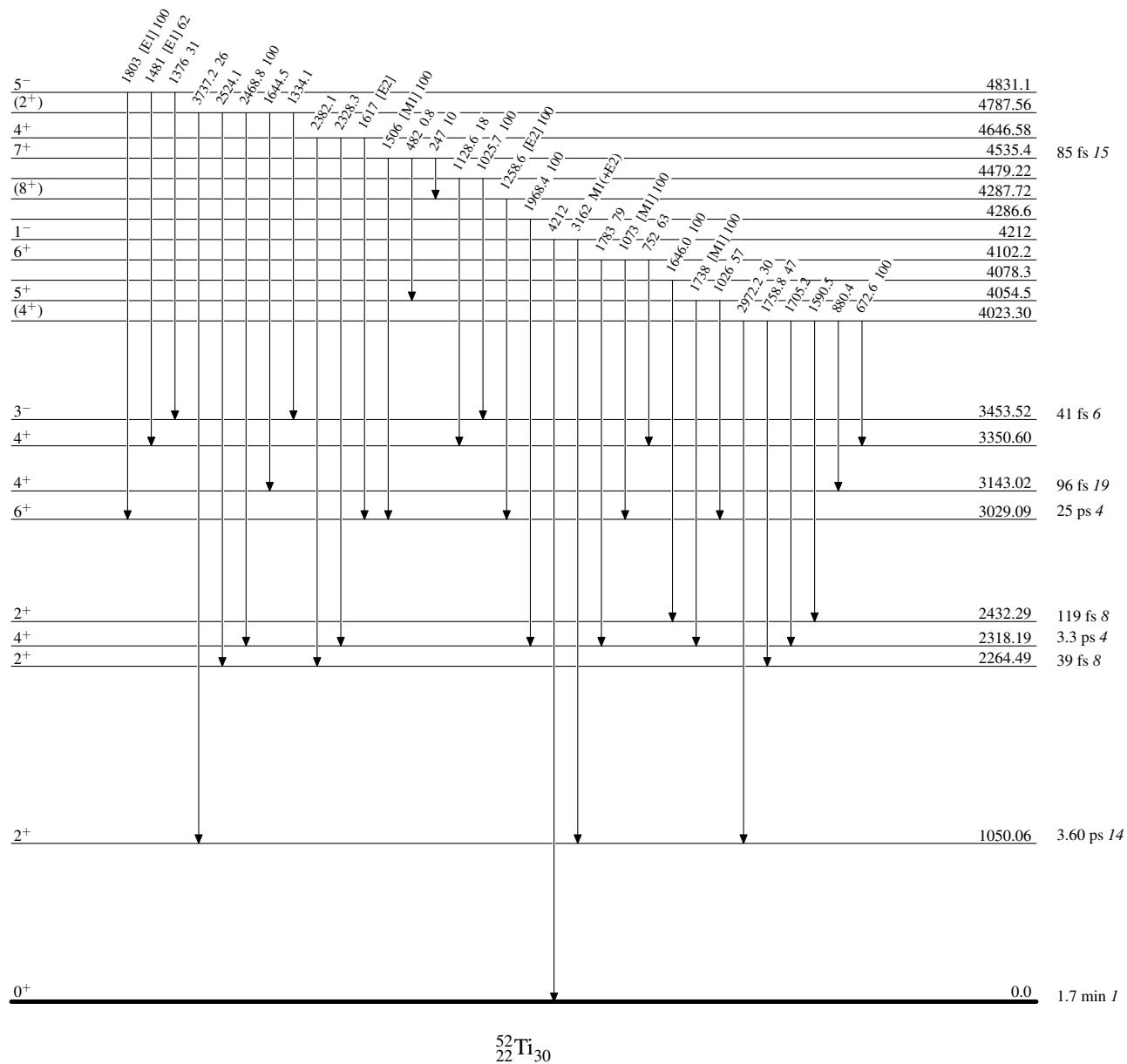
Adopted Levels, GammasLevel Scheme

Intensities: Relative photon branching from each level



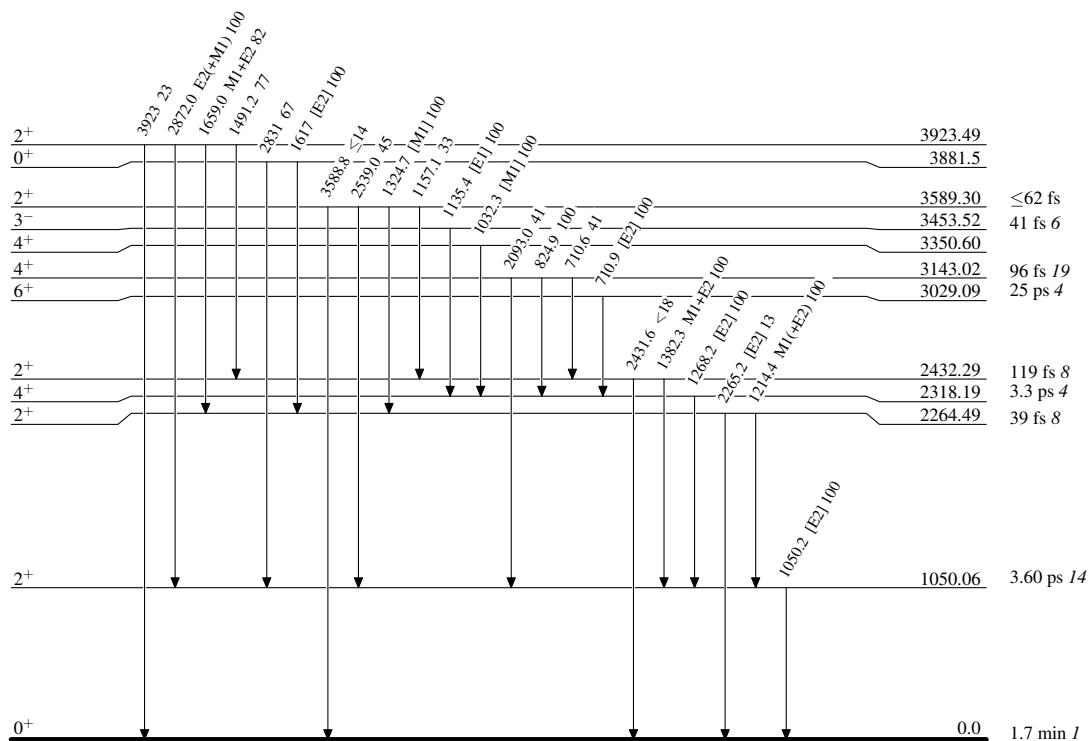
Adopted Levels, Gammas**Level Scheme (continued)**

Intensities: Relative photon branching from each level



Adopted Levels, Gammas**Level Scheme (continued)**

Intensities: Relative photon branching from each level

 $^{52}_{22}\text{Ti}_{30}$