^{47}Ca β^- decay 1987Ju04,1969Wo02,1966Fr14

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	T. W. Burrows	NDS 108, 923 (2007)	20-Feb-2007

Parent: ^{47}Ca: E=0.0; J^π=7/2$^-$; $T_{1/2}$=4.536 d *3*; Q(β^-)=1992.0 *12*; %β^- decay=100.0
^{47}Ca-Q(β^-): From 2003Au03.
1966Fr14 measured γ's and $\beta\gamma$-coincidences (Si(Li),Ge(Li)).
1969Wo02 measured γ's, $\gamma\gamma$-coin (NaI,Ge(Li)), and $\beta\gamma$-coincidences (Si(Li),Ge(Li)).
Others: see 1995Bu05.

^{47}Sc Levels

E(level)	J^π†	$T_{1/2}$	Comments
0.0	7/2$^-$	3.3492† d *6*	%β^-=100
766.83 *9*	(3/2)$^+$	270 ns *12*	$T_{1/2}$: from 1966Ba40 ($\gamma\gamma$(t)).
807.89 *8*	3/2$^-$		
(1146.99)	11/2$^-$		
1297.12 *8*	5/2$^-$		T=5/2 J^π,T: $\beta\gamma$-CP(1297γ) (1967Be20,1965Ma06) indicates that the most likely spin value in the sequence 7/2(β^-)J(D,Q)7/2 is J=5/2.
1878.2 *5*	9/2$^-$		

† From the Adopted Levels.

β^- radiations

1987Ju04 measured β's and $\beta\gamma$-coincidences; β spectrometer, pc, NaI.
Coincidences: from 1969Wo02 and 1968Fi04.
See 1987Mi18 for calculations of GT matrix elements.

E(decay)	E(level)	$I\beta^-$†#	Log *ft*	Comments
(113.8 *13*)	1878.2	0.037 *8*	6.7 *1*	av Eβ=31.27 *39*
695.0‡ *27*	1297.12	73 *15*	6.08 *9*	av Eβ=242.66 *49*
(1184.1@ *12*)	807.89			av Eβ=450.7 *6* $I\beta^-$: From 1968Fi04 (s; $\beta\gamma$ coin, Si(Li), Ge(Li)). Other: <0.79 (90% C.L.) from intensity balancing.
(1225.2 *12*)	766.83	0.087 *3*	10.67^{1u} *2*	av Eβ=494.79 *53* $I\beta^-$: From 1968Fi04 (s; $\beta\gamma$ coin, Si(Li), Ge(Li)).
1990.6‡ *23*	0.0	27 *15*	8.3 *3*	av Eβ=818.91 *56* E(decay): assuming a 1+aW shape factor. Others: 1984.9 *11* (assuming a statistical shape factor), 1987.4 *27* (assuming a 1+aW+bW^2 shape factor), and 1990.1 *21* (assuming a 1+b/W shape factor) (1987Ju04), 1988.3 *25* (1968Fi04. ms, Si(Li)), and 1980.6 *26* (1967Hs03. ms, Si(Li)). See comment on ^{47}Ca Q(β^-). Log *ft*: comparison with Eβ(to 1297)+Eγ(1297γ) indicates a nonstatistical shape factor (1987Ju04). log $f^{1u}t$≥8.5.

† From intensity balance At each state, except As noted.
‡ From 1987Ju04.
\# Absolute intensity per 100 decays.
@ Existence of this branch is questionable.

$\gamma(^{47}$Sc)

Iγ normalization: from Iβ to 767-keV state and Σ (Iγ(1+α)(out)-Iγ(1+α)(In)) for this state.
1969Wo02 did not observe (Iγ<2.E−5) the 1766 and 1836 gammas suggested by 1968Fi04.

E$_\gamma$[†]	I$_\gamma$[b]	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult.	δ	α[‡]	Comments
41.06 *5*	0.0083[#] *10*	807.89	3/2$^-$	766.83	(3/2)$^+$	(E1)[‡]		0.399	α(K)=0.363 *6*; α(L)=0.0321 *5*; α(M)=0.00392 *6*; α(N+..)=0.000205 *3* α(N)=0.000205 *3*
489.23 *10*	8.8 *5*	1297.12	5/2$^-$	807.89	3/2$^-$	M1+E2	−0.21 *4*	3.66×10^{-4} *10*	α=3.66×10^{-4} *10*; α(K)=0.000333 *9*; α(L)=2.94×10^{-5} *8*; α(M)=3.64×10^{-6} *10*; α(N+..)=2.04×10^{-7} *6* α(N)=2.04×10^{-7} *6* I$_\gamma$: from 1966Fr14. Mult.,δ: from 1963Fu09 ($\gamma\gamma(\theta)$,pol; NaI).
530.6[@] *5*	0.128 *12*	1297.12	5/2$^-$	766.83	(3/2)$^+$	(E1)[‡]		0.000188 *3*	α=0.000188 *3*; α(K)=0.0001710 *25*; α(L)=1.500×10^{-5} *22*; α(M)=1.86×10^{-6} *3* α(N+..)=1.039×10^{-7} *15* α(N)=1.039×10^{-7} *15* I$_\gamma$: from Iγ(531)/Iγ(489)=0.0146 *10* (1966Fr14).
(731.6[&])	0.017 *3*	1878.2	9/2$^-$	1146.99?	11/2$^-$	(M1+E2)[‡]	−0.14[‡] *11*	1.49×10^{-4} *5*	α=1.49×10^{-4} *5*; α(K)=0.000136 *4*; α(L)=1.19×10^{-5} *4*; α(M)=1.48×10^{-6} *5*; α(N+..)=8.31×10^{-8} *24* α(N)=8.31×10^{-8} *24* I$_\gamma$: from adopted branching ratios and Iγ(1878γ)=0.038 *4*.
767.1[@] *3*	0.269 *19*	766.83	(3/2)$^+$	0.0	7/2$^-$	(M2)[‡]		0.000334 *5*	α=0.000334 *5*; α(K)=0.000304 *5*; α(L)=2.69×10^{-5} *4*; α(M)=3.33×10^{-6} *5*; α(N+..)=1.87×10^{-7} *3* α(N)=1.87×10^{-7} *3* I$_\gamma$: from Iγ(767)/Iγ(808)=0.0294 *10* (1966Fr14) and decay scheme.
807.86 *10*	8.8[#] *5*	807.89	3/2$^-$	0.0	7/2$^-$	(E2)[‡]		0.000183 *3*	α=0.000183 *3*; α(K)=0.0001667 *24*; α(L)=1.467×10^{-5} *21*; α(M)=1.82×10^{-6} *3* α(N+..)=1.015×10^{-7} *15* α(N)=1.015×10^{-7} *15*
(1146.97[&] *4*)	0.017 *3*	(1146.99)	11/2$^-$	0.0	7/2$^-$				I$_\gamma$: from intensity balance at 1147 state.
1297.09 *10*	100	1297.12	5/2$^-$	0.0	7/2$^-$	M1+E2[a]	−0.020[‡a] *16*	6.82×10^{-5} *10*	α=6.82×10^{-5} *10*; α(K)=4.40×10^{-5} *7*; α(L)=3.85×10^{-6} *6*; α(M)=4.78×10^{-7} *7*; α(N+..)=1.98×10^{-5} *3* α(N)=2.69×10^{-8} *4*; α(IPF)=1.98×10^{-5} *3*

$^{47}_{21}$Sc$_{26}$-2

^{47}Ca β^- decay 1987Ju04,1969Wo02,1966Fr14 (continued)

γ(^{47}Sc) (continued)

E_γ[†]	I_γ[b]	E_i(level)	J^π_i	E_f	J^π_f	Mult.	δ	α[‡]	Comments
1878.0 *5*	0.038 *4*	1878.2	9/2$^-$	0.0	7/2$^-$	(M1+E2)[‡]	−0.14[‡] *9*	0.000225 *4*	α=0.000225 *4*; α(K)=2.29×10^{-5} *4*; α(L)=2.00×10^{-6} *3*; α(M)=2.48×10^{-7} *4*; α(N+..)=0.000200 *4* α(N)=1.398×10^{-8} *20*; α(IPF)=0.000200 *4* I_γ: from 1969Wo02.

[†] From 1969Wo02, except as noted.
[‡] From the Adopted Gammas.
[#] From Iγ(41γ)/Iγ(808γ)=9.4×10^{-4} *9* (1969Wo02) and the decay scheme.
[@] From 1966Fr14.
[&] From the Adopted Gammas; not observed in β^- decay (evaluator).
[a] Mult from βγ-CP(1297γ) (1967Be20,1965Ma06) and Δπ. δ=−0.088 *24* (1965Ma06) or +0.035 *24* (1967Be20). Solutions with large δ are also possible but considered unlikely.
[b] For absolute intensity per 100 decays, multiply by 0.67 *13*.

$^{47}_{21}Sc_{26}$-3

^{47}Ca β^- decay 1987Ju04,1969Wo02,1966Fr14