^{77}Ge β^- decay (53.7 s) 2000Ke08,1970Me20,1970Im01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	30-Sep-2020

Parent: ^{77}Ge: E=159.71 *6*; $J^\pi=1/2^-$; $T_{1/2}$=53.7 s *6*; Q(β^-)=2703.5 *17*; %β^- decay=81 *2*

^{77}Ge-E,J^π,$T_{1/2}$: From ^{77}Ge Adopted Levels.

^{77}Ge-Q(β^-): From 2017Wa10.

^{77}Ge-%β^- decay: From Iγ(215γ)/Iβ=0.265 *27* (1970Im01) and I(γ+ce)(159γ)/I(γ+ce)(215γ)=0.881 *23* (1969Im02). Others: Iγ(215γ)/Iβ=0.27 *3* (1969Im02), Iγ(215γ)/Iβ=0.28 (1957Ly49).

2000Ke08: measured Eγ, Iγ.

1970Me20: measured Eγ, Iγ, $\gamma\gamma$.

1970Im01 (also 1969Im02): measured Eγ, Iγ, $\gamma\gamma$, $T_{1/2}$.

Additional information 1.

Others (γ, $T_{1/2}$): 1965Va12, 1962We08, 1957Ly49.

Total decay energy of 2319 keV *112* deduced (by RADLIST code) from proposed decay scheme is in agreement with the expected value of 2318 keV *57*, indicating that decay scheme is well established.

^{77}As Levels

E(level)	J^π†	$T_{1/2}$†
0.0	$3/2^-$	38.79 h *5*
194.76 *12*	$3/2^-$	
215.53 *6*	$3/2^-$	
264.4 *4*	$5/2^-$	
503.88 *17*	$1/2^-$	
614.43 *15*	$3/2^-$	
1604.68 *9*	$1/2^-$,$3/2^-$	
1676.48 *12*	$1/2^-$,$3/2^-$	

† From the Adopted Levels.

β^- radiations

β and $\beta\gamma$ data: 1955Bo36, 1954Bu94.

Iβ(264.7 level)=0.007 *4* gives log *ft*=8.7 *3*, which is too low for $\Delta J=2$, $\Delta\pi$=no. Apparent weak β^- feeding is probably due to undetected weak γ rays feeding this level.

E(decay)	E(level)	Iβ^-†‡	Log *ft*	Comments
(1186.7 *17*)	1676.48	0.23 *3*	5.8 *1*	av Eβ=439.22 *79*
(1258.5 *17*)	1604.68	0.37 *5*	5.7 *1*	av Eβ=470.58 *79*
(2248.8 *17*)	614.43	0.111 *22*	7.2 *1*	av Eβ=921.88 *85*
(2359.3 *17*)	503.88	0.043 *7*	7.7 *1*	av Eβ=973.67 *85*
(2647.7 *17*)	215.53	22 *4*	5.3 *1*	av Eβ=1109.56 *86*
(2668.4 *17*)	194.76	0.26 *10*	7.2 *2*	av Eβ=1119.39 *86*
(2863.2 *17*)	0.0	58 *4*	4.96 *4*	av Eβ=1211.75 *86* E(decay): measured value: 2900 *50* (1955Bo36). Others: 1954Bu94, 1947Ar01. Iβ^-: deduced from Iγ(215γ)/Iβ=0.265 *27* (1970Im01) and I(γ+ce)(159γ)/I(γ+ce)(215γ)=0.881 *23* (1969Im02).

† From Iγ(215γ)/Iβ=0.265 *27* (1970Im01) and γ-ray intensity balance at each level.

‡ Absolute intensity per 100 decays.

^{77}Ge β^- decay (53.7 s) 2000Ke08,1970Me20,1970Im01 (continued)

$\gamma(^{77}As)$

Iγ normalization: From Iγ(215γ)/Iβ=0.265 *27* (1970Im01).

E_γ [†]	I_γ [†&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	α [a]	Comments
194.8[‡] *2*	109×10[1][#] *18*	194.76	3/2$^-$	0.0	3/2$^-$	[M1,E2]		0.04 *3*	α(K)=0.036 *23*; α(L)=0.004 *3*; α(M)=0.0006 *4*; α(N)=4.E−5 *3* E$_\gamma$: not observed by 2000Ke08 due to lead absorber.
215.53 *6*	48×10[3][#] *7*	215.53	3/2$^-$	0.0	3/2$^-$	(M1+E2)	−0.164 *16*	0.01277 *25*	α(K)=0.01136 *22*; α(L)=0.001213 *25*; α(M)=0.000185 *4*; α(N)=1.40×10^{-5} *3* δ: from ^{77}Ge β^- decay (11.211 h) (1974LeYO).
264.4[@]	49 *22*	264.4	5/2$^-$	0.0	3/2$^-$	[M1,E2]		0.014 *8*	α(K)=0.013 *7*; α(L)=0.0014 *8*; α(M)=0.00021 *11*; α(N)=1.6×10^{-5} *8* E$_\gamma$: rounded energy from Adopted Gammas. I$_\gamma$: from absolute Iγ>0.012 and <0.031 (2000Ke08).
419.4[‡@] *5*	214[#] *38*	614.43	3/2$^-$	194.76	3/2$^-$				
503.86 *18*	113 *10*	503.88	1/2$^-$	0.0	3/2$^-$				
614.43 *18*	100.0	614.43	3/2$^-$	0.0	3/2$^-$				
990.3 *3*	53 *6*	1604.68	1/2$^-$,3/2$^-$	614.43	3/2$^-$				
1061.6 *5*	12 *3*	1676.48	1/2$^-$,3/2$^-$	614.43	3/2$^-$				
1100.8 *5*	7 *4*	1604.68	1/2$^-$,3/2$^-$	503.88	1/2$^-$				
1172.4 *5*	9 *4*	1676.48	1/2$^-$,3/2$^-$	503.88	1/2$^-$				
1340.0 *5*	34 *5*	1604.68	1/2$^-$,3/2$^-$	264.4	5/2$^-$				
1389.1 *5*	16 *3*	1604.68	1/2$^-$,3/2$^-$	215.53	3/2$^-$				
1409.94 *16*	238 *12*	1604.68	1/2$^-$,3/2$^-$	194.76	3/2$^-$				
1412.5 *7*	15 *4*	1676.48	1/2$^-$,3/2$^-$	264.4	5/2$^-$				
1461.3 *5*	14 *3*	1676.48	1/2$^-$,3/2$^-$	215.53	3/2$^-$				
1481.73 *24*	103 *7*	1676.48	1/2$^-$,3/2$^-$	194.76	3/2$^-$				
1604.65 *10*	482 *22*	1604.68	1/2$^-$,3/2$^-$	0.0	3/2$^-$				
1676.46 *14*	363 *17*	1676.48	1/2$^-$,3/2$^-$	0.0	3/2$^-$				
[x]2006.2	11								

[†] From 2000Ke08, except as noted.
[‡] From 1970Me20.
[#] From 1970Me20, normalized to Iγ=100 of 614γ (Iγ=0.21 *3* in 1970Me20).
[@] In 2000Ke08, the line is strongly contaminated by decays of other Ge isotopes.
[&] For absolute intensity per 100 decays, multiply by 4.5×10^{-4} *5*.
[a] 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.
[x] γ ray not placed in level scheme.

$^{77}_{33}As_{44}$-2

^{77}Ge β^- decay (53.7 s) 2000Ke08,1970Me20,1970Im01

Decay Scheme

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