^{50}K β^-n decay 1983RaZR,1982Ca04,1998Ba80

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	T. W. Burrows[a]	NDS 109,1879 (2008)	14-Jul-2008

Parent: ^{50}K: E=0.0; $J^\pi=0^-$; $T_{1/2}$=472 ms *4*; Q(β^-n)=7.87×10^3 *28*; %β^-n decay=29 *3*

^{50}K-E,$T_{1/2}$: From the ^{50}K Adopted Levels in 1995Bu09.

^{50}K-J^π: 0^-,1,2,3,4$^-$ from log *ft*=7.0 (log $f^{1u}t$=9.6) to 2^+ and 0^-,1,2$^-$ from log *ft*=5.9 (log $f^{1u}t$=8.6) to 0^+. 1998Ba80 confirm $J^\pi=0^-$ suggested by 1991Wa23 based on the systematics and theory of first-forbidden ΔJ=0 log *ft*′s in the A=34-44 region (1988Wa30). 1995Bu09 adopted (0^-,1,2$^-$) since a direct and accurate measurement of feeding to ^{50}Ca g.s. was required to confirm the suggestion of 1991Wa23.

^{50}K-Q(β^-n): from 2003Au03.

^{50}K-%β^-n decay: from 1982Ca04.

1983RaZR,1982Ca04: measured n′s, γ′s, and γn coincidences.

1998Ba80: potassium isotopes produced by bombarding 50 g/cm^2 UC_2 target with protons; mass separated in the ISOLDE magnet. Measured β^-′s (thin cylindrical plastic scin; near 4π geometry), γ′s (Ge), and β-γ coin and n′s (tof; 12 small NE102A scin for low energy; large curved plastic scin for high energy).

Others: see 1995Bu23.

Coincidences are from 1983RaZR.

^{49}Ca Levels

E(level)[†]	J^π[‡]	$T_{1/2}$	Comments
0.0	3/2$^-$	8.718 min *6*	%β^-=100 $T_{1/2}$,%β^-: from the Adopted Levels.
2023.0 *5*	1/2$^-$		
3356.8 *10*	(9/2$^+$)		
3585.0[‡] *8*	5/2$^-$		
3859.9 *9*	(1/2$^-$,3/2$^-$)		
4072.2 *10*	3/2$^-$		

[†] From least-squares fit to Eγ′s (evaluator), except as noted.
[‡] From the Adopted Levels.

γ(^{49}Ca)

Iγ normalization: from ΣI(γ+ce)(to g.s.)=100−ΣI(n)(to g.s.).

E$_\gamma$[†]	I$_\gamma$[†#]	E$_i$(level)	J_i^π	E$_f$	J_f^π	Mult.[‡]	α[@]	Comments
2023.0 *5*	100	2023.0	1/2$^-$	0.0	3/2$^-$	(M1,E2)	0.000314 *4*	α(K)=1.82×10^{-5} *9*; α(L)=1.56×10^{-6} *7*; α(M)=1.85×10^{-7} *9*; α(N+..)=0.00029 *4* α(N)=1.05×10^{-8} *5*; α(IPF)=0.00029 *4*
3356.7 *10*	5.6 *12*	3356.8	(9/2$^+$)	0.0	3/2$^-$	[E3]		
3859.7 *9*	7.9 *13*	3859.9	(1/2$^-$,3/2$^-$)	0.0	3/2$^-$			
4072.0 *10*	7.3 *20*	4072.2	3/2$^-$	0.0	3/2$^-$	(M1,E2)	0.001137 *16*	α(K)=6.02×10^{-6} *13*; α(L)=5.14×10^{-7} *11*; α(M)=6.11×10^{-8} *13*; α(N+..)=0.00113 *7* α(N)=3.48×10^{-9} *8*; α(IPF)=0.00113 *7*

[†] From 1998Ba80.
[‡] From the Adopted Gammas.
[#] For absolute intensity per 100 decays, multiply by 0.050 *11*.

Continued on next page (footnotes at end of table)

^{50}K β^-n decay 1983RaZR,1982Ca04,1998Ba80 (continued)

$\gamma(^{49}Ca)$ (continued)

[@] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

Delayed Neutrons (^{49}Ca)

Particle normalization: from 1982Ca04.

E(n)[†]	E(^{49}Ca)	I(n)[‡c]	E(^{50}Ca)[#]	Comments
151 *5*	0.0	9.2 *51*	6510	I(n)(rel.)=38 *21*.
446[@] *25*	3585.0	1.0 *3*	10430	I(n)(rel.)=4 *1*.
500 *10*	2023.0	11.6 *17*	8800	I(n)(rel.)=48 *6*.
642[@] *35*	4072.2	1.21 *26*	11050	I(n)(rel.)=5 *1*.
660[@] *35*	0.0	1.21 *26*	7030	I(n)(rel.)=5 *1*.
695 *23*	3356.8	1.31 *24*	10430	I(n)(rel.)=5.4 *9*.
844[@] *45*	2023.0	1.9 *7*	9230	I(n)(rel.)=8 *3*.
890[@] *45*	0.0	0.97 *25*	7260	I(n)(rel.)=4 *1*.
931[@] *40*	0.0	1.2 *5*	7300	I(n)(rel.)=5 *2*.
978 *36*	4072.2	1.79 *32*	11470	I(n)(rel.)=7.4 *12*.
1102[@] *60*	3585.0	1.5 *5*	11050	I(n)(rel.)=6 *2*.
1246 *34*	0.0	4.4 *15*	7610	I(n)(rel.)=18 *6*.
1300[&] *40*	3356.8	0.71 *8*	11050[a]	I(n)(rel.)=2.9 *3*.
1428[b] *30*	2023.0	0.75 *9*	9770	I(n)(rel.)=3.1 *3*.
1606[@] *85*	0.0	2.4 *10*	7990	I(n)(rel.)=10 *4*.
1741[@] *90*	3585.0	1.7 *5*	11470	I(n)(rel.)=7 *2*.
1845[@] *95*	0.0	2.7 *12*	8240	I(n)(rel.)=11 *5*.
2030[&] *60*	0.0	4.9 *5*	8430[a]	I(n)(rel.)=20 *1*.
2133 *67*	2023.0	2.4 *4*	10540	I(n)(rel.)=10.1 *13*.
2260[&] *70*	0.0	2.3 *4*	8660[a]	I(n)(rel.)=10 *1*.
2464 *54*	0.0	24.2 *12*	8800	I(n)(rel.)=100 *4*.
2827 *74*	0.0	15.7 *16*	9230	I(n)(rel.)=65 *4*.
3340 *96*	0.0	6.5 *7*	9770	I(n)(rel.)=27 *2*.
3.85×10^3 *11*	0.0	0.48 *6*	10430	I(n)(rel.)=2.0 *2*.
4.01×10^3 *12*	0.0	1.94 *27*	10540	I(n)(rel.)=8.0 *9*.
4.60×10^3 *12*	0.0	0.48 *6*	11050	I(n)(rel.)=2.0 *2*.
5.01×10^3 *12*	0.0	0.48 *6*	11470	I(n)(rel.)=2.0 *2*.

[†] Weighted average (internal) from 1983RaZR and 1998Ba80, except as noted.
[‡] Converted by evaluator from relative intensities to intensities per 100 decays by the β^-n decay mode. Normalization factor=0.242 *19*.
[#] From 1998Ba80, except as noted.
[@] From 1998Ba80. Not reported by 1983RaZR.
[&] From 1983RaZR. Not reported by 1998Ba80. I(n) renormalized by evaluator to I(n)(2464)=100.
[a] From the ^{50}Ca Adopted Levels in 1995Bu09.
[b] Weighted average (external) from 1983RaZR and 1998Ba80.
[c] For absolute intensity per 100 decays, multiply by 0.29 *3*.

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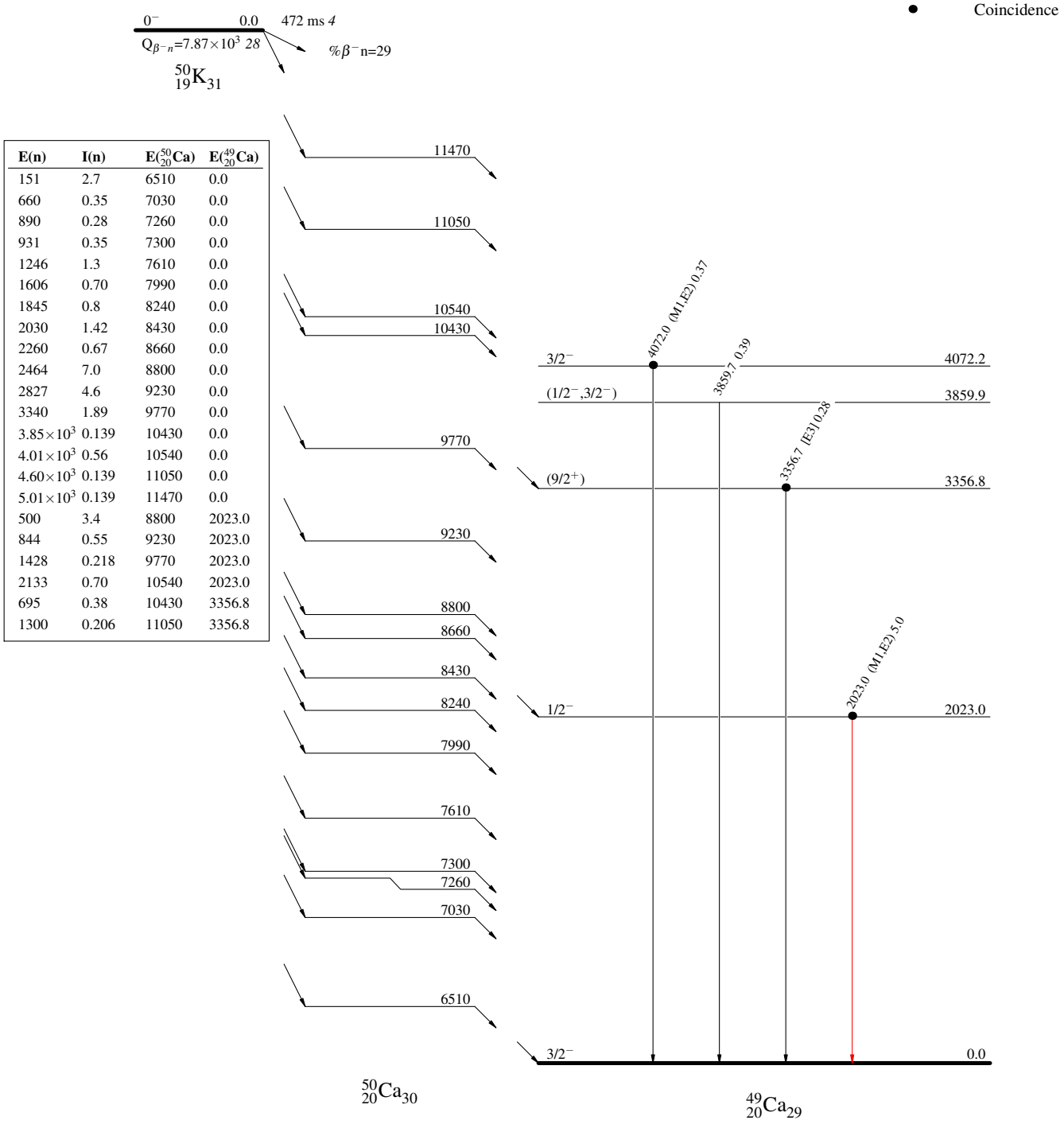
Decay Scheme

γ Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
I(n) Intensities: I(n) per 100 parent decays

Legend

● Coincidence



E(n)	I(n)	E($^{50}_{20}$Ca)	E($^{49}_{20}$Ca)
151	2.7	6510	0.0
660	0.35	7030	0.0
890	0.28	7260	0.0
931	0.35	7300	0.0
1246	1.3	7610	0.0
1606	0.70	7990	0.0
1845	0.8	8240	0.0
2030	1.42	8430	0.0
2260	0.67	8660	0.0
2464	7.0	8800	0.0
2827	4.6	9230	0.0
3340	1.89	9770	0.0
3.85×10^3	0.139	10430	0.0
4.01×10^3	0.56	10540	0.0
4.60×10^3	0.139	11050	0.0
5.01×10^3	0.139	11470	0.0
500	3.4	8800	2023.0
844	0.55	9230	2023.0
1428	0.218	9770	2023.0
2133	0.70	10540	2023.0
695	0.38	10430	3356.8
1300	0.206	11050	3356.8

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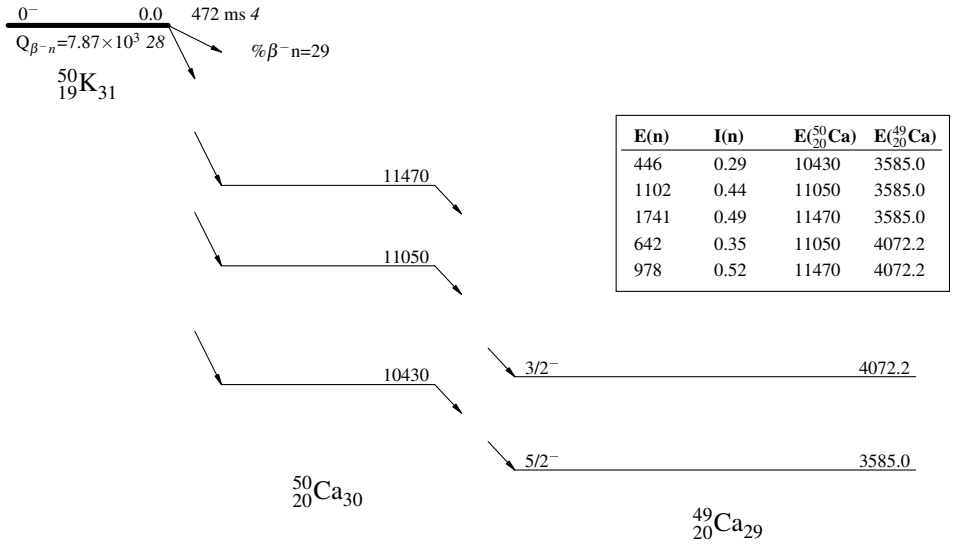
Decay Scheme (continued)

γ Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
I(n) Intensities: I(n) per 100 parent decays



E(n)	I(n)	E($^{50}_{20}$Ca)	E($^{49}_{20}$Ca)
446	0.29	10430	3585.0
1102	0.44	11050	3585.0
1741	0.49	11470	3585.0
642	0.35	11050	4072.2
978	0.52	11470	4072.2