^{59}Co(^{28}Si,2pnγ) 1994Ch01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	N. Nica and M. Bostan	NDS 110,2815 (2009)	30-Sep-2009

1994Ch01: ^{59}Co(^{28}Si,2pnγ) E=98 MeV. Measured γ, $\gamma\gamma$, γ(t), $\gamma(\theta)$, DCO, excit, deduced $T_{1/2}$, RDM. Level calculations using particle-rotor, Hartree-Fock, and cranked-shell models.

Others: 1993Ch03 (superseded by 1994Ch01).

^{84}Y Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$[#]	Comments
0.0[b]	(6$^+$)	39.5 min *8*	1994Ch01 assumed that their lowest observed level was the (6$^+$), 39.5 min isomer At about 500 keV above the 1$^+$, 4.6 s g.s.. However we adopted In this evaluation an inversed order of these states, having the (6$^+$) state the ground state, and the 1$^+$ the higher lying state (see Adopted Levels, Gammas dataset). J$^\pi$: the authors deduced deformation parameter $\beta\approx$0.17 from B(E2) values for the stretched E2 transitions. The signature splitting observed for the π=+ band agrees with J$^\pi$=6$^+$ (1993Ch03). $T_{1/2}$: adopted value (see Adopted Levels, Gammas dataset).
16.8[e] *10*	(4$^-$)		
156.70[b] *9*	(8$^+$)	14.6[a] ns *7*	
162.88 *10*	(5$^-$)	32[a] ns *4*	
216.11[d] *9*	(5$^-$)	18.7[a] ns *21*	
419.79[e] *13*	(6$^-$)	17[&] ps *4*	
564.70 *15*	(6$^-$)		
668.81[c] *12*	(9$^+$)		
743.98[d] *11*	(7$^-$)		
936.22 *12*	(7$^-$)		
1070.62[b] *12*	(10$^+$)	1.7[&] ps *3*	
1211.61[e] *14*	(8$^-$)	1.4 ps *6*	
1591.59[d] *12*	(9$^-$)	1.3 ps *6*	$T_{1/2}$: the authors also give $T_{1/2}$=2.1 ps *8* in another of their tables, it is not clear which of the two is the correct value.
1603.21[c] *13*	(11$^+$)	0.42 ps *11*	
1644.13 *13*	(9$^-$)	2.5[&] ps *7*	
2076.75 *14*	(10$^-$)		
2123.15 *16*	(10$^-$)		
2132.71[e] *13*	(10$^-$)	1.0 ps *4*	
2196.36[b] *17*	(12$^+$)	0.31 ps *9*	
2244.74 *15*	(10$^-$)	1.8 ps *8*	
2285.26 *15*	(11$^-$)		
2528.98[d] *13*	(11$^-$)	1.7 ps *6*	
2608.17 *17*	(11$^-$)		
2741.15[c] *18*	(13$^+$)	0.25 ps *8*	
2888.55[e] *13*	(12$^-$)	1.4[&] ps *3*	
3222.33 *15*	(13$^-$)		
3400.8[d] *4*	(13$^-$)	0.62 ps *24*	
3502.59[b] *21*	(14$^+$)	0.17 ps *4*	
3592.7 *4*	(13$^-$)		
3872.3[e] *4*	(14$^-$)	0.19 ps *7*	
3903.4 *4*	(14)		
4019.61[c] *23*	(15$^+$)	0.15 ps *4*	
4024.4 *12*	(14$^-$)		
4235.4 *10*	(15$^-$)		

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^{59}Co(^{28}Si,2pnγ) 1994Ch01 (continued)

^{84}Y Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	E(level)[†]	Jπ[‡]
4500.4[d] 5	(15⁻)	0.55 ps 21	6591.4[b] 7	(18⁺)	0.10[@] ps 3	10329.5[c] 24	(23⁺)
4746.7 11	(15⁻)		7001.4[c] 8	(19⁺)	0.09 ps 3	12080[c] 5	(25⁺)
4969.4[b] 3	(16⁺)	0.11 ps 3	7096.4[d] 20	(19⁻)		13890[c]	(27⁺)
5005.4[e] 7	(16⁻)	0.14 ps 5	7717.4[e] 17	(20⁻)		15770[c]	(29⁺)
5445.4[c] 3	(17⁺)	0.12 ps 3	8330.5[b] 14	(20⁺)		17800[c]	(31⁺)
5700.4[d] 12	(17⁻)	0.52 ps 19	8632.5[c] 12	(21⁺)	0.12[@] ps 4		
6281.4[e] 14	(18⁻)	0.17[@] ps 6	10120[b]	(22⁺)			

[†] From least squares fit to Eγ (with ΔEγ=1.0 keV assumed by evaluator when not given by 1994Ch01).
[‡] From 1994Ch01 based on measured γ-ray multipolarities (all assignments are made tentative by evaluator).
[#] From line-shape analysis unless stated otherwise.
[@] Deduced from line shape. Value is an upper limit since feeding lifetimes are not taken into account.
[&] From RDM.
[a] From γ(t).
[b] Band(A): (π,α)=(+,0) Expected Configuration=((π $1g_{9/2}$)(ν $1g_{9/2}$)).
[c] Band(B): (π,α)=(+,1).
[d] Band(C): (π,α)=(-,1).
[e] Band(D): (π,α)=(-,0).

γ(^{84}Y)

Eγ	Iγ	E_i(level)	$J^π_i$	E_f	$J^π_f$	Mult.[†]	δ	Comments
145.0 2	<1	564.70	(6⁻)	419.79	(6⁻)			
156.7 1	100 2	156.70	(8⁺)	0.0	(6⁺)	E2		A_2=+0.33 2; A_4= −0.14 4
162.1 1	3 1	2285.26	(11⁻)	2123.15	(10⁻)	(M1+E2)		DCO=0.36 15
162.9 1	7 2	162.88	(5⁻)	0.0	(6⁺)	(E1)		A_2=−0.44 3; A_4=+0.02 3; DCO=0.23 6
168.0 1	2.0 5	2244.74	(10⁻)	2076.75	(10⁻)	(M1+E2)		DCO=0.54 14
179.3 2	1.5 4	743.98	(7⁻)	564.70	(6⁻)	(M1+E2)		A_2=−0.30 4; A_4=+0.02 4; DCO=0.25 9
203.7 2	9.0 5	419.79	(6⁻)	216.11	(5⁻)	(M1+E2)		A_2=−0.28 4; A_4=+0.11 5; DCO=0.38 11
211[‡]		4235.4	(15⁻)	4024.4	(14⁻)			
216.1 1	22 2	216.11	(5⁻)	0.0	(6⁺)	(E1)		A_2=−0.21 3; A_4=+0.03 5; DCO=0.41 8
275 1	<1	1211.61	(8⁻)	936.22	(7⁻)			
280.5 2	1.5 5	2888.55	(12⁻)	2608.17	(11⁻)			
302 2	<0.5	8632.5	(21⁺)	8330.5	(20⁺)			
310.7 2	2 1	3903.4	(14)	3592.7	(13⁻)			
324.1 2	5.5 8	743.98	(7⁻)	419.79	(6⁻)	(M1+E2)		A_2=−0.26 4; A_4=+0.10 5; DCO=0.43 10
333.8 1	5 1	3222.33	(13⁻)	2888.55	(12⁻)	(M1+E2)		DCO=0.38 15
348.5 2	2.0 4	564.70	(6⁻)	216.11	(5⁻)	(M1+E2)		DCO=0.42 12
359.6 1	12 2	2888.55	(12⁻)	2528.98	(11⁻)	(M1+E2)		DCO=0.33 9
363.5 2	2.5 5	2608.17	(11⁻)	2244.74	(10⁻)			
380.0 2	1.2 3	1591.59	(9⁻)	1211.61	(8⁻)			DCO=0.46 20
396.4 2	2.0 4	2528.98	(11⁻)	2132.71	(10⁻)	(M1+E2)		DCO=0.38 15
401.8 1	6 1	1070.62	(10⁺)	668.81	(9⁺)	(M1+E2)	−0.11 4	A_2=−0.35 5; A_4=+0.08 4; DCO=0.42 8
403 1	1.5 5	419.79	(6⁻)	16.8	(4⁻)			
410 1	1.0 3	7001.4	(19⁺)	6591.4	(18⁺)			
419.7 3	1.5 3	419.79	(6⁻)	0.0	(6⁺)			
432.6 1	6 1	2076.75	(10⁻)	1644.13	(9⁻)	(M1+E2)		A_2=−0.33 4; A_4=+0.01 3; DCO=0.41 12
467.7 2	3.0 5	1211.61	(8⁻)	743.98	(7⁻)	(M1+E2)		DCO=0.43 14
471.5 2	12 2	3872.3	(14⁻)	3400.8	(13⁻)	(M1+E2)		A_2=−0.42 4; A_4=+0.11 3; DCO=0.36 11

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^{59}Co(^{28}Si,2pnγ) 1994Ch01 (continued)

γ(^{84}Y) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.†	δ	Comments
476.0 *2*	3.5 *5*	5445.4	(17$^+$)	4969.4	(16$^+$)	(M1+E2)		DCO=0.40 *12*
479.0 *2*	4.0 *1*	2123.15	(10$^-$)	1644.13	(9$^-$)	(M1+E2)		DCO=0.38 *15*
505.0 *5*	7.5 *20*	5005.4	(16$^-$)	4500.4	(15$^-$)	(M1+E2)		A_2=−0.45 *4*; A_4=+0.04 *3*; DCO=0.38 *12*
512.1 *1*	21 *2*	668.81	(9$^+$)	156.70	(8$^+$)	(M1+E2)		DCO=0.36 *6*
512.2 *6*	8 *1*	3400.8	(13$^-$)	2888.55	(12$^-$)	(M1+E2)		DCO=0.42 *12*
517.0 *2*	7 *1*	4019.61	(15$^+$)	3502.59	(14$^+$)	(M1+E2)	−0.15 *5*	A_2=−0.36 *5*; A_4=+0.12 *5*; DCO=0.44 *10*
527.9 *2*	3.0 *4*	743.98	(7$^-$)	216.11	(5$^-$)	E2		DCO=0.88 *25*
532.6 *1*	25 *1*	1603.21	(11$^+$)	1070.62	(10$^+$)	(M1+E2)	−0.13 *5*	A_2=−0.37 *4*; A_4=+0.09 *4*; DCO=0.26 *4*
541.1 *3*	4.5 *10*	2132.71	(10$^-$)	1591.59	(9$^-$)			
544.8 *1*	14 *1*	2741.15	(13$^+$)	2196.36	(12$^+$)	(M1+E2)	−0.15 *5*	A_2=−0.32 *4*; A_4=+0.12 *5*; DCO=0.32 *6*
581 *1*	4.0 *15*	6281.4	(18$^-$)	5700.4	(17$^-$)			
581.2 *2*	7 *2*	743.98	(7$^-$)	162.88	(5$^-$)	E2		A_2=+0.30 *4*; A_4=+0.03 *4*; DCO=1.12 *20*
593.2 *2*	6 *1*	2196.36	(12$^+$)	1603.21	(11$^+$)	E2		DCO=0.44 *8*
603.3 *1*	2.0 *3*	2888.55	(12$^-$)	2285.26	(11$^-$)	(M1+E2)		DCO=0.40 *16*
614.2 *2*	2.0 *5*	3222.33	(13$^-$)	2608.17	(11$^-$)			
621‡		7717.4	(20$^-$)	7096.4	(19$^-$)			
628.1 *3*	6.5 *20*	4500.4	(15$^-$)	3872.3	(14$^-$)	(M1+E2)		A_2=−0.22 *4*; A_4=+0.02 *2*; DCO=0.44 *15*
643.8 *2*	6.5 *15*	2888.55	(12$^-$)	2244.74	(10$^-$)	E2		DCO=0.90 *25*
692 *1*	<1	2888.55	(12$^-$)	2196.36	(12$^+$)			
693.3 *2*	2 *1*	3222.33	(13$^-$)	2528.98	(11$^-$)			
695 *1*	2.5 *10*	5700.4	(17$^-$)	5005.4	(16$^-$)	(M1+E2)		DCO=0.49 *16*
704.1 *7*	3 *1*	3592.7	(13$^-$)	2888.55	(12$^-$)	(M1+E2)		DCO=0.49 *16*
707.9 *1*	11 *1*	1644.13	(9$^-$)	936.22	(7$^-$)	E2		A_2=+0.20 *4*; A_4=+0.02 *4*
720.1 *1*	10 *2*	936.22	(7$^-$)	216.11	(5$^-$)	E2		DCO=1.08 *16*
744.1 *5*	<1	743.98	(7$^-$)	0.0	(6$^+$)	(E1)		DCO=0.46 *20*
755.8 *1*	10 *1*	2888.55	(12$^-$)	2132.71	(10$^-$)	E2		DCO=1.10 *30*
761.4 *2*	4 *1*	3502.59	(14$^+$)	2741.15	(13$^+$)	(M1+E2)	−0.14 *5*	A_2=−0.35 *5*; A_4=+0.10 *5*; DCO=0.41 *10*
791.8 *2*	4 *1*	1211.61	(8$^-$)	419.79	(6$^-$)	E2		DCO=1.06 *20*
802‡#		4024.4	(14$^-$)	3222.33	(13$^-$)			
811.7 *2*	4 *1*	2888.55	(12$^-$)	2076.75	(10$^-$)	E2		DCO=1.14 *32*
815‡#		7096.4	(19$^-$)	6281.4	(18$^-$)			
847.6 *1*	20 *2*	1591.59	(9$^-$)	743.98	(7$^-$)	E2		A_2=+0.35 *3*; A_4=−0.04 *5*
865 *1*	<1	2076.75	(10$^-$)	1211.61	(8$^-$)			
872 *1*	6 *2*	3400.8	(13$^-$)	2528.98	(11$^-$)	E2		DCO=0.96 *18*
913.9 *1*	70 *2*	1070.62	(10$^+$)	156.70	(8$^+$)	E2		A_2=+0.30 *2*; A_4=−0.05 *3*
921.1 *1*	6 *1*	2132.71	(10$^-$)	1211.61	(8$^-$)	(E2)		A_2=+0.27 *5*; A_4=+0.06 *4*
922.7 *4*	<1	1591.59	(9$^-$)	668.81	(9$^+$)			
925.8 *4*	<1	2528.98	(11$^-$)	1603.21	(11$^+$)	(E1)		DCO=0.42 *14*
934.4 *1*	6 *1*	1603.21	(11$^+$)	668.81	(9$^+$)	E2		A_2=+0.28 *5*; A_4=+0.02 *5*; DCO=1.05 *15*
936 *1*	1.0 *5*	936.22	(7$^-$)	0.0	(6$^+$)			
937.0 *2*	2.0 *5*	3222.33	(13$^-$)	2285.26	(11$^-$)	E2		DCO=1.03 *30*
937.4 *1*	22 *2*	2528.98	(11$^-$)	1591.59	(9$^-$)	E2		DCO=1.06 *20*
949.9 *4*	1.0 *3*	4969.4	(16$^+$)	4019.61	(15$^+$)	(M1+E2)		DCO=0.38 *14*
964.5 *5*	1.0 *5*	2608.17	(11$^-$)	1644.13	(9$^-$)	E2		DCO=1.03 *30*
983.8 *5*	7 *3*	3872.3	(14$^-$)	2888.55	(12$^-$)	E2		DCO=1.15 *30*
1013‡		4235.4	(15$^-$)	3222.33	(13$^-$)			
1014.7 *5*	3.0 *15*	3903.4	(14)	2888.55	(12$^-$)			
1063.8 *5*	10 *2*	3592.7	(13$^-$)	2528.98	(11$^-$)	E2		DCO=1.10 *40*
1099‡#		4500.4	(15$^-$)	3400.8	(13$^-$)			
1125.7 *2*	36 *2*	2196.36	(12$^+$)	1070.62	(10$^+$)	E2		A_2=+0.29 *3*; A_4=−0.12 *4*; DCO=1.16 *12*
1133 *1*	7 *2*	5005.4	(16$^-$)	3872.3	(14$^-$)	E2		DCO=1.12 *30*
1136 *2*	4 *2*	4024.4	(14$^-$)	2888.55	(12$^-$)			
1137.9 *2*	14 *1*	2741.15	(13$^+$)	1603.21	(11$^+$)	E2		A_2=+0.23 *3*; A_4=+0.06 *4*; DCO=1.06 *14*
1146 *1*	0.5 *2*	6591.4	(18$^+$)	5445.4	(17$^+$)	(M1+E2)		DCO=0.40 *15*

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^{59}Co(^{28}Si,2pnγ) 1994Ch01 (continued)

γ(^{84}Y) (continued)

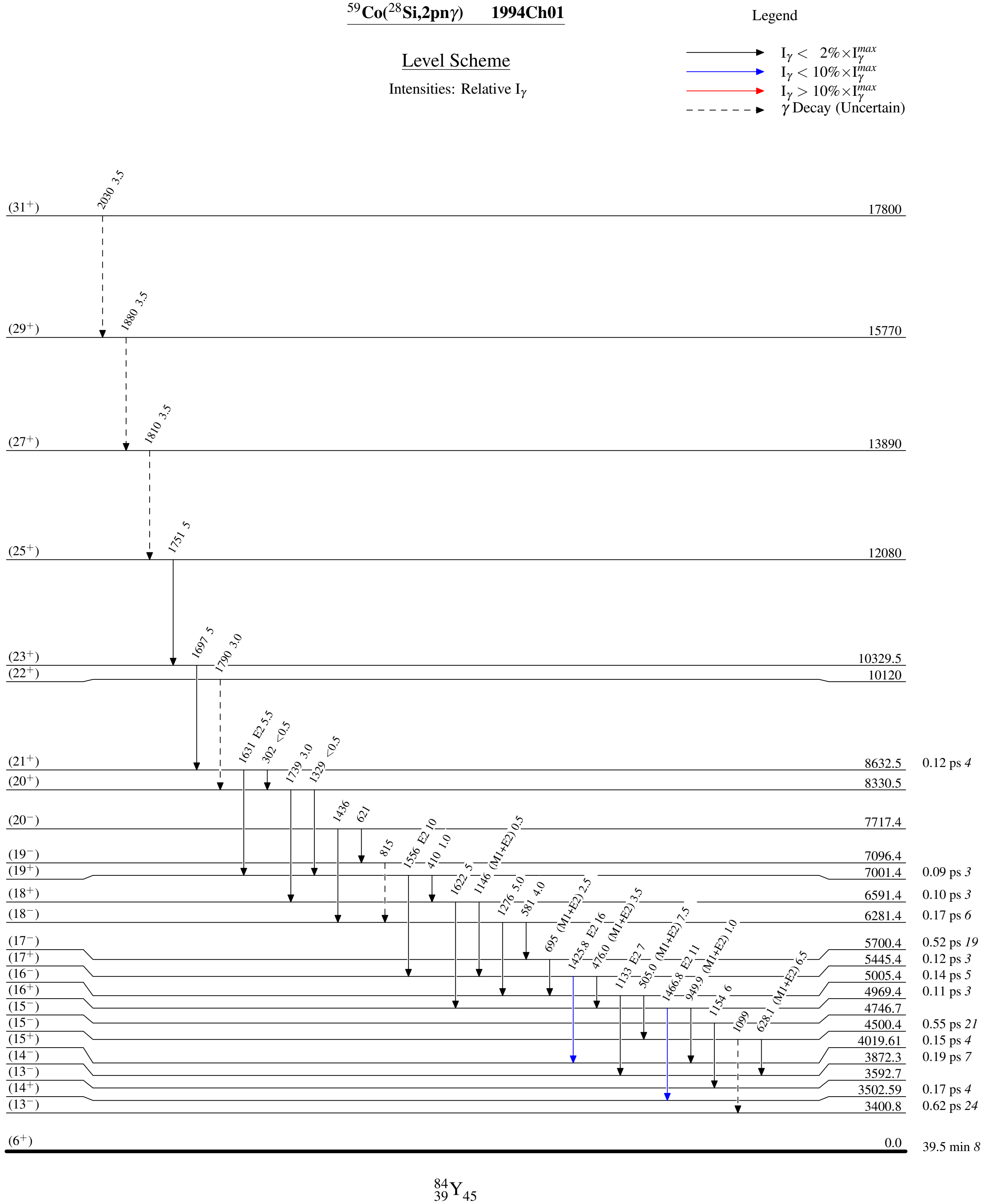
E_γ	I_γ	E_i(level)	J^π_i	E_f	J^π_f	Mult.†	Comments
1154 *1*	6 *2*	4746.7	(15⁻)	3592.7	(13⁻)		
1174.1 *5*	2.0 *5*	2244.74	(10⁻)	1070.62	(10⁺)	(E1)	DCO=0.36 *14*
1276 *2*	5.0 *15*	6281.4	(18⁻)	5005.4	(16⁻)		
1278.5 *2*	17 *2*	4019.61	(15⁺)	2741.15	(13⁺)	E2	A_2=+0.25 *5*; A_4=+0.01 *3*; DCO=1.08 *16*
1285.4 *7*	4.0 *5*	2888.55	(12⁻)	1603.21	(11⁺)	(E1)	DCO=0.44 *15*
1306.2 *2*	22 *2*	3502.59	(14⁺)	2196.36	(12⁺)	E2	A_2=+0.26 *4*; A_4=−0.02 *2*; DCO=1.14 *15*
1329 *2*	<0.5	8330.5	(20⁺)	7001.4	(19⁺)		
1425.8 *2*	16 *2*	5445.4	(17⁺)	4019.61	(15⁺)	E2	A_2=+0.34 *5*; A_4=+0.01 *3*; DCO=1.08 *19*
1435.0 *5*	4.0 *5*	1591.59	(9⁻)	156.70	(8⁺)	(E1)	DCO=0.47 *15*
1436‡		7717.4	(20⁻)	6281.4	(18⁻)		
1458.2 *3*	7.0 *6*	2528.98	(11⁻)	1070.62	(10⁺)	(E1)	DCO=0.45 *13*
1466.8 *2*	11 *1*	4969.4	(16⁺)	3502.59	(14⁺)	E2	A_2=+0.38 *5*; A_4=+0.01 *3*; DCO=1.05 *24*
1556 *1*	10 *1*	7001.4	(19⁺)	5445.4	(17⁺)	E2	A_2=+0.28 *7*; A_4=+0.02 *4*; DCO=0.98 *25*
1576.2 *5*	5.0 *6*	2244.74	(10⁻)	668.81	(9⁺)	(E1)	A_2=−0.30 *5*; A_4=+0.06 *5*; DCO=0.40 *14*
1622 *1*	5 *2*	6591.4	(18⁺)	4969.4	(16⁺)		
1631 *1*	5.5 *15*	8632.5	(21⁺)	7001.4	(19⁺)	E2	A_2=+0.27 *10*; A_4=+0.01 *5*
1697 *2*	5 *2*	10329.5	(23⁺)	8632.5	(21⁺)		
1739 *2*	3.0 *15*	8330.5	(20⁺)	6591.4	(18⁺)		
1751 *4*	5 *2*	12080	(25⁺)	10329.5	(23⁺)		
1790# *5*	3.0 *15*	10120	(22⁺)	8330.5	(20⁺)		
1810# *5*	3.5 *15*	13890	(27⁺)	12080	(25⁺)		
1880# *5*	3.5 *15*	15770	(29⁺)	13890	(27⁺)		
2030# *5*	3.5 *15*	17800	(31⁺)	15770	(29⁺)		

† Inferred from $\gamma(\theta)$, DCO ratio, level half-life and band structure.
‡ Shown in authors′ level scheme but not given in their table.
# Placement of transition in the level scheme is uncertain.

$^{59}Co(^{28}Si,2pn\gamma)$ 1994Ch01

Level Scheme

Intensities: Relative I_γ



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Level Scheme (continued)

Intensities: Relative I_γ

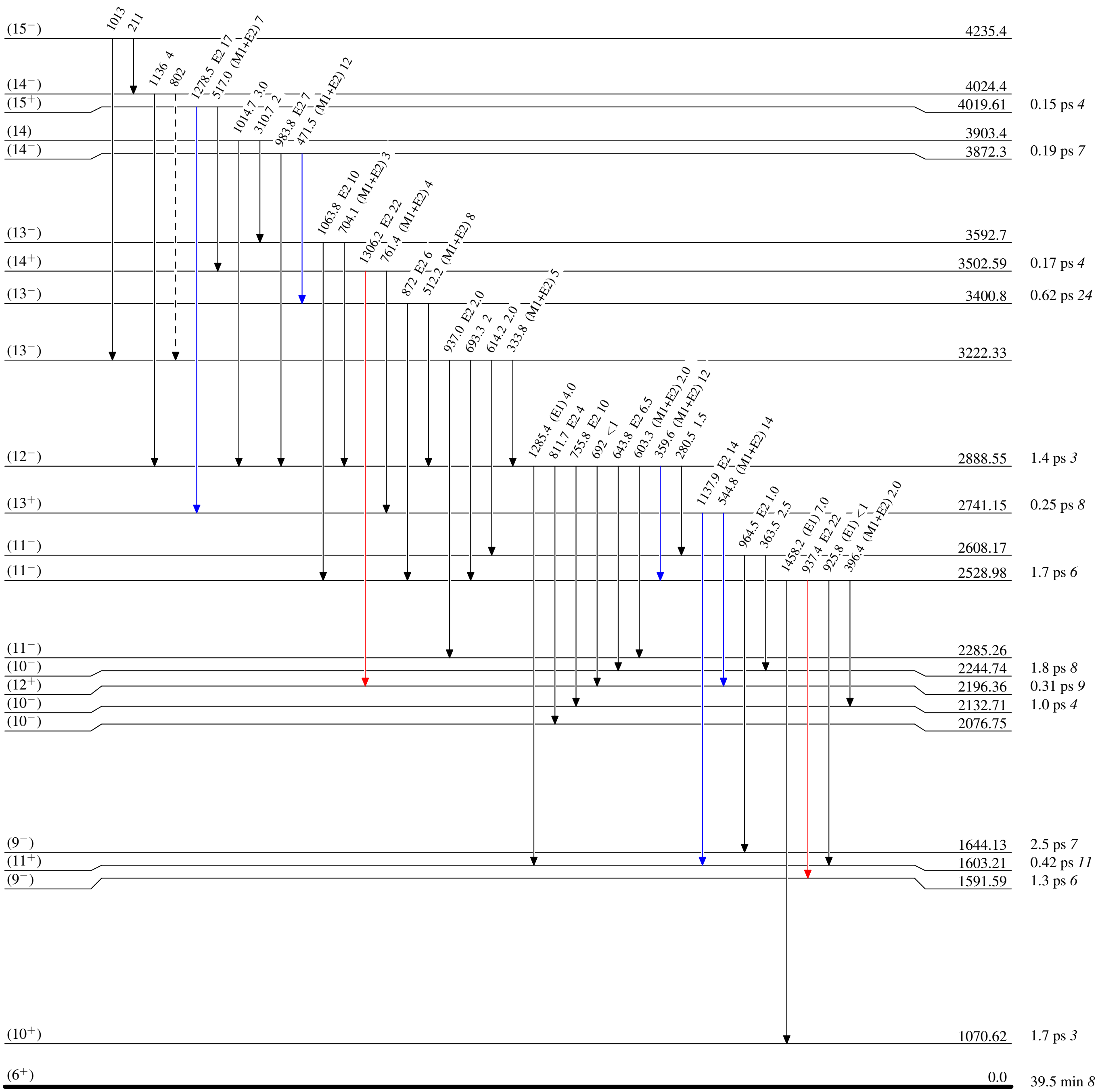
Legend

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

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

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

γ Decay (Uncertain)



$^{84}_{39}Y_{45}$

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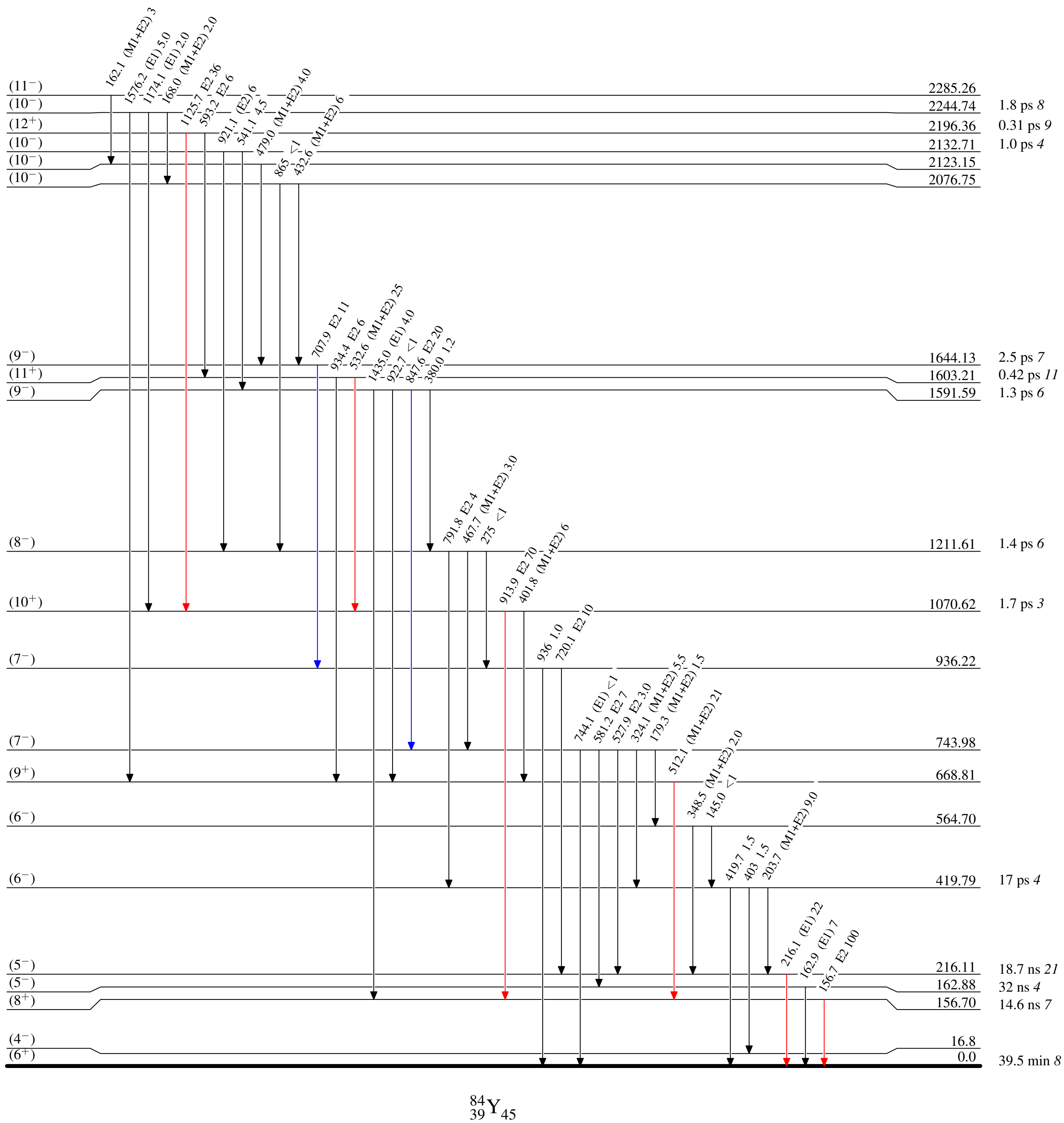
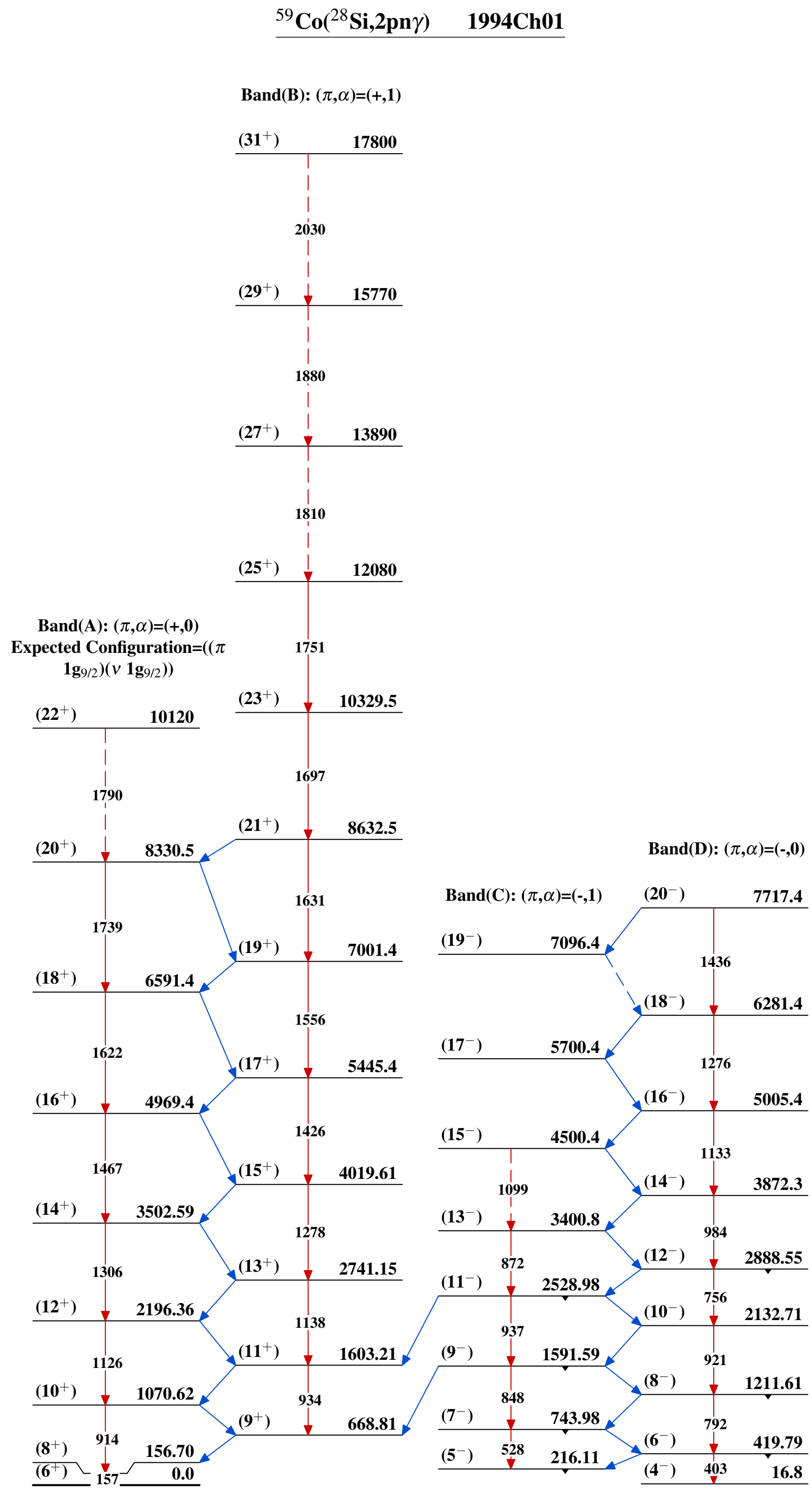
Level Scheme (continued)

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(B): (π,α)=(+,1)
Band(A): (π,α)=(+,0)
Expected Configuration=((π 1g9/2)(ν 1g9/2))
Band(C): (π,α)=(-,1)
Band(D): (π,α)=(-,0)
(31+) 17800
2030
(29+) 15770
1880
(27+) 13890
1810
(25+) 12080
1751
(23+) 10329.5
1697
(22+) 10120
1790
(21+) 8632.5
(20+) 8330.5
1631
1739
(19+) 7001.4
(18+) 6591.4
1556
1622
(17+) 5445.4
(16+) 4969.4
1426
1467
(15+) 4019.61
(14+) 3502.59
1278
1306
(13+) 2741.15
(12+) 2196.36
1138
1126
(11+) 1603.21
(10+) 1070.62
934
914
(9+) 668.81
(8+) 156.70
(6+) 0.0
157
(20−) 7717.4
(19−) 7096.4
1436
(18−) 6281.4
(17−) 5700.4
1276
(16−) 5005.4
(15−) 4500.4
1133
1099
(14−) 3872.3
(13−) 3400.8
984
872
(12−) 2888.55
(11−) 2528.98
756
(10−) 2132.71
937
921
(9−) 1591.59
(8−) 1211.61
848
792
(7−) 743.98
(6−) 419.79
(5−) 216.11
528
(4−) 16.8
403

$^{84}_{39}Y_{45}$