^{76}Kr ε decay (14.8 h)   **1973Pa02,1973Lo07**

	Type	Author	History Citation	Literature Cutoff Date
	Full Evaluation	Balraj Singh	NDS 74,63 (1995)	22-Dec-1994

Parent: ^{76}Kr: E=0.0; J$^{\pi}$=0$^+$; T$_{1/2}$=14.8 h *1*; Q(ε)=1311 *14*; %ε+%β^+ decay=100.0

Others: production of ^{76}Kr and T$_{1/2}$: 1979De39, 1963Do04, 1955Th01, 1954Ca03.

1973Pa02 report γ, $\gamma\gamma$, ce data. 1973Lo07 report γ, $\gamma\gamma$, ce (for two transitions), $\gamma\gamma$(t) and ce Ce(t) data using a mass-separated sample.

^{76}Br Levels

The 260 and 280 levels proposed by 1973Pa02 and 432, 808 and 932 levels proposed by 1973Lo07 have been omitted by the evaluator. The transitions connected with these levels have either not been confirmed or have been relocated.

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$[#]	Comments
0.0	1$^-$		
45.48 *11*	(2)$^-$	1.13 ns *6*	
102.64? *20*	(4)$^+$		Population of this level suggested by the evaluator.
150.51 *13*	($\leq$3)		
252.06 *12*	(2$^+$)	2.18 ns *9*	
315.68 *11*	1$^+$		
317.05 *12*	(2$^+$)		
355.28 *11*	1$^+$	0.5 ns *2*	
446.15 *16*	0$^+$,1$^+$		
451.98 *11*	1$^+$	0.4 ns *1*	
487.72 *20*	(0,1)		
548.5? *4*	($\leq$3)		Level proposed by the evaluator on the basis of (p,nγ) results.
616.02 *15*	1$^+$		
815.10 *23*	(0,1)		
868.15 *25*	1$^+$		
898.38 *16*	1$^+$		
936.47 *18*	1$^+$		
1047.78 *22*	1$^+$		

[†] From least-squares fit to Eγ's.
[‡] From Adopted Levels.
[#] From $\gamma\gamma$(t) and (ce)(ce)(t) data of 1973Lo07.

ε,β^+ radiations

E(decay)	E(level)	Iε[†]	Log ft	I(ε+β^+)[†]	Comments
(263 *14*)	1047.78	0.74 *8*	5.57 *9*	0.74 *8*	εK= 0.8703; εL= 0.1079 *7*; εM+= 0.02180 *15*
(375 *14*)	936.47	1.40 *15*	5.59 *7*	1.40 *15*	εK= 0.8731; εL= 0.1056 *3*; εM+= 0.02128 *7*
(413 *14*)	898.38	2.24 *22*	5.47 *6*	2.24 *22*	εK= 0.8737; εL= 0.10511 *25*; εM+= 0.02116 *6*
(443 *14*)	868.15	2.18 *23*	5.54 *6*	2.18 *23*	εK= 0.8741; εL= 0.10477 *22*; εM+= 0.02109 *5*
(496 *14*)	815.10	0.45 *9*	6.32 *10*	0.45 *9*	εK= 0.8747; εL= 0.10429 *17*; εM+= 0.02098 *4*
(695 *14*)	616.02	1.95 *22*	5.97 *6*	1.95 *22*	εK= 0.8762; εL= 0.10312; εM+=0.020707
(763[‡] *14*)	548.5?	0.20 *5*	7.0 *2*	0.20 *5*	εK=0.8765; εL=0.10286; εM+=0.20647
(823 *14*)	487.72	0.42 *5*	6.78 *6*	0.42 *5*	εK= 0.8767; εL= 0.10266; εM+=0.020602
(859 *14*)	451.98	26.2 *22*	5.03 *5*	26.2 *22*	εK= 0.8769; εL= 0.10256; εM+=0.020578
(865 *14*)	446.15	0.64 *9*	6.64 *7*	0.64 *9*	εK= 0.8769; εL= 0.10255; εM+=0.020574
(956 *14*)	355.28	10.4 *11*	5.52 *5*	10.4 *11*	εK= 0.8772; εL= 0.10232; εM+=0.020523
(994[‡] *14*)	317.05	<1.1	>6.5	<1.1	εK= 0.8773; εL= 0.10224; εM+=0.020504

Continued on next page (footnotes at end of table)

^{76}Kr ε decay (14.8 h)　　　**1973Pa02,1973Lo07 (continued)**

ε,β^+ radiations (continued)

E(decay)	E(level)	I$\varepsilon^{\dagger}$	Log ft	I$(\varepsilon+\beta^+)^{\dagger}$	Comments
(995 *14*)	315.68	55 *6*	4.83 *5*	55 *6*	εK= 0.8773; εL= 0.10224; εM+=0.020503
(1059‡ *14*)	252.06	<1.2	>6.5	<1.2	εK= 0.8774; εL= 0.10211; εM+=0.020475
(1160‡ *14*)	150.51	<0.10	>7.7	<0.10	εK= 0.8770; εL= 0.10188; εM+=0.020423
(1208‡ *14*)	102.64?	<0.40	>7.1	<0.40	av Eβ=　　95 *9*; εK= 0.8760; εL= 0.10168 *12*; εM+=0.020380 *25*
(1266‡ *14*)	45.48	<4	>7.0^{1u}	<4	εK= 0.8748; εL= 0.10386; εM+=0.020848
(1311‡ *14*)	0.0	<6	>6.0	<6	av Eβ=　　139 *9*; εK= 0.8692 *24*; εL= 0.1007 *3*; εM+= 0.02019 *6*

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

$\gamma(^{76}$Br$)$

Iγ normalization: assumed no ε, β^+ feeding to g.s. From I$\gamma(\gamma^{\pm})$, 1973Pa02 deduced that feeding to g.s. Was<6%.

E$_{\gamma}^{\dagger}$	I$_{\gamma}^{\dagger b}$	E$_i$(level)	J$_i^{\pi}$	E$_f$	J$_f^{\pi}$	Mult.‡	δ	α^c	Comments
35.6^a *2*	0.22 *5*	487.72	(0,1)	451.98	1$^+$	[M1]		2.2	I$_{\gamma}$: 0.69 *9* (1973Lo07).
38.0^{ae} *3*	0.35 *9*	936.47	1$^+$	898.38	1$^+$	[M1]		1.8	
40.0 *5*	0.14 *3*	355.28	1$^+$	315.68	1$^+$	[M1]		1.6	
45.5 *2*	50 *5*	45.48	(2)$^-$	0.0	1$^-$	M1		1.066	Mult.: α(K)exp=0.96 *9* (1973Pa02), 1.06 *8* (1973Lo07). α(L)exp + α(M)exp=0.13 (1973Pa02).
57.2 *2*	0.14 *3*	102.64?	(4)$^+$	45.48	(2)$^-$	M2		9.71	Placement suggested on the basis of ^{76}Br IT decay. Mult.: from adopted gammas. 1973Pa02 give α(K)exp=4.1, α(L)exp+α(M)exp=0.96. α(K)exp is too low for mult=M2.
63.6 *2*	0.17 *4*	315.68	1$^+$	252.06	(2$^+$)	M1(+E2)	<0.2	0.41	I$_{\gamma}$: 0.43 *7* (1973Lo07). Mult.: α(K)exp=0.46 (1973Pa02).
^{x}76.3$^{\#e}$	0.35 *9*								Placement with 432 level (1973Lo07) not adopted (evaluator).
91.1 *2*	0.53 *11*	446.15	0$^+$,1$^+$	355.28	1$^+$	M1(+E2)	<0.35	0.15	I$_{\gamma}$: 2.1 *5* (1973Lo07). Mult.: α(K)exp=0.16 *2* (1973Pa02).
96.6 *2*	0.28 *6*	451.98	1$^+$	355.28	1$^+$	M1(+E2)	<0.25	0.127	I$_{\gamma}$: 0.60 *9* (1973Lo07). Mult.: α(K)exp=0.15 *1* (1973Pa02).
103.3 *2*	8.5 *9*	355.28	1$^+$	252.06	(2$^+$)	M1(+E2)	<0.15	0.106	Mult.: α(K)exp=0.10 *1* (1973Pa02), 0.113 *7* (1973Lo07). α(L)exp + α(M)exp=0.019 *3* (1973Pa02).
104.9 *2*	0.42 *9*	150.51	($\leq$3)	45.48	(2)$^-$	[D]		0.1	
^{x}113.4$^{\#e}$ *3*	0.35 *9*								
^{x}121.3$^{\#e}$ *3*	0.51 *9*								
134.9 *2*	6.5 *7*	451.98	1$^+$	317.05	(2$^+$)	(M1)		0.051	Mult.: α(K)exp=0.044 *4*, α(L)exp + α(M)exp=0.0064 *9* for 134.9γ+136.4γ consistent with M1 for both γ's (1973Pa02).
136.4 *2*	2.7 *3*	451.98	1$^+$	315.68	1$^+$	(M1)		0.050	Mult.: see comment for 134.9γ.
^{x}141.9$^{\#e}$ *3*	0.51 *14*								
150.5^d *2*	<0.50^d	150.51	($\leq$3)	0.0	1$^-$	[D]		0.04	
150.5^{de} *2*	<0.5^d	252.06	(2$^+$)	102.64?	(4)$^+$				Placement suggested by the evaluator.

^{76}Kr ε decay (14.8 h)   1973Pa02,1973Lo07 (continued)

$\gamma(^{76}$Br) (continued)

$E_\gamma{}^\dagger$	$I_\gamma{}^{\dagger b}$	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	δ	α^c	Comments
166.7 2	0.42 9	317.05	(2$^+$)	150.51	(≤3)	[M1]		0.03	
171.0^{ae} 3	0.35 9	487.72	(0,1)	317.05	(2$^+$)	[M1,E2]		0.08 4	From 1973Lo07 only.
^{x}179.9$^{\#e}$	0.43 9								Placement with 432 level (1973Lo07) not adopted (evaluator).
^{x}192.0 4	0.11 3								1973Pa02 suggested placement from 452 level to 260 level (not adopted by the evaluator).
199.8 2	3.0 3	451.98	1$^+$	252.06	(2$^+$)	M1+E2	0.6 2	0.031 5	Mult.,δ: α(K)exp=0.027 3 (1973Pa02).
214.5 3	0.78 8	317.05	(2$^+$)	102.64?	(4)$^+$	[M1,E2]		0.04 2	Placement suggested by the evaluator on the basis of (135γ)(214γ) (1973Lo07).
232.7 3	0.14 3	1047.78	1$^+$	815.10	(0,1)	[M1,E2]		0.026 13	
^{x}234.7$^{\&e}$ 3	0.34 7								Placement with 280 level (1973Pa02) not adopted (evaluator).
^{x}239.0$^{\#e}$ 3	0.69 9								
252.0 2	16 2	252.06	(2$^+$)	0.0	1$^-$	E1		0.0057	Mult.: from α(K)exp=0.0060 5 (1973Pa02).
270.2 2	54 6	315.68	1$^+$	45.48	(2)$^-$	(E1)		0.0047	Mult.: α(K)exp(270γ+272γ)= 0.0044 4 (1973Pa02) consistent with E1 for both γ's.
271.6 2	11 1	317.05	(2$^+$)	45.48	(2)$^-$	(E1)		0.0046	Mult.: see comment for 270γ.
295.0 3	0.50 10	446.15	0$^+$,1$^+$	150.51	(≤3)			<0.02	
299.0 2	2.2 3	616.02	1$^+$	317.05	(2$^+$)	(M1,E2)		0.012 5	Mult.: α(K)exp=0.010 2 for 299.0γ+300.2γ (1973Pa02).
300.2 2	1.1 3	616.02	1$^+$	315.68	1$^+$	(M1,E2)		0.012 5	
309.8 2	6.6 7	355.28	1$^+$	45.48	(2)$^-$				
315.7 2	100 10	315.68	1$^+$	0.0	1$^-$	E1		0.0030	Mult.: α(K)exp=0.0026 2, α(L)exp+α(M)exp=0.00031 4 (1973Pa02).
317.2 4	1.2 4	317.05	(2$^+$)	0.0	1$^-$				I_γ: from $\gamma\gamma$ (1973Lo07 only).
355.3 2	12 2	355.28	1$^+$	0.0	1$^-$				
364.0 3	1.5 2	616.02	1$^+$	252.06	(2$^+$)				
406.5 2	31 3	451.98	1$^+$	45.48	(2)$^-$	E1		0.0015	Mult.: α(K)exp=0.0016 3 (1973Pa02).
^{x}428.5$^{\#e}$ 5	0.43 11								
431.6 4	0.20 4	1047.78	1$^+$	616.02	1$^+$				I_γ: 0.60 12 (1973Lo07).
^{x}438.6$^{\#e}$ 4	0.35 9								
446.2^d 3	<1.0^d	446.15	0$^+$,1$^+$	0.0	1$^-$				
446.2^d 3	<1.0^d	898.38	1$^+$	451.98	1$^+$				Placement from 1973Lo07.
451.9 2	25 3	451.98	1$^+$	0.0	1$^-$				
452^e 1		898.38	1$^+$	446.15	0$^+$,1$^+$				Placement suggested by the evaluator on the basis of (452γ)(91γ) (1973Lo07).
459.4$^{\&e}$ 5	0.11 3	815.10	(0,1)	355.28	1$^+$				
^{x}473.1$^{@e}$ 3	0.86 12								
484.5 4	0.17 4	936.47	1$^+$	451.98	1$^+$				
490.2 4	0.47 10	936.47	1$^+$	446.15	0$^+$,1$^+$				
499.6 3	1.2 2	815.10	(0,1)	315.68	1$^+$				
^{x}520.9$^{\#e}$ 3	0.51 9								
543.2 4	0.75 8	898.38	1$^+$	355.28	1$^+$				

^{76}Kr ε decay (14.8 h)　　　**1973Pa02,1973Lo07 (continued)**

$\gamma(^{76}$Br) (continued)

$E_\gamma{}^\dagger$	$I_\gamma{}^{\dagger b}$	E_i(level)	J_i^π	E_f	J_f^π	Comments
548.5^e 4	0.50 10	548.5?	($\leq$3)	0.0	1$^-$	Placement suggested by the evaluator.
552.5 3	4.3 5	868.15	1$^+$	315.68	1$^+$	
570.8^{ae} 4	0.35 12	616.02	1$^+$	45.48	(2)$^-$	From 1973Lo07 only (probably a contaminant from ^{76}Br ε decay).
^{x}576.0 3	0.31 7					
581.5 3	1.3 2	898.38	1$^+$	317.05	(2$^+$)	
581.8^{ae} 5		936.47	1$^+$	355.28	1$^+$	I_γ: not available.
582.5 3	2.9 3	898.38	1$^+$	315.68	1$^+$	
^{x}599.2$^{@e}$ 4	0.51 18					
619.5 4	1.0 1	936.47	1$^+$	317.05	(2$^+$)	
^{x}640.9$^{\#e}$ 4	0.51 18					
^{x}666.0$^{@e}$ 4	0.35 14					
684.3 4	0.39 8	936.47	1$^+$	252.06	(2$^+$)	I_γ: 0.86 18 (1973Lo07).
730.8 4	0.50 10	1047.78	1$^+$	317.05	(2$^+$)	
795.8 4	0.75 8	1047.78	1$^+$	252.06	(2$^+$)	
822.5 6	0.64 7	868.15	1$^+$	45.48	(2)$^-$	
853.0 5	0.36 8	898.38	1$^+$	45.48	(2)$^-$	
868.2 5	0.64 7	868.15	1$^+$	0.0	1$^-$	
891.0$^{\&e}$ 5	0.31 7	936.47	1$^+$	45.48	(2)$^-$	
898.5 5	0.42 9	898.38	1$^+$	0.0	1$^-$	
^{x}911.0$^{\&e}$ 10	0.31 7					
936.0$^{\&e}$ 10	0.28 6	936.47	1$^+$	0.0	1$^-$	
1002.0$^{\&e}$ 10	0.31 7	1047.78	1$^+$	45.48	(2)$^-$	
^{x}1030.3$^{@e}$ 5	0.69 26					
^{x}1070.3$^{@e}$ 5	0.77 26					

† From 1973Pa02 unless otherwise stated.
‡ From ce data (1973Pa02,1973Lo07).
$^\#$ Reported by 1973Lo07 only. Treated as uncertain by the evaluator.
$^@$ Reported by 1973Lo07 only. Probably contributed by ^{76}Br decay.
$^\&$ Reported by 1973Pa02 only. Treated as uncertain by the evaluator.
^{a} Placement from 1973Lo07.
^{b} For absolute intensity per 100 decays, multiply by 0.39 2.
^{c} 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.
^{d} Multiply placed with undivided intensity.
^{e} Placement of transition in the level scheme is uncertain.
^{x} γ ray not placed in level scheme.

^{76}Kr ε decay (14.8 h)   1973Pa02,1973L007

Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
& Multiply placed: undivided intensity given

Legend

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

$Q_\varepsilon = 1311\ 14$

$^{76}_{36}$Kr$_{40}$ 0$^+$ 0.0   14.8 h l

%ε + %β$^+$ = 100

Transitions (energy, intensity, multipolarity):

1002.0 0.12
795.8 0.29
730.8 0.20
431.6 0.078
232.7 [M1,E2] 0.056
936.0 0.109
891.0 0.12
684.3 0.15
619.5 0.43
581.8 0.12
490.2 0.18
484.5 0.066
38.0 [M1] 0.38
898.5 0.16
853.0 0.14
582.5 1.13
581.5 0.55
543.2 0.29
452
446.2 <0.39&
868.2 0.25
822.5 0.25
552.5 1.68
499.6 0.51
459.4 0.043
570.8 0.14
364.0 0.62
300.2 (M1,E2) 0.43
299.0 (M1,E2) 0.87
548.5 0.20
171.0 [M1,E2] 0.15
35.6 [M1] 0.27
451.9 9.8
406.5 E1 12.1
199.8 M1+E2 1.21
136.4 (M1) 1.11
134.9 (M1) 2.7
96.6 M1(+E2) 0.12
446.2 <0.39&
295.0 0.20
91.1 M1(+E2) 0.24
355.3 5.1
309.8 2.6
103.3 M1(+E2) 3.7
40.0 [M1] 0.14
317.2 0.47
271.6 (E1) 4.7
214.5 [M1,E2] 0.32
166.7 [M1] 0.17
315.7 E1 39
270.2 (E1) 21
63.6 M1(+E2) 0.093
252.0 E1 6.6
150.5 <0.195&
150.5 [D] <0.203&
104.9 [D] 0.18
57.2 M2 0.58
45.5 M1 40

Levels (energy, I_ε, Log ft, half-life, J$^\pi$):

Level	J$^\pi$	$T_{1/2}$	I_ε	Log ft
1047.78	1$^+$		0.74	5.57
936.47	1$^+$		1.40	5.59
898.38	1$^+$		2.24	5.47
868.15	1$^+$		2.18	5.54
815.10	(0,1)		0.45	6.32
616.02	1$^+$		1.95	5.97
548.5	(<3)		0.20	7.0
487.72	(0,1)		0.42	6.78
451.98	0$^+$,1$^+$	0.4 ns l	26.2	5.03
446.15	1$^+$		0.64	6.64
355.28	1$^+$	0.5 ns 2	10.4	5.52
317.05	(2$^+$)		<1.1	>6.5
315.68	1$^+$		55	4.83
252.06	(2$^+$)	2.18 ns 9	<1.2	>6.5
150.51	(<3)		<0.10	>7.7
102.64	(4)$^+$		<0.40	>7.1
45.48	(2)$^-$	1.13 ns 6	<4	>7.0^{lu}
0.0	1$^-$		<6	>6.0

$^{76}_{35}$Br$_{41}$

From ENSDF