$^{13}C(^{48}Ca,p2n\gamma),^{14}C(^{48}Ca,p3n\gamma)$ 2010St01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Caroline D. Nesaraja, Scott D. Geraedts and Balraj Singh	NDS 111, 897 (2010)	12-Jan-2010

2010St01: E=130 MeV ^{48}Ca beam in 11^+ charge state provided by ATLAS facility at Argonne. Measured Eγ, Iγ, γγ coin using GAMMASPHERE array of 91 and 100 Compton-suppressed HPGe detectors. Enriched ^{13}C and ^{14}C targets. Detected charged ions with the Fragment Mass Analyzer. Comparisons with shell-model calculations using GXPF1A interaction in full *fp* space.
2010St01: now published in Phys. Rev. C 81, 014305 (2010); pre-publication copy received from the authors Dec 24, 2009).

^{58}Mn Levels

E(level)†	Jπ	E(level)†	Jπ	E(level)†	Jπ	E(level)†	Jπ
0	$(1)^+$	734.9‡ *4*	(4^+)	2854.3 *5*		5311.5 *7*	
71.3‡ *4*	$(4)^+$	1239.7‡ *4*	(6^+)	3042.2# *6*	(9)	5424.0# *6*	(12)
125.5‡ *2*	(2^+)	1337.7 *4*	(4)	3461.7 *6*		6336.7 *13*	
169.5‡ *3*	(3^+)	1457.1 *4*	(5)	3720.9# *6*	(10)	6565.9 *8*	
429.2‡ *4*	(3^+)	1601.0 *4*	(6)	4707.2 *18*		6872.2# *6*	(13)
447.6‡ *4*	(5^+)	1880.0# *4*	(7)	4732.6# *6*	(11)	7442.0# *9*	(14)
590.8‡ *4*	(4^+)	2339.3 *4*		4811.9 *6*	(11)	9830.7# *15*	(16)
660.7‡ *4*	(5^+)	2459.2# *6*	(8)	4940.6 *6*			

† From least-squares fit to Eγ's. Normalized χ^2=1.9, slightly greater than critical χ^2=1.7. Some of the uncertainties may have been underestimated.
‡ Multiplet structure.
# Band(A): ΔJ=1 band based on (7). Possible negative-parity rotational band involving $g_{9/2}$ neutron excitation.

γ(^{58}Mn)

Eγ	Iγ	Ei(level)	J_i^π	Ef	J_f^π	Eγ	Iγ	Ei(level)	J_i^π	Ef	J_f^π
44.2 *3*	4.5 *9*	169.5	(3^+)	125.5	(2^+)	601.9 *5*	0.73 *9*	1337.7	(4)	734.9	(4^+)
97.9 *3*	10.8 *24*	169.5	(3^+)	71.3	$(4)^+$	607.4 *3*	1.0 *1*	3461.7		2854.3	
119.8 *4*	2.3 *3*	1457.1	(5)	1337.7	(4)	612.0 *2*	1.1 *1*	5424.0	(12)	4811.9	(11)
125.5 *2*	5.0† *9*	125.5	(2^+)	0	$(1)^+$	640.2 *2*	3.8 *4*	1880.0	(7)	1239.7	(6^+)
143.7 *2*	15.9 *13*	1601.0	(6)	1457.1	(5)	663.8 *2*	0.61 *6*	734.9	(4^+)	71.3	$(4)^+$
212.8 *2*	2.4 *3*	660.7	(5^+)	447.6	(5^+)	678.7 *1*	24.1 *17*	3720.9	(10)	3042.2	(9)
279.0 *1*	62 *4*	1880.0	(7)	1601.0	(6)	691.6 *2*	9.5 *7*	5424.0	(12)	4732.6	(11)
286.8 *2*	0.65 *5*	734.9	(4^+)	447.6	(5^+)	721.7 *2*	3.5 *4*	1457.1	(5)	734.9	(4^+)
303.1 *4*	0.49 *10*	429.2	(3^+)	125.5	(2^+)	792.1 *3*	1.5† *3*	1239.7	(6^+)	447.6	(5^+)
305.6 *2*	0.74 *8*	734.9	(4^+)	429.2	(3^+)	866.5 *2*	0.76 *8*	1457.1	(5)	590.8	(4^+)
358.0 *2*	1.1 *3*	429.2	(3^+)	71.3	$(4)^+$	890.3 *2*	0.76 *21*	1337.7	(4)	447.6	(5^+)
361.4 *2*	2.7 *2*	1601.0	(6)	1239.7	(6^+)	940.3 *2*	1.8 *2*	1601.0	(6)	660.7	(5^+)
376.1 *1*	100 *5*	447.6	(5^+)	71.3	$(4)^+$	1009.5 *2*	7.6 *8*	1457.1	(5)	447.6	(5^+)
421.4 *2*	0.64 *9*	590.8	(4^+)	169.5	(3^+)	1012.1 *4*	7.0 *6*	4732.6	(11)	3720.9	(10)
459.3 *2*	4.2 *3*	2339.3		1880.0	(7)	1090.9 *2*	4.5 *4*	4811.9	(11)	3720.9	(10)
465.8 *5*	0.08 *2*	590.8	(4^+)	125.5	(2^+)	1153.5 *3*	63 *5*	1601.0	(6)	447.6	(5^+)
490.9 *4*	2.5 *3*	660.7	(5^+)	169.5	(3^+)	1162.4 *5*	13.1 *9*	3042.2	(9)	1880.0	(7)
515.0 *2*	3.9 *3*	2854.3		2339.3		1261.6 *7*	6.6 *7*	3720.9	(10)	2459.2	(8)
565.3 *2*	3.5 *3*	734.9	(4^+)	169.5	(3^+)	1266.6 *9*	3.5 *7*	1337.7	(4)	71.3	$(4)^+$
579.1 *5*	40 *4*	2459.2	(8)	1880.0	(7)	1386.2 *3*	3.9 *4*	1457.1	(5)	71.3	$(4)^+$
580.0 *6*	5.0† *5*	1239.7	(6^+)	660.7	(5^+)	1448.2 *2*	2.2 *2*	6872.2	(13)	5424.0	(12)
582.8 *5*	32 *4*	3042.2	(9)	2459.2	(8)	1590.5 *3*	1.8 *2*	5311.5		3720.9	(10)
589.8 *2*	16.9 *23*	660.7	(5^+)	71.3	$(4)^+$	1690.5 *2*	7.1 *5*	4732.6	(11)	3042.2	(9)

Continued on next page (footnotes at end of table)

^{13}C(^{48}Ca,p2nγ),^{14}C(^{48}Ca,p3nγ) 2010St01 (continued)

γ(^{58}Mn) (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
1702.3 *4*	4.0 *3*	5424.0	(12)	3720.9	(10)	2059.9 *12*	0.51 *5*	6872.2	(13)	4811.9	(11)
1770.6 *7*	3.3 *2*	4811.9	(11)	3042.2	(9)	2138.9 *10*	1.5 *1*	6872.2	(13)	4732.6	(11)
1833.3 *5*	3.8 *3*	6565.9		4732.6	(11)	2247.9 *17*	1.4 *1*	4707.2		2459.2	(8)
1898.4 *3*	1.9 *2*	4940.6		3042.2	(9)	2388.6 *11*	1.3 *1*	9830.7	(16)	7442.0	(14)
2018.0 *7*	1.8 *1*	7442.0	(14)	5424.0	(12)	2615.7 *11*	0.72 *6*	6336.7		3720.9	(10)

† Listed value is a lower limit (2010St01).

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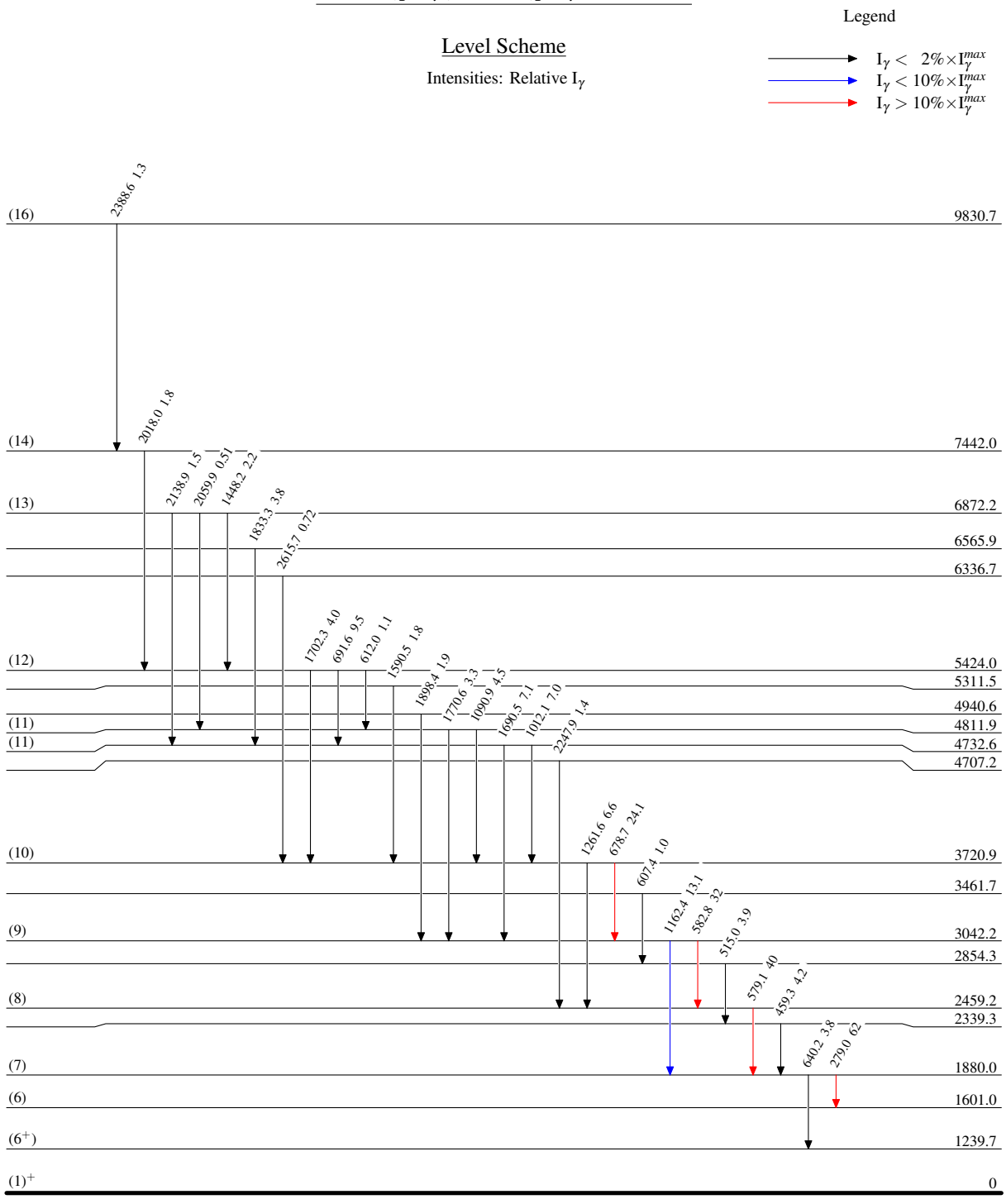
Level Scheme

Intensities: Relative I_γ



$^{58}_{25}Mn_{33}$

$^{13}C(^{48}Ca,p2n\gamma),^{14}C(^{48}Ca,p3n\gamma)$ 2010St01

Level Scheme (continued)

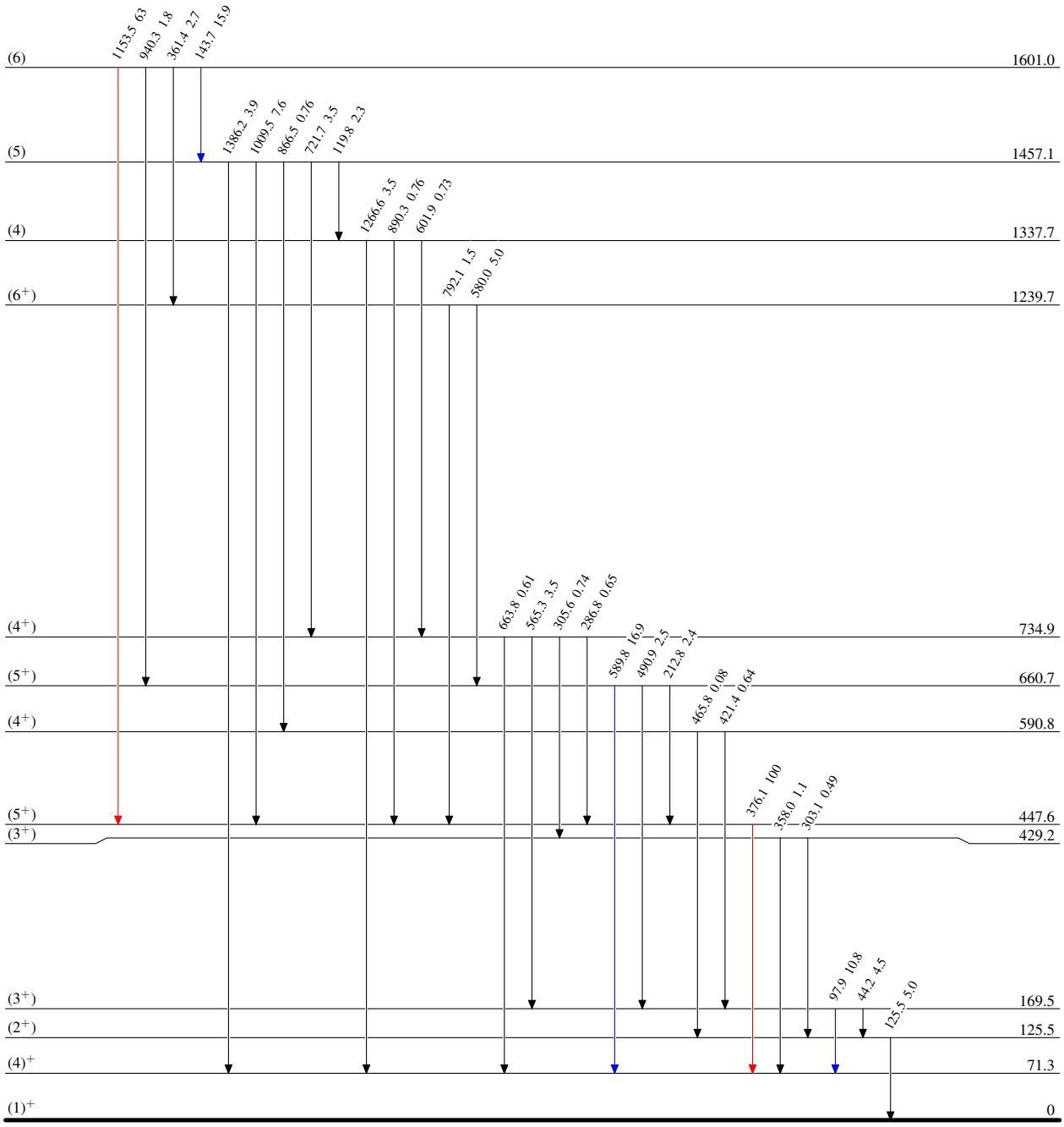
Intensities: Relative I_γ

Legend

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

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

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



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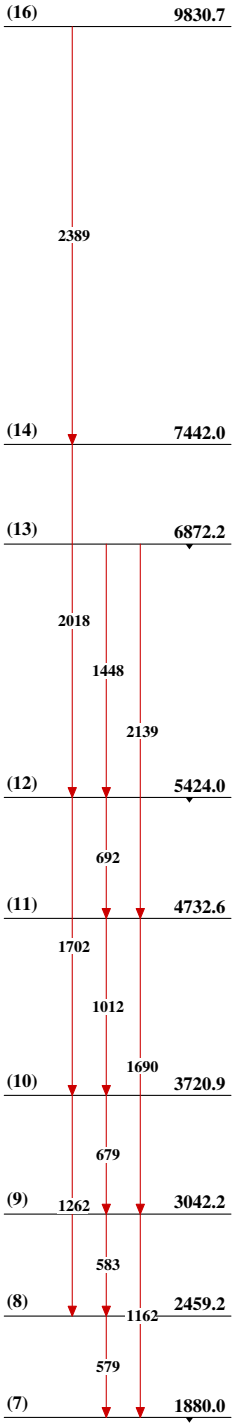
Band(A): ΔJ=1 band based on (7)



$^{58}_{25}Mn_{33}$