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^{40}Ca(^{24}Mg,pnγ)   **2004Ru03**

History

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Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Alan L. Nichols, Balraj Singh, Jagdish K. Tuli	NDS 113, 973 (2012)	15-Apr-2012

2004Ru03: E=55 MeV. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$(DCO), (particle)γ coin, $\gamma\gamma$(angular asymmetry) by means of GASP
   Ge-detector array with 40 Compton-suppressed high-purity Ge-detector elements and 74 out of the standard 80 BGO elements.
   Particles were detected with the ISIS array consisting of 40 ΔE-E Si telescopes. Comparisons made with spherical shell-model
   calculations based on the π(f$_{5/2}$g$_{9/2}$) valence space.
Search for the even-spin T=1 isobaric analog states.

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^{62}Ga Levels

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E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$	Comments
0.0	0$^+$		
571.2[#] *1*	1$^+$		
817.2[#] *1*	3$^+$	4.0 ns +*21*−*15*	T$_{1/2}$: from delayed $\gamma\gamma$ coin (2004Ru03).
1016.7 *3*	2		
1193.5[#] *2*	5$^+$		
1439.4 *2*	4$^+$,5$^+$		
2234.0 *5*			
2373.6 *3*	6$^+$		
2434.3[#] *2*	7$^+$		
2674.5 *3*	6		
3014.8 *3*	6$^+$,7$^+$		
3491.8 *3*	7		
3922.0[@] *3*	8$^+$		
4657.8 *4*	8		
4789.1[#] *3*	9$^+$		
4945.2[@] *4*	9$^+$,10$^+$		
5735.0[#] *4*	11$^+$		
6842.3[#] *5*			

[†] From least-squares fit to Eγ data.
[‡] As proposed in 2004Ru03 based on DCO ratios for selected transitions, yrast sequence based on γ-ray intensities.
[#] Band(A): yrast sequence, α=1.
[@] Band(a): yrast sequence, α=0.

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γ(^{62}Ga)

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DCO ratios are for 35° and 81° geometry with gates on ΔJ=2, quadrupole transitions. Expected ratios are: 1.0 for ΔJ=2,
   quadrupole and $\approx$0.6 for ΔJ=1, dipole transitions.
R$_{35,90}$=Angular distribution ratio.

E$_\gamma$	I$_\gamma$	E$_i$(level)	J$^{\pi}_i$	E$_f$	J$^{\pi}_f$	Mult.[†]	Comments
246.0 *1*	100 *3*	817.2	3$^+$	571.2	1$^+$	E2	DCO=0.92 *6* R$_{35,90}$=1.30 *3*. Mult.: DCO and RUL.
340.4 *2*	3.2 *7*	3014.8	6$^+$,7$^+$	2674.5	6		R$_{35,90}$=1.7 *6*.
376.3 *1*	89 *3*	1193.5	5$^+$	817.2	3$^+$	Q	DCO=1.05 *6* R$_{35,90}$=1.35 *5*. Mult.: E2 in 2004Ru03.

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Continued on next page (footnotes at end of table)

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^{40}Ca(^{24}Mg,pnγ)   **2004Ru03 (continued)**

$\gamma(^{62}$Ga) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	Comments
445.5 *3*	1.7 *2*	1016.7	2	571.2	1$^+$	D	$R_{35,90}$=0.58 *9*.
571.2 *1*	120 *4*	571.2	1$^+$	0.0	0$^+$	D	DCO=0.59 *3*
							$R_{35,90}$=0.77 *3*.
							Mult.: M1 in 2004Ru03.
622.3 *1*	13.0 *5*	1439.4	4$^+$,5$^+$	817.2	3$^+$	Q,D+Q	DCO=1.06 *16*
							$R_{35,90}$=1.37 *10*.
							Mult.: E2, M1+E2 in 2004Ru03.
641.2 *2*	2.7 *3*	3014.8	6$^+$,7$^+$	2373.6	6$^+$	D,D+Q	DCO=0.89 *24*
							$R_{35,90}$=1.26 *18*.
							Mult.: dipole, M1+E2 in 2004Ru03.
789.5[‡] *6*	1.1 *6*	5735.0	11$^+$	4945.2	9$^+$,10$^+$		
794.4 *5*	1.7 *6*	2234.0		1439.4	4$^+$,5$^+$		$R_{35,90}$=1.6 *6*.
867.1 *2*	3.6 *3*	4789.1	9$^+$	3922.0	8$^+$	D+Q	DCO=0.41 *10*
							$R_{35,90}$=0.55 *8*.
							Mult.: M1+E2 in 2004Ru03.
907.3 *3*	5.5 *6*	3922.0	8$^+$	3014.8	6$^+$,7$^+$	Q,D+Q	DCO=1.09 *22*
							$R_{35,90}$=0.87 *9*.
							Mult.: E2, M1+E2 in 2004Ru03.
934.2 *4*	3.8 *4*	2373.6	6$^+$	1439.4	4$^+$,5$^+$		$R_{35,90}$=1.2 *3*.
945.9 *2*	16.0 *6*	5735.0	11$^+$	4789.1	9$^+$	Q	DCO=1.09 *11*
							$R_{35,90}$=1.38 *8*.
							Mult.: E2 in 2004Ru03.
1023.1 *2*	8.0 *5*	4945.2	9$^+$,10$^+$	3922.0	8$^+$	Q,D+Q	DCO=0.91 *16*
							$R_{35,90}$=1.12 *8*.
							Mult.: E2, M1+E2 in 2004Ru03.
1057.6 *2*	11.4 *5*	3491.8	7	2434.3	7$^+$	D	DCO=0.95 *13*
							Mult.: ΔJ=0 transition.
							$R_{35,90}$=1.32 *7*.
1107.3 *3*	5.9 *7*	6842.3		5735.0	11$^+$		
1118.2 *2*	5.3 *5*	3491.8	7	2373.6	6$^+$	D	DCO=0.70 *16*
							$R_{35,90}$=0.77 *8*.
1166.0 *3*	7.6 *4*	4657.8	8	3491.8	7	D+Q	DCO=1.17 *19*
							$R_{35,90}$=1.05 *9*.
							Mult.: M1+E2 in 2004Ru03.
1180.1 *3*	12.7 *5*	2373.6	6$^+$	1193.5	5$^+$	D+Q	DCO=0.93 *12*
							$R_{35,90}$=0.97 *6*.
							Mult.: M1+E2 in 2004Ru03.
1236[‡] *1*	1 *1*	2674.5	6	1439.4	4$^+$,5$^+$		
1240.7 *2*	62 *2*	2434.3	7$^+$	1193.5	5$^+$	Q	DCO=0.99 *7*
							$R_{35,90}$=1.26 *5*.
							Mult.: E2 in 2004Ru03.
1417 *1*	2.6 *7*	2234.0		817.2	3$^+$		$R_{35,90}$=0.77 *23*.
1481 *1*	1.8 *3*	2674.5	6	1193.5	5$^+$	D	$R_{35,90}$=0.62 *11*.
1487.7 *3*	12.3 *6*	3922.0	8$^+$	2434.3	7$^+$	D+Q	DCO=0.36 *6*
							$R_{35,90}$=0.61 *4*.
							Mult.: M1+E2 in 2004Ru03.
2354.8 *5*	13.6 *10*	4789.1	9$^+$	2434.3	7$^+$	Q	DCO=1.21 *17*
							$R_{35,90}$=1.37 *10*.
							Mult.: E2 in 2004Ru03.

[†] For mult=D and Q, generally 2004Ru03 assign M1 and E2, respectively.
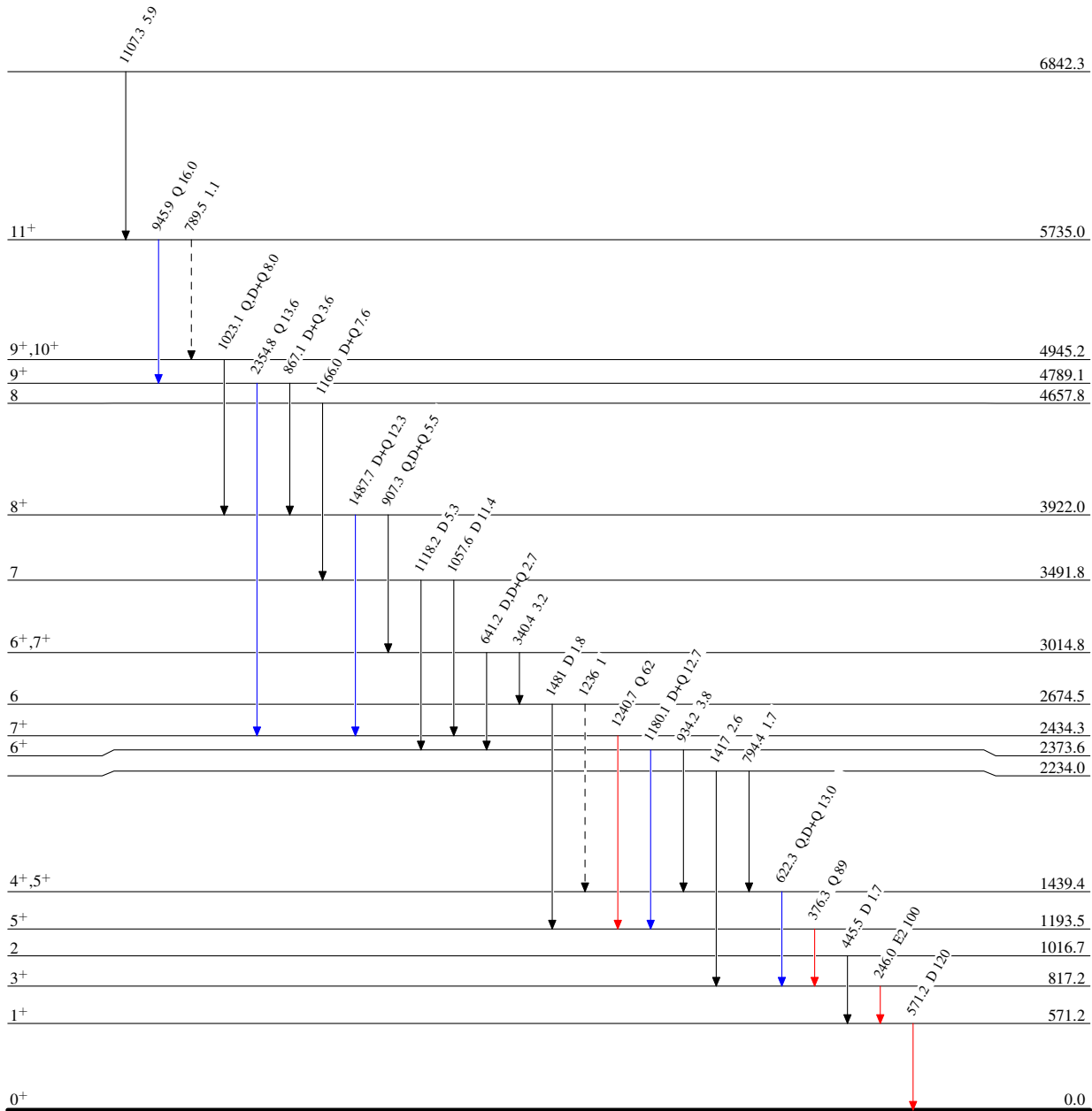[‡] Placement of transition in the level scheme is uncertain.

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Legend

Level Scheme

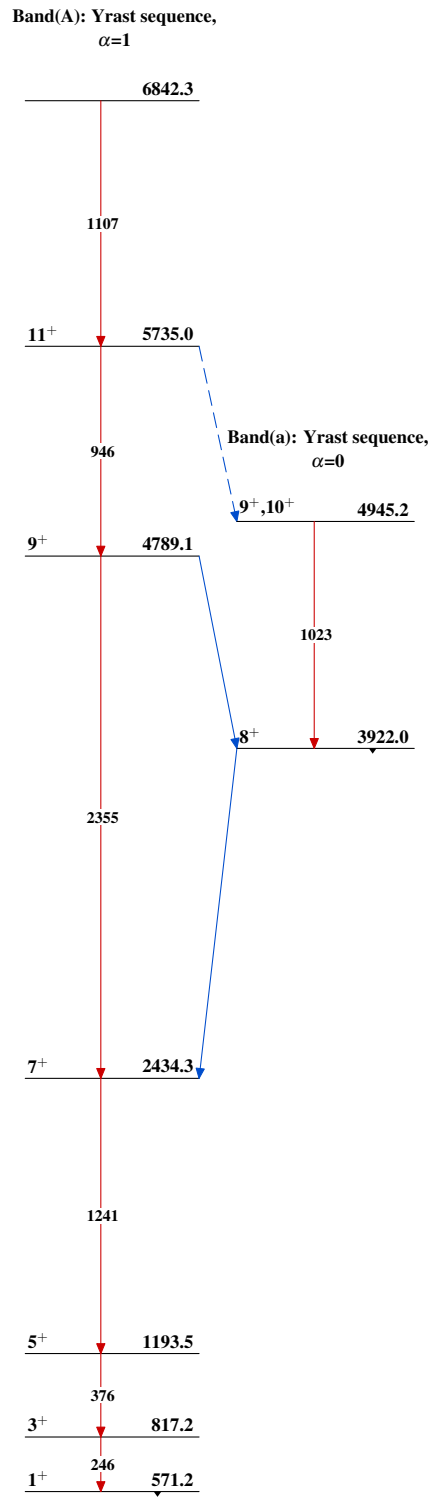Intensities: Relative I$_\gamma$

I$_\gamma$ < 2%×I$_\gamma^{max}$
I$_\gamma$ < 10%×I$_\gamma^{max}$
I$_\gamma$ > 10%×I$_\gamma^{max}$
γ Decay (Uncertain)

$^{62}_{31}$Ga$_{31}$

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Band(A): Yrast sequence,
$\alpha=1$

6842.3

1107

11^+ 5735.0

946

Band(a): Yrast sequence,
$\alpha=0$

$9^+,10^+$ 4945.2

9^+ 4789.1

1023

8^+ 3922.0

2355

7^+ 2434.3

1241

5^+ 1193.5

376

3^+ 817.2

246

1^+ 571.2

$^{62}_{31}$Ga$_{31}$