^{93}Br β^- decay 2001Lh01

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 112, 1163 (2011)	15-Dec-2010

Parent: ^{93}Br: E=0; J^π=(5/2$^-$); $T_{1/2}$=102 ms *10*; Q(β^-)=11.09×10^3 *SY*; %β^- decay=100.0

2001Lh01: ^{93}Br from 600 MeV proton-induced fission of U; chemically-selective LaB_6 surface ion source, moving-tape system; two coaxial Ge detectors (for Eγ<4 MeV), planar Ge detector (for >8 keV x rays) and BaF_2 and plastic (for β's) scintillators; measured Eγ, Iγ, I(K x ray), $\gamma\gamma$ coin, $\gamma\gamma$(t). Supersedes very brief, preliminary report by 1990WoZZ.

^{93}Kr Levels

E(level)[†]	J^π[‡]	$T_{1/2}$	Comments
0	1/2$^+$	1.286 s *10*	$T_{1/2}$: from Adopted Levels.
117.45 *15*	(3/2$^+$)		
354.85 *25*	(7/2$^+$)	22 ns *12*	$T_{1/2}$: from $\gamma\gamma$(t).
359.46 *15*	(3/2$^+$,5/2$^+$)		
710.10 *18*	(3/2,5/2$^+$)		
805.40 *20*			
1029.0 *4*			
1325.9 *8*			
1337.1 *7*			

[†] From least-squares fit to Eγ.
[‡] From Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-[†#]	Log *ft*[‡]	Comments
(9752 *SY*)	1337.1	1.3 *8*	6.3 *3*	av Eβ=4.53×10^3 *15*
(9764 *SY*)	1325.9	1.1 *8*	6.4 *4*	av Eβ=4.53×10^3 *15*
(10061 *SY*)	1029.0	0.65 *17*	6.68 *14*	av Eβ=4.68×10^3 *15*
(10284 *SY*)	805.40	2.3 *6*	6.18 *14*	av Eβ=4.78×10^3 *15*
(10379 *SY*)	710.10	6.4 *16*	5.75 *13*	av Eβ=4.83×10^3 *15*
(10730 *SY*)	359.46	7.3 *25*	5.76 *17*	av Eβ=5.00×10^3 *15*
(10735 *SY*)	354.85	5.8 *14*	5.86 *13*	av Eβ=5.00×10^3 *15*
(11090[@] *SY*)	0	≤0.15	≥10.0[1*u*]	av Eβ=5.18×10^3 *15*
				Iβ^-: deduced by 2001Lh01 by comparing Iγ for ^{93}Kr transitions with Iγ for transitions In the ^{93}Rb and ^{93}Sr decay products of ^{93}Kr.

[†] From intensity imbalance.
[‡] Calculated allowing 300 keV uncertainty In Q(β^-).
[#] Absolute intensity per 100 decays.
[@] Existence of this branch is questionable.

^{93}Br β^- decay 2001Lh01 (continued)

$\gamma(^{93}Kr)$

Iγ normalization: 0.19 *4* calculated assuming [Σ(I(γ+ce) to g.s.)+Σ(unplaced Iγ)]=100%-%β^-n(^{93}Br), with %β^-n(^{93}Br)=68 *7*. if none of the unplaced transitions fed the g.s., Iγ normalization would rise to 0.24 *5* (unplaced Iγ constitutes≈21% of total observed photon intensity).

E_γ	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[@]	Comments
117.4 *2*	100 *5*	117.45	(3/2$^+$)	0	1/2$^+$	(M1)	0.0832	α(K)exp=0.058 *10* (2001Lh01) α(K)=0.0735 *11*; α(L)=0.00820 *12*; α(M)=0.001330 *20*; α(N+..)=0.0001335 *20* α(N)=0.0001335 *20* Mult.: D from α(K)exp determined from I(K x ray) relative to I(ce); $\Delta\pi$=No based on shell-model considerations (2001Lh01).
237.4 *2*	29.6 *25*	354.85	(7/2$^+$)	117.45	(3/2$^+$)	(E2)[‡]	0.0388	α(K)=0.0340 *5*; α(L)=0.00404 *6*; α(M)=0.000653 *10*; α(N+..)=6.31×10^{-5} *9* α(N)=6.31×10^{-5} *9*
242.0 *2*	60 *8*	359.46	(3/2$^+$,5/2$^+$)	117.45	(3/2$^+$)	(M1(+E2))[‡]	0.024 *12*	α(K)=0.021 *11*; α(L)=0.0025 *13*; α(M)=0.00040 *21*; α(N+..)=3.9×10^{-5} *20* α(N)=3.9×10^{-5} *20*
349.9 *5*	3.6[†] *21*	710.10	(3/2,5/2$^+$)	359.46	(3/2$^+$,5/2$^+$)			
359.4 *2*	3.7 *7*	359.46	(3/2$^+$,5/2$^+$)	0	1/2$^+$			
446.0 *2*	6.8 *9*	805.40		359.46	(3/2$^+$,5/2$^+$)			
592.7 *4*	10.6[†] *26*	710.10	(3/2,5/2$^+$)	117.45	(3/2$^+$)			
[x]629 *1*	≤1							
669.5 *3*	3.4 *5*	1029.0		359.46	(3/2$^+$,5/2$^+$)			
687.9 *2*	5.3 *4*	805.40		117.45	(3/2$^+$)			
710.2 *2*	19.7 *18*	710.10	(3/2,5/2$^+$)	0	1/2$^+$			
966.4 *7*	6[†] *4*	1325.9		359.46	(3/2$^+$,5/2$^+$)			
977.6 *6*	7[†] *4*	1337.1		359.46	(3/2$^+$,5/2$^+$)			
[x]1142 *1*	≤1							
[x]1220 *1*	≤1							
[x]2103.5 *4*	19 *3*							
[x]2224.7 *4*	4.3 *12*							
[x]3085.8 *7*	1.4 *4*							
[x]3606.3 *6*	7.8 *10*							

[†] From coincidence spectrum.

[‡] α(K)exp cannot Be measured independently for 237γ and 242γ; however, 2001Lh01 conclude that one is predominantly M1 and the other is E2. Since the level scheme implies ΔJ=2 for the 237γ, that γ is assigned As the E2 transition (note also that, were it an M1 transition, its B(M1)(W.u.)=7×10^{-5} *4* would Be unusually small). The 242γ must then Be the M1(+E2) transition.

[#] For absolute intensity per 100 decays, multiply by 0.19 *4*.

[@] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation

Continued on next page (footnotes at end of table)

^{93}Br β^- decay 2001Lh01 (continued)

$\gamma(^{93}Kr)$ (continued)

based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
[x] γ ray not placed in level scheme.

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Decay Scheme

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