^{72}Ge(^{16}O,p2nγ) 1985Di13

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 116, 1 (2014)	31-Dec-2013

Includes ^{59}Co(^{28}Si,2pγ); ^{70}Ge(^{19}F,$\alpha\gamma$); ^{73}Ge(^{16}O,p3nγ) and ^{74}Ge(^{14}N,3nγ); ^{72}Ge(^{14}N,3nγ); ^{85}Rb(^{3}He,3nγ) reactions.

1985Di13: ^{72}Ge(^{16}O,p2nγ) E=48-60 MeV, measured Eγ, Iγ, nγ and $\gamma\gamma$ coincidences, determined γ excitation functions and angular distributions.

Others:

2000Io02: ^{85}Rb(^{3}He,3nγ) E=30 MeV. Measured g factor of 266 level by time-dependent perturbed angular distribution (PAD) method in external magnetic field.

1999Do13: ^{59}Co(^{28}Si,2pγ) E=99 MeV. Measured Eγ, Iγ, $\gamma\gamma$ using Pitt-FSU detector array with five HPGe Compton-suppressed detectors and a low energy photon spectrometer (LEPS). Selected portions of level scheme with no data details.

1985BuZP: ^{70}Ge(^{19}F,$\alpha\gamma$). Measured lifetimes using recoil-distance method.

1982RaZY: ^{76}Se(^{12}C,p2nγ), E=48 MeV. Measured g factor of 266 level by time-dependent PAD method in external magnetic field.

1981Bu05: ^{74}Ge(^{14}N,3nγ) E=40-52 MeV; ^{72}Ge(^{16}O,p2nγ) E=45-64 MeV; and ^{73}Ge(^{16}O,p3nγ) E=48-60 MeV. The 852-983-795 cascade observed and its measured $\gamma(\theta)$ consistent with both transitions of stretched quadrupole multipolarity.

^{85}Y Levels

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$[#]	Comments
0	1/2$^-$	2.68[&] h *5*	
19.8[a] *5*	9/2$^+$	4.86 h *20*	E(level),J$^\pi$,T$_{1/2}$: from Adopted Levels.
266.3	(5/2)$^-$	176 ns *7*	g=+0.542 *9* (2000Io02); g=+0.53 *3* (1982RaZY) J$^\pi$: from Adopted Levels. T$_{1/2}$: from γ(t) (1982RaZY).
474.0 *5*	7/2$^+$,9/2$^+$		
814.8[a] *5*	13/2$^+$	2.36 ps *14*	T$_{1/2}$: other: 3.0 ps *4* (1985BuZP).
1179.6 *5*	11/2$^+$		
1648.5 *5*	13/2$^+$		
1797.6[a] *5*	17/2$^+$	1.32 ps *14*	
2259.6 *5*	17/2$^+$	3.05 ps *35*	
2303.2[b] *5*	(15/2$^-$)	11.1 ps *14*	
2507.0[b] *5*	(17/2$^-$)	11.1[@] ps *7*	
2649.8[a] *5*	21/2$^+$	4.02 ps *21*	J$^\pi$: the angular correlation of the 852-983-795 cascade is consistent with stretched quadrupole transitions. T$_{1/2}$: other: 4.4 ps *8* (1985BuZP).
2745.7 *5*	(15/2 to 19/2)		
2925.7[b] *5*	(19/2$^-$)	5.1 ps *10*	
2990.4 *6*	(19/2$^+$)	1.73[@] ps *35*	
3018.8 *6*	(15/2 to 19/2)		
3304.4[b] *5*	(21/2$^-$)	1.39 ps *14*	
3391.5 *6*	23/2$^+$	1.0 ps *4*	
3672.4[a] *6*	25/2$^+$	2.4 ps *+3−7*	
4004.6[b] *6*	(23/2$^-$)	<5.5[@] ps	
4079.6 *6*			
4360.9[b] *6*	(25/2$^-$)	1.66[@] ps *14*	
4601.9 *6*			
4913.3[a] *6*	(29/2$^+$)	0.69[@] ps *14*	
4983.3 *6*			E(level): 622.4γ is relocated from 7262 level In 2009Ru03, thus 4983 level is omitted In Adopted Levels.
5020.4[b] *6*	(27/2$^-$)		

Continued on next page (footnotes at end of table)

^{72}Ge(^{16}O,p2nγ) 1985Di13 (continued)

^{85}Y Levels (continued)

E(level)[†]	J$^{\pi}$[‡]
5436.5[b] 6	(29/2$^-$)
6353[a] 1	

† From least-squares fit to Eγ data.
‡ As given In 1985Di13 based on $\gamma(\theta)$ data and band assignments. See Adopted Levels also.
# From DSAM and recoil-distance measurements (1985Di13) unless indicated otherwise. For some levels, half-lives were also measured by 1985BuZP in ^{70}Ge(^{19}F,$\alpha\gamma$) reaction using recoil-distance method.
@ Upper limit, measured value is effective half-life, not corrected for side feedings.
& From Adopted Levels.
a Band(A): 9/2$^+$ band, α=+1/2. Band crossing near spin 21/2 due to alignment of a pair of $g_{9/2}$ neutrons as suggested by systematics of N=46 isotopes.
b Band(B): Band based on (15/2$^-$).

^{72}Ge(^{16}O,p2nγ) 1985Di13 (continued)

$\gamma(^{85}Y)$

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
203.82 *5*	12.3 *9*	2507.0	(17/2$^-$)	2303.2	(15/2$^-$)	D		A_2=−0.20 *7*; A_4=+0.03 *9*
238.66 *6*	3.5 *2*	2745.7	(15/2 to 19/2)	2507.0	(17/2$^-$)			
266.3		266.3	(5/2)$^-$	0	1/2$^-$			
273.1 *1*	1.8 *1*	3018.8	(15/2 to 19/2)	2745.7	(15/2 to 19/2)			
275.52 *9*	2.8 *1*	2925.7	(19/2$^-$)	2649.8	21/2$^+$			
280.8 *1*	5.2 *4*	3672.4	25/2$^+$	3391.5	23/2$^+$	(M1+E2)	−0.16 *10*	A_2=−0.35 *10*; A_4=+0.13 *12* δ: 1985Di13 give δ=−3.8 *5*. This value leads to B(E2)(W.u.) value which exceeds RUL. From $\gamma(\theta)$ data, 1985Di13 list δ=−(4.0 *+24−12*) or −0.16 *10*. Because 1985Di13 quote B(M1)(W.u.)=0.28 *+14−4*, it can be concluded that lower value of δ is more likely, and that listed final value of −3.8 *5* is a misprint in 1985Di13.
311[#]		4913.3	(29/2$^+$)	4601.9				
340.8 *5*	2.4 *5*	2990.4	(19/2$^+$)	2649.8	21/2$^+$			
356.4 *1*	3.0 *2*	4360.9	(25/2$^-$)	4004.6	(23/2$^-$)	(M1+E2)	−0.2 *1*	A_2=−0.38 *10*; A_4=+0.11 *8*
364.58 *9*	3.3 *2*	1179.6	11/2$^+$	814.8	13/2$^+$	(M1+E2)	+0.25 *8*	A_2=−0.35 *7*; A_4=+0.04 *8*
378.72 *7*	10.7 *3*	3304.4	(21/2$^-$)	2925.7	(19/2$^-$)	(M1+E2)	−0.2 *1*	A_2=−0.40 *9*; A_4=+0.1 *1*
416.1 *1*	7.2 *3*	5436.5	(29/2$^-$)	5020.4	(27/2$^-$)	(D+Q)		A_2<0; A_4>0
454.17 *10*	7.6 *2*	474.0	7/2$^+$,9/2$^+$	19.8	9/2$^+$			
462.18 *11*	3.0 *2*	2259.6	17/2$^+$	1797.6	17/2$^+$	(M1+E2)		A_2=+0.29 *6*; A_4=+0.06 *7*
468.84 *6*	5.7 *2*	1648.5	13/2$^+$	1179.6	11/2$^+$	(M1+E2)	−0.12 *5*	A_2=−0.32 *5*; A_4=+0.07 *6*
522.3 *1*	2.7 *11*	4601.9		4079.6				
622.4[@] *1*		2925.7	(19/2$^-$)	2303.2	(15/2$^-$)			
622.4[@] *1*		4983.3		4360.9	(25/2$^-$)			
654.85 *6*	16.3 *4*	2303.2	(15/2$^-$)	1648.5	13/2$^+$	D		A_2=−0.25 *3*; A_4=+0.03 *4*
659.5 *1*	6.3 *6*	5020.4	(27/2$^-$)	4360.9	(25/2$^-$)	(D+Q)		A_2<0; A_4>0
700.3 *6*	1.7 *4*	4004.6	(23/2$^-$)	3304.4	(21/2$^-$)			
706		1179.6	11/2$^+$	474.0	7/2$^+$,9/2$^+$			
741.6 *1*	9.3 *6*	3391.5	23/2$^+$	2649.8	21/2$^+$	(M1+E2)	−1.4 *11*	A_2=−0.60 *10*; A_4=+0.25 *15* δ(Q/D)=−0.3 to −2.5.
795.00 *5*	100	814.8	13/2$^+$	19.8	9/2$^+$	E2		A_2=+0.26 *3*; A_4=−0.05 *3*
797.35 *8*	5.8 *3*	3304.4	(21/2$^-$)	2507.0	(17/2$^-$)	(E2)		A_2=+0.15 *5*; A_4=+0.02 *4*
834.02 *8*	7.3 *5*	1648.5	13/2$^+$	814.8	13/2$^+$			
851.92 *8*	44.5 *4*	2649.8	21/2$^+$	1797.6	17/2$^+$	(E2)		A_2=+0.26 *2*; A_4=−0.03 *3*
932[#]		4601.9		3672.4	25/2$^+$			
982.76 *5*	70.4 *4*	1797.6	17/2$^+$	814.8	13/2$^+$	(E2)		A_2=+0.26 *2*; A_4=−0.01 *3* E_γ: uncertainty of 0.01 keV In 1985Di13 seems unrealistically small, evaluators have assigned 0.05 keV based on minimum uncertainty assigned In 1985Di13 for some other strong γ rays.
1022.8 *1*	9.4 *3*	3672.4	25/2$^+$	2649.8	21/2$^+$	(E2)		A_2=+0.29 *5*; A_4=+0.03 *7*
1056.3 *1*	10.2 *4*	4360.9	(25/2$^-$)	3304.4	(21/2$^-$)	E2		A_2=+0.27 *4*; A_4=−0.07 *5*

From ENSDF

$^{85}_{39}Y_{46}$-3

^{72}Ge(^{16}O,p2nγ) 1985Di13 (continued)

$\gamma(^{85}Y)$ (continued)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
1079.5 *2*	5.8 *4*	4004.6	(23/2$^-$)	2925.7	(19/2$^-$)	(E2)		A_2=+0.38 *10*; A_4=−0.10 *13*
1089.2 *2*	4.6 *2*	4079.6		2990.4	(19/2$^+$)			
1128.65 *10*	5.4 *3*	2925.7	(19/2$^-$)	1797.6	17/2$^+$	(D)		A_2<0
1159.8 *1*	4.7 *2*	1179.6	11/2$^+$	19.8	9/2$^+$	(M1+E2)	−0.9 *3*	A_2=−0.75 *10*; A_4=+0.12 *10*
1192.8 *1*	7.9 *3*	2990.4	(19/2$^+$)	1797.6	17/2$^+$			
1240.8 *2*	1.7 *2*	4913.3	(29/2$^+$)	3672.4	25/2$^+$			
1440[#]		6353		4913.3	(29/2$^+$)			
1444.7 *1*	10.4 *3*	2259.6	17/2$^+$	814.8	13/2$^+$	(E2)		A_2=+0.25 *8*; A_4=+0.06 *10*
1488.5 *1*	10.7 *2*	2303.2	(15/2$^-$)	814.8	13/2$^+$	D		A_2=−0.24 *4*; A_4=+0.06 *5*
1628.6 *2*	2.9 *3*	1648.5	13/2$^+$	19.8	9/2$^+$	(Q)		A_2=+0.43 *15*; A_4=+0.07 *8*

[†] From (neutron)γ coin, at 54 MeV and θ=125°.
[‡] From $\gamma(\theta)$.
[#] γ from 1999Do13.
[@] Multiply placed.

From ENSDF

$^{85}_{39}Y_{46}$-4

^{72}Ge(^{16}O,p2nγ) **1985Di13**

Level Scheme

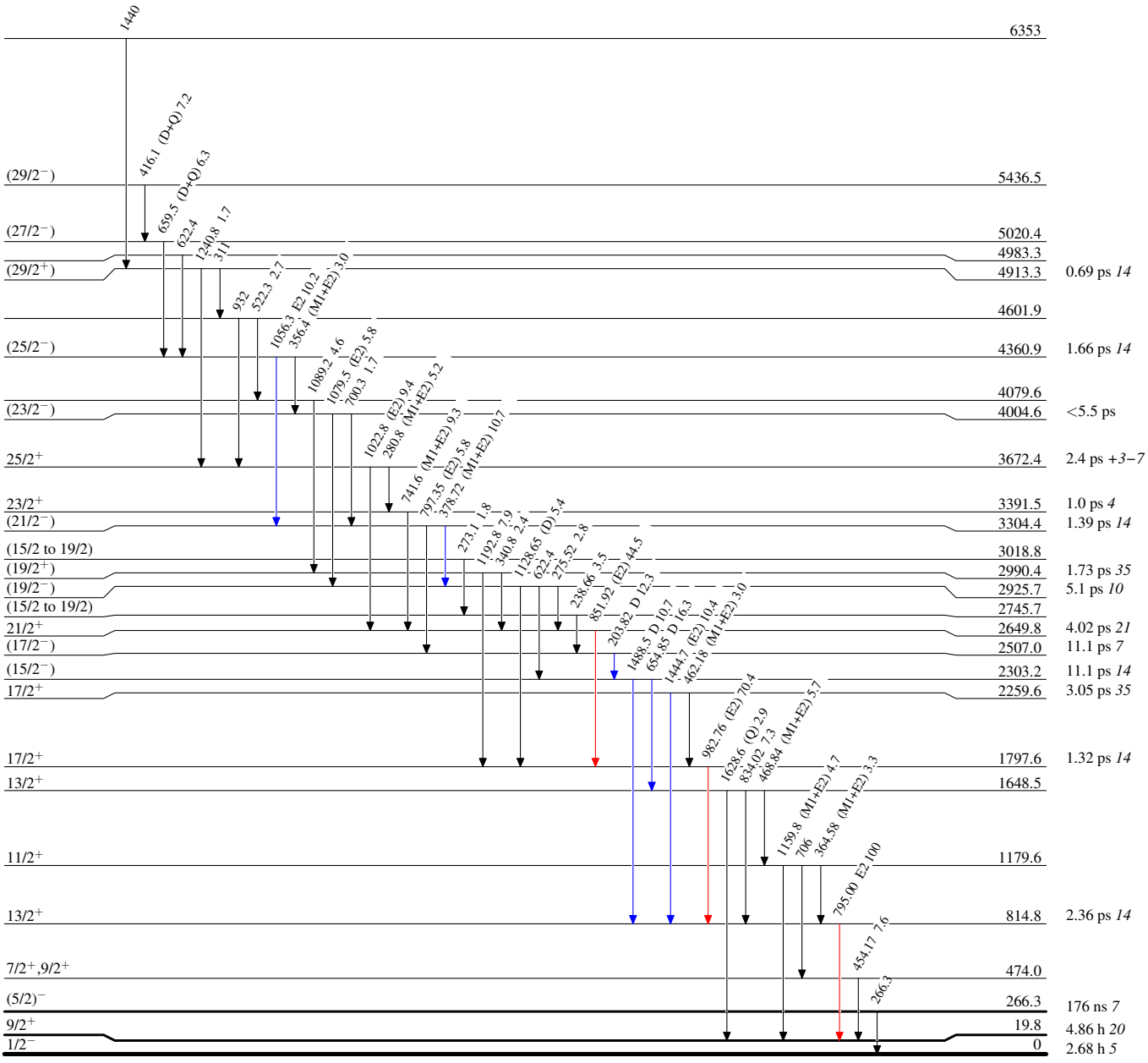
Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

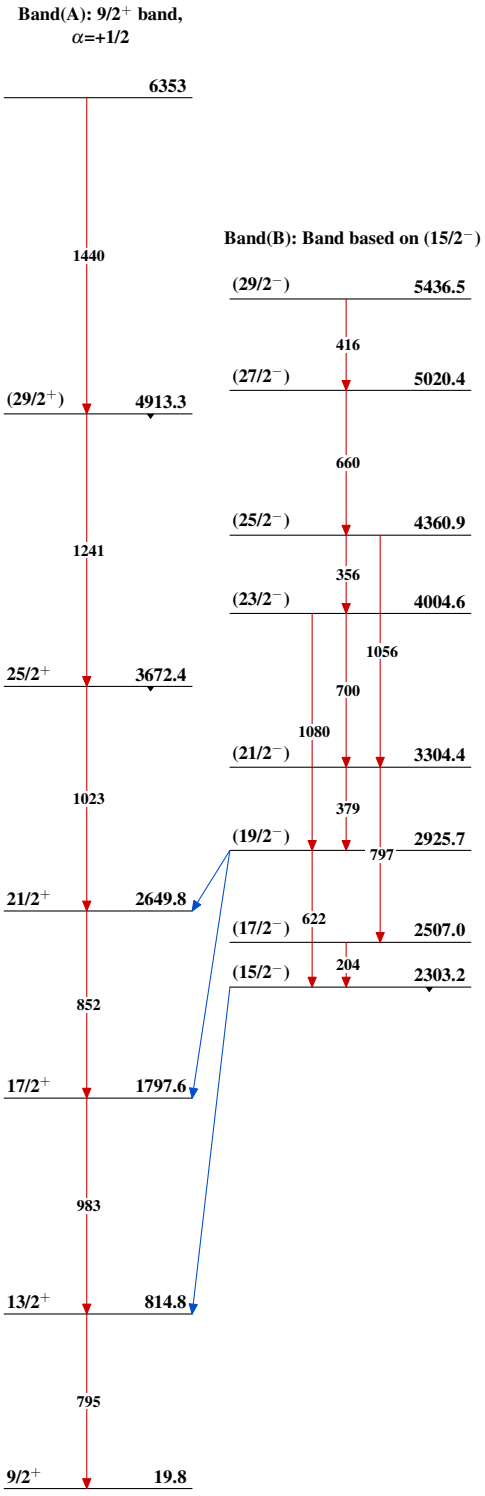
$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$



$^{85}_{39}Y_{46}$

^{72}Ge(^{16}O,p2nγ) 1985Di13



$^{85}_{39}Y_{46}$