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 $ −1376.3 *24* 10393.724 *13816* 10 1995Au04.
Isotope shifts: 1993Si20.

^{46}Ca 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,α2nγ)
C	^{44}Ca(t,p)	H	^{46}Ca(d,d′)	M	^{48}Ti(^{14}C,^{16}O)
D	^{44}Ca(t,pγ)	I	Coulomb excitation		
E	^{44}Ca(α,^{2}He)	J	^{48}Ca(p,p2nγ)		

E(level)	J$^\pi$[b]	$T_{1/2}$	XREF	Comments
0.0	0$^+$	stable	ABCDEFGHIJKLM	
1346.0[a] *3*	2$^+$	3.6 ps *3*	ABCDE GHIJKLM	J$^\pi$: 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,pγ) (1974Be28).
2423.1 *8*	0$^+$	>4.5 ps	CD G K M	E(level): weighted average of values from (t,pγ) (Eγ plus adopted 1346.0 level), (p,p′), and (p,t). J$^\pi$: L=0 in (t,p) and (p,t). $T_{1/2}$: from (t,pγ) (1974Be28).
2574.7[a] *5*	4$^+$		A C E G JKLM	J$^\pi$: 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$^\pi$: L=6 in (α,^{2}He) and (p,t). $T_{1/2}$: weighted average of 10.3 ns *10* (p,p2nγ) (1975Bi01) and 10.5 ns *6* (α,α2nγ) (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 Eγ′s and 1346.0 *3* for first excited state (evaluator)). J$^\pi$: 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$^\pi$: L=3 in (t,p) and (p,t).
3638.9[@] *12*	2$^+$		C G K	J$^\pi$: L=2 in (t,p) and (p,t).
3859.7[@] *13*	4$^+$		C G K	J$^\pi$: L=4 in (p,t).
3952? *2*			G	
3988[#] *3*	(3$^-$)		G K	J$^\pi$: L=(3) in (p,t).
4184.5[#] *15*	5$^-$		G K	J$^\pi$: L=5 in (p,t).
4261 *2*			C G	E(level): from (p,p′).
4407.0[#] *14*	3$^-$		G K	J$^\pi$: 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$^\pi$: L=2 in (t,p).
4489.4[#] *12*	(4$^+$)		G K	J$^\pi$: L=(4) in (p,t).
4728.8[#] *18*	5$^-$		E G K	J$^\pi$: L=5 in (p,t) and L=6,5 in (α,^{2}He).
4744.9[&] *24*	(4$^+$)		C G	J$^\pi$: L=(4) in (t,p).
4758 *3*	0$^+$		K	J$^\pi$: L=0 in (p,t).
4994.7[#] *20*	(4$^+$)		C G K	J$^\pi$: L=(2) in (t,p); L=(4) in (p,t).
5013.6 *20*			G	
5051 *3*	(4$^+$)		AB G K	E(level): weighted average of values from (p,p′) and (p,t). J$^\pi$: L=(4) in (p,t).

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Adopted Levels, Gammas (continued)

^{46}Ca Levels (continued)

E(level)	J^{π}[b]	XREF	Comments
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	
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).

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Adopted Levels, Gammas (continued)

^{46}Ca Levels (continued)

E(level)	J$^{\pi}$[b]	$T_{1/2}$	XREF	Comments
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}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,^{2}He), and a comparison of experimental cross sections with theoretical DWBA values.

γ(^{46}Ca)

E_i(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.
2423.1	0^+	1077.5 *20*	100	1346.0	2^+		E_{γ}: from (t,pγ).
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,p2nγ).
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}K β^- decay: data set #2; 2285 *3* from ^{46}K β^- decay: data set #1 is inconsistent with 2268 separation of Adopted Levels levels.

† From (p,p2nγ).
‡ From ^{46}K β^- decay set #1.
# Placement of transition in the level scheme is uncertain.

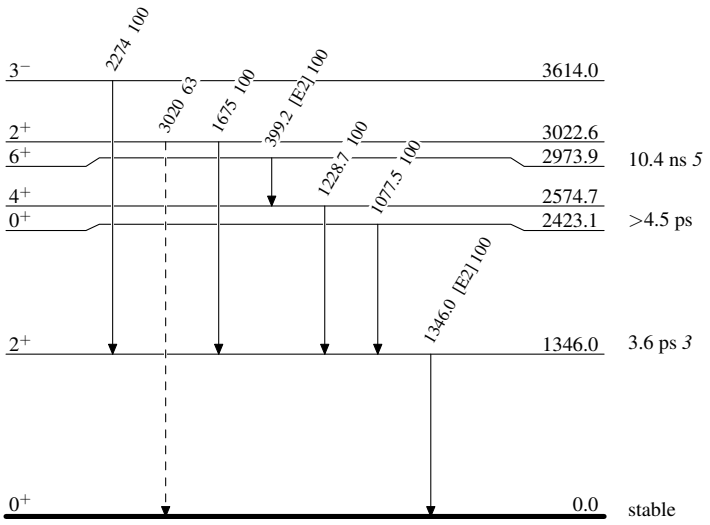
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)



$^{46}_{20}Ca_{26}$