(HI,xnγ)   **1997Ju01,1994Wa16,1994Ma47**

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	D. De Frenne and A. Negret	NDS 109, 943 (2008)	1-May-2007

1994Wa16: ^{54}Fe(^{58}Ni,α2pγ). E=243 MeV. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$(DCO) using 8π array of 20 Compton-suppressed HPGE detectors with an inner ball of 71 BGO detectors.

1994Ma47: ^{51}V(^{58}Ni,p2nγ). E=217 MeV. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma(\theta)$, (particle)γ coin, linear pol, lifetimes, g factor for 6^{+} state at 2325 by integral PAD method. linear pol=[n(parallel)/n(perpendicular)]. If pol > 1: magnetic radiation, if < 1: electric radiation is assumed.

1997Ju01: ^{54}Fe(^{58}Ni,α2pγ). E= 270 MeV. Measured γ, $\gamma\gamma$, $\gamma(\theta)$ using Nordball array of 15 Ge detectors.

Others: 1989Az02, 1988IsZW, 1980Au08.

^{106}Sn Levels

E(level)[†][‡]	J$^{\pi}$ [@]	T$_{1/2}$	Comments
0.0[a]	0^{+}		
1207.7[a] 5	2^{+}		
2019.6[a] 5	4^{+}		
2325.0[a] 18	6^{+}	2.3 ns 5	g factor=−0.14 9 (1994Ma47), measured relative to 6^{+} state of ^{108}Sn. T$_{1/2}$: from (particle)γ(t) (1994Ma47)and $\gamma\gamma$(t) (1988IsZW).
3480.4[a] 6	8^{+}		
3777.3 6			
4135.0[a] 23	10^{+}	25 ps 4	T$_{1/2}$: From recoil-distance method (1994Ma47).
4393.9 6	9^{-}		
4459.0 7			
4587.3 6	10^{+}		
4853.3 6			
5294.2[a] 6	12^{+}		
5542.1 7	11^{+}		
5543.4 6	11^{-}		
5860.3 21	(12^{+})		
5900.9 7	(11)		
5959.8 7			
6255.8 6	13^{-}		
6655.8 7	13		
6711.4 7	14^{-}	≤15 ps	T$_{1/2}$: From recoil-distance method (1994Ma47).
6745.6 7	(13^{-})		
6745.7 7			
6752.5 7			
6773.3 7			
7007.0 7	13		
7141.8[#] 3	15^{-}		
7385.3 7	15^{-}		
7596.8[#] 3	(16^{+})		
7598.5[&] 7	(14^{-})		
7681.3 7			
7686.1 7			
7745.0 7	15		
7804.6 7	16^{-}		
7865.3? 10			E(level): Observed only by 1989Az02. Level energy recalculated by evaluators using decaying gamma to level energy taken from 1997Ju01.
8012.0[&] 7	(15^{-})		
8045.8 7	(15^{-})		
8140.5[#] 5			
8141.0 7			

(HI,xnγ)   1997Ju01,1994Wa16,1994Ma47 (continued)

^{106}Sn Levels (continued)

E(level)[†‡]	Jπ [@]	Comments
8215.7 *7*	17⁻	
8215.7+x[#] *3*		
8559.0[&] *7*	(16⁻)	
8617.7+x *10*		
8653.5 *3*	(18)	
8686.5[#] *3*	(18⁺)	
9096.7+x *15*		
9100.5[#] *3*	(19⁺)	
9102.3[&] *7*	(17⁻)	
9552.2[&] *7*	(18⁻)	Jπ: Jπ=(20⁺) suggested by 1994Wa16.
9987.2 *7*	18	
10040.4[&] *8*	(19⁻)	Jπ: Jπ=(21⁺) suggested by 1994Wa16.
10370.7[#] *3*		
10632.4[&] *2*	1	
10806.7 *8*	20	Jπ: Jπ=(19) suggested by 1994Wa16.
11265.4[&] *24*		Jπ: Jπ=(23⁺) suggested by 1994Wa16.
11318.7[#] *4*	(20)	
11318.7+y[#]	(22⁺)	
12312.7+y[#] *10*	(24⁺)	
13440.7+y[#] *15*	(26⁺)	
14714.7+y[#] *18*	(28⁺)	
16181.7+y[#] *20*	(30⁺)	
17898.7+y[#] *23*	(32⁺)	
19931.7+y[#] *25*	(34⁺)	
z[#]		Additional information 1.
941.0+z[#] *10*		
2050.0+z[#] *15*		
3291.0+z[#] *18*		
4693.0+z[#] *20*		
6265.0+z[#] *23*		

† Calculated by the evaluators using a least-squares fit, using , if available, gammas from 1997Ju01 as they are the most precise. Level energies not observed by 1997Ju01 were calculated using decaying gammas to known levels.

‡ There are important energy differences (up to several keV) between the results of 1989Az02, 1994Wa16 and 1994Ma47 for the same levels.

From 1994Wa16.

@ From γγ, γγ(θ), γ linear pol and observed band structure.

& Band(A): ΔJ=1 band.

a Band(B): yrast band.

(HI,xnγ)   1997Ju01,1994Wa16,1994Ma47 (continued)

$\gamma(^{106}$Sn$)$

$\gamma(\theta)$ data in terms of ratio of γ-ray intensities at different angles are quoted by 1997Ju01 and used to assign ΔJ and multipolarity.

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#@]	δ	Comments
296.9 2	1.0 2	3777.3		3480.4	8$^+$			
304.7 2	94.4 8	2325.0	6$^+$	2019.6	4$^+$	E2		A$_2$=+0.27 2; A$_4$=−0.10 4
325.7 2	1.3 2	4459.0		4135.0	10$^+$			
^{x}401.8 2	4.0 9							
402		8617.7+x		8215.7+x				
413.4 2	10.6 2	8012.0	(15$^-$)	7598.5	(14$^-$)	D[&]		
414		9100.5	(19$^+$)	8686.5	(18$^+$)			
^{x}420.4 2	1.8 2							
447		9100.5	(19$^+$)	8653.5	(18)			
447.4 2	6.3 3	8045.8	(15$^-$)	7598.5	(14$^-$)	D[&]		
449.9 2	11.5 5	9552.2	(18$^-$)	9102.3	(17$^-$)	D[&]		
455		7596.8	(16$^+$)	7141.8	15$^-$			
455.4 2	24.9 10	6711.4	14$^-$	6255.8	13$^-$	M1+E2	−0.20 6	A$_2$=−0.53 8; A$_4$=−0.03 12
								Mult.: E1 given by 1989Az02.
								Pol≈ 0 at 90° to the beam direction
								(1994Ma47).
478 1		7865.3?		7385.3	15$^-$	Q		
^{x}478.5 2	9.8 9							
479		9096.7+x		8617.7+x				
488.2 2	8.1 6	10040.4	(19$^-$)	9552.2	(18$^-$)			
496.7 2	1.0 2	6752.5		6255.8	13$^-$			
512		11318.7	(20)	10806.7	20			DCO=0.94 20
								Mult.: Dipole or M1+E2.
								Mult.: Dipole or M1+E2.
513		8653.5	(18)	8140.5				
513.2 2	10.6 7	8559.0	(16$^-$)	8045.8	(15$^-$)			
517.5 2	3.3 2	6773.3		6255.8	13$^-$			
^{x}532.7 2	3.0 6							
^{x}540.3 2	2.0 2							
542		8140.5		7596.8	(16$^+$)			
543.3 2	16.1 6	9102.3	(17$^-$)	8559.0	(16$^-$)	D[&]		
546		8686.5	(18$^+$)	8140.5				
547.0 2	12.3 5	8559.0	(16$^-$)	8012.0	(15$^-$)			
^{x}555.0 2	4.4 2							E$_\gamma$: Unassigned gammas from 1997Ju01.
592 2	3.1 5	10632.4	1	10040.4	(19$^-$)			
633 1	<1	11265.4		10632.4	1			
652.8 2	69 2	4135.0	10$^+$	3480.4	8$^+$	E2		A$_2$=+0.34 3; A$_4$=−0.06 7
706.9 2	3.1 3	5294.2	12$^+$	4587.3	10$^+$			
712.4 2	2.9 3	6255.8	13$^-$	5543.4	11$^-$	(E2)		
811.9 2	95 2	2019.6	4$^+$	1207.7	2$^+$	E2		A$_2$=+0.28 2; A$_4$=−0.05 4
819.5 2	2.0 3	10806.7	20	9987.2	18			DCO=0.50 5
								Mult.: Dipole or M1+E2.
830.4 2	13.0 6	8215.7	17$^-$	7385.3	15$^-$	D[&]		Mult.: D excluded if J^π initial and final
								levels are correct.
886		7141.8	15$^-$	6255.8	13$^-$			
887.0 2	9.8 5	7598.5	(14$^-$)	6711.4	14$^-$	Q		
913.5 2	9.3 4	4393.9	9$^-$	3480.4	8$^+$			
940.5 2	5.0 1	7686.1		6745.7				
941		941.0+z		z				
954.8 2	7.3 3	5542.1	11$^+$	4587.3	10$^+$			
961.5 2	45.8 11	6255.8	13$^-$	5294.2	12$^+$	E1		A$_2$=+0.31 3; A$_4$=−0.05 7

(HI,xnγ)   **1997Ju01,1994Wa16,1994Ma47 (continued)**

$\gamma(^{106}\text{Sn})$ (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#@]	Comments
993[a] 2	3.2 6	9552.2	(18⁻)	8559.0	(16⁻)		
994		12312.7+y	(24⁺)	11318.7+y	(22⁺)		
1055		8653.5	(18)	7598.5	(14⁻)		
1088		8686.5	(18⁺)	7598.5	(14⁻)		
1089.2 2	3.7 4	7745.0	15	6655.8	13		
1093.2 2	6.2 4	7804.6	16⁻	6711.4	14⁻	Q	
1106.9 2	6.4 4	4587.3	10⁺	3480.4	8⁺		
1109		2050.0+z		941.0+z			
1128		13440.7+y	(26⁺)	12312.7+y	(24⁺)		
1129.5 2	19.0 9	7385.3	15⁻	6255.8	13⁻	Q	
1149.6 2	7.2 5	5543.4	11⁻	4393.9	9⁻	(E2)	
1156.1 2	95 1	3480.4	8⁺	2325.0	6⁺	E2	A_2=+0.34 3; A_4=−0.06 7
1160.9 2	55.0 9	5294.2	12⁺	4135.0	10⁺	E2	A_2=+0.31 3; A_4=−0.05 7
1202.2 2	1.4 5	6745.6	(13⁻)	5543.4	11⁻		
1207.7 5		1207.7	2⁺	0.0	0⁺	E2	A_2=+0.29 2; A_4=−0.05 7
1241		3291.0+z		2050.0+z			
1274		14714.7+y	(28⁺)	13440.7+y	(26⁺)		
1300.6[a] 2	1.7 3	8012.0	(15⁻)	6711.4	14⁻		
1334.2 2	2.2 1	8045.8	(15⁻)	6711.4	14⁻		
1361.6 2	6.4 5	6655.8	13	5294.2	12⁺		
1372.9 2	2.5 3	4853.3		3480.4	8⁺		
1402		4693.0+z		3291.0+z			
1410.1 2	4.7 3	5543.4	11⁻	4135.0	10⁺		
1425.5 2	4.9 10	7681.3		6255.8	13⁻		
1429.6 2	4.3 6	8141.0		6711.4	14⁻		
1451.5 2	1.1 3	6745.7		5294.2	12⁺		
1470		16181.7+y	(30⁺)	14714.7+y	(28⁺)		
1572		6265.0+z		4693.0+z			
1712.8 2		7007.0	13	5294.2	12⁺		
1717		17898.7+y	(32⁺)	16181.7+y	(30⁺)		
1727 2	2.5 2	5860.3	(12⁺)	4135.0	10⁺		
1756.5 2	3.3 2	8012.0	(15⁻)	6255.8	13⁻		
1767.6 2	2.8 3	5900.9	(11)	4135.0	10⁺		
1771.5 2	3.5 3	9987.2	18	8215.7	17⁻	Q[&]	
1826.5 2	0.6 3	5959.8		4135.0	10⁺		
2033		19931.7+y	(34⁺)	17898.7+y	(32⁺)		
2155		10370.7		8215.7	17⁻		

[†] Unless noted otherwise, from 1997Ju01 as these values were more precise than those given by 1994Wa16 fore the same gammas.

[‡] From 1997Ju01.

[#] From $\gamma\gamma(\theta)$(DCO)(1994Ma47) and $\gamma(\theta)$: 1997Ju01,1994Ma47 $\gamma(\theta)$ and γ linear pol (1989Az02).

[@] A_2,A_4 from 1994Ma47.

[&] Based only on ratio line intensities in spectra at 0° and 150° (1989Az02).

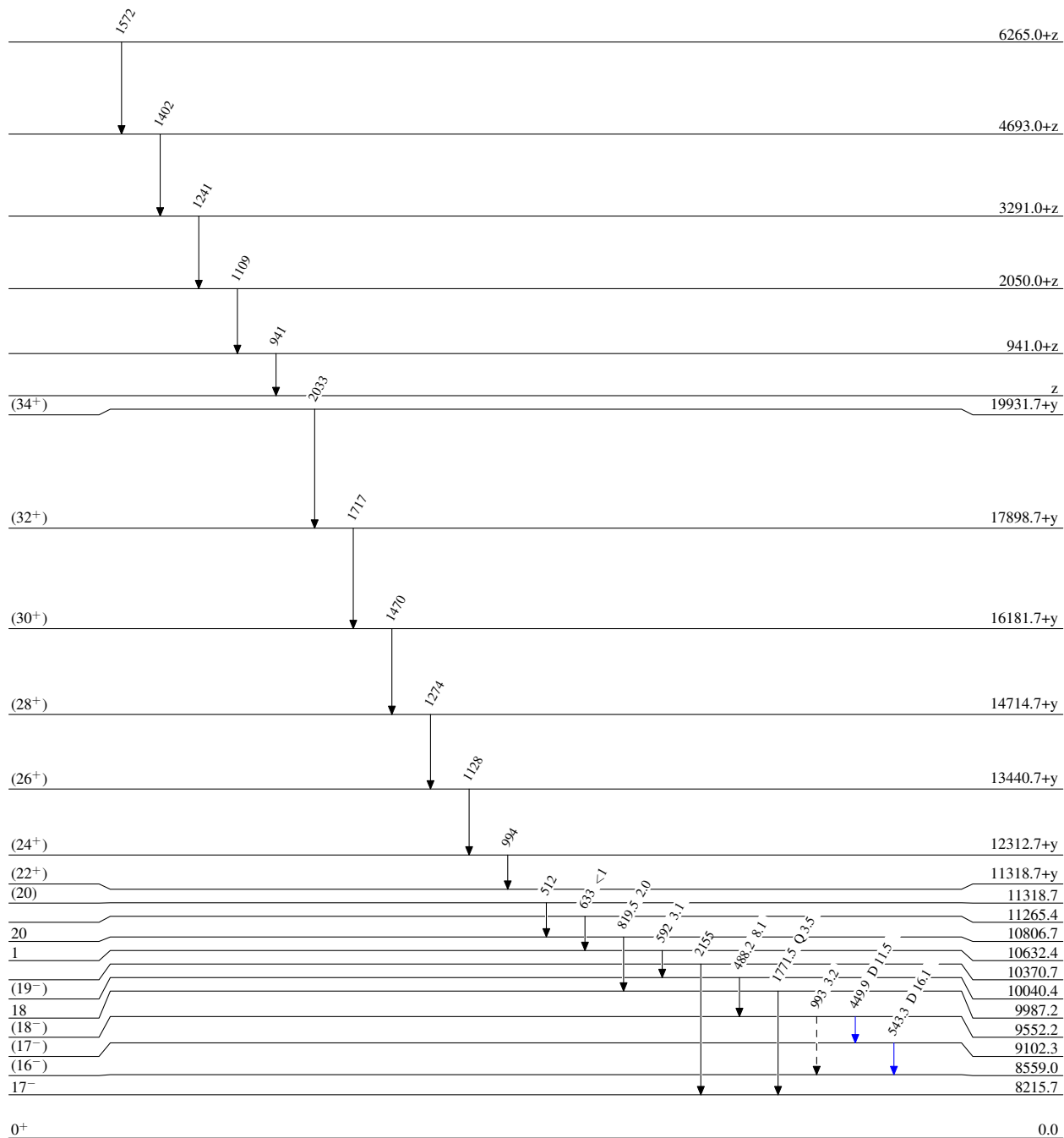[a] Placement of transition in the level scheme is uncertain.

[x] γ ray not placed in level scheme.

(HI,xnγ)   1997Ju01,1994Wa16,1994Ma47

<u>Level Scheme</u>

Intensities: Relative I_γ

Legend

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

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

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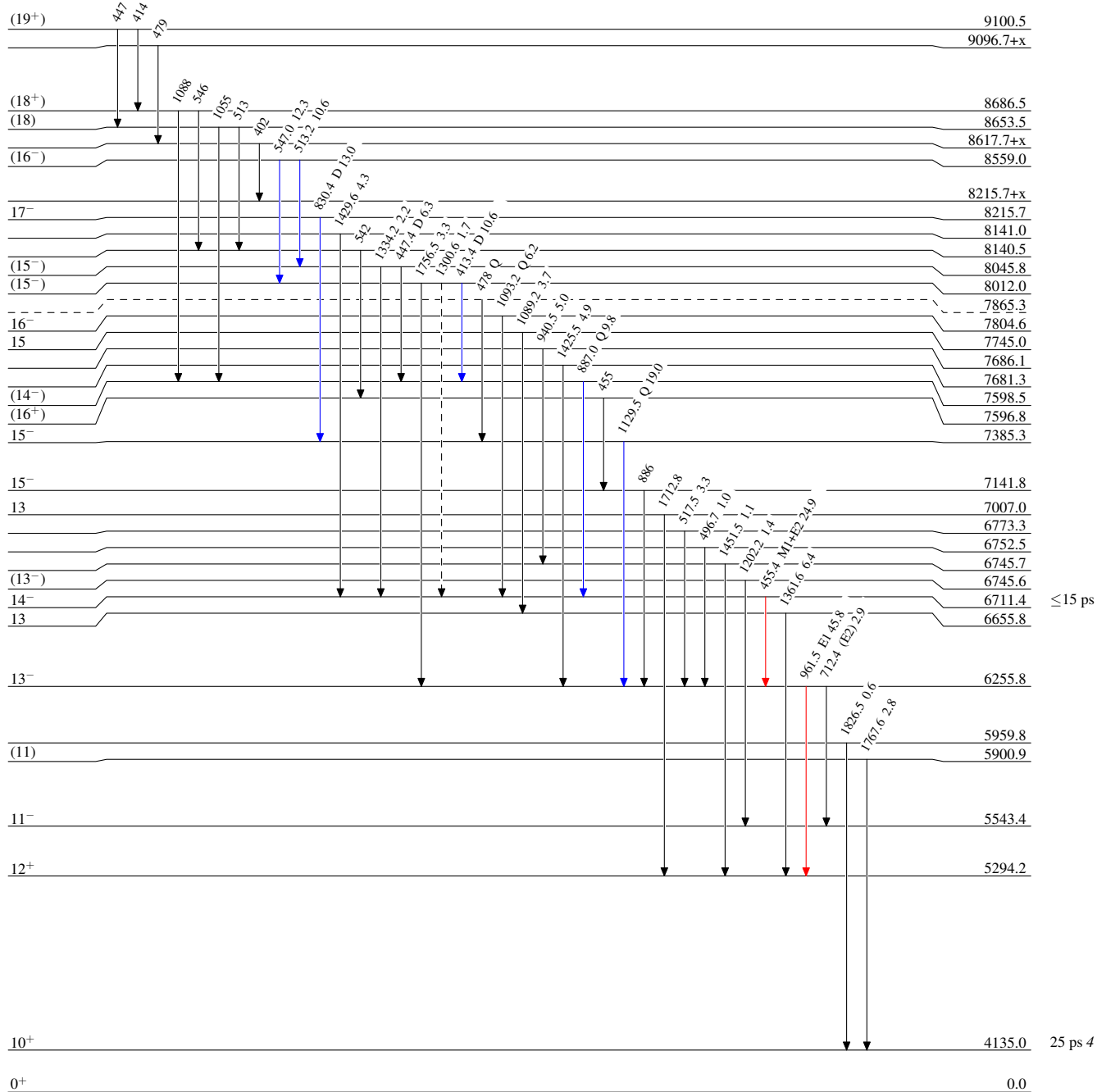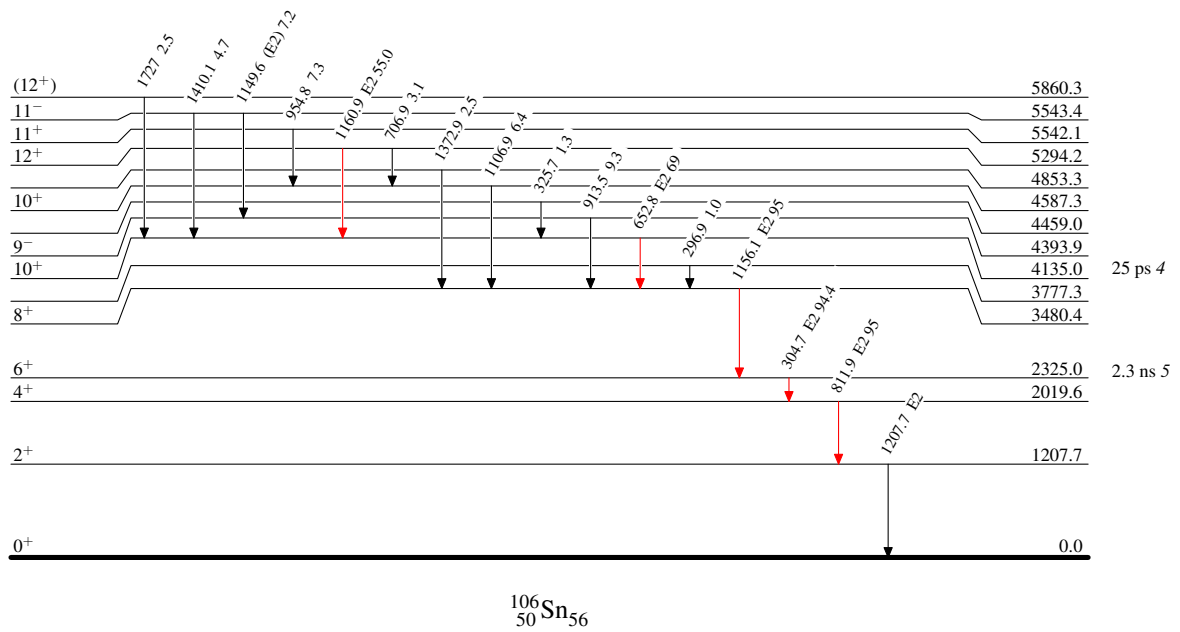
γ Decay (Uncertain)

$^{106}_{50}\text{Sn}_{56}$

(HI,xnγ)　　**1997Ju01,1994Wa16,1994Ma47**　　　　Legend

Level Scheme (continued)

Intensities: Relative I$_\gamma$

I$_\gamma$ < 2% × I$_\gamma^{max}$
I$_\gamma$ < 10% × I$_\gamma^{max}$
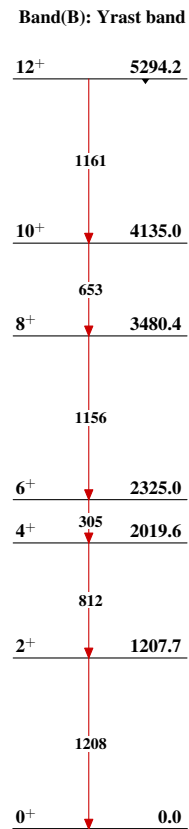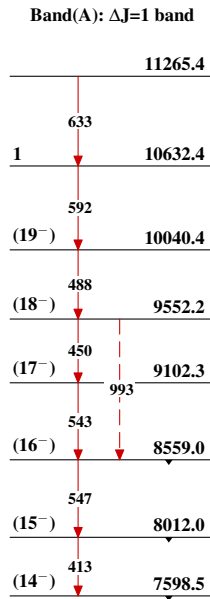I$_\gamma$ > 10% × I$_\gamma^{max}$
γ Decay (Uncertain)

$^{106}_{50}$Sn$_{56}$

(HI,xnγ)   1997Ju01,1994Wa16,1994Ma47

Level Scheme (continued)

Intensities: Relative I$_\gamma$

Legend

I$_\gamma$ < 2%×I$_\gamma^{max}$
I$_\gamma$ < 10%×I$_\gamma^{max}$
I$_\gamma$ > 10%×I$_\gamma^{max}$

$^{106}_{50}$Sn$_{56}$

(HI,xnγ)   1997Ju01,1994Wa16,1994Ma47

Band(A): ΔJ=1 band

11265.4

633

1   10632.4

592

(19⁻)   10040.4

488

(18⁻)   9552.2

450

(17⁻)   9102.3

993

543

(16⁻)   8559.0

547

(15⁻)   8012.0

413

(14⁻)   7598.5

Band(B): Yrast band

12⁺   5294.2

1161

10⁺   4135.0

653

8⁺   3480.4

1156

6⁺   2325.0

4⁺   305   2019.6

812

2⁺   1207.7

1208

0⁺   0.0

$^{106}_{50}$Sn$_{56}$