

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	S. -c. Wu	NDS 91, 1 (2000)	15-Jul-2000

Q(β^-)=-1377.9 24; S(n)=10397.6 23; S(p)=13811.7 24; Q(α)=-11141 7 2012Wa38

Note: Current evaluation has used the following Q record.

Q(β^-)=-1376.3 24; S(n)=10393.7 24; S(p)=13816 10; 1995Au04

Isotope shifts: 1993Si20.

⁴⁶Ca Levels

Cross Reference (XREF) Flags

A	⁴⁶ K β^- decay: data set #1	F	⁴⁶ Ca(e,e')	K	⁴⁸ Ca(p,t)
B	⁴⁶ K β^- decay: data set #2	G	⁴⁶ Ca(p,p')	L	⁴⁸ Ca(α , α 2n γ)
C	⁴⁴ Ca(t,p)	H	⁴⁶ Ca(d,d')	M	⁴⁸ Ti(¹⁴ C, ¹⁶ O)
D	⁴⁴ Ca(t,p γ)	I	Coulomb excitation		
E	⁴⁴ Ca(α , ² He)	J	⁴⁸ Ca(p,p2n γ)		

E(level)	J π^b	T _{1/2}	XREF	Comments
0.0	0 ⁺	stable	ABCDEFGHIJKLM	
1346.0 ^a 3	2 ⁺	3.6 ps 3	ABCDE GHIJKLM	J π : L=2 in (t,p), (α , ² He) and (p,t). T _{1/2} : from Coul. ex. if B(E2)=0.0178 13 (1975Ku17), T _{1/2} >5.5 ps from (t,p γ) (1974Be28).
2423.1 8	0 ⁺	>4.5 ps	CD G K M	E(level): weighted average of values from (t,p γ) (E γ plus adopted 1346.0 level), (p,p'), and (p,t). J π : L=0 in (t,p) and (p,t). T _{1/2} : from (t,p γ) (1974Be28).
2574.7 ^a 5	4 ⁺		A C E G JKLM	J π : L=4 in (t,p), (α , ² He) and (p,t).
2973.9 ^a 6	6 ⁺	10.4 ns 5	C E G JKL	J π : L=6 in (α , ² He) and (p,t). T _{1/2} : weighted average of 10.3 ns 10 (p,p2n γ) (1975Bi01) and 10.5 ns 6 (α , α 2n γ) (1975Ku17).
3022.6 10	2 ⁺		ABC GH K M	E(level): weighted average of values from ⁴⁶ K β^- decay: data set #1, (t,p), (p,p'), (d,d'), and (p,t) (3020.5 21 from ⁴⁶ K β^- decay: data set #1 based on E γ 's and 1346.0 3 for first excited state (evaluator)). J π : L=2 in (t,p) and (p,t).
3614.0 9	3 ⁻		ABC GH K M	E(level): weighted average of values from (t,p), (p,p'), (d,d'), and (p,t). J π : L=3 in (t,p) and (p,t).
3638.9 [@] 12	2 ⁺		C G K	J π : L=2 in (t,p) and (p,t).
3859.7 [@] 13	4 ⁺		C G K	J π : L=4 in (p,t).
3952? 2			G	
3988 [#] 3	(3 ⁻)		G K	J π : L=(3) in (p,t).
4184.5 [#] 15	5 ⁻		G K	J π : L=5 in (p,t).
4261 2			C G	E(level): from (p,p').
4407.0 [#] 14	3 ⁻		G K	J π : L=3 in (p,t).
4430.2 9	2 ⁺		C GH K	E(level): weighted average of values from (t,p), (p,p'), (d,d'), and (p,t). J π : L=2 in (t,p).
4489.4 [#] 12	(4 ⁺)		G K	J π : L=(4) in (p,t).
4728.8 [#] 18	5 ⁻		E G K	J π : L=5 in (p,t) and L=6,5 in (α , ² He).
4744.9 ^{&} 24	(4 ⁺)		C G	J π : L=(4) in (t,p).
4758 3	0 ⁺		K	J π : L=0 in (p,t).
4994.7 [#] 20	(4 ⁺)		C G K	J π : L=(2) in (t,p); L=(4) in (p,t).
5013.6 20			G	

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Adopted Levels, Gammas (continued) ^{46}Ca Levels (continued)

E(level)	$J^{\pi b}$	XREF			Comments
5051 3	(4 ⁺)	AB	G	K	E(level): weighted average of values from (p,p') and (p,t). J^{π} : L=(4) in (p,t).
5151.6# 26	(4 ⁺)		G	K	J^{π} : L=(4) in (p,t).
5218 4			G	K	E(level): from (p,t); 5216 from (p,p'), ΔE not given.
5251.5# 28	4 ⁺		G	K	J^{π} : L=4 in (p,t).
5317@ 3	0 ⁺	C	G	K	J^{π} : L=0 in (t,p) and L=(0) in (p,t).
5379.6# 24	(3 ⁻)		G	K	J^{π} : L=3 in (p,t).
5392& 4		C	G		
5416.7# 24			G	K	
5436.7# 24	4 ⁺		G	K	J^{π} : L=4 in (p,t).
5474 4	(3 ⁻)			K	J^{π} : L=(3) in (p,t).
5536.7@ 23	(4 ⁺)	C	G	K	J^{π} : L=(4) in (p,t).
5600‡ 4	0 ⁺	C		K	J^{π} : L=0 in (t,p).
5628 10	0 ⁺	C			J^{π} : L=0 in (t,p).
5638# 3			G	K	
5679			G		
5690 4		C	G	K	E(level): weighted average of values from (t,p) and (p,t).
5722# 3			G	K	
5781.6@ 27		C	G	K	
5821 4				K	
5850.9@ 27		C	G	K	
5863.0# 28	(6 ⁺)		G	K	J^{π} : L=(6) in (p,t).
5958‡ 4	(2 ⁺)	C		K	J^{π} : L=(2) in (p,t).
5987 4	(6 ⁺)			K	J^{π} : L=(6) in (p,t).
6010# 4			G	K	
6036# 4	(4 ⁺)		G	K	J^{π} : L=(4) in (p,t).
6047 15	(0 ⁺)	C			J^{π} : L=(0) in (t,p).
6077 5				K	
6116 5	(2 ⁺)			K	J^{π} : L=(2) in (p,t).
6156 5				K	
6201 5				K	
6252 5	(4 ⁺)			K	J^{π} : L=(4) in (p,t).
6267‡ 5	2 ⁺	C		K	J^{π} : L=2 in (t,p).
6309 5				K	
6372 15	2 ⁺	C			J^{π} : L=2 in (t,p).
6555 15	(0 ⁺)	C			J^{π} : L=(0) in (t,p).
6626 15	2 ⁺	A C			J^{π} : L=2 in (t,p).
6745 15		C			
6836 15		C			
6964 15		C			
7025 15	(2 ⁺)	C			J^{π} : L=(2) in (t,p).
7055 7	5 ⁻ ,6 ⁺ C	E		K	E(level): weighted average of values from (p,t) and (α , ² He).
7098 15		C			
7168 15		C			
7233 15	(0 ⁺)	C			J^{π} : L=(0) in (t,p).
7267 15	(0 ⁺)	C			
7311 15		C			
7380 15		C			
7438 15		C			
7490‡ 6	(2 ⁺)	C		K	J^{π} : L=(2) in (t,p) and (p,t).
7503 15		C			

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Adopted Levels, Gammas (continued)

^{46}Ca Levels (continued)

E(level)	J^π ^b	$T_{1/2}$	XREF	Comments
7667 14	(2 ⁺ ,5 ⁻) ^c		C E	E(level): weighted average of values from (t,p) and (α , ² He). L=2 in (t,p) and L=5 in (α , ² He).
7738 15			C	
≈7830	0 ⁺		K	J^π : L=0 in (p,t).
7914 8			C	Possible doublet.
8382 5	7 ^{-c}		C E	Possible doublet.
8770 50	7 ^{-c}		E	
9070 50	5 ^{-c}		E	
9680 50	5 ⁻ ,6 ⁺ ,8 ⁺ ^c		E	
12660 50	6 ⁺ ,8 ⁺ ,7 ^{-c}		E	
13020 40	1 ⁺	0.022 fs 7	F	Observed and J^π assigned in $^{46}\text{Ca}(e,e')$. $T_{1/2}$: from B(M1)↑=2.47 77.
13130 50	6 ⁺ ,8 ⁺ ,7 ^{-c}		E	
13895 [†] 30			K	
14488 [†] 30	3 ⁻		K	J^π : L=3 in (p,t).
14610 [†] 30			K	
14795 [†] 30	5 ⁻		K	J^π : L=5 in (p,t).
15279 [†] 30	3 ⁻		K	J^π : L=3 in (p,t).
15847 [†] 30			K	
16155 [†] 30	(0 ⁺)		K	J^π : L=(0) in (p,t).
16721 [†] 30	(2 ⁺)		K	J^π : L=(2) in (p,t).
≈17295 [†]			K	

[†] Proposed T=4 analog state from (p,t).

[‡] Weighted average of values from (t,p) and (p,t).

Weighted average of values from (p,p') and (p,t).

@ Weighted average of values from (t,p), (p,p'), and (p,t).

& Weighted average of values from (t,p) and (p,p').

^a From least-squares fit to γ data.

^b From (t,p) and/or (p,t), unless otherwise specified.

^c Based on L-transfers in (α ,²He), and a comparison of experimental cross sections with theoretical DWBA values.

$\gamma(^{46}\text{Ca})$

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	Comments
1346.0	2 ⁺	1346.0 [†] 3	100	0.0	0 ⁺	[E2]	B(E2)(W.u.)=3.63 Mult.: based on J^π assignment. E_γ : from (t,p γ).
2423.1	0 ⁺	1077.5 20	100	1346.0	2 ⁺		
2574.7	4 ⁺	1228.7 [†] 3	100	1346.0	2 ⁺		
2973.9	6 ⁺	399.2 [†] 3	100	2574.7	4 ⁺	[E2]	B(E2)(W.u.)=0.55 Mult.: based on J, $T_{1/2}$, and decay modes in (p,p2n γ).
3022.6	2 ⁺	1675 [‡] 3	100 [‡]	1346.0	2 ⁺		
		3020 [‡] # 3	63 [‡] 29	0.0	0 ⁺		
3614.0	3 ⁻	2274 2	100	1346.0	2 ⁺		E_γ : from $^{46}\text{K} \beta^-$ decay: data set #2; 2285 3 from $^{46}\text{K} \beta^-$ decay: data set #1 is inconsistent with 2268 separation of Adopted Levels levels.

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Adopted Levels, Gammas (continued) $\gamma(^{46}\text{Ca})$ (continued)† From (p,p2n γ).‡ From ^{46}K β^- decay set #1.

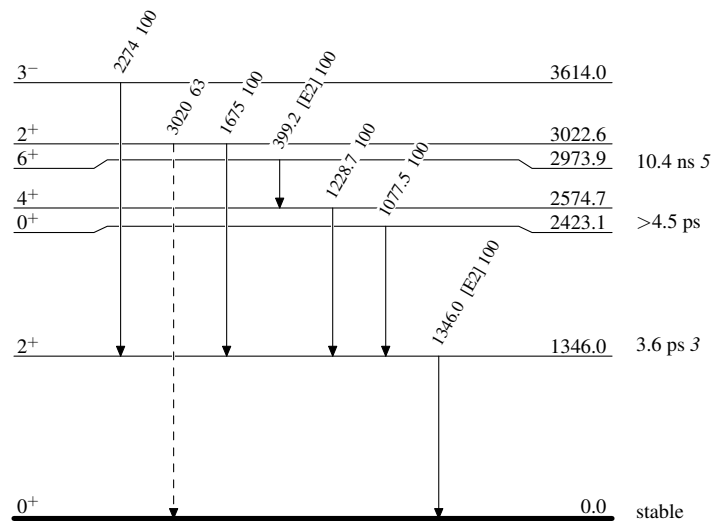
Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

-----▶ γ Decay (Uncertain) $^{46}_{20}\text{Ca}_{26}$