^{67}Ge ε decay 1969Zo05,1969Vr01,1969Ba07

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Huo Junde, Huang Xiaolong, J. K. Tuli	NDS 106, 159 (2005)	1-Apr-2005

Parent: ^{67}Ge: E=0; $J^\pi=1/2^-$; $T_{1/2}$=18.9 min *3*; Q(ε)=4222 *5*; %ε+%$β^+$ decay=100.0

1969Zo05: Eγ, Iγ, γγ coincidences.

1969Vr01: Eγ, Iγ.

1969Ba07: Eγ, Iγ, γγ coincidences, $T_{1/2}$, ce spectrum, $β^+$ spectra and Fermi-Kurie analysis.

Decay scheme is based on 1969Zo05. See 1959Ri35, 1964Va23, and 1969Ba07 for $β^+$ measurements.

^{67}Ga Levels

E(level)†	Jπ‡	$T_{1/2}$	E(level)†	Jπ‡	E(level)†	Jπ‡
0	$3/2^-$	3.261 d *1*	1555.9? *11*	$5/2^-$	3162.0 *8*	
167.01 *5*	$1/2^-$		1639.92 *17*	$3/2^-$	3225.1 *3*	$3/2^-$
359.39 *16*	$5/2^-$		1809.84 *18*	$3/2^-$	3401.6 *5*	$(1/2^-,3/2^-)$
828.33 *15*	$3/2^-$		1976.1 *5*		3632.2 *15*	
911.23 *18*	$5/2^-$		2526.7 *5*	$(1/2^-,3/2^-)$	3655.4 *7*	$(1/2^-,3/2^-)$
1081.64 *18*	$1/2^-$		2619.6 *5*		3728.0 *9*	$(1/2^-,3/2^-)$
1203? *1*	$7/2^-$		2730.7 *4*	$(1/2^-,3/2^-)$		

† From a least-squares fit to the Eγ data.

‡ From Adopted Levels.

ε,$β^+$ radiations

E(decay)	E(level)	Iβ+ †‡	Iε†‡	Log *ft*	I(ε+β+)‡	Comments
(494 *5*)	3728.0		0.030 *4*	5.60 *6*	0.030 *4*	εK=0.8806; εL=0.1010; εM+=0.01839
(567 *5*)	3655.4		0.040 *6*	5.60 *7*	0.040 *6*	εK=0.8811; εL=0.1006; εM+=0.01831
(590 *5*)	3632.2		0.014 *3*	6.09 *10*	0.014 *3*	εK=0.8813; εL=0.1005; εM+=0.01828
(820 *5*)	3401.6		0.186 *18*	5.26 *5*	0.186 *18*	εK=0.8822; εL=0.09968; εM+=0.01812
(997 *5*)	3225.1		0.45 *4*	5.04 *4*	0.45 *4*	εK=0.8826; εL=0.09933; εM+=0.01805
(1060 *5*)	3162.0		0.134 *12*	5.62 *4*	0.134 *12*	εK=0.8827; εL=0.09924; εM+=0.01803
(1491 *5*)	2730.7	0.0242 *25*	0.30 *3*	5.58 *5*	0.32 *3*	av Eβ=202.9 *22*; εK=0.8165 *25*; εL=0.0913 *3*; εM+=0.01658 *5*
(1602 *5*)	2619.6	0.0183 *20*	0.105 *11*	6.09 *5*	0.123 *13*	av Eβ=249.9 *22*; εK=0.752 *4*; εL=0.0840 *4*; εM+=0.01525 *7*
(1695 *5*)	2526.7	0.047 *6*	0.159 *17*	5.96 *5*	0.206 *22*	av Eβ=289.5 *22*; εK=0.683 *4*; εL=0.0762 *5*; εM+=0.01384 *9*
(2246 *5*)	1976.1	0.086 *11*	0.040 *5*	6.81 *6*	0.126 *16*	av Eβ=530.5 *23*; εK=0.280 *3*; εL=0.0311 *3*; εM+=0.00565 *6*
(2412 *5*)	1809.84	4.1 *3*	1.27 *10*	5.36 *4*	5.4 *4*	av Eβ=605.0 *23*; εK=0.2080 *19*; εL=0.02316 *21*; εM+=0.00420 *4*
(2582 *5*)	1639.92	7.5 *5*	1.60 *9*	5.32 *3*	9.1 *5*	av Eβ=681.8 *23*; εK=0.1556 *13*; εL=0.01732 *15*; εM+=0.00314 *3*
(2666 *5*)	1555.9?	0.024 *4*	0.0043 *7*	7.92 *7*	0.028 *4*	av Eβ=720.0 *24*; εK=0.1356 *12*; εL=0.01509 *13*; εM+=0.002738 *23*
(3019 *5*)	1203?	0.012 *3*	0.0012 *3*	8.60 *10*	0.013 *3*	av Eβ=882.0 *24*; εK=0.0797 *6*; εL=0.00886 *7*; εM+=0.001607 *12*
(3140 *5*)	1081.64	3.5 *4*	0.29 *3*	6.24 *5*	3.8 *4*	av Eβ=938.2 *24*; εK=0.0675 *5*; εL=0.00750 *5*; εM+=0.001361 *10*
(3394 *5*)	828.33	1.0 *3*	0.061 *17*	6.98 *12*	1.1 *3*	av Eβ=1056.2 *24*; εK=0.0489 *3*; εL=0.00543 *4*; εM+=0.000985 *6*
(4055 *5*)	167.01	74 *5*	2.05 *14*	5.61 *4*	76 *5*	av Eβ=1367.9 *24*; εK=0.02390 *12*; εL=0.002653 *13*

Continued on next page (footnotes at end of table)

^{67}Ge ε decay **1969Zo05,1969Vr01,1969Ba07 (continued)**

ε,β^+ radiations (continued)

† From I(γ+ce) imbalance at each level.
‡ Absolute intensity per 100 decays.

^{67}Ge ε decay 1969Zo05,1969Vr01,1969Ba07 (continued)

γ(^{67}Ga)

Iγ normalization: From measured absolute intensity of the 1473γ (1969Zo05), the uncertainty in Iγ normalization is estimated by the evaluator from the uncertainties in the intensities of the 167γ and the 511γ added in quadrature.

E_γ[†]	I_γ[‡@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[&]	Comments
167.01 *5*	1720 *60*	167.01	1/2⁻	0	3/2⁻	[M1]		0.01823	
253.3 *4*	6.6 *6*	1081.64	1/2⁻	828.33	3/2⁻				
359.5 *2*	30 *3*	359.39	5/2⁻	0	3/2⁻	M1+E2	−0.08 *1*		
468.6 *10*	2.6 *3*	828.33	3/2⁻	359.39	5/2⁻				
551.2 *8*	1.7 *2*	911.23	5/2⁻	359.39	5/2⁻	(M1(+E2))	+0.3 *+10−5*		
557.4 *8*	1.2 *1*	1639.92	3/2⁻	1081.64	1/2⁻				
661.1 *3*	6.2 *6*	828.33	3/2⁻	167.01	1/2⁻	M1+E2	−0.36 *9*		
728.2 *5*	9 *2*	1809.84	3/2⁻	1081.64	1/2⁻				
728.7 *4*	48 *5*	1639.92	3/2⁻	911.23	5/2⁻				
744.2 *4*	1.4 *2*	911.23	5/2⁻	167.01	1/2⁻	E2(+M3)	−0.03 *7*		
811.8 *3*	16.0 *16*	1639.92	3/2⁻	828.33	3/2⁻				δ: ≤−0.3≥−1.7 for M1+E2.
828.3 *3*	61 *5*	828.33	3/2⁻	0	3/2⁻	M1+E2	−0.14 *4*		
898.5 *3*	19.5 *20*	1809.84	3/2⁻	911.23	5/2⁻	(M1(+E2))	≤+0.41		
911.2 *3*	63 *6*	911.23	5/2⁻	0	3/2⁻	M1+E2	+0.32 *2*		
914.8 *3*	62 *6*	1081.64	1/2⁻	167.01	1/2⁻	(M1)			
981.3 *3*	23 *2*	1809.84	3/2⁻	828.33	3/2⁻	(M1(+E2))	+0.8 *+27−8*		
1081.3 *3*	21 *2*	1081.64	1/2⁻	0	3/2⁻				
1196.5 *10*	0.58 *7*	1555.9?	5/2⁻	359.39	5/2⁻	M1+E2	−0.65 *3*		
1203 *1*	0.26 *5*	1203?	7/2⁻	0	3/2⁻	E2(+M3)	−0.00 *2*		
1280.6 *3*	7.7 *8*	1639.92	3/2⁻	359.39	5/2⁻	(M1(+E2))	≤+0.5		
[x]1317.6 *8*	1.6 *2*								
1450.7 *3*	13.4 *13*	1809.84	3/2⁻	359.39	5/2⁻	(M1(+E2))	≤+0.22		
1472.8 *3*	100	1639.92	3/2⁻	167.01	1/2⁻	M1+E2	−0.16 *2*		
1639.5 *7*	13 *2*	1639.92	3/2⁻	0	3/2⁻				
1643.0 *5*	18 *2*	1809.84	3/2⁻	167.01	1/2⁻				
[x]1668.8 *10*	0.26 *5*								
1680.0 *10*	0.23 *5*	3655.4	(1/2⁻,3/2⁻)	1976.1					
1708.2 *10*	0.9 *1*	2619.6		911.23	5/2⁻				
1790.8 *8*	1.3 *2*	2619.6		828.33	3/2⁻				
1809.4 *6*	27 *3*	1809.84	3/2⁻	0	3/2⁻	(M1(+E2))	−0.26 *26*		
1844.7 *10*	0.5 *1*	3655.4	(1/2⁻,3/2⁻)	1809.84	3/2⁻				
1976.2 *5*	2.8 *3*	1976.1		0	3/2⁻				
2079.5 *10*	0.44 *5*	3162.0		1081.64	1/2⁻				
2144 *1*	1.2 *4*	3225.1	3/2⁻	1081.64	1/2⁻				
2395.9 *6*	1.4 *2*	3225.1	3/2⁻	828.33	3/2⁻				
2453.0 *7*	0.32 *3*	2619.6		167.01	1/2⁻				
2526.6 *5*	4.2 *4*	2526.7	(1/2⁻,3/2⁻)	0	3/2⁻				
2563.6 *5*	4.6 *5*	2730.7	(1/2⁻,3/2⁻)	167.01	1/2⁻				

$^{67}_{31}Ga_{36}$-3

^{67}Ge ε decay 1969Zo05,1969Vr01,1969Ba07 (continued)

γ(^{67}Ga) (continued)

E_γ †	I_γ ‡@	E_i(level)	J_i^π	E_f	J_f^π	E_γ †	I_γ ‡@	E_i(level)	J_i^π	E_f	J_f^π
x2668.8 *8*	0.71 *7*					x3307.8 *10*	0.36 *4*				
2730.6 *7*	1.9 *2*	2730.7	(1/2$^-$,3/2$^-$)	0	3/2$^-$	x3361.9 *10*	0.41 *4*				
2865.6 *10*	2.1 *2*	3225.1	3/2$^-$	359.39	5/2$^-$	3368.8 *10*	0.36 *4*	3728.0	(1/2$^-$,3/2$^-$)	359.39	5/2$^-$
3042.2 *7*	0.7 *1*	3401.6	(1/2$^-$,3/2$^-$)	359.39	5/2$^-$	3401.5 *5*	3.1 *3*	3401.6	(1/2$^-$,3/2$^-$)	0	3/2$^-$
3058.3 *5*	3.9 *4*	3225.1	3/2$^-$	167.01	1/2$^-$	3465.7 *20*	0.17 *3*	3632.2		167.01	1/2$^-$
x3123.1 *7*	1.4 *2*					x3612.4 *20*	0.12 *4*				
x3144.2 *10*	0.27 *3*					3631.4 *20*	0.12 *4*	3632.2		0	3/2$^-$
3162.8 *10*	2.3 *2*	3162.0		0	3/2$^-$	3655.6 *20*	0.09 *3*	3655.4	(1/2$^-$,3/2$^-$)	0	3/2$^-$
3225.5 *7*	0.59 *6*	3225.1	3/2$^-$	0	3/2$^-$	3727.0 *20*	0.26 *5*	3728.0	(1/2$^-$,3/2$^-$)	0	3/2$^-$

† From 1969Zo05.
‡ Relative intensity from 1969Zo05.
# From Adopted Levels.
@ For absolute intensity per 100 decays, multiply by 0.049 *2*.
& 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.

$^{67}_{31}Ga_{36}$-4

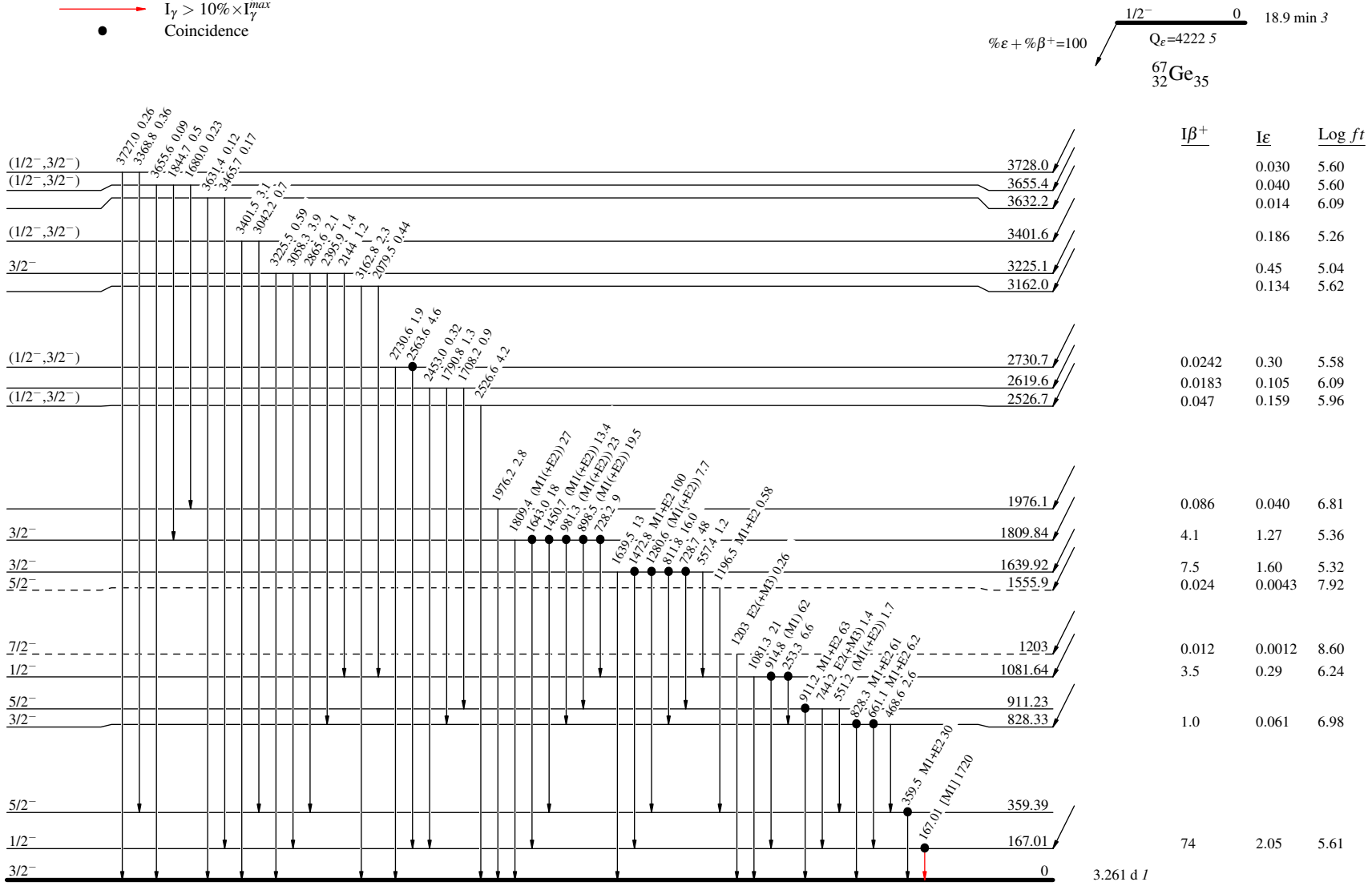
^{67}Ge ε decay 1969Zo05,1969Vr01,1969Ba07

Decay Scheme

Intensities: Relative I_γ

Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- Coincidence



	Iβ+	Iε	Log *ft*
		0.030	5.60
		0.040	5.60
		0.014	6.09
		0.186	5.26
		0.45	5.04
		0.134	5.62
	0.0242	0.30	5.58
	0.0183	0.105	6.09
	0.047	0.159	5.96
	0.086	0.040	6.81
	4.1	1.27	5.36
	7.5	1.60	5.32
	0.024	0.0043	7.92
	0.012	0.0012	8.60
	3.5	0.29	6.24
	1.0	0.061	6.98
	74	2.05	5.61

$^{67}_{31}Ga_{36}$

$^{67}_{31}Ga_{36}$-5