^{76}Kr $\varepsilon+\beta^+$ decay (14.79 h) 1973Pa02,1973Lo07

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, Jun Chen and Ameenah R. Farhan	NDS 194,3 (2024)	8-Jan-2024

Parent: ^{76}Kr: E=0.0; $J^\pi=0^+$; $T_{1/2}$=14.79 h *5*; Q(ε)=1275 *10*; %ε+%β^+ decay=100

^{76}Kr-$T_{1/2}$: From ^{76}Kr Adopted Levels.

^{76}Kr-Q(ε): From 2021Wa16.

1973Pa02: ^{76}Kr source produced in ^{79}Br(p,4n),E=45 MeV reaction at the McGill synchrocyclotron. Measured Eγ, Iγ, $\gamma\gamma$-coin, ce data and and half-life of 14.6 h *2* from γ-decay curves using Ge(Li) detectors for γ radiation and Si detector for electrons Contaminant γ rays were from decays of ^{76}Br and ^{79}Kr. Authors quoted, in their Table 2, earlier conversion electron data for 45.5-, (57.2- or 71$^-$), 63.7-, 91.1-, 95.1-, 104-, 135-, 143-, 269- and 315-keV transitions from Ph.D. thesis by A. Carter, McGill University (1958).

1973Lo07: mass-separated sources of ^{76}Kr produced at ISOLDE-CERN using 600-MeV synchrocyclotron facility. Measured Eγ, Iγ, $\gamma\gamma$-coin, ce (for two transitions), $\gamma\gamma$(t) and (ce)(ce)(t) data. Contaminant γ rays were from decays of ^{76}Br, ^{75}Br and ^{77}Kr.

Others:

1979De39: measured thick-target yield in ^{76}Se(^{3}He,n) and ^{77}Se(^{3}He,4n), both at E(^{3}He)=38.5 MeV.

1963Do04: ^{76}Kr produced in spallation reaction: Ag,U(p,X),E=3,30 GeV, and ^{74}Se(α,2n),E=30 MeV at the Brookhaven National Laboratory. Measured γ-ray spectra, and half-life of 14.8 h *1* for the decay of ^{76}Kr by growth and decay method. Reported 39-, 73-, 104-, 135-, 197-, 267-, 316-, 360-, 407- and 452-keV γ rays.

1955Th01: ^{76}Kr produced in ^{79}Br(p,4n),E=60 MeV. Measured γ spectrum and half-life of ^{76}Kr decay.

1954Ca03: ^{76}Kr produced and identified in spallation reaction: Y(p,X),E=150, 175, 240 MeV from Rochester cyclotron. Measured half-life of 9.7 h *5* for the decay of ^{76}Kr.

^{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 evaluators. The transitions connected with these levels have either not been confirmed or have been relocated.

E(level)†	J^π‡	$T_{1/2}$#	Comments
0.0	1^-		
45.50 *11*	$(2)^-$	1.13 ns *6*	
102.66 *20*	$(4)^+$	1.31 s *2*	%IT>99.4; %ε+%β^+<0.6 Population of this level suggested by evaluators.
150.52 *13*	(0,1,2)		
252.05 *12*	$(2)^+$	2.18 ns *9*	
315.68 *11*	1^+		
317.08 *12*	(2^+)		
355.28 *11*	1^+	0.5 ns *2*	
446.15 *16*	$(1)^+$		
451.96 *11*	1^+	0.4 ns *1*	
487.56? *23*			
548.5? *4*	(0,1,2)		Level proposed by evaluators on the basis of (p,nγ) results.
616.02 *16*	$1^{(+)}$		
815.2 *3*	0,1		
868.16 *25*	1^+		
898.36 *17*	1^+		
936.44 *22*	1^+		
1047.83 *23*	1^+		

† From a least-squares fit to Eγ data, not including the transitions which are uncertain placements.

‡ From Adopted Levels.

From $\gamma\gamma$(t) and (ce)(ce)(t) data of 1973Lo07.

^{76}Kr $\varepsilon+\beta^+$ decay (14.79 h) 1973Pa02,1973Lo07 (continued)

ε,β^+ radiations

av Eβ: Additional information 1.

E(decay)	E(level)	Iβ^+ ‡	Iε‡	Log *ft*	I($\varepsilon+\beta^+$)†‡	Comments
(227 *10*)	1047.83		0.84 *11*	5.33 *10*	0.84 *11*	εK=0.8711 *9*; εL=0.1072 *6*; εM+=0.02174 *21*
(339 *10*)	936.44		1.44 *17*	5.46 *+9–8*	1.44 *17*	εK=0.8751 *5*; εL=0.10396 *34*; εM+=0.02099 *15*
(377 *10*)	898.36		2.01 *34*	5.41 *+11–10*	2.01 *34*	εK=0.8759 *5*; εL=0.10331 *30*; εM+=0.02084 *14*
(407 *10*)	868.16		2.11 *20*	5.46 *7*	2.11 *20*	εK=0.8764 *4*; εL=0.10288 *28*; εM+=0.02074 *14*
(460 *10*)	815.2		0.39 *6*	6.30 *+10–9*	0.39 *6*	εK=0.8771 *4*; εL=0.10228 *25*; εM+=0.02060 *12*
(659 *10*)	616.02		1.78 *17*	5.96 *6*	1.78 *17*	εK=0.87882 *33*; εL=0.10089 *19*; εM+=0.02028 *11*
(727# *10*)	548.5?		0.14 *5*	7.15 *+21–15*	0.14 *5*	εK=0.87918 *32*; εL=0.10060 *18*; εM+=0.02021 *11*
(787# *10*)	487.56?		0.7 *3*	6.52 *+26–17*	0.7 *3*	εK=0.87946 *31*; εL=0.10038 *18*; εM+=0.02017 *11*
(823 *10*)	451.96		24.9 *19*	5.01 *5*	24.9 *19*	εK=0.87959 *31*; εL=0.10027 *17*; εM+=0.02013 *10*
(829 *10*)	446.15		0.9 *5*	6.5 *+4–2*	0.9 *5*	εK=0.87962 *31*; εL=0.10025 *17*; εM+=0.02013 *10*
(920 *10*)	355.28		10.2 *9*	5.49 *5*	10.2 *9*	εK=0.87992 *30*; εL=0.10001 *17*; εM+=0.02007 *10*
(958# *10*)	317.08					εK=0.8771; εL=0.10236 *3*; εM+=0.020533 *6* I($\varepsilon+\beta^+$): intensity balance gives 0.6% *6*, consistent with no β feeding.
(959 *10*)	315.68		53.3 *31*	4.81 *4*	53.3 *31*	εK=0.88003 *30*; εL=0.09992 *16*; εM+=0.02005 *10*
(1023# *10*)	252.05					εK=0.8773; εL=0.10222 *2*; εM+=0.020500 *5* I($\varepsilon+\beta^+$): intensity balance gives 0.3% *6*, consistent with no β feeding.
(1125# *10*)	150.52					I($\varepsilon+\beta^+$): intensity balance gives −0.08% *18*, consistent with no β feeding.
(1172# *10*)	102.66					I($\varepsilon+\beta^+$): intensity balance gives 0.4% *3*, consistent with no β feeding.
(1230# *10*)	45.50	1.664×10^{-5}	<0.09998	>8.5[1u]	<0.1	av Eβ=106 *5*; εK=0.87786 *32*; εL=0.10157 *18*; εM+=0.02040 *11* I($\varepsilon+\beta^+$): intensity balance gives −3% *3*, consistent with no β feeding.
(1275# *10*)	0.0	<0.026	<6.0	>6.0	<6	av Eβ=114 *4*; εK=0.8768 *8*; εL=0.09896 *17*; εM+=0.01984 *10* I($\varepsilon+\beta^+$): <6% deduced from measured x-ray intensity (1973Pa02); −5% *5* (1973Lo07) deduced from measured I($K_{\alpha1}+K_{\alpha2}$ x rays)/Iγ(45.5γ) = 2.87 *15* and α(K)exp for 45.5γ. Value of log *ft*>5.9 for first-forbidden transition gives I($\varepsilon+b^+$)<8%.

† From γ-intensity balance at each level. Average β feeding was taken from intensity balances by including and excluding uncertain γ ray placements (marked with ?) in calculating the intensity balances.

‡ Absolute intensity per 100 decays.

Existence of this branch is questionable.

^{76}Kr $\varepsilon+\beta^+$ decay (14.79 h) 1973Pa02,1973Lo07 (continued)

$\gamma(^{76}Br)$

Iγ normalization: From summed transition intensity=97 *3*, based on measured I($\gamma^{\pm}$)≤1.00, relative to 100 for 315.8γ in 1973Pa02, from which deduced g.s. feeding is <6% (or 3% *3*). Note that ≈3% intensity may be associated with unplaced γ rays, but with questionable isotopic assignment. The γ-normalization factor of 0.373 *24* can be compared with 0.358 *36* in 1973Pa02.

I(x rays)=1.70 *17* relative to 100 for 315.8γ (1973Pa02). I($K_{\alpha1}+K_{\alpha2}$ x rays)/Iγ(45.5γ)=2.87 *15* (1973Lo07).

E_γ[‡]	I_γ[‡d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
35.60[bf] *15*	0.46 *24*	487.56?		451.96	1^+	[D]	2.1 *4*	%Iγ=0.17 *9* E_γ: from 1973Lo07. Other: 35.6 *2* (1973Pa02), placed from 316 level. I_γ: unweighted average of 0.22 *5* (1973Pa02) and 0.69 *9* (1973Lo07). Mult.: possible dipole since total conversion coefficient of 37.5 for E2 may make it difficult to observe this γ ray.
38.0[bf] *3*	0.34 *9*	936.44	1^+	898.36	1^+	[M1]	1.78 *5*	%Iγ=0.128 *35* α(K)=1.57 *4*; α(L)=0.178 *5*; α(M)=0.0283 *8* α(N)=0.00261 *7*
39.5 *2*	0.15 *5*	355.28	1^+	315.68	1^+	[M1]	1.590 *32*	%Iγ=0.057 *19* α(K)=1.404 *29*; α(L)=0.1585 *32*; α(M)=0.0252 *5* α(N)=0.00233 *5* E_γ: weighted average of 40.0 *6* (1973Pa02) and 39.4 *2* (1973Lo07). I_γ: weighted average of 0.14 *3* (1973Pa02) and 0.34 *12* (1973Lo07).
45.50 *15*	47.8 *34*	45.50	$(2)^-$	0.0	1^-	M1	1.056 *18*	%Iγ=18.0 *11* α(K)exp=0.96 *9*; α(L)exp+α(M)exp=0.13 (1973Pa02); α(K)exp=1.06 *8* (1973Lo07) α(K)=0.932 *16*; α(L)=0.1051 *18*; α(M)=0.01673 *28* α(N)=0.001545 *26* E_γ: weighted average of 45.5 *2* (1973Pa02) and 45.50 *15* (1973Lo07). I_γ: weighted average of 50 *5* (1973Pa02) and 46.8 *34* (1973Lo07). Absolute Ice(K)=17.5 *8*, Ice(L+M)=2.28 (1973Pa02). Ice(L+M) is deduced from Ice(L+M)(45.5γ)+Ice(K)(57.2γ)=2.55 *16*.
57.1 *2*	0.20 *6*	102.66	$(4)^+$	45.50	$(2)^-$	M2	9.59 *19*	α(K)exp=4.1; α(L)exp+α(M)exp=0.96 (1973Pa02) %Iγ=0.075 *23* α(K)=8.10 *16*; α(L)=1.263 *25*; α(M)=0.205 *4* α(N)=0.0183 *4* E_γ: weighted average of 57.2 *2* (1973Pa02) and 57.0 *2* (1973Lo07). Placement suggested on the basis of ^{76}Br IT decay; placed from 317 to 260 level by 1973Pa02; unplaced in 1973Lo07. I_γ: unweighted average of 0.14 *3* (1973Pa02) and 0.26 *5* (1973Lo07). Mult.: from the Adopted dataset. α(K)exp in 1973Pa02 is too low to be consistent with mult=M2. Absolute Ice(K)=0.27, Ice(L+M)(57.2γ)+Ice(K)(63.6γ)=0.078 *7* (1973Pa02). Ice(K) is deduced from Ice(L+M)(45.5γ)+Ice(K)(57.2γ)=2.55 *16*. α(L+M)exp from 1958−Carter work cited in Table 2 of 1973Pa02.

From ENSDF

$^{76}_{35}Br_{41}$-3

^{76}Kr $\varepsilon+\beta^+$ decay (14.79 h) 1973Pa02,1973Lo07 (continued)

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

E_γ[‡]	I_γ[‡d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[†]	Comments
63.7 *2*	0.30 *13*	315.68	1^+	252.05	$(2)^+$	M1(+E2)	<0.2	0.48 *8*	α(K)exp=0.46 (1973Pa02) %Iγ=0.11 *5* α(K)=0.42 *7*; α(L)=0.053 *13*; α(M)=0.0084 *20* α(N)=0.00074 *16* E_γ: weighted average of 63.6 *2* (1973Pa02) and 63.8 *2* (1973Lo07). I_γ: unweighted average of 0.17 *4* (1973Pa02) and 0.43 *7* (1973Lo07). Absolute Ice(K)(63.6γ)+Ice(L+M)(57.2γ)=0.078 *7* (1973Pa02). α(K)exp from 1958-Carter work cited in Table 2 of 1973Pa02.
[x]76.3[@c] *3*	0.34[@] *9*								%Iγ=0.128 *35* E_γ: placement from 432 level in 1973Lo07 is not adopted (evaluators).
91.0 *2*	1.3 *8*	446.15	$(1)^+$	355.28	1^+	M1(+E2)	<0.35	0.21 *6*	α(K)exp=0.16 *2* (1973Pa02) %Iγ=0.49 *30* α(K)=0.18 *5*; α(L)=0.022 *8*; α(M)=0.0036 *12* α(N)=3.2×10^{-4} *10* E_γ: weighted average of 91.1 *2* (1973Pa02) and 90.9 *2* (1973Lo07). I_γ: unweighted average of 0.53 *11* (1973Pa02) and 2.1 *4* (1973Lo07). Absolute Ice(K)=0.030 *2* (1973Pa02).
96.7 *2*	0.44 *16*	451.96	1^+	355.28	1^+	M1(+E2)	<0.25	0.151 *26*	α(K)exp=0.15 *1* (1973Pa02) %Iγ=0.17 *6* α(K)=0.133 *22*; α(L)=0.0156 *33*; α(M)=0.0025 *5* α(N)=0.00022 *4* E_γ: weighted average of 96.6 *2* (1973Pa02) and 96.7 *2* (1973Lo07). I_γ: unweighted average of 0.28 *6* (1973Pa02) and 0.60 *9* (1973Lo07). Absolute Ice(K)=0.015 *3* (1973Pa02).
103.24 *15*	9.2 *9*	355.28	1^+	252.05	$(2)^+$	M1(+E2)	<0.15	0.112 *8*	α(K)exp=0.10 *1*; α(L)exp+α(M)exp=0.019 *3* (1973Pa02); α(K)exp=0.113 *7* (1973Lo07) %Iγ=3.5 *4* α(K)=0.099 *7*; α(L)=0.0112 *9*; α(M)=0.00179 *15* α(N)=0.000164 *12* E_γ: weighted average of 103.3 *2* (1973Pa02) and 103.20 *15* (1973Lo07). I_γ: weighted average of 8.5 *9* (1973Pa02) and 9.8 *9* (1973Lo07). Absolute Ice(K)=0.300 *10*, Ice(L+M)=0.061 *8* (1973Pa02).
104.9 *2*	0.42 *9*	150.52	(0,1,2)	45.50	$(2)^-$	[D]		0.087 *14*	%Iγ=0.16 *4* E_γ: weighted average of 104.9 *2* (1973Pa02) and 105.0 *3* (1973Lo07). I_γ: other: 0.086 *26* (1973Lo07, seen only in $\gamma\gamma$-coin).
[x]113.4[@c] *3*	0.34[@] *9*								%Iγ=0.128 *35*
[x]121.3[@c] *3*	0.51[@] *9*								%Iγ=0.19 *4*
134.9 *2*	6.8 *7*	451.96	1^+	317.08	(2^+)	(M1)		0.0509 *7*	α(K)exp=0.044 *4*; α(L)exp+α(M)exp=0.0064 *9* (1973Pa02) %Iγ=2.57 *30*

From ENSDF

$^{76}_{35}Br_{41}$-4

^{76}Kr $\varepsilon+\beta^+$ decay (14.79 h) 1973Pa02,1973Lo07 (continued)

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

E_γ[‡]	I_γ[‡d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
								α(K)=0.0451 *7*; α(L)=0.00496 *7*; α(M)=0.000790 *11* α(N)=7.34×10^{-5} *11* E_γ: other: 134.8 *2* (1973Lo07). I_γ: weighted average of 6.5 *7* (1973Pa02) and 7.2 *9* (1973Lo07). Mult.: ce data for 134.9γ+136.4γ consistent with M1 for both γ rays (1973Pa02). Absolute Ice(K)(134.9+136.4)=0.180 *10*, Ice(L+M)(134.9+136.4)=0.026 *4* (1973Pa02).
136.3 *2*	2.66 *28*	451.96	1^+	315.68	1^+	(M1)	0.0496 *7*	α(K)exp=0.044 *4*; α(L)exp+α(M)exp=0.0064 *9* (1973Pa02) %Iγ=1.00 *12* α(K)=0.0439 *6*; α(L)=0.00482 *7*; α(M)=0.000768 *11* α(N)=7.14×10^{-5} *10* E_γ: weighted average of 136.4 *2* (1973Pa02) and 136.2 *2* (1973Lo07). I_γ: weighted average of 2.74 *28* (1973Pa02) and 2.4 *5* (1973Lo07). Mult.: ce data for 134.9γ+136.4γ consistent with M1 for both γ rays (1973Pa02). Absolute Ice(K)(134.9+136.4)=0.180 *10*, Ice(L+M)(134.9+136.4)=0.026 *4* (1973Pa02).
[x]141.9[@c] *3*	0.51[@] *14*							%Iγ=0.19 *6*
150.5[e] *2*	<0.66[e]	150.52	(0,1,2)	0.0	1^-	[D]	0.032 *7*	%Iγ=0.12 *12* E_γ: also from 1973Lo07. I_γ: from 0.56 *10* for the doublet, weighted average of 0.50 *10* (1973Pa02) and 0.69 *14* (1973Lo07).
150.5[ef] *2*	<0.66[e]	252.05	$(2)^+$	102.66	$(4)^+$	[E2]	0.1930 *29*	%Iγ<0.25 α(K)=0.1681 *25*; α(L)=0.02124 *32*; α(M)=0.00336 *5* α(N)=0.000292 *4* E_γ: also from 1973Lo07; placement suggested by the evaluators. I_γ: from 0.56 *10* for the doublet, weighted average of 0.50 *10* (1973Pa02) and 0.69 *14* (1973Lo07).
166.7 *2*	0.46 *9*	317.08	(2^+)	150.52	(0,1,2)	[D,E2]	0.08 *6*	%Iγ=0.17 *4* E_γ: weighted average of 166.7 *2* (1973Pa02) and 166.8 *3* (1973Lo07). I_γ: weighted average of 0.42 *9* (1973Pa02) and 0.51 *10* (1973Lo07).
171.0[bf] *3*	0.34 *9*	487.56?		317.08	(2^+)			%Iγ=0.128 *35* γ from 1973Lo07 only.
[x]179.9[@c] *3*	0.43[@] *9*							%Iγ=0.16 *4* E_γ: placement from 432 level in 1973Lo07 is not adopted (evaluators).
[x]192.2 *4*	0.119 *23*							%Iγ=0.045 *9* E_γ: weighted average of 192.0 *4* (1973Pa02) and 192.8 *7* (1973Lo07). I_γ: weighted average of 0.112 *23* (1973Pa02) and 0.17 *6* (1973Lo07). 1973Pa02 suggested placement from 452 level to 260 level is not adopted by the evaluators.

From ENSDF

^{76}Kr $\varepsilon+\beta^+$ decay (14.79 h) 1973Pa02,1973Lo07 (continued)

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

E_γ[‡]	I_γ[‡d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[†]	Comments
199.9 *2*	3.11 *30*	451.96	1^+	252.05	$(2)^+$	M1+E2	0.6 *2*	0.031 *6*	α(K)exp=0.027 *3* (1973Pa02) %Iγ=1.17 *13* α(K)=0.028 *6*; α(L)=0.0032 *7*; α(M)=0.00050 *11* α(N)=4.5×10^{-5} *9* E$_\gamma$: weighted average of 199.8 *2* (1973Pa02) and 199.9 *2* (1973Lo07). I$_\gamma$: weighted average of 3.00 *30* (1973Pa02) and 3.43 *52* (1973Lo07). Absolute Ice(K)=0.030 *3* (1973Pa02).
214.5 *2*	0.65 *14*	317.08	(2^+)	102.66	$(4)^+$	[E2]		0.0526 *8*	%Iγ=0.25 *6* α(K)=0.0462 *7*; α(L)=0.00546 *8*; α(M)=0.000864 *12* α(N)=7.69×10^{-5} *11* E$_\gamma$: weighted average of 214.5 *2* (1973Pa02) and 214.4 *4* (1973Lo07). Placement suggested by the evaluators on the basis of (135γ)(214γ)-coin in 1973Lo07; it is placed from 260 to 46 level in 1973Pa02 and unplaced in 1973Lo07. I$_\gamma$: unweighted average of 0.78 *8* (1973Pa02) and 0.51 *6* (1973Lo07).
232.6 *3*	0.24 *10*	1047.83	1^+	815.2	0,1				%Iγ=0.09 *4* E$_\gamma$: weighted average of 232.7 *3* (1973Pa02) and 232.3 *4* (1973Lo07). I$_\gamma$: unweighted average of 0.140 *28* (1973Pa02) and 0.34 *9* (1973Lo07).
[x]234.7[ac] *3*	0.34 *7*								%Iγ=0.128 *27* E$_\gamma$: placement from 280 level in 1973Pa02 is not adopted (evaluators).
[x]239.0[@c] *3*	0.69[@] *9*								%Iγ=0.26 *4*
252.1 *2*	17.0 *9*	252.05	$(2)^+$	0.0	1^-	E1		0.00560 *8*	α(K)exp=0.0060 *5* (1973Pa02) %Iγ=6.4 *5* α(K)=0.00498 *7*; α(L)=0.000526 *7*; α(M)=8.33×10^{-5} *12* α(N)=7.72×10^{-6} *11* E$_\gamma$: weighted average of 252.0 *2* (1973Pa02) and 252.2 *2* (1973Lo07). I$_\gamma$: weighted average of 16.2 *16* (1973Pa02) and 17.2 *9* (1973Lo07). Absolute Ice(K)=0.035 *3* (1973Pa02).
270.3 *2*	52.7 *34*	315.68	1^+	45.50	$(2)^-$	(E1)		0.00460 *7*	α(K)exp=0.0044 *4*; α(L)exp+α(M)exp=0.00048 *7* (1973Pa02) %Iγ=19.9 *17* α(K)=0.00409 *6*; α(L)=0.000432 *6*; α(M)=6.84×10^{-5} *10* α(N)=6.34×10^{-6} *9* E$_\gamma$: weighted average of 270.2 *2* (1973Pa02) and 270.4 *2* (1973Lo07). I$_\gamma$: weighted average of 54 *6* (1973Pa02) and 52.7 *34* (1973Lo07). Mult.: α(K)exp and α(L+M)exp for 270.2γ+271.6γ consistent with E1 for both γ rays in 1973Pa02. Absolute Ice(K)(270.2+271.6)=0.105 *3*, Ice(L+M)(270.2+271.6)=0.011 *2* (1973Pa02).
271.7 *2*	11.6 *12*	317.08	(2^+)	45.50	$(2)^-$	(E1)		0.00453 *6*	α(K)exp=0.0044 *4*; α(L)exp+α(M)exp=0.00048 *7* (1973Pa02) %Iγ=4.4 *5* α(K)=0.00403 *6*; α(L)=0.000426 *6*; α(M)=6.74×10^{-5} *10*

From ENSDF

^{76}Kr $\varepsilon+\beta^+$ decay (14.79 h) 1973Pa02,1973Lo07 (continued)

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

E_γ ‡	I_γ ‡ d	E_i(level)	J_i^π	E_f	J_f^π	Mult. #	α †	Comments
								α(N)=6.25×10^{-6} *9* E_γ: weighted average of 271.6 *2* (1973Pa02) and 271.8 *2* (1973Lo07). I_γ: weighted average of 11.5 *12* (1973Pa02) and 11.7 *14* (1973Lo07). Mult.: α(K)exp and α(L+M)exp for 270.2γ+271.6γ consistent with E1 for both γ rays in 1973Pa02. See comment for 270.3γ from 315 level. Absolute Ice(K)(270.2+271.6)=0.105 *3*, Ice(L+M)(270.2+271.6)=0.011 *2* (1973Pa02).
294.9 *3*	0.50 *10*	446.15	(1)$^+$	150.52	(0,1,2)			%Iγ=0.19 *4* E_γ: weighted average of 295.0 *3* (1973Pa02) and 294.8 *3* (1973Lo07). Unplaced in 1973Lo07. I_γ: weighted average of =0.50 *10* (1973Pa02) and 0.51 *14* (1973Lo07).
299.0 *3*	2.21 *22*	616.02	1$^{(+)}$	317.08	(2$^+$)	(M1,E2)	0.011 *5*	α(K)exp=0.010 *2* (1973Pa02) %Iγ=0.83 *10* α(K)=0.010 *4*; α(L)=0.0011 *5*; α(M)=1.8×10^{-4} *8* α(N)=1.6×10^{-5} *7* E_γ: from 1973Pa02. Other: 299.2 *2* in 1973Lo07 probably a doublet corresponding to 299.0 and 300.2 in 1973Pa02. I_γ: from 1973Pa02. Other: 2.57 *26* in 1973Lo07 probably for a doublet corresponding to 299.0 and 300.2 in 1973Pa02. Absolute Ice(K)(299.0+300.2)=0.012 *3* (1973Pa02). α(K)exp for 299.0γ+300.2γ.
300.2 *2*	1.12 *11*	616.02	1$^{(+)}$	315.68	1$^+$	(M1,E2)	0.011 *5*	%Iγ=0.42 *5* α(K)=0.010 *4*; α(L)=0.0011 *5*; α(M)=1.8×10^{-4} *8* α(N)=1.6×10^{-5} *7* E_γ,I_γ: other: see comments for 299.0γ above. Absolute Ice(K)(299.0+300.2)=0.012 *3* (1973Pa02).
309.9 *2*	6.5 *7*	355.28	1$^+$	45.50	(2)$^-$			%Iγ=2.45 *30* E_γ: weighted average of 309.8 *2* (1973Pa02) and 309.9 *2* (1973Lo07). I_γ: weighted average of 6.6 *7* (1973Pa02) and 6.2 *9* (1973Lo07).
315.8 *2*	100 *7*	315.68	1$^+$	0.0	1$^-$	E1	0.00298 *4*	α(K)exp=0.0026 *2*; α(L)exp+α(M)exp=0.00031 *4* (1973Pa02) %Iγ=37.7 *23* α(K)=0.00265 *4*; α(L)=0.000280 *4*; α(M)=4.44×10^{-5} *6* α(N)=4.12×10^{-6} *6* E_γ: weighted average of 315.7 *2* (1973Pa02) and 315.8 *2* (1973Lo07). I_γ: from 1973Lo07. Other: 100 *10* (1973Pa02). Absolute Ice(K)=0.093 *6*, Ice(L+M)=0.011 *1* (1973Pa02).
317.2 *4*	1.20 *34*	317.08	(2$^+$)	0.0	1$^-$			%Iγ=0.45 *13* E_γ,I_γ: from $\gamma\gamma$-coin, γ only in 1973Lo07.
355.3 *2*	12.8 *13*	355.28	1$^+$	0.0	1$^-$			%Iγ=4.8 *5* E_γ: also from 1973Lo07. I_γ: weighted average of 12.6 *13* (1973Pa02) and 13.2 *17* (1973Lo07).

From ENSDF

$^{76}_{35}Br_{41}$-7

^{76}Kr $\varepsilon+\beta^+$ decay (14.79 h) 1973Pa02,1973Lo07 (continued)

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

E_γ[‡]	I_γ[‡d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
364.0 *3*	1.41 *15*	616.02	$1^{(+)}$	252.05	$(2)^+$			%Iγ=0.53 *7* E_γ: falso from 1973Lo07. I_γ: weighted average of 1.51 *15* (1973Pa02) and 1.29 *17* (1973Lo07).
406.5 *2*	30.3 *26*	451.96	1^+	45.50	$(2)^-$	E1	1.52×10^{-3} *2*	α(K)exp=0.0016 *3* (1973Pa02) %Iγ=11.4 *12* α(K)=0.001352 *19*; α(L)=0.0001423 *20*; α(M)=2.254×10^{-5} *32* α(N)=2.098×10^{-6} *30* E_γ: also from 1973Lo07. I_γ: weighted average of 30.7 *31* (1973Pa02) and 30.0 *26* (1973Lo07). Absolute Ice(K)=0.018 *3* (1973Pa02).
x428.5[@c] *5*	0.43[@] *11*							%Iγ=0.16 *4*
431.7 *4*	0.40 *20*	1047.83	1^+	616.02	$1^{(+)}$			%Iγ=0.15 *8* E_γ: weighted average of 431.6 *4* (1973Pa02) and 431.9 *5* (1973Lo07). I_γ: unweighted average of 0.20 *4* (1973Pa02) and 0.60 *14* (1973Lo07).
x438.6[@c] *4*	0.34[@] *9*							%Iγ=0.128 *35*
446.2[e] *3*	<1.5[e]	898.36	1^+	451.96	1^+			%Iγ<0.57 E_γ: weighted average of 446.2 *3* (1973Pa02) and 446.5 *3* (1973Lo07). Placement from 1973Lo07. I_γ: from 1.27 *27* for the doublet, weighted average of 1.00 *10* (1973Pa02) and 1.54 *26* (1973Lo07). See also 446.4 from 446 level.
446.4[e] *3*	<1.5[e]	446.15	$(1)^+$	0.0	1^-			%Iγ=0.28 *28* E_γ: weighted average of 446.2 *3* (1973Pa02) and 446.5 *3* (1973Lo07). Placement from 1973Pa02. I_γ: from 1.27 *27* for the doublet, weighted average of 1.00 *10* (1973Pa02) and 1.54 *26* (1973Lo07). See also 446.4 from 898 level.
452.0 *2*	24.5 *25*	451.96	1^+	0.0	1^-			%Iγ=9.2 *10* E_γ: weighted average of 451.9 *2* (1973Pa02) and 452.1 *2* (1973Lo07). I_γ: weighted average of 25.1 *25* (1973Pa02) and 23.2 *35* (1973Lo07).
452.1[f] *3*		898.36	1^+	446.15	$(1)^+$			E_γ: placement suggested by evaluators on the basis of (452γ)(91γ)-coin in 1973Lo07, who place this transition from a 807.5 level.
459.4[af] *5*	0.112 *22*	815.2	0,1	355.28	1^+			%Iγ=0.042 *9* γ not in 1973Lo07.
x473.1[&c] *3*	0.86 *12*							%Iγ=0.32 *5*
484.4 *3*	0.19 *6*	936.44	1^+	451.96	1^+			%Iγ=0.072 *23* E_γ: from 1973Lo07. Other: 484.5 *4* (1973Pa02). I_γ: weighted average of 0.17 *4* (1973Pa02) and 0.34 *10* (1973Lo07).
490.3 *3*	0.51 *10*	936.44	1^+	446.15	$(1)^+$			%Iγ=0.19 *4* E_γ: from 1973Lo07. Other: 490.2 *4* (1973Pa02). I_γ: weighted average of 0.47 *10* (1973Pa02) and 0.60 *16* (1973Lo07).
499.8 *3*	1.17 *12*	815.2	0,1	315.68	1^+			%Iγ=0.44 *5*

From ENSDF

^{76}Kr ε+β^+ decay (14.79 h) 1973Pa02,1973Lo07 (continued)

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

E_γ ‡	I_γ ‡ d	E_i(level)	J_i^π	E_f	J_f^π	Comments
						E_γ: weighted average of 499.6 *3* (1973Pa02) and 499.9 *3* (1973Lo07). I_γ: weighted average of 1.20 *12* (1973Pa02) and 1.12 *17* (1973Lo07).
x520.9 @ c *3*	0.51 @ *9*					%Iγ=0.19 *4*
543.5 *2*	0.77 *8*	898.36	1^+	355.28	1^+	%Iγ=0.290 *34* E_γ: weighted average of 543.2 *4* (1973Pa02) and 543.6 *2* (1973Lo07). I_γ: weighted average of 0.75 *8* (1973Pa02) and 0.86 *17* (1973Lo07).
548.3 f *4*	0.37 *12*	548.5?	(0,1,2)	0.0	1^-	%Iγ=0.14 *5* E_γ: weighted average of 548.5 *4* (1973Pa02) and 548.1 *4* (1973Lo07). Placement suggested by evaluators. I_γ: weighted average of 0.50 *10* (1973Pa02) and 0.26 *9* (1973Lo07).
552.7 *3*	4.1 *4*	868.16	1^+	315.68	1^+	%Iγ=1.55 *17* E_γ: weighted average of 552.5 *3* (1973Pa02) and 552.8 *3* (1973Lo07). I_γ: weighted average of 4.3 *4* (1973Pa02) and 3.4 *7* (1973Lo07).
570.8 b f *4*	0.34 *12*	616.02	$1^{(+)}$	45.50	$(2)^-$	%Iγ=0.13 *5* E_γ: from 1973Lo07 only (probably a contaminant from ^{76}Br ε decay).
x575.9 c *3*	0.32 *6*					%Iγ=0.121 *24* E_γ: weighted average of 576.0 *3* (1973Pa02) and 575.7 *5* (1973Lo07). I_γ: weighted average of 0.31 *6* (1973Pa02) and 0.34 *12* (1973Lo07).
581.6 *3*	1.25 *13*	898.36	1^+	317.08	(2^+)	%Iγ=0.47 *6* E_γ: weighted average of 581.5 *3* (1973Pa02) and 581.8 *4* (1973Lo07). I_γ: weighted average of 1.31 *13* (1973Pa02) and 1.03 *26* (1973Lo07).
581.8 b f *4*		936.44	1^+	355.28	1^+	
582.3 *4*	2.70 *29*	898.36	1^+	315.68	1^+	%Iγ=1.02 *12* E_γ: weighted average of 582.5 *3* (1973Pa02) and 581.8 *4* (1973Lo07). I_γ: weighted average of 2.91 *29* (1973Pa02) and 2.40 *34* (1973Lo07).
x599.2 & c *4*	0.51 *17*					%Iγ=0.19 *7*
619.5 *4*	0.94 *10*	936.44	1^+	317.08	(2^+)	%Iγ=0.36 *4* E_γ: also from 1973Lo07. I_γ: weighted average of 1.00 *10* (1973Pa02) and 0.77 *17* (1973Lo07).
x640.9 @ c *4*	0.51 @ *17*					%Iγ=0.19 *7*
x666.0 & c *4*	0.34 *14*					%Iγ=0.13 *5*
684.5 *3*	0.63 *24*	936.44	1^+	252.05	$(2)^+$	%Iγ=0.24 *9* E_γ: weighted average of 684.3 *4* (1973Pa02) and 684.6 *3* (1973Lo07). I_γ: unweighted average of 0.39 *8* (1973Pa02) and 0.86 *17* (1973Lo07).
731.2 *4*	0.50 *10*	1047.83	1^+	317.08	(2^+)	%Iγ=0.19 *4* E_γ: weighted average of 730.8 *4* (1973Pa02) and 731.5 *4* (1973Lo07). I_γ: from 1973Pa02. Other: 0.51 *17* (1973Lo07).
796.1 *4*	0.77 *10*	1047.83	1^+	252.05	$(2)^+$	%Iγ=0.29 *4* E_γ: weighted average of 795.8 *4* (1973Pa02) and 796.5 *5* (1973Lo07). I_γ: weighted average of 0.75 *8* (1973Pa02) and 1.20 *34* (1973Lo07).

From ENSDF

$^{76}_{35}Br_{41}$-9

^{76}Kr ε+β^+ decay (14.79 h) 1973Pa02,1973Lo07 (continued)

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

E_γ ‡	I_γ ‡ d	E_i(level)	J_i^π	E_f	J_f^π	Comments
822.6 *5*	0.66 *7*	868.16	1^+	45.50	$(2)^-$	%Iγ=0.249 *30* E_γ: weighted average of 822.5 *6* (1973Pa02) and 822.7 *5* (1973Lo07). I_γ: weighted average of 0.64 *7* (1973Pa02) and 0.77 *17* (1973Lo07).
853.0 *5*	0.36 *7*	898.36	1^+	45.50	$(2)^-$	%Iγ=0.136 *28* E_γ: from 1973Pa02. Other: 853.1 *6* (1973Lo07). I_γ: from 1973Pa02. Other: 0.34 *12* (1973Lo07).
868.3 *5*	0.84 *20*	868.16	1^+	0.0	1^-	%Iγ=0.32 *8* E_γ: weighted average of 868.2 *5* (1973Pa02) and 868.3 *5* (1973Lo07). I_γ: unweighted average of 0.64 *7* (1973Pa02) and 1.03 *17* (1973Lo07).
891.0 a f *5*	0.31 *6*	936.44	1^+	45.50	$(2)^-$	%Iγ=0.117 *24*
898.3 *5*	0.44 *9*	898.36	1^+	0.0	1^-	%Iγ=0.166 *35* E_γ: weighted average of 898.5 *5* (1973Pa02) and 897.9 *6* (1973Lo07). I_γ: weighted average of 0.42 *9* (1973Pa02) and 0.51 *17* (1973Lo07).
x 911.0 a c *10*	0.31 *6*					%Iγ=0.117 *24*
936.0 a f *10*	0.28 *6*	936.44	1^+	0.0	1^-	%Iγ=0.106 *23*
1002.0 a f *10*	0.31 *6*	1047.83	1^+	45.50	$(2)^-$	%Iγ=0.117 *24*
x 1030.3 & c *5*	0.69 *26*					%Iγ=0.26 *10*
x 1070.3 @ c *5*	0.77 @ *26*					%Iγ=0.29 *10*

† Additional information 2.
‡ From 1973Pa02, unless otherwise stated. Note that original values of intensities are absolute values in 1973Pa02 but relative values normalized to Iγ(252γ)=100. The quoted values in this dataset are relative values deduced by the evaluators from those original values by re-normalizing them to Iγ=100 of the strongest 315.8γ.
# From ce data (1973Pa02,1973Lo07).
@ γ reported by 1973Lo07 only. Treated as uncertain (evaluators).
& γ reported by 1973Lo07 only. Probably contributed by ^{76}Br decay.
a γ reported by 1973Pa02 only. Treated as uncertain (evaluators).
b Placement from 1973Lo07, considered as uncertain by evaluators.
c Questionable assignment to ^{76}Kr ε decay.
d For absolute intensity per 100 decays, multiply by 0.377 *21*.
e Multiply placed with undivided intensity.
f Placement of transition in the level scheme is uncertain.
x γ ray not placed in level scheme.

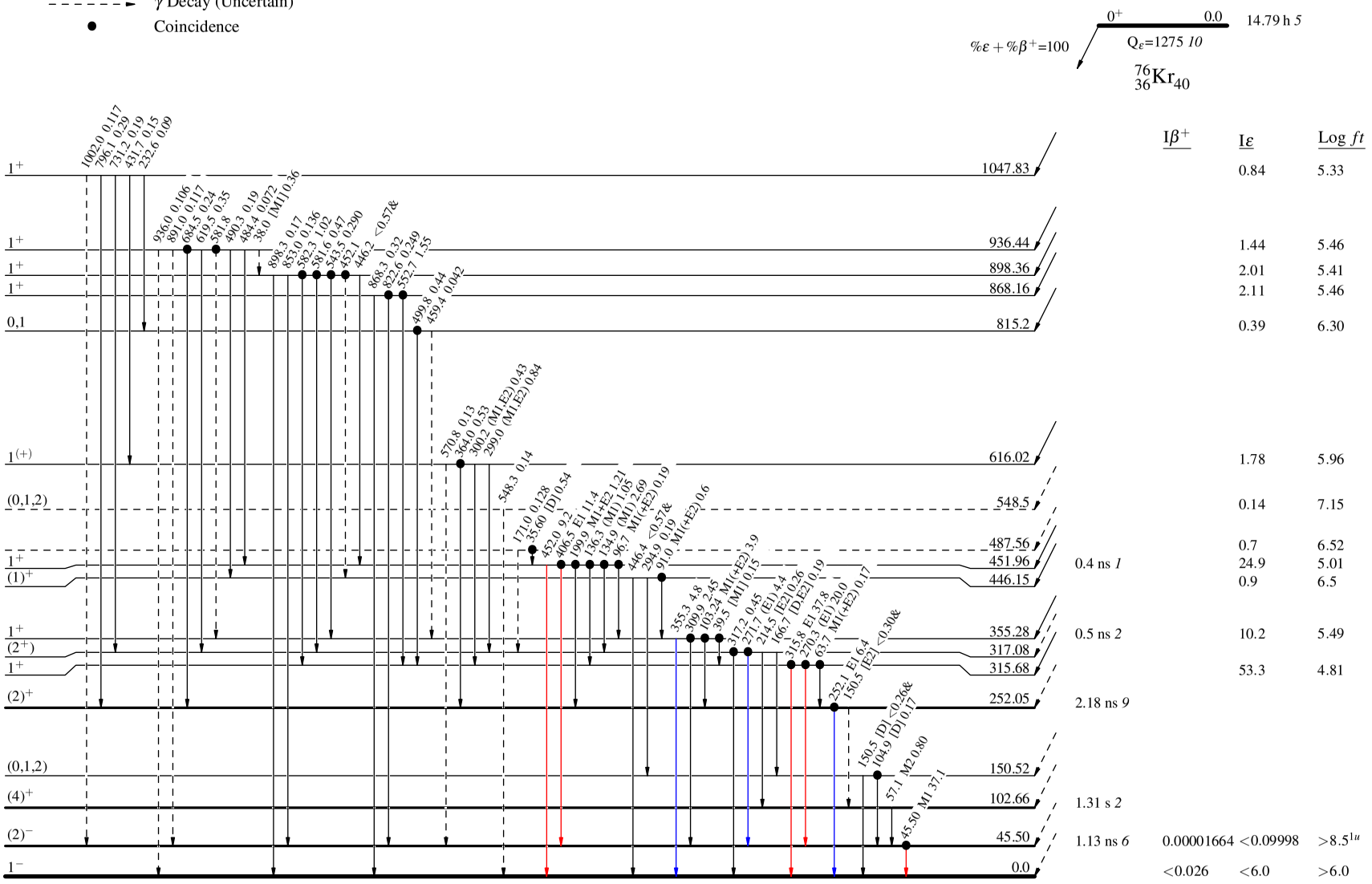
From ENSDF
$^{76}_{35}Br_{41}$-10

^{76}Kr ε decay (14.79 h) 1973Pa02,1973Lo07

Decay Scheme

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

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



$^{76}_{35}Br_{41}$-11