

^{52}K β^- -n decay (110 ms) 1985Hu03,2006Pe16

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Wang Jimin and Huang Xiaolong		NDS 144, 1 (2017)	1-Mar-2016

Parent: ^{52}K : $E=0$; $J^\pi=(2^-)$; $T_{1/2}=110$ ms 6; $Q(\beta^-n)=11123$ 34; $\% \beta^-n$ decay=72 9

^{52}K - $T_{1/2}$: From Adopted Levels in ^{52}K .

^{52}K - $\% \beta^-n$ decay: $\% \beta^-n=72.2$ 93 (β - γ -n coin, 2006Pe16). Value of $\% \beta^-n=74.4$ 93 is also given by 2006Pe16 in text (section V-A, page 014313-10), this value includes $\% \beta^-2n$.

1985Hu03: Source produced by $U(p,X)$ $E=600$ MeV; measured β -delayed neutron yield, $\% \beta^-n=100$, $E(n)$, and $T_{1/2}=105$ ms 5.

2006Pe16: ^{52}K isotope produced in spallation reaction by bombarding a UC_x target by a 1.4 GeV proton beam produced by the CERN proton-synchrotron booster (PSB). Spallation products analyzed using the high resolution separator (HRS). Measured E_γ , $\gamma\gamma$, β , βn coin, $\beta n\gamma$ coin, $\beta\gamma$ coin, $\beta\gamma\gamma$. γ rays detected using two large Ge clusters from the MINIBALL array. Low energy neutrons detected using six detectors each composed of a thick BC400 plastic scintillator. High energy neutrons detected using 11 curved BC400 scintillating plastic bars from the TONNERRE array. β particles detected using a cylindrical plastic scintillator.

 ^{51}Ca Levels

E(level)	J^π^\dagger
0	$3/2^{(-)}$
1718 1	
2377 1	
2934 1	
3460 2	
3500 1	
4493 2	

† From Adopted Levels.

 $\gamma(^{51}\text{Ca})$

E_γ	I_γ^\dagger	$E_i(\text{level})$	E_f	J_f^π
1123 1	0.20 4	3500	2377	
1559 1	0.40 5	4493	2934	
1718 1	5.4 5	1718	0	$3/2^{(-)}$
2377 1	6.9 7	2377	0	$3/2^{(-)}$
2934 1	3.0 3	2934	0	$3/2^{(-)}$
3460 2	1.10 15	3460	0	$3/2^{(-)}$
3500 2	1.9 2	3500	0	$3/2^{(-)}$

† For absolute intensity per 100 decays, multiply by 0.72 9.

Delayed Neutrons (^{51}Ca)

$E(n)^\dagger$	$E(^{51}\text{Ca})$	$I(n)^{\#\#}$	$E(^{52}\text{Ca})$
240 5	1718	0.50 15	6660
280 10	2377	0.60 19	
330 30	1718	0.41 13	
380 10	2377	0.60 19	7460
480 20	0	4.3 11	5190
510 15	1718	0.41 13	6940

Continued on next page (footnotes at end of table)

^{52}K β^- -n decay (110 ms) [1985Hu03,2006Pe16](#) (continued)Delayed Neutrons (continued)

$E(n)^\dagger$	$E(^{51}\text{Ca})$	$I(n)^\ddagger$	$E(^{52}\text{Ca})$	Comments
730 20	1718	0.69 17	7160	
73×10^1 15	3500	1.5 5		E(n): 580-880 in Table VI of 2006Pe16 .
830 30	0	6.5 16	5550	E(n): 850 20 in 1985Hu03 . I(n): 3.2 3 in 1985Hu03 .
930 50	2934	0.99 26	8580	E(n): 880-980 in Table VI of 2006Pe16 .
950 40	3460	0.41 13	9130	
990 20	2377	2.6 5	8090	
1040 40	0	21.6	5760	E(n): 1080 20 in 1985Hu03 . I(n): 17.1 10 in 1985Hu03 .
1130 35	1718	0.99 24	7570	
1230 40	0	3.1 8	5950	
1260 40	2377	0.80 19	8370	
137×10^1 12	2934	0.91 24	8980	E(n): 1250-1480 in Table VI of 2006Pe16 .
1380 80	3460	0.41 11	9630	
1600 80	2377	1.10 24	8710	
1930 90	1718	2.2 5	8370	
1960 70	2934	0.69 19	9630	
2220 80	0	12 3	6940	E(n): 2270 40 in 1985Hu03 . I(n): 41.9 10 in 1985Hu03 .
226×10^1 15	3500	0.60 19	10500	
227×10^1 12	2377	0.50 13	9390	
288×10^1 51	3460	0.30 9		E(n): 2370-3390 in Table VI of 2006Pe16 .
305×10^1 25	2377	0.50 15	10140	
352×10^1 12	0	4.6 13	8290	E(n): 3440 60 in 1985Hu03 . I(n): 23.3 18 in 1985Hu03 .
360×10^1 20	1718	0.30 9	10140	
460×10^1 21	0	1.7 5	9390	E(n): 4400 80 in 1985Hu03 . I(n): 14.5 17 in 1985Hu03 .

[†] Delayed-neutron energy from ^{52}K β^- -n decay, energies in the lab system.

[‡] Delayed-neutron intensity per 100 ^{52}K β^- -n decays. The relative intensities given by [2006Pe16](#) have been multiplied by a factor of 0.216.

[#] For absolute intensity per 100 decays, multiply by 0.72 9.

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Decay Scheme

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

I(n) Intensities: Relative I(n)

