^{83}Se β^- decay (70.1 s) 1973Fe08,1976Kr20

History

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

Parent: ^{83}Se: E=228.92 *7*; $J^\pi=1/2^-$; $T_{1/2}$=70.1 s *4*; Q(β^-)=3673 *5*; %β^- decay=100.0

1976Kr20: ^{83}Se activity from ^{82}Se(n,γ), E=thermal. Measured Eγ, Iγ, $\gamma\gamma$ using two coaxial Ge(Li) detectors.

1973Fe08: ^{83}Se activity from ^{82}Se(n,γ), E=thermal. Measured Eγ, Iγ, $\gamma\gamma$ using two Ge(Li) detectors.

Others: 1986Sc10, 1967Ma35, 1958Co57.

A total energy release of 3940 keV *40* is calculated for this decay scheme using the RADLST code, in good agreement with the Q value of 3902 keV *5*.

Additional information 1.

α: Additional information 2.

^{83}Br Levels

E(level)[†]	J^π[‡]	$T_{1/2}$[‡]	Comments
0	$3/2^-$	2.374 h *4*	
356.69 *4*	$5/2^-$		
799.12 *6*	$(5/2,7/2)^-$		
866.80 *11*	$7/2^-$		
987.96 *7*	$1/2^-,3/2^-$		
1030.65 *6*	$(3/2)^-$		
1053.78 *8*	$1/2^-,3/2^-$		
1660.08 *9*	$1/2^-,3/2^-$		
1915.45 *10*	$1/2^{(-)},3/2$		E(level): reported by 1976Kr20 only.
2051.45 *8*	$1/2^-,3/2^-$		
2809.71 *19*	$1/2^-,3/2^-$		
3091.3 *3*	$1/2^-,3/2^-$		

[†] From a least-squares fit to Eγ, by evaluator.

[‡] From the Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(811 *5*)	3091.3	0.095 *12*	5.7 *1*	av Eβ=279.2 *22*
(1092 *5*)	2809.71	0.21 *15*	5.9 *4*	av Eβ=396.9 *24*
(1850 *5*)	2051.45	18.6 *4*	4.8 *1*	av Eβ=734.9 *25*
(1986 *5*)	1915.45	2.07 *11*	5.9 *1*	av Eβ=797.5 *25*
(2242 *5*)	1660.08	2.63 *20*	6.0 *1*	av Eβ=916.0 *26*
(2848 *5*)	1053.78	0.36 *10*	7.3 *1*	av Eβ=1201.5 *26*
(2871 *5*)	1030.65	33.2 *11*	5.4 *1*	av Eβ=1212.5 *26*
(2914 *5*)	987.96	12.8 *8*	5.8 *1*	av Eβ=1232.7 *26*
(3035 *5*)	866.80	<0.27	>7.5	av Eβ=1290.3 *26*
(3103 *5*)	799.12	<0.20	>7.7	av Eβ=1322.5 *26*
(3902 *5*)	0	31.0 *7*	6.0 *1*	av Eβ=1705.1 *26*
				Iβ^-: from 1968Sc10.

[†] Absolute intensity per 100 decays.

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$\gamma(^{83}Br)$

Iγ normalization: From ΣI(γ+ce) to g.s.=100 − 31.0% *7* with Iβ(g.s)=31.0% *7* from 1968Sc10.

E_γ[†]	I_γ[†&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	δ[@]	α	Comments
188.9 *1*	1.03 *10*	987.96	1/2$^-$,3/2$^-$	799.12	(5/2,7/2)$^-$				
231.5 *1*	1.86 *10*	1030.65	(3/2)$^-$	799.12	(5/2,7/2)$^-$				
[x]322.2 *3*	0.15 *15*								
356.69 *5*	100 *6*	356.69	5/2$^-$	0	3/2$^-$	M1(+E2)	+0.02 *16*	0.00428 *16*	α(K)=0.00381 *14*; α(L)=0.000407 *16*; α(M)=6.47×10^{-5} *25*; α(N)=6.05×10^{-6} *22* Iγ: ΔIγ from 1976Kr20.
[x]371.66 *12*	0.56 *7*								
391.5 *2*	0.70 *9*	2051.45	1/2$^-$,3/2$^-$	1660.08	1/2$^-$,3/2$^-$				
442.4 *1*	0.37 *7*	799.12	(5/2,7/2)$^-$	356.69	5/2$^-$				
510.1 *1*	1.2 *4*	866.80	7/2$^-$	356.69	5/2$^-$	M1(+E2)	−0.04 *12*	0.00184 *4*	α(K)=0.00164 *3*; α(L)=0.000174 *4*; α(M)=2.76×10^{-5} *6*; α(N)=2.59×10^{-6} *5* Iγ: from 1976Kr20. 1973Fe08 give an upper limit of Iγ<2.1.
631.2 *1*	2.65 *15*	987.96	1/2$^-$,3/2$^-$	356.69	5/2$^-$				
673.98 *11*	87 *3*	1030.65	(3/2)$^-$	356.69	5/2$^-$				
[x]698.9 *3*	0.5 *1*								
799.15 *15*	7.2 *3*	799.12	(5/2,7/2)$^-$	0	3/2$^-$				
[x]812.6[#] *3*	1.1 *4*								
884.5[#] *5*	1.2 *4*	1915.45	1/2$^{(-)}$,3/2	1030.65	(3/2)$^-$				
988.05 *12*	92 *4*	987.96	1/2$^-$,3/2$^-$	0	3/2$^-$				
997.6 *1*	7.0 *3*	2051.45	1/2$^-$,3/2$^-$	1053.78	1/2$^-$,3/2$^-$				
1020.75 *15*	12.4 *9*	2051.45	1/2$^-$,3/2$^-$	1030.65	(3/2)$^-$				
1030.6 *1*	121 *4*	1030.65	(3/2)$^-$	0	3/2$^-$				
1053.7 *1*	9.1 *4*	1053.78	1/2$^-$,3/2$^-$	0	3/2$^-$				
1063.7 *2*	20.4 *6*	2051.45	1/2$^-$,3/2$^-$	987.96	1/2$^-$,3/2$^-$				
1116.3[‡] *1*	4.0 *3*	1915.45	1/2$^{(-)}$,3/2	799.12	(5/2,7/2)$^-$				Eγ: unplaced transition with Eγ=1116.0 *1*, Iγ=3.1 *2* observed by 1973Fe08.
1303.3 *3*	5.0 *3*	1660.08	1/2$^-$,3/2$^-$	356.69	5/2$^-$				
[x]1549.3 *8*	0.3 *1*								
1558.9[‡] *2*	7.0 *4*	1915.45	1/2$^{(-)}$,3/2	356.69	5/2$^-$				Eγ: unplaced transition with Eγ=1558.5 *3*, Iγ=6.9 *4* observed by 1973Fe08.
[x]1642.8[#] *6*	1.0 *5*								
1660.1 *1*	11.2 *11*	1660.08	1/2$^-$,3/2$^-$	0	3/2$^-$				
1694.7 *2*	4.5 *3*	2051.45	1/2$^-$,3/2$^-$	356.69	5/2$^-$				
1779.0 *2*	≤1.7	2809.71	1/2$^-$,3/2$^-$	1030.65	(3/2)$^-$				Iγ: from 1976Kr20. 1973Fe08 give Iγ=4.1 *3*.
[x]2022.5 *3*	0.52 *11*								
2051.5 *2*	64.3 *17*	2051.45	1/2$^-$,3/2$^-$	0	3/2$^-$				
2453.2 *7*	0.29 *8*	2809.71	1/2$^-$,3/2$^-$	356.69	5/2$^-$				

$^{83}_{35}Br_{48}$-2

^{83}Se β^- decay (70.1 s) 1973Fe08,1976Kr20 (continued)

$\gamma(^{83}Br)$ (continued)

E_γ [†]	I_γ [†&]	E_i(level)	J_i^π	E_f	J_f^π
2734.7 *3*	0.31 *6*	3091.3	$1/2^-$,$3/2^-$	356.69	$5/2^-$
2809.9 *7*	0.09 *2*	2809.71	$1/2^-$,$3/2^-$	0	$3/2^-$
[x]2944.8 *5*	0.15 *3*				
3090.7 *5*	0.25 *4*	3091.3	$1/2^-$,$3/2^-$	0	$3/2^-$

[†] Weighted average of 1973Fe08 and 1976Kr20, except where noted.
[‡] From 1976Kr20. 1973Fe08 could not place this γ.
[#] Seen by 1976Kr20 only.
[@] From the Adopted Gammas.
[&] For absolute intensity per 100 decays, multiply by 0.170 *4*.
[x] γ ray not placed in level scheme.

$^{83}_{35}Br_{48}$-3

^{83}Se β^- decay (70.1 s) 1973Fe08,1976Kr20

Decay Scheme

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