^{28}Si(^{28}Si,αpnγ) 1998Sv02

History

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

1998Sv02 (also 1998Le43): E=115 MeV beam from the XTU Tandem Accelerator at the Legnaro National Laboratory. Measured Eγ, Iγ, $\gamma\gamma$-coin, (particle)γ-coin, $\gamma\gamma(\theta)$(DCO), lifetimes using GASP array of 40 Compton-suppressed HPGe detectors and 80 BGO detectors forming a multiplicity filter. Particles were detected by an array of 40 Si detector telescopes. Values of DCO ratios are not listed in the paper. Deduced levels, J, π, band structures, γ-ray multipolarities.

1999Br40: measured lifetime of 2537, 9^+ state by DSAM.

All data are from 1998Sv02, unless otherwise noted.

^{50}Mn Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	Comments
0[&]	0^+		
225.28[#] *9*	5^+	1.75 min *3*	E(level),$T_{1/2}$: from Adopted Levels. Additional information 1.
651.0[a] *9*	1^+		
659.2 *7*	6^+		
800.0[&] *9*	2^+		
1030.3[#] *7*	7^+		
1143.0[a] *13*	3^+		
1917.0[a] *17*	5^+		J$^\pi$: from Adopted Levels. $J^\pi=4^+$ in 1998Sv02.
2119.0 *9*	8^+		
2533.9[#] *10*	9^+	0.52 ps *8*	$T_{1/2}$: from DSAM (1999Br40).
4253.5[@] *7*	(8^-)		
4584.9[#] *14*	11^+		
4837.5[@] *12*	(10^-)		
6147.5[@] *16*	(12^-)		
6937.0[#] *17*	13^+		
8277.0[#] *20*	15^+	>2 ps	$T_{1/2}$: fully stopped peak shape for 1340γ implies that lifetime is longer than the recoil-stopping time of ≈2 ps.

[†] From least-squares fit to Eγ data, except as noted. Uncertainty of 1 keV is assumed in the fitting procedure.
[‡] As assigned in 1998Sv02, based on $\gamma(\theta)$ and $\gamma\gamma(\theta)$(DCO) data together with corresponding analog states in ^{50}Cr.
[#] Band(A): $K^\pi=5^+$ band. This band is observed to 15^+, $f_{7/2}$ shell terminating state.
[@] Band(B): Band based on (8^-). Possible octupole vibration coupled to 5^+, T=0 state.
[&] Band(C): g.s. band, T=1. The 0^+, 2^+ and 4^+ are interpreted as T=1 IAS of 0, 783, and 1882 states in ^{50}Cr, respectively.
[a] Band(D): low-spin T=0 band.

$\gamma(^{50}Mn)$

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.[†]	Comments
651.0	1^+	651		0	0^+		
659.2	6^+	434		225.28	5^+		
800.0	2^+	149	62 *18*	651.0	1^+	(D)	
		800	38 *18*	0	0^+	(Q)	
1030.3	7^+	371	15 *2*	659.2	6^+		Mult.: (E2) listed by 1998Sv02, but ΔJ^π requires ΔJ=1, M1 or M1+E2.
		805	85 *2*	225.28	5^+	(Q)	
1143.0	3^+	343	100 *25*	800.0	2^+	(D)	

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^{28}Si(^{28}Si,αpnγ) 1998Sv02 (continued)

γ(^{50}Mn) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.[†]	Comments
1917.0	5^+	774	100 *25*	1143.0	3^+		Mult.: (M1) listed in 1998Sv02, but with revised 5^+ for 1917 level as in 2002Ol01, this transition should be E2.
2119.0	8^+	1089	47 *16*	1030.3	7^+		Mult.: (E2) listed by 1998Sv02, but level scheme requires ΔJ=1, M1 or M1+E2.
		1460	53 *16*	659.2	6^+	(Q)	
2533.9	9^+	1503	100 *4*	1030.3	7^+	(Q)	
4253.5	(8^-)	1719		2533.9	9^+		
		2135		2119.0	8^+		
		3223		1030.3	7^+		
		3594		659.2	6^+		
		4028		225.28	5^+		Mult.: ΔJ^π suggests mult=(E3).
4584.9	11^+	2051		2533.9	9^+		
4837.5	(10^-)	584		4253.5	(8^-)		
6147.5	(12^-)	1310		4837.5	(10^-)		
6937.0	13^+	2352		4584.9	11^+		
8277.0	15^+	1340		6937.0	13^+		

[†] 1998Sv02 give (M1) and (E2) based on $\gamma(\theta)$ and $\gamma\gamma(\theta)$(DCO) data. No results of these measurements are listed in 1998Sv02. The evaluators assign ΔJ=1,(D) to (M1) and ΔJ=2,(Q) to (E2) transitions.

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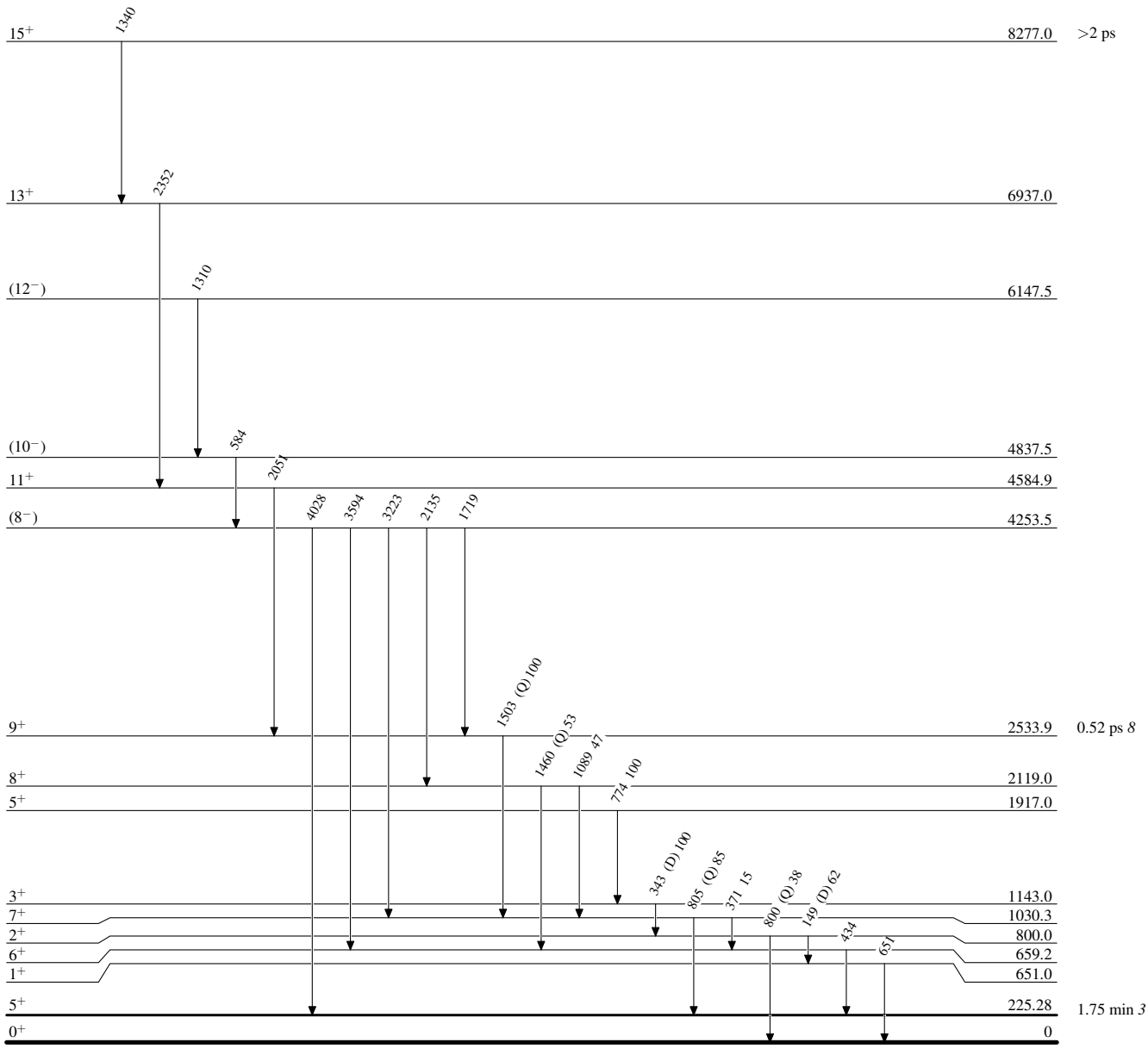
Level Scheme

Intensities: % photon branching from each level



$^{50}_{25}Mn_{25}$

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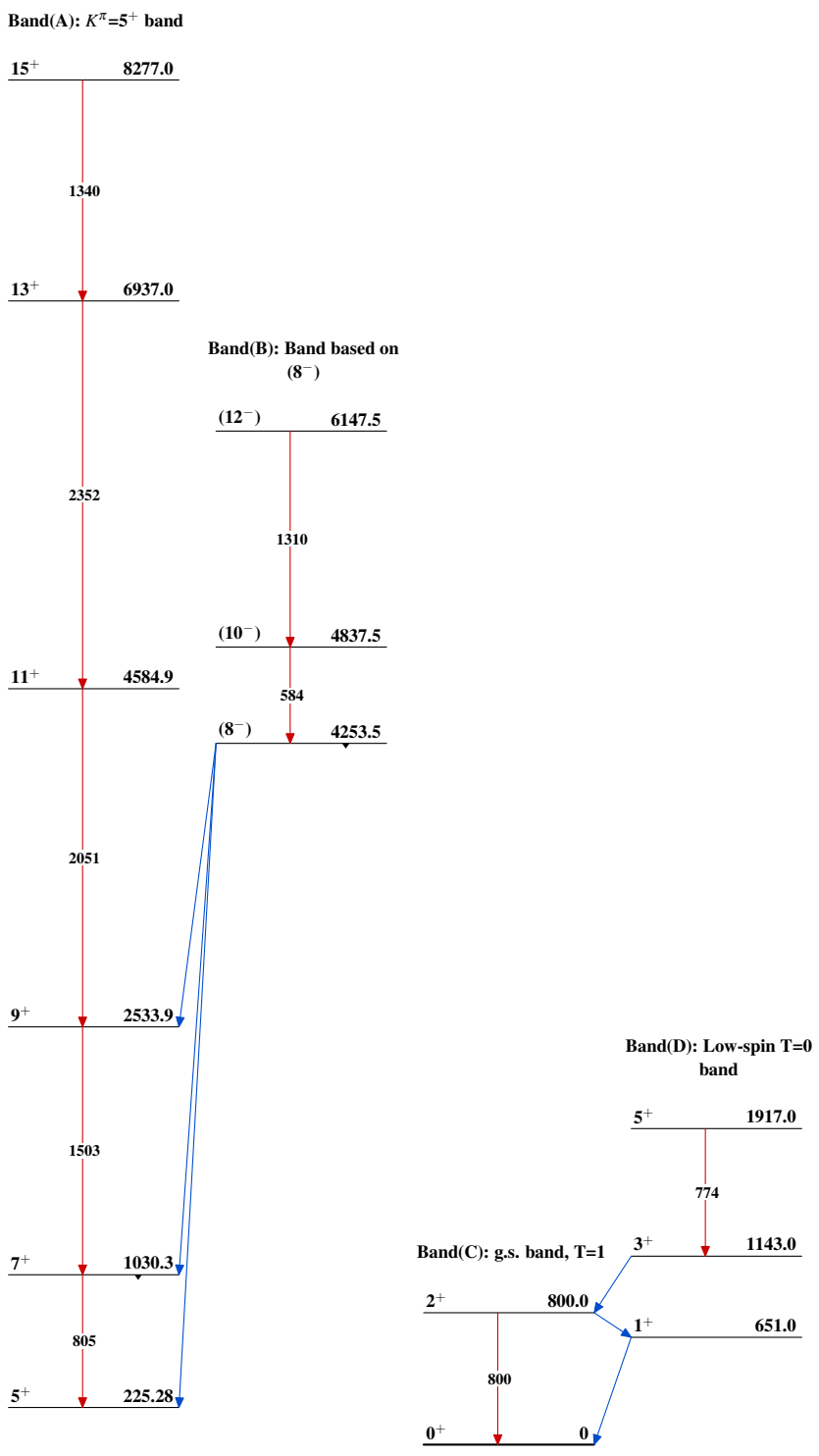

$^{50}_{25}Mn_{25}$