^{43}Cl β^- decay (3.13 s) 2006Wi10,1998WiZX,1981HuZT

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen[#]	NDS 126, 1 (2015)	31-Mar-2015

Parent: ^{43}Cl: E=0; J^π=(1/2$^+$); $T_{1/2}$=3.13 s *9*; Q(β^-)=7.69×10^3 *10*; %β^- decay=100.0

^{43}Cl-J^π,$T_{1/2}$: From Adopted Levels.

^{43}Cl-Q(β^-): From 2012Wa38.

2006Wi10: ^{43}Cl isotope produced by fragmentation of a ^{48}Ca beam at 70 MeV/nucleon hitting a ^{9}Be target. The fragments were separated by A1200 fragment separator at NSCL, MSU facility. Measured Eγ, Iγ, $\gamma\gamma$, β, $\beta\gamma$ coin using two Ge detectors for γ-rays and a plastic scintillator for β-rays. Comparisons with shell-model calculations.

1998WiZX (also 1998WiZV): fragmentation of ^{48}Ca beam E(^{48}Ca)=70 MeV/nucleon with a Be target. Measured γ, $\gamma\gamma$ coin, $\beta\gamma\gamma$ coin.

^{43}Cl identification and production: 1991Zh24 (also 1990Tu01), 1981Vo04, 1976Ka24.

Evaluators consider the decay scheme to be incomplete in view of several uncertain placements of γ transitions and unaccounted 28% *10* β feeding.

^{43}Ar Levels

E(level)[†]	J^π	E(level)[†]	E(level)[†]	E(level)[†]	J^π
0.0	5/2$^{(-)}$[‡]	1816.65? *23*	2798.4? *5*	4009.2? *3*	
762.02 *8*		1944.96? *21*	3374.8? *5*	4247.02 *18*	(3/2$^+$)[@]
1381.73 *7*		2344.4 *8*	3395.8? *3*	4289.0? *5*	
1441.43 *11*		2390.47 *15*	3425.5? *5*	4550.8? *4*	
1793.77 *11*	(3/2$^+$)[#]	2520.35 *13*	3549.4? *7*		

[†] From least-squares fit to Eγ data.
[‡] From Adopted Levels. 1998WiZX suggested 5/2$^-$ or 7/2$^-$.
[#] From shell-model prediction.
[@] Allowed β-decay from (1/2$^+$) parent.

β^- radiations

There is a total of 28% *10* unidentified β feeding (2006Wi10). Up to 8% can be associated with feeding to the ground state. It is possible that some of the unidentified feeding is associated with β-delayed neutron decay of ^{43}Cl.

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(3.14×10^3[‡] *10*)	4550.8?	0.53 *12*	5.7 *1*	av Eβ=1368 *49*
(3.40×10^3[‡] *10*)	4289.0?	1.6 *5*	5.4 *2*	av Eβ=1495 *49*
(3.44×10^3 *10*)	4247.02	5.8 *9*	4.9 *1*	av Eβ=1515 *49*
(3.68×10^3[‡] *10*)	4009.2?	0.66 *22*	5.9 *2*	av Eβ=1630 *49*
(4.14×10^3[‡] *10*)	3549.4?	0.33 *9*	6.5 *1*	av Eβ=1853 *49*
(4.26×10^3[‡] *10*)	3425.5?	0.74 *17*	6.2 *1*	av Eβ=1914 *49*
(4.29×10^3[‡] *10*)	3395.8?	1.28 *22*	6.0 *1*	av Eβ=1928 *49*
(4.32×10^3[‡] *10*)	3374.8?	0.19 *12*	6.8 *3*	av Eβ=1939 *49*
(4.89×10^3 *10*)	2798.4?	0.33 *8*	6.8 *1*	av Eβ=2220 *49*
(5.17×10^3 *10*)	2520.35	3.0 *5*	6.0 *1*	av Eβ=2356 *49*
(5.30×10^3 *10*)	2390.47	4.6 *7*	5.8 *1*	av Eβ=2420 *49*
(5.35×10^3 *10*)	2344.4	3	6.0	av Eβ=2442 *49*
(5.87×10^3 *10*)	1816.65?	0.98 *23*	6.7 *1*	av Eβ=2701 *49*

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^{43}Cl β^- decay (3.13 s) 2006Wi10,1998WiZX,1981HuZT (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(5.90×10^3 *10*)	1793.77	50 *7*	5.0 *1*	av Eβ=2712 *49*
(6.25×10^3 *10*)	1441.43	1.7 *6*	6.6 *2*	av Eβ=2885 *50*
(6.31×10^3 *10*)	1381.73	3.3 *6*	6.3 *1*	av Eβ=2914 *50*
(7.69×10^3[‡] *10*)	0.0	<8	>8.5[1u]	

[†] Absolute intensity per 100 decays.
[‡] Existence of this branch is questionable.

$\gamma(^{43}Ar)$

Iγ normalization: Deduced by 2006Wi10 from intensity of γ-rays from ^{43}Ar decay.

E$_\gamma$[†]	I$_\gamma$[†@]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$
352.13 *14*	2.1 *3*	1793.77	(3/2$^+$)	1441.43	
411.8 *3*	1.23 *19*	1793.77	(3/2$^+$)	1381.73	
619.56 *10*	2.25 *22*	1381.73		762.02	
679.24 *10*	10.0 *7*	1441.43		762.02	
726.58 *8*	4.94 *24*	2520.35		1793.77	(3/2$^+$)
761.81 *11*	100.0 *21*	762.02		0.0	5/2$^{(-)}$
903[‡&]		2344.4		1441.43	
948.96 *17*	1.69 *17*	2390.47		1441.43	
1008.82 *24*	0.68 *13*	2390.47		1381.73	
1031.84 *9*	89.7 *24*	1793.77	(3/2$^+$)	762.02	
1381.79 *7*	6.3 *4*	1381.73		0.0	5/2$^{(-)}$
1441.69[&] *23*	1.6 *3*	1441.43		0.0	5/2$^{(-)}$
1628.1[&] *6*	0.69 *14*	2390.47		762.02	
1631.8[&] *5*	1.29 *23*	3425.5?		1793.77	(3/2$^+$)
1758.2 *5*	0.31 *13*	2520.35		762.02	
1793.5[#] *6*	2.72 *17*	1793.77	(3/2$^+$)	0.0	5/2$^{(-)}$
1816.5[&] *3*	3.18 *24*	1816.65?		0.0	5/2$^{(-)}$
1933.3[&] *5*	0.34 *20*	3374.8?		1441.43	
1944.96[&] *21*	3.9 *3*	1944.96?		0.0	5/2$^{(-)}$
2036.4[&] *4*	0.57 *11*	2798.4?		762.02	
2108.0[&] *7*	0.58 *13*	3549.4?		1441.43	
2215.4[&] *3*	1.2 *3*	4009.2?		1793.77	(3/2$^+$)
2344[‡&]		2344.4		0.0	5/2$^{(-)}$
2344.0[&] *4*	2.7 *7*	4289.0?		1944.96?	
2390.5 *4*	5.1 *4*	2390.47		0.0	5/2$^{(-)}$
2430.0[&] *5*	1.46 *19*	4247.02	(3/2$^+$)	1816.65?	
2452.7 *6*	1.38 *17*	4247.02	(3/2$^+$)	1793.77	(3/2$^+$)
2805.43 *17*	2.9 *3*	4247.02	(3/2$^+$)	1441.43	
2865.7 *4*	0.83 *14*	4247.02	(3/2$^+$)	1381.73	
3109.3[&] *4*	0.93 *15*	4550.8?		1441.43	
3395.8[&] *3*	2.24 *20*	3395.8?		0.0	5/2$^{(-)}$
4247.0 *7*	3.5 *7*	4247.02	(3/2$^+$)	0.0	5/2$^{(-)}$

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^{43}Cl β^- decay (3.13 s) 2006Wi10,1998WiZX,1981HuZT (continued)

$\gamma(^{43}Ar)$ (continued)

† From 2006Wi10, unless otherwise stated.
‡ From 1981HuZT only.
# From 1998WiZX only.
@ For absolute intensity per 100 decays, multiply by 0.57 *8*.
& Placement of transition in the level scheme is uncertain.

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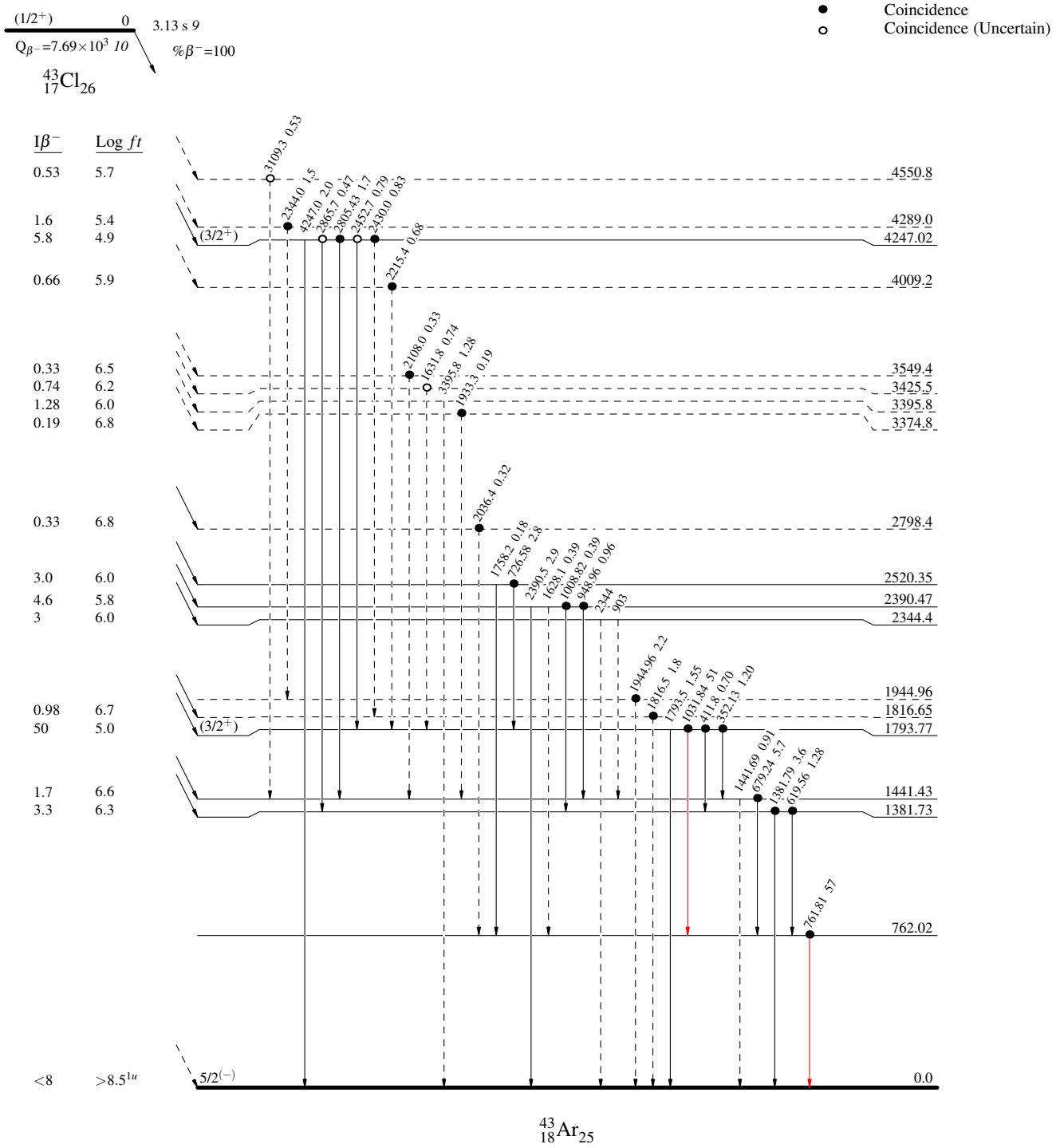
Decay Scheme

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

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)
- Coincidence
- Coincidence (Uncertain)



$^{43}_{18}Ar_{25}$