^{24}Mg(^{40}Ca,pnγ) 2013Da16

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, Huang Xiaolong, and Wang Xianghan	NDS 204,1 (2025)	30-Jun-2023

2013Da16: E(^{40}Ca)=103 MeV. Measured Eγ, Iγ, β-tagged γ spectra, $\gamma\gamma$-coin, (recoil)γ-coin, $\gamma\gamma$ asymmetry ratio using Gammasphere array with 96 HPGe detectors at ATLAS-ANL facility. Comparison with IBM-4 model calculations.

^{62}Ga Levels

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$	Comments
0.0	0$^+$	116.15 ms *13*	T=1 T$_{1/2}$: from $\beta\gamma$(t) (2013Da16).
571.8[#] *5*	1$^+$		T=0
818.0[#] *10*	3$^+$		T=0
978.7 *4*	1$^+$		T=0
1017.7 *9*	2$^+$		T=1
1161.5 *4*	2$^+$		T=0
1193.7[#] *10*	5$^+$		T=0
1439.7 *10*	4$^+$		T=0
1575.1 *8*	(2,3)$^+$		T=0
2211.4 *5*	(2,3)$^+$		
2238.1 *20*			
2374.3 *11*	6$^+$		
2434.4[#] *10*	7$^+$		
2674.0[@] *11*	4$^+$		
2990.3 *14*	(5,6,7)$^+$		
3014.1[@] *11*	6$^+$		
3492.3 *11*	7		
3796.6 *12*	(7$^+$)		
3921.7[@] *11*	8$^+$		
4658.3 *15*	8		
4789.6[#] *13*	9$^+$		
4944.7[@] *15*	9$^+$,10$^+$		
5735.6[#] *16*	11$^+$		
6842.6[#] *19*	13$^+$		
8588.8[#] *21*	(15$^+$)		
9978.5[#] *22*	(17$^+$)		

[†] From least-squares fit to Eγ data, assuming 1 keV when not listed.
[‡] As given by 2013Da16, based on previous assignments for low-lying levels, and $\gamma(\theta)$ data in the present study.
[#] Seq.(B): ΔJ=2 sequence based on 1$^+$.
[@] Band(A): Band based on 4$^+$.

γ(^{62}Ga)

R$_\theta$=Angular distribution ratio measured as Iγ(32°)/Iγ(90°). Expected ratio is 0.72 *4* for ΔJ=1, dipole and 1.15 *3* for ΔJ=2, quadrupole transitions, as measured for known transitions in ^{62}Zn.

Continued on next page (footnotes at end of table)

^{24}Mg(^{40}Ca,pnγ) 2013Da16 (continued)

γ(^{62}Ga) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
182.8 *1*	2 *1*	1161.5	2^+	978.7	1^+		
246†	112†	818.0	3^+	571.8	1^+		
340.1 *3*	5 *1*	3014.1	6^+	2674.0	4^+		
375.7 *1*	100 *2*	1193.7	5^+	818.0	3^+	Q	R_θ=1.21 *11*.
445.9 *7*	2‡ *1*	1017.7	2^+	571.8	1^+		
478.3 *11*	2‡ *1*	3492.3	7	3014.1	6^+		
571†	135†	571.8	1^+	0.0	0^+		
589.5 *3*	12 *1*	1161.5	2^+	571.8	1^+	D	R_θ=0.72 *21*.
595.9 *9*	3 *1*	1575.1	$(2,3)^+$	978.7	1^+		
621.9 *2*	13 *1*	1439.7	4^+	818.0	3^+	Q,D+Q	R_θ=1.26 *36*.
641 *2*	4‡ *2*	3014.1	6^+	2374.3	6^+		
867		4789.6	9^+	3921.7	8^+		
907.6 *5*	12 *2*	3921.7	8^+	3014.1	6^+		
935.3 *4*	10 *1*	2374.3	6^+	1439.7	4^+		
946		5735.6	11^+	4789.6	9^+		
978.8 *4*	17 *2*	978.7	1^+	0.0	0^+	(D)	R_θ=0.77 *25*.
1004 *1*	5 *3*	1575.1	$(2,3)^+$	571.8	1^+		
1023		4944.7	9^+,10^+	3921.7	8^+		
1057.4 *5*	10 *1*	3492.3	7	2434.4	7^+		
1107		6842.6	13^+	5735.6	11^+		
1120.3 *12*	11‡ *3*	3492.3	7	2374.3	6^+		
1166		4658.3	8	3492.3	7		
1179.4 *7*	18‡ *3*	2374.3	6^+	1193.7	5^+	D	R_θ=0.60 *22*.
1232.7 *3*	7‡ *4*	2211.4	$(2,3)^+$	978.7	1^+		
1240.6 *2*	87 *3*	2434.4	7^+	1193.7	5^+	Q	R_θ=1.20 *18*.
1362.2 *7*	6 *2*	3796.6	(7^+)	2434.4	7^+		
1389.7 *8*		9978.5	(17^+)	8588.8	(15^+)		
1420.1 *17*	13‡ *4*	2238.1		818.0	3^+		
1486.9 *5*	22 *3*	3921.7	8^+	2434.4	7^+		
1513.0 *17*	7 *3*	2674.0	4^+	1161.5	2^+		
1746.2 *8*		8588.8	(15^+)	6842.6	13^+		
1796.5 *9*	10 *1*	2990.3	$(5,6,7)^+$	1193.7	5^+		
2356		4789.6	9^+	2434.4	7^+		

† Energy taken by 2013Da16 from 2004Ru03. Intensity estimated from 2004Ru03.
‡ Estimated from $\gamma\gamma$-coin data.

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Level Scheme

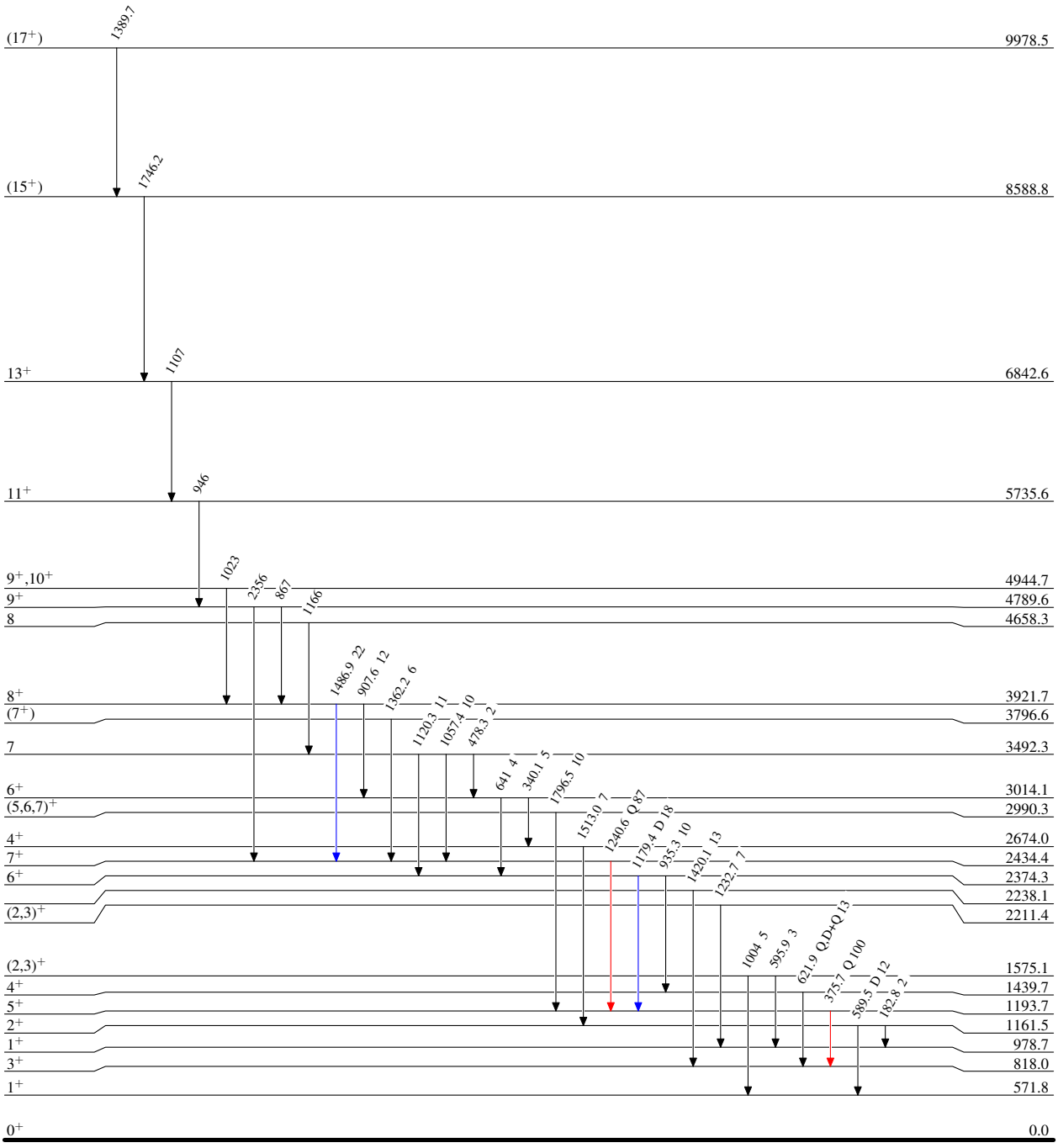
Intensities: Relative I_γ

Legend

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

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

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



$^{62}_{31}Ga_{31}$

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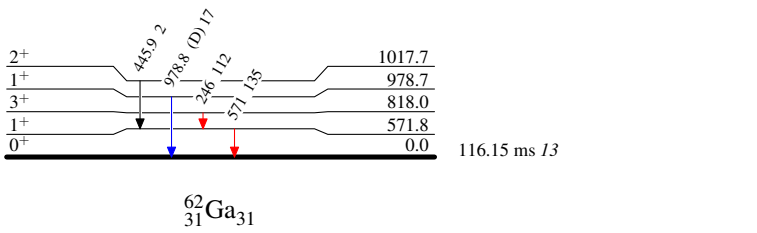
Level Scheme (continued)

Intensities: Relative I_γ



$^{62}_{31}Ga_{31}$

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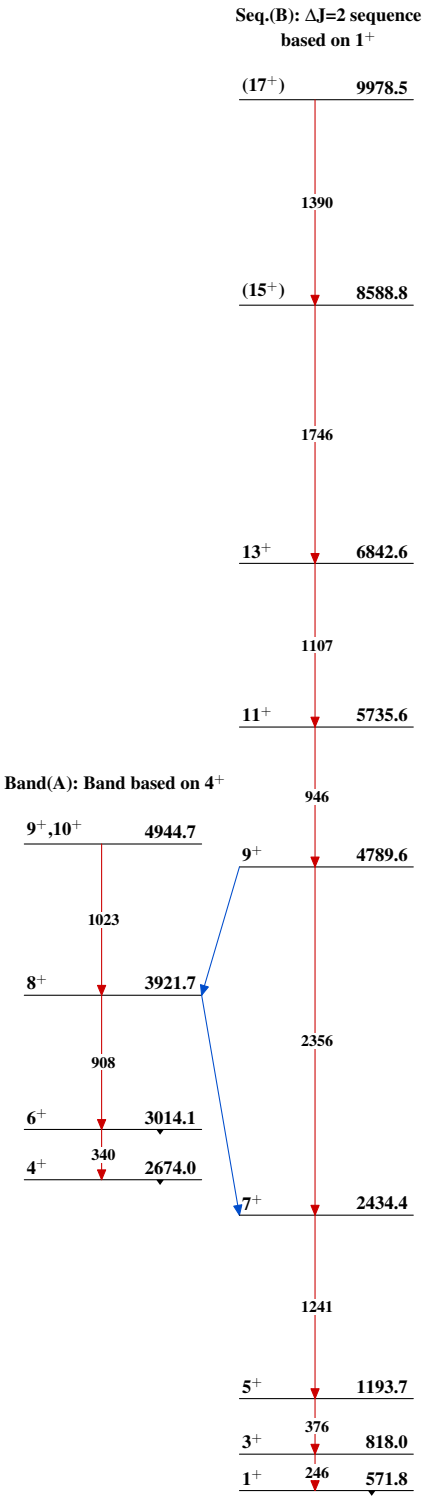

$^{62}_{31}Ga_{31}$