^{73}Br ε decay (3.4 min) 1987He21,1970Mu02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 158, 1 (2019)	16-May-2019

Parent: ^{73}Br: E=0; J$^{\pi}$=1/2$^-$; T$_{1/2}$=3.4 min *2*; Q(ε)=4580 *10*; %ε+%β^+ decay=100.0
^{73}Br-J$^{\pi}$,T$_{1/2}$: From ^{73}Br Adopted Levels.
^{73}Br-Q(ε): From 2017Wa10.
1987He21: produced ^{73}Br using the reaction ^{60}Ni(^{16}O,p2n), E=60 MeV, mass separation. Measured γ(t), Eγ, Iγ, Ice, and $\gamma\gamma$, $\beta\gamma$, γce coin.
1970Mu02: produced ^{73}Br using the reaction ^{59}Co(^{16}O,2n), E=64 MeV, chemical separation. Measured Eγ, Iγ, γ(t).

^{73}Se Levels

A search for an isomeric level with T$_{1/2}$>1 ms in ^{73}Br proved negative (1970Mu02).

E(level)†	J$^{\pi}$‡	T$_{1/2}$‡
0.0	9/2$^+$	
25.70 *20*	3/2$^-$	39.8 min *17*
26.4 *3*	(3/2$^-$)	
90.60 *21*	(1/2,3/2)$^-$	
151.29 *21*	5/2$^-$	222 ps *33*
192.60 *20*	5/2$^+$	0.97 ns *21*
400.21 *22*	(5/2$^-$)	
426.53 *21*	(1/2$^-$,3/2$^-$)	
565.77 *22*	(1/2,3/2)	
641.07 *22*	(1/2$^-$,3/2)	
790.39 *21*	(1/2$^-$,3/2$^-$)	
940.09 *21*	(1/2$^-$,3/2$^-$)	
1021.96 *21*	(1/2$^-$,3/2$^-$)	
1550.75 *23*	(1/2,3/2)	
1619.4 *4*	(1/2,3/2)	

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

ε,β^+ radiations

E(decay)†	E(level)	Iβ^+ #	Iε#	Log *ft*‡	I(ε+β^+)‡#	Comments
(2961 *10*)	1619.4	0.48 *10*	0.076 *15*	6.2 *1*	0.56 *11*	av Eβ=857.5 *46*; εK=0.1198 *17*; εL=0.01364 *19*; εM+=0.00267 *4*
(3029 *10*)	1550.75	1.4 *3*	0.20 *4*	5.8 *1*	1.6 *3*	av Eβ=889.1 *47*; εK=0.1091 *15*; εL=0.01242 *17*; εM+=0.00243 *4*
(3558 *10*)	1021.96	8.6 *13*	0.59 *9*	5.4 *1*	9.2 *14*	av Eβ=1135.2 *47*; εK=0.0569 *7*; εL=0.00647 *8*; εM+=0.001266 *15*
(3640 *10*)	940.09	13.0 *20*	0.82 *12*	5.3 *1*	13.8 *21*	av Eβ=1173.6 *47*; εK=0.0520 *6*; εL=0.00591 *7*; εM+=0.001157 *13*
(3790 *10*)	790.39	12.0 *19*	0.63 *10*	5.5 *1*	12.6 *20*	av Eβ=1244.0 *48*; εK=0.0443 *5*; εL=0.00504 *6*; εM+=0.000986 *11*
(3939 *10*)	641.07	3.6 *7*	0.16 *3*	6.1 *1*	3.8 *7*	av Eβ=1314.5 *48*; εK=0.0381 *4*; εL=0.00433 *5*; εM+=0.000847 *9*
(4014 *10*)	565.77	1.4 *6*	0.060 *24*	6.5 *2*	1.5 *6*	av Eβ=1350.1 *48*; εK=0.0354 *4*; εL=0.00403 *4*; εM+=0.000787 *8*
(4153 *10*)	426.53	17 *3*	0.63 *11*	5.5 *1*	18 *3*	av Eβ=1416.1 *48*; εK=0.0310 *3*; εL=0.00353 *4*; εM+=0.000690 *7*
(4489 *10*)	90.60	15.5 *23*	0.42 *6*	5.8 *1*	15.9 *24*	av Eβ=1576.0 *48*; εK=0.02309 *20*; εL=0.002622 *23*; εM+=0.000513 *5*
(4554 *10*)	25.70	21 *5*	0.55 *12*	5.7 *1*	22 *5*	av Eβ=1607.0 *48*; εK=0.02187 *19*; εL=0.002484 *21*; εM+=0.000486 *4*

† Measured endpoint energy of all β^+: 3640 *140* (1987He21). Others: 3.7 MeV *5* (1970Mu02), and 3.6 MeV *4* (1974Ro11).

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^{73}Br ε decay (3.4 min) 1987He21,1970Mu02 (continued)

ε,β^+ radiations (continued)

‡ Values considered as approximate since the Q value of 4580 keV allows the possibility of populating levels above the currently known highest level at 1619 keV.

Absolute intensity per 100 decays.

γ(^{73}Se)

Iγ normalization: from measured $\gamma^{\pm}$ intensity and theoretical ε/β^+ ratios. The normalization is dependent on mult=M1 for 65.0γ and 125.6γ.

I($\gamma^{\pm}$)=506 *18* relative to Iγ(65γ)=100 (1987He21). Other: 574 *40* (1970Mu02).

Eγ=861.7 *3* (Iγ=3 *1*) reported by 1970Mu02 is omitted here since 1987He21 report $T_{1/2}$=84 s for this γ ray.

E_γ[†]	I_γ[†#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[@]	Comments
25.7 *2*		25.70	3/2⁻	0.0	9/2⁺	E3	5250 *90*	α(K)=1045 *16*; α(L)=3600 *60*; α(M)=573 *10*; α(N)=32.7 *6* E_γ: from ce(L) (1987He21).
65.0 *1*	100.0 *12*	90.60	(1/2,3/2)⁻	25.70	3/2⁻	M1	0.337	α(K)=0.298 *5*; α(L)=0.0330 *5*; α(M)=0.00515 *8*; α(N)=0.000434 *7* α(K)exp=0.29 *1*
125.6 *1*	20.4 *4*	151.29	5/2⁻	25.70	3/2⁻	M1	0.0548	α(K)=0.0486 *7*; α(L)=0.00530 *8*; α(M)=0.000827 *12*; α(N)=7.00×10⁻⁵ *10* α(K)exp=0.049 *6*
166.2 *2*	1.3 *2*	192.60	5/2⁺	26.4	(3/2⁻)	(E1)	0.0175	
192.6 *2*	0.3 *1*	192.60	5/2⁺	0.0	9/2⁺	[E2]		
249.4 *2*	0.9 *1*	400.21	(5/2⁻)	151.29	5/2⁻			
275.2 *1*	7.3 *6*	426.53	(1/2⁻,3/2⁻)	151.29	5/2⁻			
335.9 *1*	28.2 *10*	426.53	(1/2⁻,3/2⁻)	90.60	(1/2,3/2)⁻			
363.9 *2*	2.1 *5*	790.39	(1/2⁻,3/2⁻)	426.53	(1/2⁻,3/2⁻)			
374.7 *2*	6.0 *6*	400.21	(5/2⁻)	25.70	3/2⁻			
390.4 *2*	2.4 *21*	790.39	(1/2⁻,3/2⁻)	400.21	(5/2⁻)			
400.9 *1*	16.1 *7*	426.53	(1/2⁻,3/2⁻)	25.70	3/2⁻			
489.8 *1*	2.8 *4*	641.07	(1/2⁻,3/2)	151.29	5/2⁻			
540.0[&] *1*	5.1[&] *12*	565.77	(1/2,3/2)	25.70	3/2⁻			
540.0[&] *1*	5.1[&] *12*	940.09	(1/2⁻,3/2⁻)	400.21	(5/2⁻)			
550.6 *2*	1.8 *10*	641.07	(1/2⁻,3/2)	90.60	(1/2,3/2)⁻			
595.3 *3*	0.5 *9*	1021.96	(1/2⁻,3/2⁻)	426.53	(1/2⁻,3/2⁻)			I_γ: the value of 0.5 *9* from 1987He21 could be a misprint, since it would give a negative Iγ.
615.3 *1*	5.6 *3*	641.07	(1/2⁻,3/2)	25.70	3/2⁻			
639.0 *1*	2.8 *4*	790.39	(1/2⁻,3/2⁻)	151.29	5/2⁻			
699.8 *1*	24.7 *8*	790.39	(1/2⁻,3/2⁻)	90.60	(1/2,3/2)⁻			
764.7 *1*	2.0 *12*	790.39	(1/2⁻,3/2⁻)	25.70	3/2⁻			
788.8 *1*	2.4 *18*	940.09	(1/2⁻,3/2⁻)	151.29	5/2⁻			
849.4 *2*	15.8 *7*	940.09	(1/2⁻,3/2⁻)	90.60	(1/2,3/2)⁻			
870.7 *1*	3.4 *3*	1021.96	(1/2⁻,3/2⁻)	151.29	5/2⁻			
914.3 *1*	13.9 *5*	940.09	(1/2⁻,3/2⁻)	25.70	3/2⁻			
931.4 *1*	15.8 *7*	1021.96	(1/2⁻,3/2⁻)	90.60	(1/2,3/2)⁻			
984.7 *2*	1.0 *4*	1550.75	(1/2,3/2)	565.77	(1/2,3/2)			
996.2 *1*	5.1 *4*	1021.96	(1/2⁻,3/2⁻)	25.70	3/2⁻			
1460.2 *1*	3.2 *3*	1550.75	(1/2,3/2)	90.60	(1/2,3/2)⁻			
1528.8 *3*	1.5 *2*	1619.4	(1/2,3/2)	90.60	(1/2,3/2)⁻			

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^{73}Br ε decay (3.4 min) 1987He21,1970Mu02 (continued)

$\gamma(^{73}Se)$ (continued)

† From 1987He21. Values from 1970Mu02 are in good agreement.
‡ From Adopted Gammas. Assignments from this dataset where α(K)exp (1987He21) are given under comments are the same. α(K) normalized to α(K)exp(65γ) assumed as M1.
# For absolute intensity per 100 decays, multiply by 0.37 *5*.
@ Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
& Multiply placed with undivided intensity.

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