^{83}Rb ε decay 1976Va03,1993Ch32

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan	NDS 125, 201 (2015)	31-Dec-2014

Parent: ^{83}Rb: E=0.0; J$^{\pi}$=5/2^{-}; $T_{1/2}$=86.2 d *1*; Q(ε)=919.4 *23*; %ε decay=100.0

1976Va03: ^{83}Br activity from neutron irradiation of natural Se target followed by chemical separation. Measured Eγ, Iγ, $\gamma\gamma$, Ece, Ice using a Ge(Li) detector, a low-energy Ge(Li) detector and a Si(Li) detector for γ rays, a surface-barrier Si detector for conversion electrons and a Ge(Li)-NaI(Tl) detector system for $\gamma\gamma$ coincidences.

1988Al01: precise measurements of Eγ using a Ge(Li) detector.

1990Me15: precise measurements of Eγ and Iγ using Ge(Li) detectors.

1993Ch32: precise measurements of Eγ using a HPGe detector.

Others: 1995Ah04, 1982Gr07, 1972Br37, 1970Go45, 1964Do11, 1955Pe19, 1952Ca39, 1950Ka62.

A total energy release of 920 keV *40* is calculated for this decay scheme using the RADLST code, in good agreement with the Q value of 919.4 keV *23*.

α: Additional information 1.

^{83}Kr Levels

E(level)†	J$^{\pi}$‡	$T_{1/2}$#	Comments
0.0	9/2^{+}	stable	
9.4057 *6*	7/2^{+}	155.1 ns *12*	$T_{1/2}$: from electronic timing between 553γ and 9.4γ (1995Ah04).
41.5575 *7*	1/2^{-}	1.83 h *2*	
561.9586 *8*	5/2^{-}		
571.1538 *10*	(3/2^{-})		
690.53 *4*	5/2^{-}		
799.49 *3*	5/2^{+}		

† From a least-squares fit to Eγ, by evaluator.
‡ From the Adopted Levels.
# From the Adopted Levels, except where noted.

ε radiations

E(decay)	E(level)	Iε†	Log *ft*	Comments
(119.9 *23*)	799.49	0.90 *11*	6.87 *6*	εK=0.8519 *6*; εL=0.1223 *5*; εM+=0.02578 *12*
(228.9 *23*)	690.53	0.137 *17*	8.30 *6*	εK=0.8655 *2*; εL=0.11132 *12*; εM+=0.02316 *3*
(348.2 *23*)	571.1538	29.4 *23*	6.35 *4*	εK=0.8701; εL=0.10759 *5*; εM+=0.02227 *1* εL(exp)/εK(exp)=0.128 *2* (1970Go45).
(357.4 *23*)	561.9586	61 *4*	6.05 *3*	εK=0.8704; εL=0.10741 *5*; εM+=0.02223 *1* εL(exp)/εK(exp)=0.132 *2*, (εL(exp) + εM(exp))/εK(exp)=0.164 *2*, εM(exp)/εL(exp)=0.240 *15*. Measured by 1970Go45 with Ge(Li), CsI, NaI; internal-source method.
(910.0 *23*)	9.4057	6.4 *30*	7.86 *21*	εK=0.8753; εL=0.1034; εM+=0.02129 I($\varepsilon+\beta^{+}$): from 1964Do11, deduced from intensity ratio of K x ray to total γ intensity and from Xγ to K x ray rate.
(919.4 *23*)	0.0	<5.0	>8.5^{1u}	εK=0.8710; εL=0.10685 *2*; εM+=0.022110 *5* I($\varepsilon+\beta^{+}$): calculated assuming log $f^{1u}t$≥8.5 for ΔJ=2, Δπ=yes.

† Absolute intensity per 100 decays.

γ(^{83}Kr)

Iγ normalization: if I(β^++ε)(g.s.)=2.5 *25* (ΔJ=2, $\Delta\pi$=yes) and I(β^++ε)(42 keV)=0 (ΔJ=2, $\Delta\pi$=no) and I(β^++ε)(9 keV)=6.4 *30* (1964Do11), and using ΣI(γ+ce)(g.s.+9+42)=91% *4*.

E$_\gamma$[†]	I$_\gamma$[‡@]	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult.[#]	δ[#]	α	Comments
9.4057[#] *6*	13.1 *30*	9.4057	7/2$^+$	0.0	9/2$^+$	M1+E2	0.0129 *3*	16.3 *3*	α(L)=13.85 *24*; α(M)=2.24 *4*; α(N)=0.218 *4* α=16 *5* (1973Va03).
32.1516[#] *5*	0.08 *1*	41.5575	1/2$^-$	9.4057	7/2$^+$	E3		1.95×10^3	α(K)=483 *7*; α(L)=1242 *18*; α(M)=208 *3*; α(N)=15.25 *22* α: α(K)exp/(α(L)exp + α(M)exp)=0.30 *5* (1973Va03).
119.32 *9*	0.032 *5*	690.53	5/2$^-$	571.1538	(3/2$^-$)	(M1+E2)		0.28 *21*	α(K)=0.24 *18*; α(L)=0.033 *25*; α(M)=0.005 *4*; α(N)=0.0005 *4*
128.55 *12*	0.0030 *5*	690.53	5/2$^-$	561.9586	5/2$^-$	[M1,E2]		0.22 *15*	α(K)=0.19 *13*; α(L)=0.025 *19*; α(M)=0.004 *3*; α(N)=0.0004 *3*
≈237.19[&]	<0.0011	799.49	5/2$^+$	561.9586	5/2$^-$				
520.3991 *5*	100 *5*	561.9586	5/2$^-$	41.5575	1/2$^-$	E2		0.00283	α(K)=0.00250 *4*; α(L)=0.000276 *4*; α(M)=4.47×10^{-5} *7*; α(N)=4.45×10^{-6} *7* E$_\gamma$: from 1993Ch32. Other values: 520.389 *12* (1988Al01); 520.41 *3* (1976Va03); 520.423 *25* (1990Me15).
529.5945 *6*	65.6 *30*	571.1538	(3/2$^-$)	41.5575	1/2$^-$	(M1+E2)	−0.20 +*5*−*1*	0.00191	α(K)=0.00169 *3*; α(L)=0.000181 *3*; α(M)=2.94×10^{-5} *5*; α(N)=2.97×10^{-6} *5* E$_\gamma$: from 1993Ch32. Other values: 529.591 *13* (1988Al01); 529.64 *1* (1976Va03); 529.653 *11* (1990Me15).
552.5512 *7*	35.7 *15*	561.9586	5/2$^-$	9.4057	7/2$^+$	(E1)		7.63×10^{-4}	α(K)=0.000679 *10*; α(L)=7.19×10^{-5} *10*; α(M)=1.161×10^{-5} *17*; α(N)=1.169×10^{-6} *17* E$_\gamma$: from 1993Ch32. Other values: 552.588 *20* (1988Al01); 552.65 *2* (1976Va03); 552.664 *21* (1990Me15).
562.17 *7*	0.019 *2*	561.9586	5/2$^-$	0.0	9/2$^+$				E$_\gamma$: weighted average of 562.16 *7* (1976Va03) and 562.174 *70* (1990Me15).
648.97 *5*	0.19 *1*	690.53	5/2$^-$	41.5575	1/2$^-$	E2		1.49×10^{-3}	α(K)=0.001323 *19*; α(L)=0.0001442 *21*; α(M)=2.33×10^{-5} *4*; α(N)=2.33×10^{-6} *4* E$_\gamma$: weighted average of 648.96 *5* (1976Va03) and 648.976 *50* (1990Me15).
681.18 *7*	0.07 *1*	690.53	5/2$^-$	9.4057	7/2$^+$	[E1]		4.72×10^{-4}	α(K)=0.000420 *6*; α(L)=4.43×10^{-5} *7*; α(M)=7.16×10^{-6} *10*; α(N)=7.23×10^{-7} *11* E$_\gamma$: weighted average of 681.17 *7* (1976Va03) and 681.187 *65* (1990Me15).
790.15 *4*	1.47 *4*	799.49	5/2$^+$	9.4057	7/2$^+$	(M1+E2)	>9	8.82×10^{-4}	α(K)=0.000783 *11*; α(L)=8.44×10^{-5} *12*;

$^{83}_{36}$Kr$_{47}$-2

γ(^{83}Kr) (continued)

E_γ [†]	I_γ [‡@]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [#]	α	Comments
								α(M)=1.366×10^{-5} *20*; α(N)=1.372×10^{-6} *20* E_γ: weighted average of 790.14 *5* (1976Va03) and 790.160 *35* (1990Me15).
799.37 *5*	0.53 *2*	799.49	5/2$^+$	0.0	9/2$^+$	E2	8.57×10^{-4}	α(K)=0.000760 *11*; α(L)=8.20×10^{-5} *12*; α(M)=1.326×10^{-5} *19*; α(N)=1.332×10^{-6} *19* E_γ: weighted average of 799.36 *5* (1976Va03) and 799.380 *51* (1990Me15).

† From 1976Va03, except where noted.

‡ From 1976Va03. Iγ given by 1990Me15 are from 1976Va03.

\# From the Adopted Gammas.

@ For absolute intensity per 100 decays, multiply by 0.447 *24*.

& Placement of transition in the level scheme is uncertain.

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