^{24}Mg(^{32}S,α2pγ) 1997Le15

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 157, 1 (2019)	15-Apr-2019

1997Le15: E(^{32}S)=130 MeV beam from the Tandem XTU accelerator of the Legnaro National Laboratory. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$(DCO), $\gamma\gamma(\theta)$(ADO) using GASP spectrometer array equipped with 40 Compton-suppressed large volume Ge detectors and a BGO multiplicity filter with 80 elements.

Other:
1997ShZS: ^{40}Ca(^{16}O,α2pγ) reaction, only γ-ray spectrum presented, no level information.

^{50}Cr Levels

E(level)	J$^\pi$†	E(level)	J$^\pi$†	E(level)	J$^\pi$†	E(level)	J$^\pi$†
0.0‡	0$^+$	6949.8# *4*	11$^+$	12389.7 *4*	(15)	16047.3 *4*	17$^+$
783.6‡ *3*	2$^+$	7612.2# *4*	12$^+$	12540.1 *10*	14$^+$	17667.1 *10*	(17)
1881.5‡ *4*	4$^+$	9326.0 *4*	12$^+$	13216.4# *4*	15$^+$	17787.9 *10*	(16)
3163.8‡ *4*	6$^+$	9640.3# *4*	13$^+$	13639.8 *4*	14$^+$	17953.8# *4*	18$^+$
4744.3‡ *4*	8$^+$	9913.1# *4*	14$^+$	13918.9 *10*	15$^+$		
6339.5‡ *4*	10$^+$	10796.1 *4*	13$^+$	15032.2# *4*	16$^+$		
6754.0 *4*	10$^+$	11012.7 *4*	13$^+$	15806.9 *4*	16$^+$		

† As proposed by 1997Le15 based on angular distribution and correlation measurements together with band associations from $\gamma\gamma$ coincidence data.
‡ Band(A): g.s. band.
# Seq.(B): γ cascade based on 11$^+$.

γ(^{50}Cr)

Expected DCO ratios are ≈1 for stretched quadrupole transitions with ΔJ=2 (ΔJ=0 also possible) ≈0.5 for pure dipole transitions with ΔJ=1 for gates on stretched quadrupole transitions; ≈=2 for stretched quadrupole with ΔJ=2 (ΔJ=0 also possible) and ≈1 for pure dipole with ΔJ=1 for gates on pure dipole (1997Le15). Values given under comments are for gates on quadrupole transitions, unless otherwise noted.
ADO=angular distribution asymmetry from oriented nuclei. Expected ADO ratios are ≈1.25 for stretched quadrupole with ΔJ=2 (ΔJ=0 also possible) and ≈0.7 for pure dipole with ΔJ=1 (1997Le15).

E$_\gamma$	I$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.†	Comments
196.3 *3*	2.5 *8*	6949.8	11$^+$	6754.0	10$^+$	D	DCO=1.06 *13* ADO=0.88 *11*. DCO gate=D.
273.3 *3*	9.2 *9*	9913.1	14$^+$	9640.3	13$^+$	D	ADO=0.71 *7*.
414.5 *3*	1.5 *5*	6754.0	10$^+$	6339.5	10$^+$		DCO=0.96 *19*
610.3 *3*	73 *7*	6949.8	11$^+$	6339.5	10$^+$	D+Q	DCO=1.59 *9* ADO=0.69 *1*.
662.4 *3*	69 *7*	7612.2	12$^+$	6949.8	11$^+$	D	DCO=1.03 *12* ADO=0.71 *1*. DCO gate=D.
783.6 *3*	100 *10*	783.6	2$^+$	0.0	0$^+$	Q	DCO=1.11 *16*
1097.9 *3*	100 *10*	1881.5	4$^+$	783.6	2$^+$	Q	DCO=1.06 *12*
1272 *1*	3.0 *10*	7612.2	12$^+$	6339.5	10$^+$		
1282.3 *3*	100 *10*	3163.8	6$^+$	1881.5	4$^+$	Q	DCO=1.11 *17*
1580.5 *3*	100 *10*	4744.3	8$^+$	3163.8	6$^+$	Q	DCO=1.97 *25*

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^{24}Mg(^{32}S,α2pγ) 1997Le15 (continued)

γ(^{50}Cr) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	Comments
							ADO=1.25 *4*. DCO gate=D.
1593.6 *3*	7.0 *10*	12389.7	(15)	10796.1	13^+		
1595.2 *3*	83 *8*	6339.5	10^+	4744.3	8^+	Q	DCO=1.86 *24* ADO=1.31 *4*. DCO gate=D.
1713.8 *3*	1.7 *5*	9326.0	12^+	7612.2	12^+		ADO=1.16 *12*. ADO ratio is consistent with mult=Q, but $\Delta J=0$ from proposed level scheme.
1815.5 *3*	3.2 *5*	15032.2	16^+	13216.4	15^+		ADO=1.41 *29*. ADO ratio is consistent with mult=Q, but $\Delta J=1$ from proposed level scheme.
2009.3 *3*	8.2 *10*	6754.0	10^+	4744.3	8^+	Q	DCO=1.03 *18* ADO=1.21 *16*.
2028.1 *3*	18.6 *19*	9640.3	13^+	7612.2	12^+	D	DCO=0.69 *12* ADO=0.56 *4*. DCO gate=D.
2168.1 *3*	1.7 *5*	15806.9	16^+	13639.8	14^+	Q	ADO=1.55 *31*.
2204.2 *3*	5.6 *6*	13216.4	15^+	11012.7	13^+	Q	ADO=1.62 *25*.
2300.9 *3*	20.9 *21*	9913.1	14^+	7612.2	12^+	Q	DCO=2.00 *24* ADO=1.52 *8*. DCO gate=D.
2476.9 *3*	2.8 *6*	12389.7	(15)	9913.1	14^+	D	DCO=0.57 *10* ADO=0.74 *16*.
2492.1 *3*	1.0 *5*	15032.2	16^+	12540.1	14^+		
2572.6 *3*	2.0 *7*	9326.0	12^+	6754.0	10^+	(Q)	ADO=1.19 *16*.
2590.5 *3*	4.5 *10*	15806.9	16^+	13216.4	15^+		
2627.1 *3*	1.8 *5*	13639.8	14^+	11012.7	13^+	D	ADO=0.82 *25*.
2830.9 *3*	3.4 *3*	16047.3	17^+	13216.4	15^+	Q	ADO=1.53 *38*.
2921.6 *3*	2.0 *5*	17953.8	18^+	15032.2	16^+	Q	ADO=1.79 *62*.
2987 *1*	<1.0	9326.0	12^+	6339.5	10^+		
3183.9 *3*	11.3 *11*	10796.1	13^+	7612.2	12^+	D	DCO=0.75 *12* ADO=0.70 *6*. DCO gate=D.
3303.3 *3*	3.0 *3*	13216.4	15^+	9913.1	14^+	D	DCO=0.48 *8*
3400.5 *3*	8.4 *8*	11012.7	13^+	7612.2	12^+	D	DCO=0.76 *13* ADO=0.79 *11*.
3577.1 *10*	3.0 *5*	13216.4	15^+	9640.3	13^+		
3748.2 *10*	1.2 *5*	17667.1	(17)	13918.9	15^+		
4005.8 *10*	3.3 *4*	13918.9	15^+	9913.1	14^+	D	DCO=0.38 *6* ADO=0.88 *20*.
4927.9 *10*	6 *3*	12540.1	14^+	7612.2	12^+		
5119.1 *10*	11 *6*	15032.2	16^+	9913.1	14^+	Q	ADO=1.32 *51*.
5398.2 *10*	5.6 *6*	17787.9	(16)	12389.7	(15)		

[†] Deduced by evaluators from measured DCO and ADO ratios in 1997Le15 according to the statements for expected values of DCO and ADO in 1997Le15, with $\Delta J=2$ for pure Q and $\Delta J=1$ for pure D.

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Level Scheme

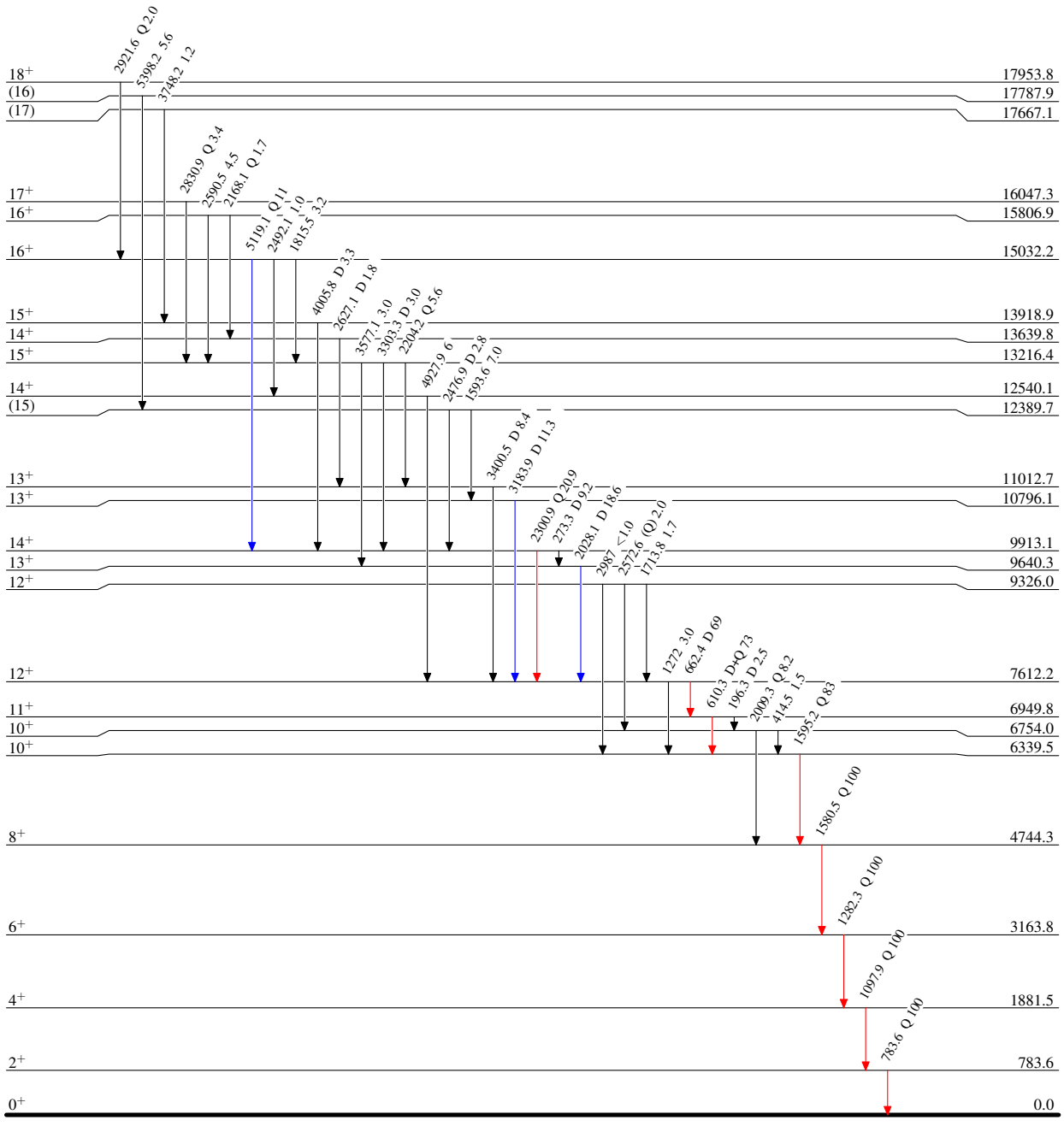
Intensities: Relative I_γ

Legend

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

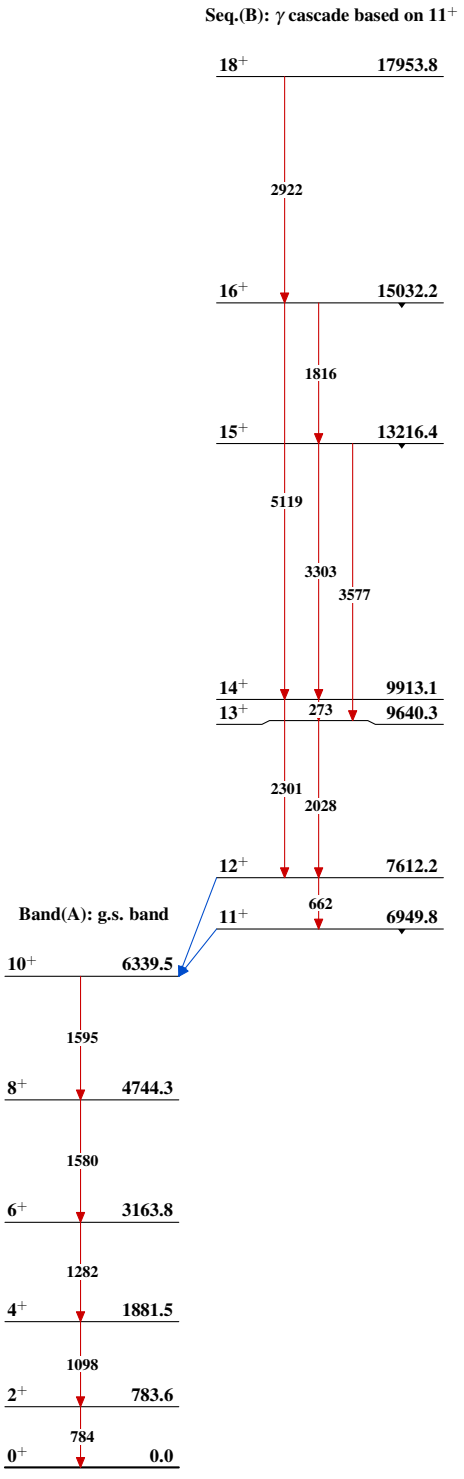
$I_\gamma < 10\% \times I_\gamma^{max}$

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



$^{50}_{24}Cr_{26}$

$^{24}Mg(^{32}S,\alpha 2p\gamma)$ 1997Le15



$^{50}_{24}Cr_{26}$