

$^{24}\text{Mg}(^{32}\text{S},\alpha\text{pn}\gamma)$ 2002OI01

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

2002OI01: E=95 MeV from the ATLAS accelerator at ANL. Measured $E\gamma$, $I\gamma$, $\gamma\gamma$, $\gamma\gamma(\theta)$ (DCO) for selected transitions using GAMMASPHERE array of 101 Compton-suppressed HPGe detectors. Deduced levels, J, π , band structures, γ -ray multipolarities.

 ^{50}Mn Levels

E(level) [†]	J ^π [‡]	T _{1/2}	Comments
0 ^{&}	0 ⁺		
225.28 [#] 9	5 ⁺	1.75 min 3	E(level),T _{1/2} : from Adopted Levels. Additional information 1.
650.7 ^a 8	1 ⁺		
659.4 8	6 ⁺		
800.3 ^{&} 8	2 ⁺		
1030.1 [#] 8	7 ⁺		
1143.6 ^a 11	3 ⁺		
1873.9 10	2 ⁺		
1917.6 ^a 15	5 ⁺		
1932.0 ^{&} 12	4 ⁺		
2117.9 10	8 ⁺		
2340.2 ^b 12	4 ⁺		J ^π : (3 ⁻) in Adopted Levels.
2533.1 [#] 11	9 ⁺		
2557.3 13	5 ⁺		
2715.9 14	4 ⁺		
3254.7 ^{&} 18	6 ⁺		
3369.1 ^b 13	6 ⁺		J ^π : (5 ⁻) in Adopted Levels.
3723.2 16	(6 ⁺)		J ^π : (3,4,5 ⁻) in Adopted Levels.
4253.1 [@] 10	(8 ⁻)		
4584.2 [#] 15	11 ⁺		
4837.1 [@] 15	(10 ⁻)		
4874.2 ^b 17	8 ⁺		J ^π : (7 ⁻) in Adopted Levels. probable T=0 state.
6147.1 [@] 18	(12 ⁻)		
6460.2 ^b 19	10 ⁺		J ^π : (9 ⁻) in Adopted Levels. probable T=0 state.
6936.2 [#] 18	13 ⁺		
8276.2 [#] 21	15 ⁺		

[†] From least-squares fit to $E\gamma$ data with 1 keV assumed uncertainty.

[‡] As proposed in 2002OI01 based on DCO ratios for selected transitions and band structures. Values in Adopted Levels are mostly the same, except that parentheses are added when strong arguments are lacking.

Band(A): T=0 band based on 5⁺.

@ Band(B): Band based on (8⁻).

& Band(C): g.s. band, T=1. T=1 analog of yrast band in ^{50}Cr .

^a Band(D): T=0 band.

^b Band(E): Band based on 4⁺. This band is based on (3⁻) in Adopted Levels.

$^{24}\text{Mg}(^{32}\text{S},\alpha\text{pn}\gamma)$ **2002OI01** (continued) $\gamma(^{50}\text{Mn})$

E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [‡]	Comments
149	800.3	2 ⁺	650.7	1 ⁺	D	DCO=1.52 11
343	1143.6	3 ⁺	800.3	2 ⁺	D	DCO=1.59 6
371	1030.1	7 ⁺	659.4	6 ⁺		
434	659.4	6 ⁺	225.28	5 ⁺		
584	4837.1	(10 ⁻)	4253.1	(8 ⁻)		
625	2557.3	5 ⁺	1932.0	4 ⁺	D	DCO=1.42 19
651	650.7	1 ⁺	0	0 ⁺	D	DCO=1.60 7
730	1873.9	2 ⁺	1143.6	3 ⁺	D	DCO=2.0 4
774	1917.6	5 ⁺	1143.6	3 ⁺	Q	DCO=1.07 9
788	1932.0	4 ⁺	1143.6	3 ⁺	D	DCO=1.40 8
800	800.3	2 ⁺	0	0 ⁺		
805	1030.1	7 ⁺	225.28	5 ⁺		
842	2715.9	4 ⁺	1873.9	2 ⁺	Q	DCO=0.98 19
1029	3369.1	6 ⁺	2340.2	4 ⁺	Q	DCO=0.99 16
1073	1873.9	2 ⁺	800.3	2 ⁺		
1088	2117.9	8 ⁺	1030.1	7 ⁺		
1224	1873.9	2 ⁺	650.7	1 ⁺		
1310	6147.1	(12 ⁻)	4837.1	(10 ⁻)		
1337	3254.7	6 ⁺	1917.6	5 ⁺	D	DCO=1.51 18
1340	8276.2	15 ⁺	6936.2	13 ⁺		
1383	3723.2	(6 ⁺)	2340.2	4 ⁺		
1414	2557.3	5 ⁺	1143.6	3 ⁺		
1437	3369.1	6 ⁺	1932.0	4 ⁺	Q	DCO=0.94 13
1458	2117.9	8 ⁺	659.4	6 ⁺		
1503	2533.1	9 ⁺	1030.1	7 ⁺		
1505	4874.2	8 ⁺	3369.1	6 ⁺	Q	DCO=1.18 16
1540	2340.2	4 ⁺	800.3	2 ⁺		
1586	6460.2	10 ⁺	4874.2	8 ⁺	Q	DCO=0.89 16
1720	4253.1	(8 ⁻)	2533.1	9 ⁺		
^x 1866 [†]						
2051	4584.2	11 ⁺	2533.1	9 ⁺		
2135	4253.1	(8 ⁻)	2117.9	8 ⁺		
^x 2192 [†]						
2352	6936.2	13 ⁺	4584.2	11 ⁺		
^x 2549 [†]						
^x 2635 [†]						
3223	4253.1	(8 ⁻)	1030.1	7 ⁺		

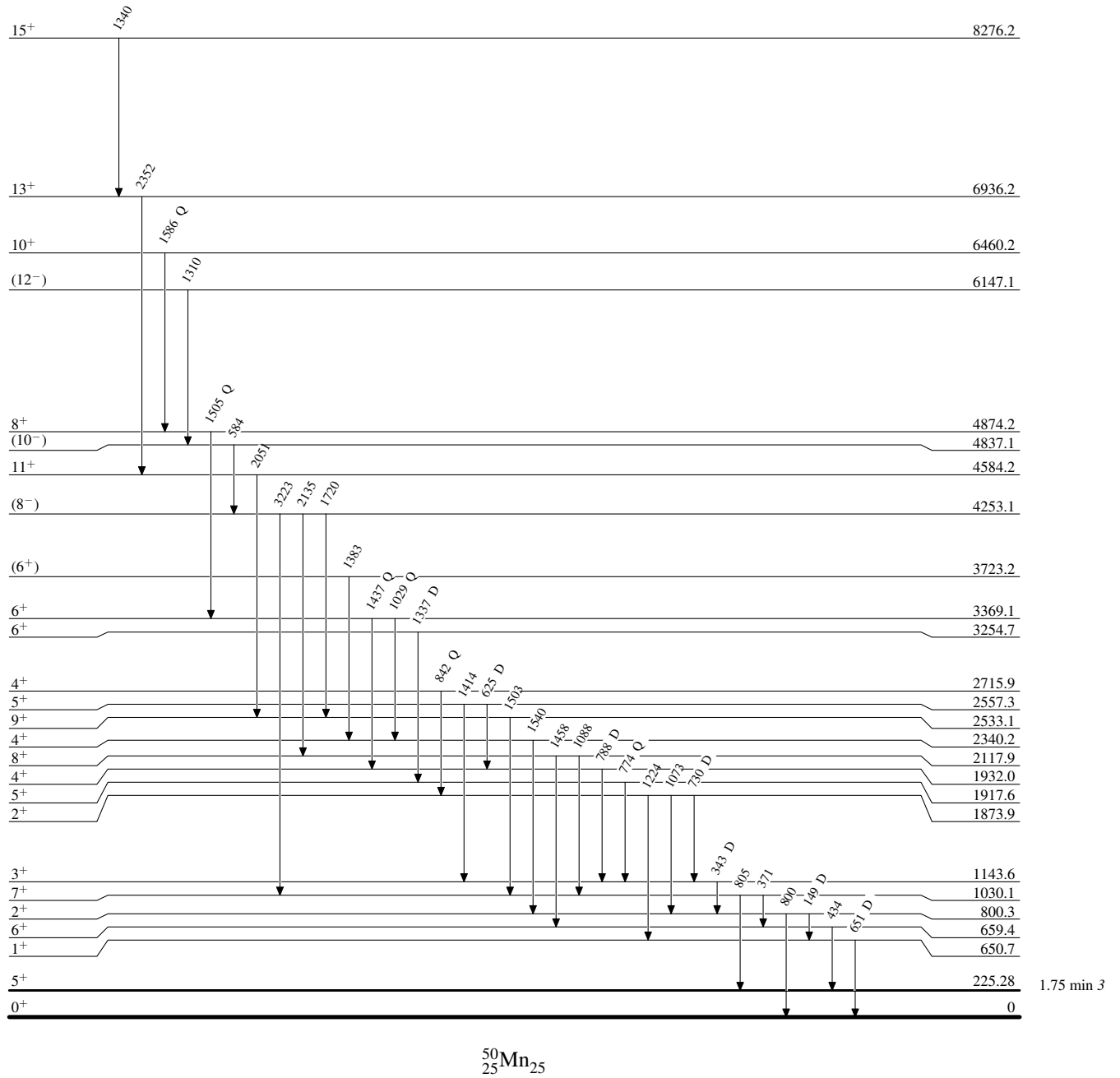
[†] From $\gamma\gamma$ -coin, this γ seems to feed into the 1932 level, but could not be placed in the level scheme.

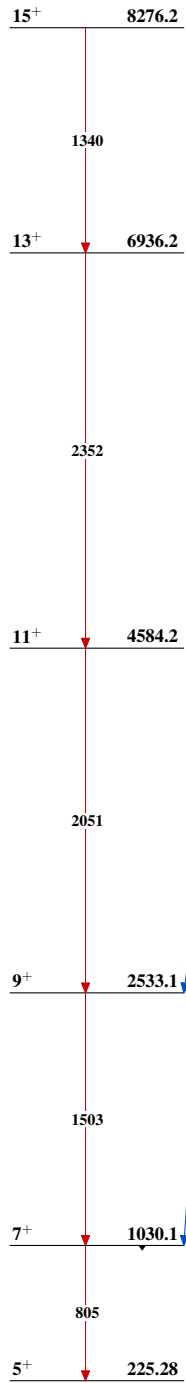
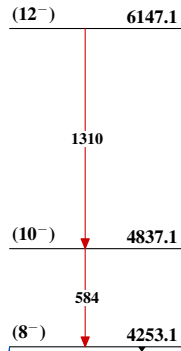
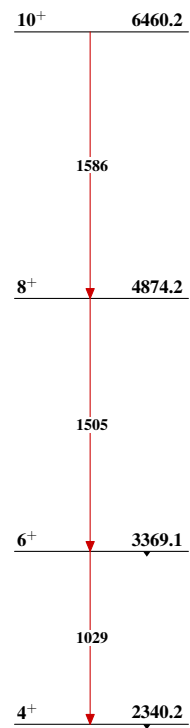
[‡] From DCO values in **2002OI01**, gated on $\Delta J=1$, dipole transitions. Expected DCO=1.5 for $\Delta J=1$, dipole and 1.0 for $\Delta J=2$, Q or $\Delta J=0$, dipole transitions. Here mult=D is interpreted as $\Delta J=1$, M1 and mult=Q as $\Delta J=2$, E2.

^x γ ray not placed in level scheme.

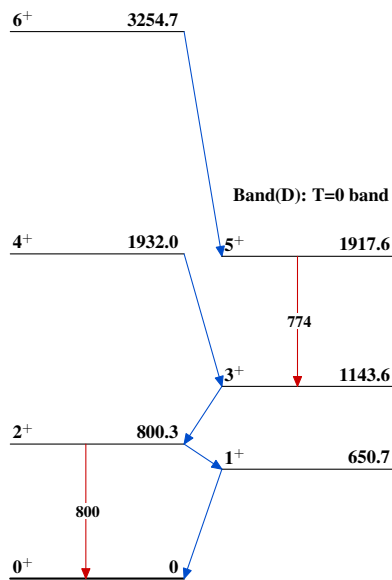
$^{24}\text{Mg}(^{32}\text{S},\alpha\text{pn}\gamma)$ 2002O101

Level Scheme

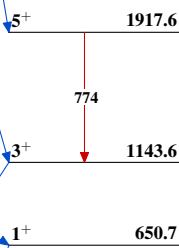


$^{24}\text{Mg}(^{32}\text{S},\alpha\text{pn}\gamma)$ 2002O101Band(A): T=0 band based
on 5^+ Band(B): Band based on
(8^-)Band(E): Band based on 4^+ 

Band(C): g.s. band, T=1



Band(D): T=0 band

 $^{50}_{25}\text{Mn}_{25}$