^{83}Br β^- decay 2015Kr02,1976Va03

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

Parent: ^{83}Br: E=0.0; $J^\pi=3/2^-$; $T_{1/2}$=2.374 h *4*; Q(β^-)=977 *4*; %β^- decay=100.0

2015Kr02: ^{83}Br activity from the decay of ^{83}Se produced via ^{82}Se(n,γ), E=thermal. Measured Eγ, Iγ, and γ(t) using two HPGe detectors; deduced $T_{1/2}$.

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.

x-rays measured by 1969Ph03 with Si(Li), resolution 260 eV at 6.406 keV. Kα_1 x ray=12.71 keV *8*, Kβ_1 x ray=14.13 keV *8*. $I_{Kx}/I_{9\gamma}$=3.14 *4* (from IT decay).

A total energy release of 935 keV *6* is calculated for this decay scheme using the RADLST code, compared with the Q value of 977 keV *4*.

α: Additional information 1.

^{83}Kr Levels

E(level)[†]	J^π[‡]	$T_{1/2}$[‡]
0.0	$9/2^+$	stable
9.4051 *8*	$7/2^+$	
41.5567 *9*	$1/2^-$	1.83 h *2*
561.954 *7*	$5/2^-$	
571.151 *10*	$(3/2^-)$	
690.141 *9*	$5/2^-$	
799.5? *10*	$5/2^+$	

[†] From a least-squares fit to Eγ, by evaluator.
[‡] From the Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(178[‡] *4*)	799.5?	<0.000012	>9.5	av Eβ=49.0 *13*
(287 *4*)	690.141	0.021 *4*	6.9 *1*	av Eβ=83.5 *14*
(406 *4*)	571.151	1.3 *4*	5.62 *14*	av Eβ=124.1 *15*
(415 *4*)	561.954	0.084 *20*	6.84 *11*	av Eβ=127.3 *15*
(935 *4*)	41.5567	98.6 *4*	5.0 *1*	av Eβ=330.1 *17* Iβ^-: from absolute β and γ intensities (1963Pa09).
(968 *4*)	9.4051	<0.13	>8.5[1u]	av Eβ=365.1 *17* Iβ^-: if log $f^{1u}t\geq$8.5 from J^π.

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

$\gamma(^{83}Kr)$

Iγ normalization: taking Iβ(g.s.)=0 (ΔJ=3), Iβ(9-keV)=0.07 *6* (ΔJ=2,Δπ=yes), and Iβ(41-keV)=98.6 *4* (1963Pa09).

E_γ †	I_γ †@	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	δ‡	α	Comments
9.4051‡ *8*		9.4051	7/2+	0.0	9/2+	M1+E2	0.0129 *3*	16.31 *24*	α(L)=13.85 *20*; α(M)=2.24 *4*; α(N)=0.218 *4* E_γ: 9.39 *1* (1976Va03).
32.1516‡ *5*	0.05# *1*	41.5567	1/2−	9.4051	7/2+	E3		1.95×10^3	α(K)=483 *7*; α(L)=1241 *18*; α(M)=208 *3*; α(N)=15.25 *22* E_γ: 32.16 *3* (1976Va03).
118.96 *3*	0.183 *12*	690.141	5/2−	571.151	(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* E_γ: other: 119.32 *2* (1976Va03). I_γ: other: 0.11 *1* (1976Va03).
128.55# *8*	0.005# *1*	690.141	5/2−	561.954	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*
520.397 *10*	4.79 *5*	561.954	5/2−	41.5567	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_γ: other: 520.41 *5* (1976Va03). I_γ: other: 4.80 *15* (1976Va03).
529.589 *10*	100 *1*	571.151	(3/2−)	41.5567	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_γ: other: 529.64 *1* (1976Va03).
552.546 *10*	1.70 *2*	561.954	5/2−	9.4051	7/2+	(E1)		7.63×10^{-4}	α(K)=0.000678 *10*; α(L)=7.18×10^{-5} *10*; α(M)=1.161×10^{-5} *17*; α(N)=1.169×10^{-6} *17* E_γ: other: 552.65 *3* (1976Va03). I_γ: other: 1.67 *9* (1976Va03).
562.16#&		561.954	5/2−	0.0	9/2+				
648.587 *10*	1.03 *1*	690.141	5/2−	41.5567	1/2−	E2		1.49×10^{-3}	α(K)=0.001324 *19*; α(L)=0.0001442 *21*; α(M)=2.33×10^{-5} *4*; α(N)=2.33×10^{-6} *4* E_γ: other: 648.96 *5* (1976Va03). I_γ: other: 1.03 *8* (1976Va03).
680.727 *19*	0.313 *6*	690.141	5/2−	9.4051	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_γ: other: 681.17 *7* (1976Va03). I_γ: other: 0.32 *3* (1976Va03).
790.1#&	<0.001#	799.5?	5/2+	9.4051	7/2+	(M1+E2)	>9	8.82×10^{-4}	α(K)=0.000782 *11*; α(L)=8.44×10^{-5} *12*; α(M)=1.366×10^{-5} *20*; α(N)=1.371×10^{-6} *20*

† From 2015Kr02, except where noted. Values from 1976Va03 are included in the comments.
‡ From the Adopted Gammas.
# From 1976Va03.

γ(^{83}Kr) (continued)

[@] For absolute intensity per 100 decays, multiply by 0.013 *4*.
[&] Placement of transition in the level scheme is uncertain.

$^{83}_{36}$Kr$_{47}$-3

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Decay Scheme

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