^{28}Si(^{32}S,2αpγ) 2002Ek01,2004Ek02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Wang Jimin and Huang Xiaolong	NDS 144, 1 (2017)	1-Mar-2016

Includes 2000Ek02 and 2004Ek03:

2000Ek02,2002Ek01: E=130 MeV. ^{28}Si target. Measured Eγ, Iγ, γγ, γγ(θ)(DCO).

2004Ek02: E=125 MeV. 99.1% ^{28}Si target. Measured Eγ, Iγ, γγ, γγ(θ)(DCO), lifetimes using GAMMASPHERE array consisting of 78 Compton-suppressed HPGe detectors. Light, charged particles were detected using the 4π-CsI-array Microball while neutrons were measured in the Neutron Shell, which replaced the 30 Ge detectors at the most forward angles. The Heavimet collimators were removed to allow for γ-ray multiplicity and sum-energy measurements.

All data are from 2004Ek02 which supersede authors′ earlier papers 2002Ek01 and 2000Ek02.

^{51}Mn Levels

E(level)[†]	Jπ[‡]	$T_{1/2}$	Comments
0.0[#]	5/2−		Jπ: From Adopted Levels.
237.4[@] 3	7/2−		Jπ: E2+M1 γ to 5/2−,g.s.
1139.8[#] 4	9/2−		Jπ: E2+M1 γ to 7/2−,237,E2 γ to 5/2−,g.s.
1488.5[@] 4	11/2−		Jπ: E2+M1 γ to 9/2−,1140,E2 γ to 7/2−,237.
2957.3[#] 6	13/2−		Jπ: E2+M1 γ to 11/2−,1488,E2 γ to 9/2−,1140.
3250.8[@] 6	15/2−		Jπ: E2+M1 γ to 13/2−,2957,E2 γ to 11/2−,1488.
3680.6[#] 7	17/2−	1.43 ns +6−5	Jπ: M1 γ to 15/2−,3251,E2 γ to 13/2−,2957. $T_{1/2}$: From 2000Ek02.15% systematic uncertainty not added.
4139.7[@] 7	19/2−		Jπ: E2+M1 γ to 17/2−,3681.
5258.5 19	(17/2,19/2)		Jπ: Based on yrast arguments, 2004Ek02 considers the 17/2 spin assignment for this level more likely.
5458.4 9	19/2−		Jπ: E2 γ to 15/2−,3251.
5639.8[#] 8	21/2−		Jπ: E2+M1 γ to 19/2−,4140,E2 γ to 17/2−,3681.
6471.5[@] 8	23/2−		Jπ: E2+M1 γ to 21/2−,5640,E2 γ to 19/2−,4140.
6822.9 9	21/2−		Jπ: E2+M1 γ to 19/2−,4140.
7175.6[@] 8	27/2−		Jπ: E2 γ to 23/2−,6471.
7297?[&] 3	(15/2+)		Jπ: Band analysis.
7500.8[b] 12	(21/2−,23/2−)		Jπ: Based on a rather large uncertainty of R_{30-80} of the populating 2100 keV transition.
7666.7 8	23/2−		Jπ: E2+M1 γ to 21/2−,5640.
7864.5?[a] 24	(17/2+)		Jπ: Band analysis.
7892.1[#] 8	25/2−		Jπ: E2+M1 γ to 23/2−,6471.
8084.8 9	21/2−,23/2		Jπ: D γ to 21/2−,5640 and 23/2−,6471.
8415.4[&] 20	(19/2+)		Jπ: γ to (15/2)+,7297 and band analysis.
8425.0 12	23/2−		Jπ: E2 γ to 19/2−,4140.
8973.1 9	25/2−		Jπ: E2+M1 γ to 23/2−,6471,E2 γ to 21/2−,5640.
9165.2[a] 14	(21/2+)		Jπ: Band analysis.
9471.3 9	25/2−,27/2	>0.69 ps	Jπ: Q γ to 21/2−,23/2,8085. $T_{1/2}$: from 2000Ek02.
9600.2[b] 10	25/2−		Jπ: E2+M1 γ to 23/2−,6471.
9677.2 13	25/2−		Jπ: E2 γ to 21/2−,6823 and 21/2−,5640.
9920.4 14	25/2−		Jπ: E2+M1 γ to 23/2−,6471.
9979.2[&] 12	23/2(+)		Jπ: Band analysis and (E1) γ to 21/2−,6823.
10468.9 10	27/2−		Jπ: E2 γ to 23/2−,6471.
10804.4 10	27/2−		Jπ: E2+M1 γ to 25/2−,7892.
10843.1[a] 12	25/2(+)		Jπ: Band analysis and (E1) γ to 23/2−,6471.
11062.3 11	27/2−		Jπ: E2+M1 γ to 25/2−,7892.

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^{28}Si(^{32}S,2αpγ) 2002Ek01,2004Ek02 (continued)

^{51}Mn Levels (continued)

E(level)†	Jπ‡	Comments
11201.8 *15*	(27/2⁻)	Jπ: (E2) γ to 23/2⁻,7667.
11510.4 *10*	29/2⁻	Jπ: E2+M1 γ to 27/2⁻,7176.
11670.6@ *15*	27/2⁻	Jπ: E2+M1 γ to 25/2⁻,7892.
11781.5 *10*	29/2⁻	Jπ: E2+M1 γ to 27/2⁻,10469 and 7176.
11945.8& *12*	27/2(+)	Jπ: (E2+M1) γ to 25/2(+),10844,E2 γ to 23/2(+),9980.
12184.8b *11*	29/2⁻	Jπ: E2+M1 γ to 27/2⁻,11063,10469 and 7176,E2 γ to 25/2⁻,9600.
12433.8 *10*	29/2⁻	Jπ: E2+M1 γ to 27/2⁻,10804 and 7176.
12791.8 *10*	31/2⁻	Jπ: E2+M1 γ to 29/2⁻,11781,E2 γ to 27/2⁻,7176.
12891.8 *18*	27/2⁻,29/2	Jπ: D γ to 25/2⁻,27/2,9472.
13169.9 *10*	31/2⁻	Jπ: E2+M1 γ to 29/2⁻,11781 and 11510,E2 γ to 27/2⁻,7176.
13468.1 *18*	29/2⁻,31/2	Jπ: Q γ to 25/2⁻,27/2,9471.
13585.2 *10*	31/2⁻	Jπ: E2+M1 γ to 29/2⁻,12434 and 11510.
13963.8 *11*	33/2⁻	Jπ: E2+M1 γ to 31/2⁻,12792,E2 γ to 29/2⁻,11510.
14128.1@ *19*	31/2⁻	Jπ: E2 γ to 27/2⁻,7176.
14318.0& *16*	31/2(+)	Jπ: E2 γ to 27/2(+),11946.
14924.2b *11*	33/2⁻	Jπ: E2+M1 γ to 31/2⁻,13585,E2 γ to 29/2⁻,11781.
15386.8 *24*	31/2,33/2⁻	Jπ: E2+M1 γ to 31/2⁻,13170. (33/2)⁻ listed in table I of 2004Ek02 for the 3876 transition, 31/2 in 2004Ek02 for ΔJ=0,2217 transition.
15862.6 *12*	(35/2)⁻	Possible configuration=$[\pi(1f_{7/2})^{-3}\otimes\nu(1f_{7/2})^{-3}]_{15+}\otimes\nu(1f_{5/2})$. This configuration is favored by 2004Ek02 for this state, as it accounts for 80% of the yrast 35/2⁻ wave function.
17061.7& *20*	35/2(+)	Jπ: E2 γ to 31/2(+),14318.
19636& *3*	39/2(+)	Jπ: E2 γ to 35/2(+),17062.

† From least-squares fit to Eγ′s.

‡ As proposed in 2004Ek02 based on DCO ratios, band structure, decay pattern, and previously known values for low-lying levels. Evaluators′ note: D is treated as M1 and Q for E2 for the purpose of J^π assignments.

Band(A): yrast band, α=+1/2.

@ Band(a): yrast band, α=−1/2.

& Band(B): band based on (15/2⁺),7279, α=−1/2.

a Band(b): band based on (17/2⁺),7864.5, α=+1/2.

b Band(C): γ sequence based on (21/2⁻,23/2⁻),7500.8.

γ(^{51}Mn)

R(ang)=Iγ(30°)/Iγ(83°).

DCO(1)=I(γ_1 at 30°; gated with γ_2 at 53°) /I(γ_1 at 53°; gated with γ_2 at 30°). 1.0 for stretched Q, 0.6 for stretched D if stretched Q in gate.

DCO(2)=I(γ_1 at 30°; gated with γ_2 at 83°) /I(γ_1 at 83°; gated with γ_2 at 30°). 1.0 for stretched Q, 0.8 for stretched D if stretched Q in gate.

DCO(3)=I(γ_1 at 53°; gated with γ_2 at 83°) /I(γ_1 at 83°; gated with γ_2 at 53°). 1.0 for stretched Q, 0.8 for stretched D if stretched Q in gate.

E_γ‡	I_γ‡	E_i(level)	J^π_i	E_f	J^π_f	Mult.†	Comments
237.4 *3*	99 *3*	237.4	7/2⁻	0.0	5/2⁻	E2+M1	DCO(1)=0.86 *4*; DCO(2)=0.55 *2*; DCO(3)=0.64 *3* R(ang)=0.68 *3*.
293.5 *3*	2.9 *1*	3250.8	15/2⁻	2957.3	13/2⁻	E2+M1	DCO(1)=0.83 *15*; DCO(2)=0.41 *8*; DCO(3)=0.68 *6* R(ang)=0.56 *2*.

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$^{28}Si(^{32}S,2\alpha p\gamma)$ 2002Ek01,2004Ek02 (continued)

$\gamma(^{51}Mn)$ (continued)

E_γ ‡	I_γ ‡	E_i(level)	J^π_i	E_f	J^π_f	Mult. †	Comments
348.8 *3*	29.1 *9*	1488.5	11/2⁻	1139.8	9/2⁻	E2+M1	DCO(1)=0.83 *4*; DCO(2)=0.55 *3*; DCO(3)=0.67 *3* R(ang)=0.66 *3*.
430.1 *3*	34.7 *11*	3680.6	17/2⁻	3250.8	15/2⁻	M1	DCO(1)=0.73 *4*; DCO(2)=0.40 *2*; DCO(3)=0.59 *3* R(ang)=0.52 *2*.
459.2 *2*	100 *3*	4139.7	19/2⁻	3680.6	17/2⁻	E2+M1	DCO(1)=0.73 *4*; DCO(2)=0.52 *2*; DCO(3)=0.69 *3* R(ang)=0.66 *3*. δ: +0.15 *+6−5* or +3.5 *+10−7*.
704.4 *4*	65.1 *20*	7175.6	27/2⁻	6471.5	23/2⁻	E2	DCO(1)=0.98 *5*; DCO(2)=0.95 *4*; DCO(3)=1.01 *5* R(ang)=1.28 *5*.
716.8 *6*	4.4 *2*	7892.1	25/2⁻	7175.6	27/2⁻		
723.2 *4*	59.7 *18*	3680.6	17/2⁻	2957.3	13/2⁻	E2	DCO(1)=0.78 *4*; DCO(2)=0.78 *3*; DCO(3)=0.84 *4* R(ang)=0.95 *4*.
814 *1*	0.1 *1*	9979.2	23/2⁽⁺⁾	9165.2	(21/2⁺)		
831.8 *4*	72.3 *22*	6471.5	23/2⁻	5639.8	21/2⁻	E2+M1	DCO(1)=0.72 *4*; DCO(2)=0.51 *2*; DCO(3)=0.68 *3* R(ang)=0.65 *3*. δ: +0.16 *+6−5* or +3.4 *+10−7*.
862 *2*	0.2 *1*	10843.1	25/2⁽⁺⁾	9979.2	23/2⁽⁺⁾		
888.4 *5*	0.9 *1*	4139.7	19/2⁻	3250.8	15/2⁻		
902.4 *4*	47.7 *14*	1139.8	9/2⁻	237.4	7/2⁻	E2+M1	DCO(1)=0.84 *4*; DCO(2)=0.68 *3*; DCO(3)=0.68 *4* R(ang)=0.90 *3*.
939.5 *10*	0.4 *1*	15862.6	(35/2)⁻	14924.2	33/2⁻	(E2+M1)	R(ang)=1.37 *19*.
1010.0 *5*	0.2 *1*	12791.8	31/2⁻	11781.5	29/2⁻	E2+M1	R(ang)=1.20 *22*.
1012 *1*	0.2 *1*	6471.5	23/2⁻	5458.4	19/2⁻		
1102.3 *5*	0.2 *1*	11945.8	27/2⁽⁺⁾	10843.1	25/2⁽⁺⁾	(E2+M1)	R(ang)=1.27 *13*.
1119# *2*	0.1 *1*	8415.4	(19/2⁺)	7297?	(15/2⁺)		
1122 *3*	0.1 *1*	12184.8	29/2⁻	11062.3	27/2⁻	E2+M1	R(ang)=0.61 *11*.
1125 *2*	0.1 *1*	10804.4	27/2⁻	9677.2	25/2⁻		
1139.7 *5*	4.5 *2*	1139.8	9/2⁻	0.0	5/2⁻	E2	DCO(1)=0.84 *7*; DCO(2)=0.86 *14*; DCO(3)=0.92 *7* R(ang)=1.25 *4*.
1151.7 *6*	0.2 *1*	13585.2	31/2⁻	12433.8	29/2⁻	E2+M1	R(ang)=0.92 *17*.
1171.8 *5*	2.8 *2*	13963.8	33/2⁻	12791.8	31/2⁻	E2+M1	DCO(1)=0.75 *5*; DCO(2)=0.51 *4*; DCO(3)=0.59 *5* R(ang)=0.75 *5*.
1175 *1*	<0.1	9600.2	25/2⁻	8425.0	23/2⁻		
1195.4 *6*	0.5 *1*	7666.7	23/2⁻	6471.5	23/2⁻		
1251.1 *6*	52.8 *16*	1488.5	11/2⁻	237.4	7/2⁻	E2	DCO(1)=0.97 *5*; DCO(2)=0.80 *4*; DCO(3)=0.79 *4* R(ang)=0.95 *3*.
1282 *1*	0.1 *1*	11201.8	(27/2⁻)	9920.4	25/2⁻		
1301# *2*	<0.1	9165.2	(21/2⁺)	7864.5?	(17/2⁺)		
1307.0 *10*	0.3 *1*	8973.1	25/2⁻	7666.7	23/2⁻		
1312.3 *7*	0.3 *1*	11781.5	29/2⁻	10468.9	27/2⁻	E2+M1	R(ang)=0.85 *12*.
1318 *1*	0.8 *2*	5458.4	19/2⁻	4139.7	19/2⁻		
1340.0 *10*	0.3 *1*	14924.2	33/2⁻	13585.2	31/2⁻	E2+M1	R(ang)=0.60 *8*.
1376 *2*	0.2 *1*	12184.8	29/2⁻	10804.4	27/2⁻		
1386.1 *5*	1.2 *2*	9471.3	25/2⁻,27/2	8084.8	21/2⁻,23/2	Q	R(ang)=1.34 *10*.
1388.0 *7*	0.2 *1*	13169.9	31/2⁻	11781.5	29/2⁻	E2+M1	R(ang)=0.84 *18*.

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$^{28}Si(^{32}S,2\alpha p\gamma)$ 2002Ek01,2004Ek02 (continued)

$\gamma(^{51}Mn)$ (continued)

E_γ ‡	I_γ ‡	E_i(level)	J^π_i	E_f	J^π_f	Mult. †	Comments
1420.9 *6*	7.9 *3*	7892.1	25/2⁻	6471.5	23/2⁻	E2+M1	DCO(1)=0.76 *10*; DCO(2)=0.33 *4*; DCO(3)=0.58 *6* R(ang)=0.61 *2*.
1468.8 *7*	43.9 *14*	2957.3	13/2⁻	1488.5	11/2⁻	E2+M1	DCO(1)=1.00 *5*; DCO(2)=0.78 *3*; DCO(3)=0.75 *4* R(ang)=0.90 *3*.
1500.0 *6*	87 *3*	5639.8	21/2⁻	4139.7	19/2⁻	E2+M1	DCO(1)=0.63 *3*; DCO(2)=0.44 *2*; DCO(3)=0.65 *3* R(ang)=0.54 *2*. δ: +0.29 *+8−7* or +2.1 *5*.
1563 *2*	0.2 *1*	9979.2	23/2⁽⁺⁾	8415.4	(19/2⁺)		
1577 *2*	0.2 *1*	5258.5	(17/2,19/2)	3680.6	17/2⁻		
1579.9 *6*	0.3 *1*	9471.3	25/2⁻,27/2	7892.1	25/2⁻	D	R(ang)=0.99 *16*.
1612.8 *5*	2.2 *2*	8084.8	21/2⁻,23/2	6471.5	23/2⁻	D	DCO(1)=0.65 *14*; DCO(2)=0.94 *13*; DCO(3)=1.08 *16* R(ang)=1.49 *9*.
1630 *1*	0.3 *1*	12433.8	29/2⁻	10804.4	27/2⁻	E2+M1	R(ang)=1.10 *23*.
1659.6 *6*	0.5 *2*	13169.9	31/2⁻	11510.4	29/2⁻	E2+M1	DCO(1)=1.2 *6*; DCO(2)=0.90 *13*; DCO(3)=0.83 *15* R(ang)=1.03 *12*.
1678 *2*	0.2 *1*	10843.1	25/2⁽⁺⁾	9165.2	(21/2⁺)		
1717.0 *10*	0.3 *1*	12184.8	29/2⁻	10468.9	27/2⁻	E2+M1	R(ang)=0.41 *9*.
1754 *1*	0.2 *1*	14924.2	33/2⁻	13169.9	31/2⁻		
1762.2 *8*	39.1 *12*	3250.8	15/2⁻	1488.5	11/2⁻	E2	DCO(1)=0.80 *5*; DCO(2)=0.79 *4*; DCO(3)=0.82 *5* R(ang)=1.05 *4*.
1795 *2*	0.2 *1*	8973.1	25/2⁻	7175.6	27/2⁻		
1817.5 *8*	23.0 *7*	2957.3	13/2⁻	1139.8	9/2⁻	E2	DCO(1)=0.74 *4*; DCO(2)=0.74 *4*; DCO(3)=0.87 *5* R(ang)=0.92 *3*.
1831 *3*	0.2 *1*	10804.4	27/2⁻	8973.1	25/2⁻		
1898.0 *10*	0.1 *1*	15862.6	(35/2)⁻	13963.8	33/2⁻		
1959.3 *7*	1.2 *1*	5639.8	21/2⁻	3680.6	17/2⁻	E2	DCO(1)=1.19 *21*; DCO(2)=0.95 *23*; DCO(3)=1.04 *16* R(ang)=1.23 *4*.
1967.3 *8*	0.6 *1*	11945.8	27/2⁽⁺⁾	9979.2	23/2⁽⁺⁾	E2	DCO(1)=0.96 *15*; DCO(2)=1.07 *13*; DCO(3)=0.81 *12* R(ang)=1.59 *12*.
2026.6 *7*	1.4 *3*	7666.7	23/2⁻	5639.8	21/2⁻	E2+M1	R(ang)=0.44 *3*.
2045 *2*	0.2 *1*	7500.8	(21/2⁻,23/2⁻)	5458.4	19/2⁻		
2075.0 *6*	0.2 *1*	13585.2	31/2⁻	11510.4	29/2⁻	E2+M1	DCO(1)=0.85 *21*; DCO(2)=0.48 *9*; DCO(3)=0.47 *9* R(ang)=0.34 *8*.
2089 *2*	0.2 *1*	11062.3	27/2⁻	8973.1	25/2⁻		
2100 *1*	0.3 *1*	9600.2	25/2⁻	7500.8	(21/2⁻,23/2⁻)	E2(+M1)	R(ang)=0.94 *24*.
2150.4 *10*	0.2 *1*	8973.1	25/2⁻	6822.9	21/2⁻		
2182.4 *9*	0.2 *1*	13963.8	33/2⁻	11781.5	29/2⁻		
2207.7 *12*	1.6 *2*	5458.4	19/2⁻	3250.8	15/2⁻	E2	R(ang)=1.70 *15*.
2208 *1*	0.3 *1*	7666.7	23/2⁻	5458.4	19/2⁻		
2217 *3*	0.2 *1*	15386.8	31/2,33/2⁻	13169.9	31/2⁻	E2+M1	R(ang)=0.9 *4*.
2251.8 *10*	0.4 *2*	7892.1	25/2⁻	5639.8	21/2⁻		
2268# *2*	<0.1	12184.8	29/2⁻	9920.4	25/2⁻		
2271# *2*	<0.1	11945.8	27/2⁽⁺⁾	9677.2	25/2⁻		
2275 *2*	0.1 *1*	15862.6	(35/2)⁻	13585.2	31/2⁻		
2294.7 *10*	4.9 *3*	9471.3	25/2⁻,27/2	7175.6	27/2⁻	D	DCO(1)=1.09 *7*; DCO(2)=1.12 *6*;

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$^{28}Si(^{32}S,2\alpha p\gamma)$ 2002Ek01,2004Ek02 (continued)

$\gamma(^{51}Mn)$ (continued)

E_γ‡	I_γ‡	E_i(level)	J_i^π	E_f	J_f^π	Mult.†	Comments
							DCO(3)=1.14 7 R(ang)=1.42 7.
2332.0 8	16.7 5	6471.5	$23/2^-$	4139.7	$19/2^-$	E2	DCO(1)=0.94 5; DCO(2)=1.01 5; DCO(3)=1.01 5 R(ang)=1.34 5.
2350 2	0.2 1	14128.1	$31/2^-$	11781.5	$29/2^-$		
2372.2 11	0.9 2	14318.0	$31/2^{(+)}$	11945.8	$27/2^{(+)}$	E2	DCO(1)=0.93 15; DCO(2)=0.97 10; DCO(3)=0.69 11 R(ang)=1.37 10.
2376 3	0.1 1	10804.4	$27/2^-$	8425.0	$23/2^-$		
2423.8 10	0.5 2	9600.2	$25/2^-$	7175.6	$27/2^-$	E2+M1	R(ang)=0.66 11.
2446.0 10	0.3 1	8084.8	$21/2^-,23/2$	5639.8	$21/2^-$	D	R(ang)=0.88 14.
2451# 2	<0.1	14128.1	$31/2^-$	11670.6	$27/2^-$		
2453.2 10	0.2 1	13963.8	$33/2^-$	11510.4	$29/2^-$	E2	R(ang)=1.28 19.
2489.4 14	0.1 1	14924.2	$33/2^-$	12433.8	$29/2^-$		
2501.8 10	1.9 2	8973.1	$25/2^-$	6471.5	$23/2^-$	E2+M1	DCO(1)=0.70 19; DCO(2)=0.49 13; DCO(3)=0.73 14 R(ang)=0.47 4.
2512 2	0.1 1	12433.8	$29/2^-$	9920.4	$25/2^-$		
2522 1	0.2 1	13585.2	$31/2^-$	11062.3	$27/2^-$		
2574 2	0.2 1	19636	$39/2^{(+)}$	17061.7	$35/2^{(+)}$	E2	R(ang)=1.64 25.
2585 2	0.6 2	12184.8	$29/2^-$	9600.2	$25/2^-$	E2	R(ang)=1.6 3.
2683.6 9	1.8 3	6822.9	$21/2^-$	4139.7	$19/2^-$	E2+M1	DCO(1)=0.54 18; DCO(2)=0.29 8; DCO(3)=0.44 9 R(ang)=0.42 3.
2701 3	0.1 1	13169.9	$31/2^-$	10468.9	$27/2^-$		
2741 2	0.1 1	14924.2	$33/2^-$	12184.8	$29/2^-$		
2743.6 11	0.4 1	17061.7	$35/2^{(+)}$	14318.0	$31/2^{(+)}$	E2	DCO(1)=1.3 3; DCO(2)=1.16 16; DCO(3)=0.82 16 R(ang)=1.42 14.
2776 2	0.2 1	9600.2	$25/2^-$	6822.9	$21/2^-$		
2780 2	0.2 1	13585.2	$31/2^-$	10804.4	$27/2^-$		
2808 2	0.3 1	11781.5	$29/2^-$	8973.1	$25/2^-$		
2853.5 11	0.3 1	9677.2	$25/2^-$	6822.9	$21/2^-$	E2	R(ang)=1.56 12.
2912.7 10	1.0 2	10804.4	$27/2^-$	7892.1	$25/2^-$	E2+M1	DCO(1)=0.26 18; DCO(2)=0.53 14; DCO(3)=0.36 13 R(ang)=0.42 5.
2972 2	0.1 1	11945.8	$27/2^{(+)}$	8973.1	$25/2^-$		
3071 2	0.1 1	15862.6	$(35/2)^-$	12791.8	$31/2^-$	(E2)	R(ang)=1.9 7.
3133 2	0.3 1	9600.2	$25/2^-$	6471.5	$23/2^-$	E2+M1	R(ang)=1.64 18.
3144 3	0.1 1	14924.2	$33/2^-$	11781.5	$29/2^-$	E2	R(ang)=1.8 6.
3155 3	0.2 1	8415.4	$(19/2^+)$	5258.5	(17/2,19/2)		
3158.3 12	0.4 1	9979.2	$23/2^{(+)}$	6822.9	$21/2^-$	(E1)	DCO(1)=0.29 9; DCO(2)=0.62 8; DCO(3)=0.65 10 R(ang)=0.65 7.
3169.2 11	0.6 2	11062.3	$27/2^-$	7892.1	$25/2^-$	E2+M1	R(ang)=0.93 11.
3293.5 12	0.7 2	10468.9	$27/2^-$	7175.6	$27/2^-$		DCO(1)=0.68 10; DCO(2)=0.79 9; DCO(3)=0.84 10 R(ang)=0.79 7.
3311 3	0.2 1	11201.8	$(27/2^-)$	7892.1	$25/2^-$		
3331.3 16	0.3 1	8973.1	$25/2^-$	5639.8	$21/2^-$	E2	R(ang)=1.7 4.
3361 2	0.2 1	7500.8	$(21/2^-,23/2^-)$	4139.7	$19/2^-$		
3417 3	0.1 1	14924.2	$33/2^-$	11510.4	$29/2^-$		
3420.4 15	0.3 1	12891.8	$27/2^-,29/2$	9471.3	$25/2^-,27/2$	D	R(ang)=0.47 10.
3450 2	0.6 2	9920.4	$25/2^-$	6471.5	$23/2^-$	E2+M1	R(ang)=1.38 16.

Continued on next page (footnotes at end of table)

^{28}Si(^{32}S,2αpγ) 2002Ek01,2004Ek02 (continued)

γ(^{51}Mn) (continued)

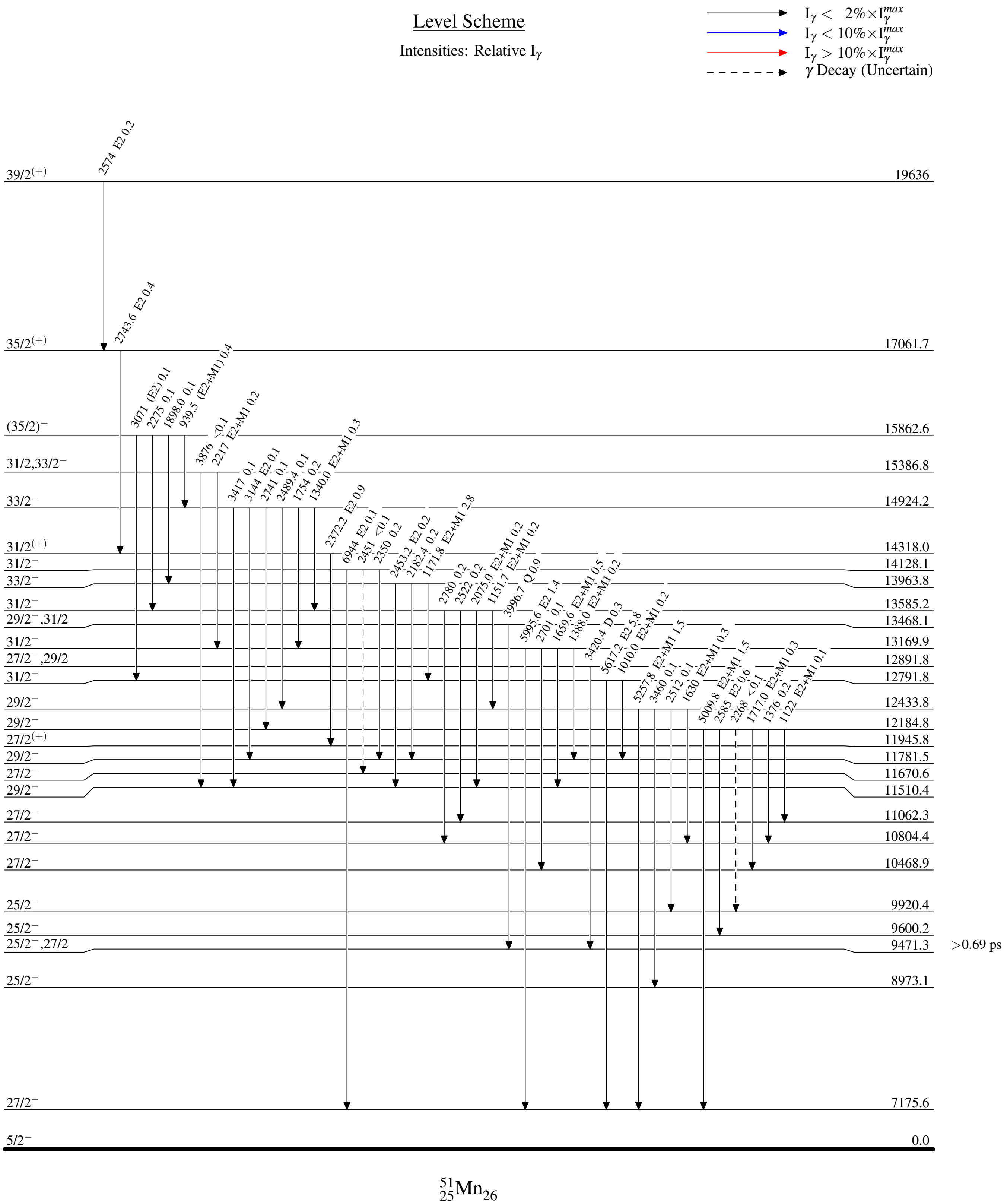
E$_\gamma$ ‡	I$_\gamma$ ‡	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult. †	Comments
3460 *3*	0.1 *1*	12433.8	29/2$^-$	8973.1	25/2$^-$		
3505 *3*	0.1 *1*	9979.2	23/2$^{(+)}$	6471.5	23/2$^-$		
3532 *2*	0.2 *1*	11201.8	(27/2$^-$)	7666.7	23/2$^-$	(E2)	R(ang)=1.3 *4*.
3628 *3*	0.1 *1*	10804.4	27/2$^-$	7175.6	27/2$^-$		
3778.4 *12*	0.3 *1*	11670.6	27/2$^-$	7892.1	25/2$^-$	E2+M1	R(ang)=0.54 *10*.
3876 *3*	<0.1	15386.8	31/2,33/2$^-$	11510.4	29/2$^-$		
3955 *3*	0.2 *1*	9600.2	25/2$^-$	5639.8	21/2$^-$		
3996.7 *15*	0.9 *2*	13468.1	29/2$^-$,31/2	9471.3	25/2$^-$,27/2	Q	R(ang)=1.33 *15*.
3998 *2*	0.7 *2*	10468.9	27/2$^-$	6471.5	23/2$^-$	E2	R(ang)=2.0 *5*.
4038 *3*	0.6 *2*	9677.2	25/2$^-$	5639.8	21/2$^-$	E2	R(ang)=1.49 *9*.
4053# *4*	<0.1	11945.8	27/2$^{(+)}$	7892.1	25/2$^-$		
4283 *2*	0.6 *2*	8425.0	23/2$^-$	4139.7	19/2$^-$	E2	R(ang)=1.7 *3*.
4336.4 *15*	4.3 *4*	11510.4	29/2$^-$	7175.6	27/2$^-$	E2+M1	DCO(1)=1.21 *9*; DCO(2)=1.21 *9*; DCO(3)=1.04 *8* R(ang)=1.65 *8*. δ: −0.51 *+7−9* or −2.3 *4*. Data for this γ also listed in 2004Ek03.
4369.9 *15*	0.5 *1*	10843.1	25/2$^{(+)}$	6471.5	23/2$^-$	(E1)	R(ang)=0.80 *6*.
4605.8 *15*	3.3 *4*	11781.5	29/2$^-$	7175.6	27/2$^-$	E2+M1	DCO(1)=0.52 *7*; DCO(2)=0.32 *3*; DCO(3)=0.52 *5* R(ang)=0.44 *3*. δ: +0.35 *+11−8* or +2.1 *5*. Data for this γ also listed in 2004Ek03.
4777# *4*	<0.1	11945.8	27/2$^{(+)}$	7175.6	27/2$^-$		
5009.8 *17*	1.5 *3*	12184.8	29/2$^-$	7175.6	27/2$^-$	E2+M1	DCO(1)=0.92 *15*; DCO(2)=0.46 *6*; DCO(3)=0.61 *8* R(ang)=0.66 *4*. δ: +0.12 *+8−6* or +5.0 *+50−20*.
5024 *4*	0.1 *1*	9165.2	(21/2$^+$)	4139.7	19/2$^-$		
5257.8 *17*	1.5 *3*	12433.8	29/2$^-$	7175.6	27/2$^-$	E2+M1	DCO(1)=1.04 *22*; DCO(2)=0.65 *8*; DCO(3)=0.70 *9* R(ang)=0.60 *4*. δ: 0.00 *+9−7* or +4.2 *+31−19*.
5617.2 *18*	5.8 *6*	12791.8	31/2$^-$	7175.6	27/2$^-$	E2	DCO(1)=1.12 *8*; DCO(2)=1.21 *8*; DCO(3)=1.16 *8* R(ang)=1.54 *7*. Data for this γ also listed in 2004Ek03.
5995.6 *20*	1.4 *3*	13169.9	31/2$^-$	7175.6	27/2$^-$	E2	DCO(1)=1.37 *23*; DCO(2)=1.36 *18*; DCO(3)=1.06 *17* R(ang)=1.63 *10*.
6944 *3*	0.1 *1*	14128.1	31/2$^-$	7175.6	27/2$^-$	E2	R(ang)=2.0 *4*.

† From 2004Ek02 based on R(DCO) and/or angular distribution ratio(R(ang)=Iγ(30°)/Iγ(83°)) and ΔJ^π; RUL used when level lifetime is known. Evaluators′ note: D for M1 and Q for E2 are used in 2004Ek02, althrough the level lifetimes are not available in most cases or other confirming data such as polarization are absent, the authors still assign E2 for all ΔJ=2 transitions and M1+E2, M1 or E1 for ΔJ=1 or 0 transitions.

‡ From 2004Ek02.

Placement of transition in the level scheme is uncertain.

$^{28}Si(^{32}S,2\alpha p\gamma)$ 2002Ek01,2004Ek02



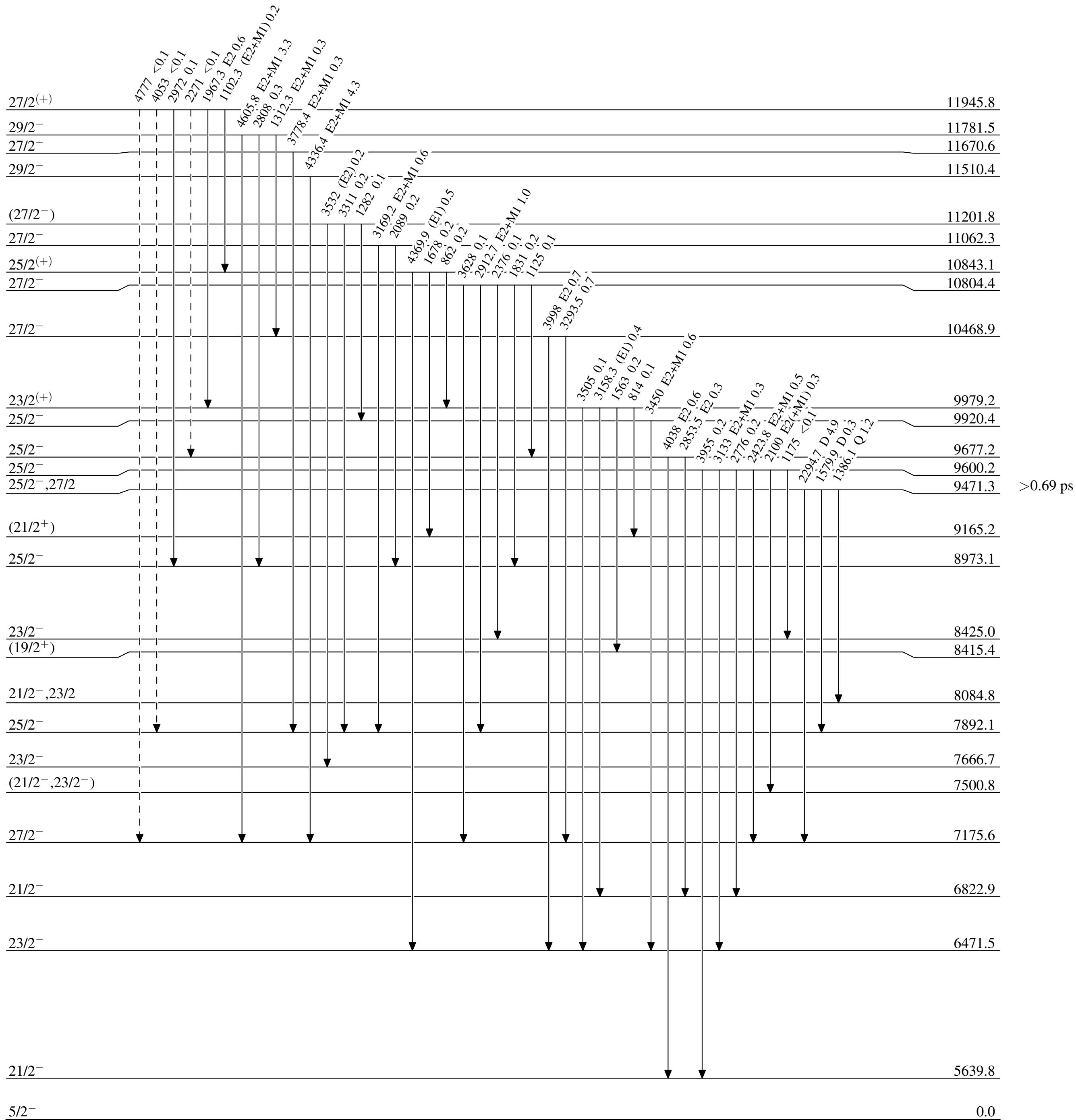
^{28}Si(^{32}S,2αpγ) 2002Ek01,2004Ek02

Level Scheme (continued)

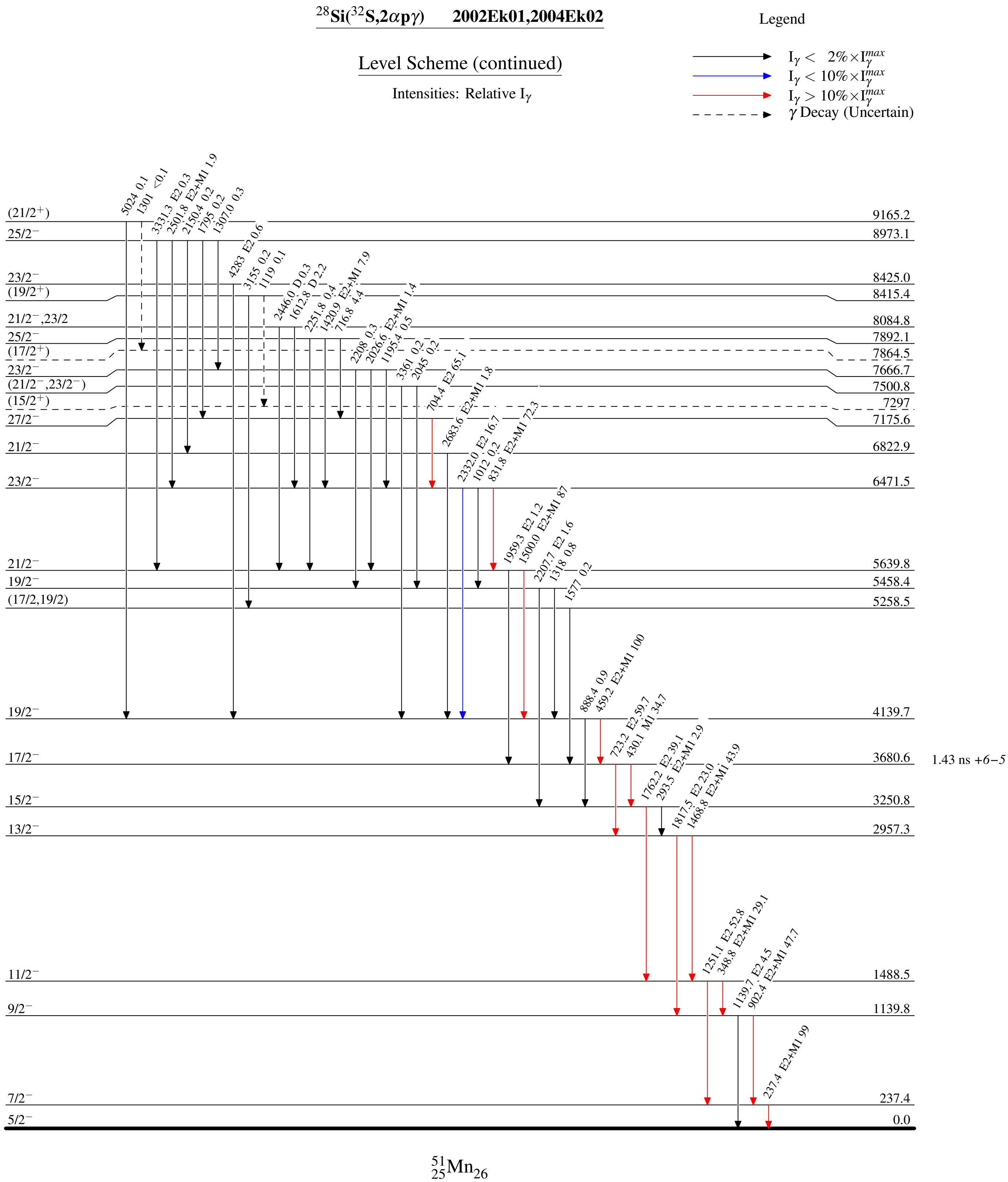
Intensities: Relative I_γ

Legend

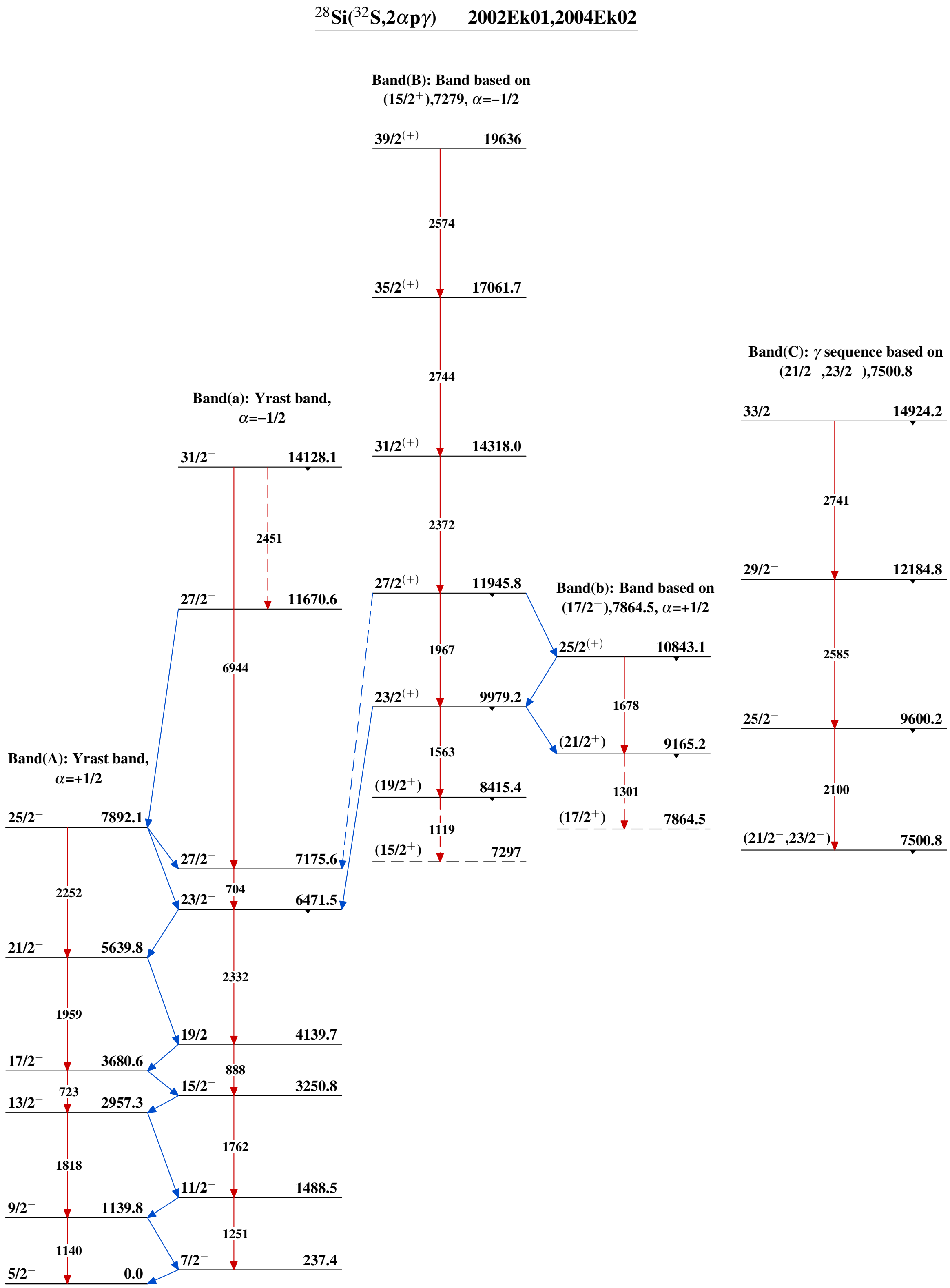
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)



$^{51}_{25}Mn_{26}$



^{28}Si(^{32}S,2αpγ) 2002Ek01,2004Ek02
Level Scheme (continued)
Intensities: Relative I_γ
Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)
(21/2+) 9165.2
25/2− 8973.1
23/2− 8425.0
(19/2+) 8415.4
21/2−,23/2 8084.8
25/2− 7892.1
(17/2+) 7864.5
23/2− 7666.7
(21/2−,23/2−) 7500.8
(15/2+) 7297
27/2− 7175.6
21/2− 6822.9
23/2− 6471.5
21/2− 5639.8
19/2− 5458.4
(17/2,19/2) 5258.5
19/2− 4139.7
17/2− 3680.6 1.43 ns +6−5
15/2− 3250.8
13/2− 2957.3
11/2− 1488.5
9/2− 1139.8
7/2− 237.4
5/2− 0.0
5024 0.1
1301 <0.1
3331.3 E2 0.3
2501.8 E2+M1 1.9
2150.4 0.2
1795 0.2
1307.0 0.3
4283 E2 0.6
3155 0.2
1119 0.1
2446.0 D 0.3
1612.8 D 2.2
2251.8 0.4
1420.9 E2+M1 7.9
716.8 4.4
2208 0.3
2026.6 E2+M1 1.4
1195.4 0.5
3361 0.2
2045 0.2
704.4 E2 65.1
2683.6 E2+M1 1.8
2332.0 E2 16.7
1012 0.2
831.8 E2+M1 72.3
1959.3 E2 1.2
1500.0 E2+M1 87
2207.7 E2 1.6
1318 0.8
1577 0.2
888.4 0.9
459.2 E2+M1 100
723.2 E2 59.7
430.1 M1 34.7
1762.2 E2 39.1
293.5 E2+M1 2.9
1817.5 E2 23.0
1468.8 E2+M1 43.9
1251.1 E2 52.8
348.8 E2+M1 29.1
1139.7 E2 4.5
902.4 E2+M1 47.7
237.4 E2+M1 99
$^{51}_{25}Mn_{26}$


^{28}Si(^{32}S,2αpγ) 2002Ek01,2004Ek02
Band(B): Band based on (15/2$^+$),7279, α=−1/2
Band(C): γ sequence based on (21/2$^-$,23/2$^-$),7500.8
Band(a): Yrast band, α=−1/2
Band(b): Band based on (17/2$^+$),7864.5, α=+1/2
Band(A): Yrast band, α=+1/2
39/2$^{(+)}$ 19636
35/2$^{(+)}$ 17061.7
31/2$^{(+)}$ 14318.0
27/2$^{(+)}$ 11945.8
23/2$^{(+)}$ 9979.2
(19/2$^+$) 8415.4
(15/2$^+$) 7297
2574
2744
2372
1967
1563
1119
33/2$^-$ 14924.2
29/2$^-$ 12184.8
25/2$^-$ 9600.2
(21/2$^-$,23/2$^-$) 7500.8
2741
2585
2100
31/2$^-$ 14128.1
27/2$^-$ 11670.6
2451
6944
25/2$^{(+)}$ 10843.1
(21/2$^+$) 9165.2
(17/2$^+$) 7864.5
1678
1301
25/2$^-$ 7892.1
27/2$^-$ 7175.6
23/2$^-$ 6471.5
21/2$^-$ 5639.8
19/2$^-$ 4139.7
17/2$^-$ 3680.6
15/2$^-$ 3250.8
13/2$^-$ 2957.3
11/2$^-$ 1488.5
9/2$^-$ 1139.8
7/2$^-$ 237.4
5/2$^-$ 0.0
2252
704
2332
1959
888
723
1762
1818
1251
1140

$^{51}_{25}Mn_{26}$