^{124}Sn(^{10}B,4nγ),^{128}Te(^{6}Li,4nγ) 1991Sa25,2001St04

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 93, 33 (2001)	11-May-2001

1991Sa25: E(^{6}Li)=38 MeV, E(^{10}B)=42 MeV. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma(\theta)$, ce using four coaxial Ge detectors for γ rays and a mini-orange spectrometer for electrons.

2001St04: E(^{10}B)=47 MeV. Measured Eγ, $\gamma\gamma$ using YRAST ball with 28 suppressed Ge detectors. Deduced sideband partner of $\pi h_{11/2}\nu h_{11/2}$ band, and interpreted as a chiral doublet structure based on systematics (similar doublet band structures in ^{132}La, ^{134}Pr and ^{136}Pm) and 3D tilted-axis cranking calculations.

A 14.1 ns *4* at 556+x was reported by 1979GaZW in ^{128}Te(^{6}Li,4nγ) from observation of delayed γ-rays of 97, 116, 152 and 191. 1991Sa25 report these four intense γ rays in the prompt spectra, but their search (with a timing resolution of≈9 ns) for levels with $T_{1/2}$ more than a few nanoseconds proved negative.

For levels built on the 5^{-} isomer at 163.2, 1991Sa25 assume that the 97-115 cascade feeds this isomer directly, although they cannot rule out the possibility of an undetected low-energy transition at the bottom of this cascade.

^{130}Cs Levels

Levels are from 1991Sa25, unless otherwise noted.

E(level)	J$^{\pi}$[†]	Comments
0.0	1^{+}	
80.31 *8*	2^{+}	
131.37 *11*	2^{+}	
148.20 *10*	(2^{-})	
163.2	5^{-}	Additional information 1.
170.49 *8*		
253.87 *10*		
270.20 *11*	(1^{+},3^{+})	
278.80 *10*	6^{-}	
314.52 *11*		
375.60[a] *15*	7^{-}	
432.13 *14*		
530.2 *4*		
565.50[&] *17*	8^{-}	
618.12[a] *24*	8^{-}	
688.35 *21*		
878.26[&] *25*	9^{-}	
954.3 *4*		
962.1 *4*		
974.8[#] *4*	9^{+}	Additional information 2.
997.25[a] *23*	9^{-}	
1126.5[#] *4*	(10)$^{+}$	
1172.1[&] *3*	10^{-}	
1242.9 *4*		
1265.4[a] *3*	10^{-}	
1479.8[#] *5*	11^{+}	
1512.9[&] *4*	11^{-}	
1673.8[‡@]	(11^{+})	
1770.0[#] *5*	(12)$^{+}$	
1805.6[a] *4*		
1960.7[&] *4*	(12)$^{-}$	
2074.8[‡@]	(12^{+})	

Continued on next page (footnotes at end of table)

^{124}Sn(^{10}B,4nγ),^{128}Te(^{6}Li,4nγ) 1991Sa25,2001St04 (continued)

^{130}Cs Levels (continued)

E(level)	Jπ[†]	E(level)	Jπ[†]	E(level)	Jπ[†]	E(level)	Jπ[†]
2086.1[a] *4*	(12)$^-$	2446.8[‡@]	(13$^+$)	2897.6[&] *5*		3547.5[‡#]	(16$^+$)
2187.0[#] *5*	(13)$^+$	2613.5[#] *6*	(14$^+$)	3082.5[‡#]	(15$^+$)	4040.5[‡#]	(17$^+$)
2309.6[&] *5*		2796.6[@] *6*	(14$^+$)	3249.8[‡@]	(15$^+$)		

[†] As proposed by 1991Sa25, based on γ(θ) and α(K)exp data.
[‡] Level from 2001St04.
[#] Band(A): ΔJ=1 band based on 9$^+$. Possible configuration=$\nu h_{11/2}\pi h_{11/2}$. See also comment for the band based on (11$^+$).
[@] Band(a): ΔJ=1 band based on (11$^+$). This band is assigned (2001St04) as the sideband partner (chiral doublet structure) of $\nu h_{11/2}\pi h_{11/2}$ configuration. Similar doublet bands are found (2001St04) in ^{132}La, ^{134}Pr and ^{136}Pm.
[&] Band(B): band based on 8$^-$. Possible configuration=$\nu h_{11/2}\pi d_{5/2}$.
[a] Band(C): band based on 7$^-$. Possible configuration=$\nu h_{11/2}\pi g_{7/2}$.

γ(^{130}Cs)

A_2, A_4, α(K)exp and K/L ratios are from 1991Sa25.

Eγ[†]	Iγ[‡]	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult.[#]	δ[#]	Comments
44.3[@] *1*		314.52		270.20	(1$^+$,3$^+$)			
51.1 *1*	17 *3*	131.37	2$^+$	80.31	2$^+$	D+Q		A_2=−0.05 *2*.
60.6[@] *1*		314.52		253.87				
80.3 *1*	100 *10*	80.31	2$^+$	0.0	1$^+$			A_2=0.00 *1*, A_4=−0.02 *2*.
83.4[@] *1*		253.87		170.49				
90.2[@] *1*		170.49		80.31	2$^+$			
96.8 *1*	75 *8*	375.60	7$^-$	278.80	6$^-$	M1(+E2)	−0.02 *2*	A_2=−0.25 *2*, A_4=−0.02 *2*. α(K)exp=0.84 *12*; K/L=7.9 *14*.
115.6 *1*	94 *9*	278.80	6$^-$	163.2	5$^-$	M1+E2	−0.06 *2*	A_2=−0.30 *1*, A_4=−0.02 *2*. α(K)exp=0.61 *12*; K/L=7.6 *20*.
117.6 *1*	<5	432.13		314.52				A_2=−0.2 *1*.
138.8 *1*	<5	270.20	(1$^+$,3$^+$)	131.37	2$^+$			A_2=−0.28 *6*.
148.2 *1*	7 *1*	148.20	(2$^-$)	0.0	1$^+$			A_2=0.00 *2*.
151.7 *1*	43 *4*	1126.5	(10)$^+$	974.8	9$^+$	M1(+E2)	−0.03 *3*	A_2=−0.29 *2*, A_4=−0.04 *3*. α(K)exp=0.30 *6*; K/L>5.1.
170.5[@] *1*		170.49		0.0	1$^+$			
173.5[@] *1*		253.87		80.31	2$^+$			
183.2 *1*	6	314.52		131.37	2$^+$			A_2=−0.28 *3*.
189.9[a] *1*	89[a] *9*	270.20	(1$^+$,3$^+$)	80.31	2$^+$	(M1+E2)	−0.06 *2*	A_2=−0.32 *1*, A_4=−0.03 *2* for doublet. α(K)exp=0.14 *1*; K/L=8.7 *15* for doublet.
189.9[a] *1*	89[a] *9*	565.50	8$^-$	375.60	7$^-$	(M1+E2)	−0.06 *2*	
242.5 *3*	23 *2*	618.12	8$^-$	375.60	7$^-$	M1+E2	−0.09 *2*	A_2=−0.34 *2*, A_4=−0.02 *3*. α(K)exp=0.066 *7*; K/L=8.2 *14*.
256.3[@] *3*		688.35		432.13				
260.0[a] *3*	8[a] *2*	530.2		270.20	(1$^+$,3$^+$)			α(K)exp=0.049 *14* for doublet gives M1,E2.
260.0[a] *3*	8[a] *2*	878.26	9$^-$	618.12	8$^-$			
268.4 *3*	<5	1265.4	10$^-$	997.25	9$^-$			
290.3 *3*	13 *3*	1770.0	(12)$^+$	1479.8	11$^+$	M1+E2	−0.11 *3*	A_2=−0.36 *2*, A_4=−0.01 *3*. α(K)exp=0.034 *7*.

Continued on next page (footnotes at end of table)

^{124}Sn(^{10}B,4nγ),^{128}Te(^{6}Li,4nγ) 1991Sa25,2001St04 (continued)

γ(^{130}Cs) (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	δ[#]	Comments
293.9 3	<5	1172.1	10^-	878.26	9^-	M1+E2	−0.2 1	A_2=−0.49 7. α(K)exp=0.043 12.
300.9 3		432.13		131.37	2^+			
312.6 3	14 3	878.26	9^-	565.50	8^-	M1+E2	−0.18 3	A_2=−0.43 2, A_4=0.00 2. α(K)exp=0.026 8.
340.8 3	<5	1512.9	11^-	1172.1	10^-			A_2=−0.34 8.
350[&]		2796.6	(14^+)	2446.8	(13^+)			
353.4 3	40 4	1479.8	11^+	1126.5	$(10)^+$	M1+E2	+0.03 2	A_2=−0.19 2, A_4=−0.03 2. α(K)exp=0.025 3; K/L=6.4 11.
372[&]		2446.8	(13^+)	2074.8	(12^+)			
373.8[@] 3		688.35		314.52				
379.2 3	5 1	997.25	9^-	618.12	8^-	D+Q	−0.28 6	A_2=−0.54 3, A_4=+0.01 5.
386.8 3	<5	1265.4	10^-	878.26	9^-			
401[&]		2074.8	(12^+)	1673.8	(11^+)			
409.3 3	53 5	974.8	9^+	565.50	8^-	E1		A_2=−0.19 1, A_4=0.00 2. α(K)exp=0.0045 6.
416.9 3	7 2	2187.0	$(13)^+$	1770.0	$(12)^+$			
418.1[@] 3		688.35		270.20	$(1^+,3^+)$			
426.5 3	<5	2613.5	(14^+)	2187.0	$(13)^+$	D+Q	−0.07 5	A_2=−0.34 3, A_4=−0.08 5.
431.9 3	<5	997.25	9^-	565.50	8^-			
453[&]		3249.8	(15^+)	2796.6	(14^+)			
469[&]		3082.5	(15^+)	2613.5	(14^+)			
493[&b]		4040.5	(17^+)	3547.5	(16^+)			
522.2 3	<5	954.3		432.13				A_2=+0.18 5.
530.0 3	<5	962.1		432.13				
547[&]		1673.8	(11^+)	1126.5	$(10)^+$			
554.6 3	<5	1242.9		688.35				
595[&]		2074.8	(12^+)	1479.8	11^+			
606.6 3	14 2	1172.1	10^-	565.50	8^-	Q		A_2=+0.33 3, A_4=−0.16 2.
609.6 3		2796.6	(14^+)	2187.0	$(13)^+$			
621.7 3	<5	997.25	9^-	375.60	7^-	(Q)		A_2=+0.27 7, A_4=−0.1 1.
634.7 3	6 1	1512.9	11^-	878.26	9^-	Q		A_2=+0.31 4, A_4=−0.24 6.
643.4 3	9 2	1770.0	$(12)^+$	1126.5	$(10)^+$			A_2>0.
647.3 3	7 1	1265.4	10^-	618.12	8^-	Q		A_2=+0.37 3, A_4=−0.10 4.
677[&]		2446.8	(13^+)	1770.0	$(12)^+$			
699[&]		1673.8	(11^+)	974.8	9^+			
707.2 3	6 1	2187.0	$(13)^+$	1479.8	11^+			A_2>0.
722[&b]		2796.6	(14^+)	2074.8	(12^+)			
773[&]		2446.8	(13^+)	1673.8	(11^+)			
788.6 3	7 2	1960.7	$(12)^-$	1172.1	10^-	(Q)		A_2=+0.20 5, A_4=−0.08 8.
796.6 3	7 2	2309.6		1512.9	11^-			
803[&]		3249.8	(15^+)	2446.8	(13^+)			
808.3 3		1805.6		997.25	9^-			E_γ: seen in (^{10}B,4nγ) only.
820.7 3	<5	2086.1	$(12)^-$	1265.4	10^-			A_2>0.
843[&]		2613.5	(14^+)	1770.0	$(12)^+$			
895[&]		3082.5	(15^+)	2187.0	$(13)^+$			
934[&]		3547.5	(16^+)	2613.5	(14^+)			
936.9 3		2897.6		1960.7	$(12)^-$			E_γ: seen in (^{10}B,4nγ) only.
958[&]		4040.5	(17^+)	3082.5	(15^+)			

Continued on next page (footnotes at end of table)

^{124}Sn(^{10}B,4nγ),^{128}Te(^{6}Li,4nγ) 1991Sa25,2001St04 (continued)

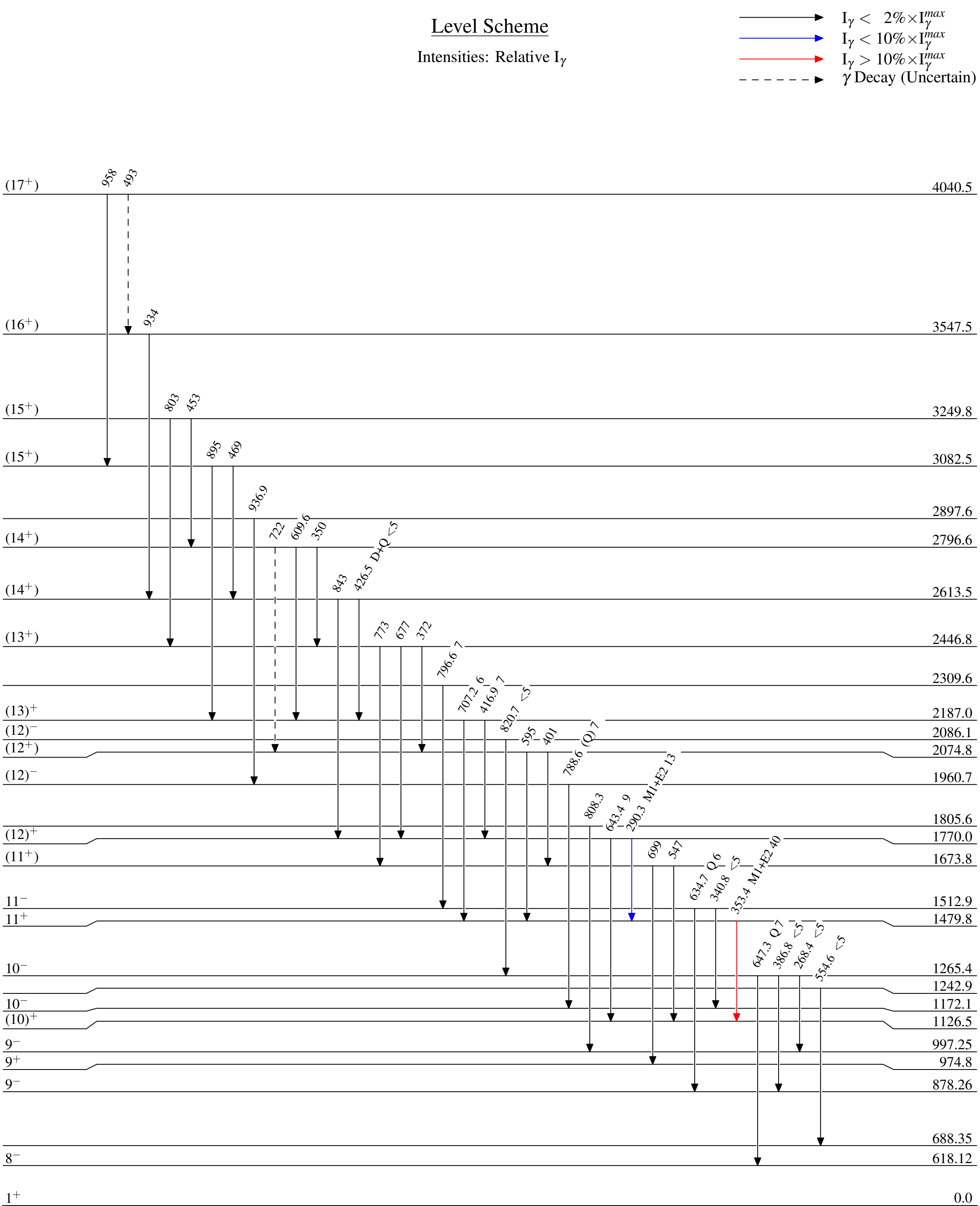
γ(^{130}Cs) (continued)

† From 1991Sa25, unless otherwise stated.
‡ From 1991Sa25, for (^{6}Li,4nγ) at E=40 MeV.
# From 1991Sa25.
@ From ^{127}I(α,nγ).
& From 2001St04.
[a] Multiply placed with undivided intensity.
[b] Placement of transition in the level scheme is uncertain.

^{124}Sn(^{10}B,4nγ),^{128}Te(^{6}Li,4nγ) 1991Sa25,2001St04

Level Scheme

Intensities: Relative I_γ



$^{130}_{55}Cs_{75}$

$^{124}Sn(^{10}B,4n\gamma),^{128}Te(^{6}Li,4n\gamma)$ 1991Sa25,2001St04

Level Scheme (continued)

Intensities: Relative I_γ

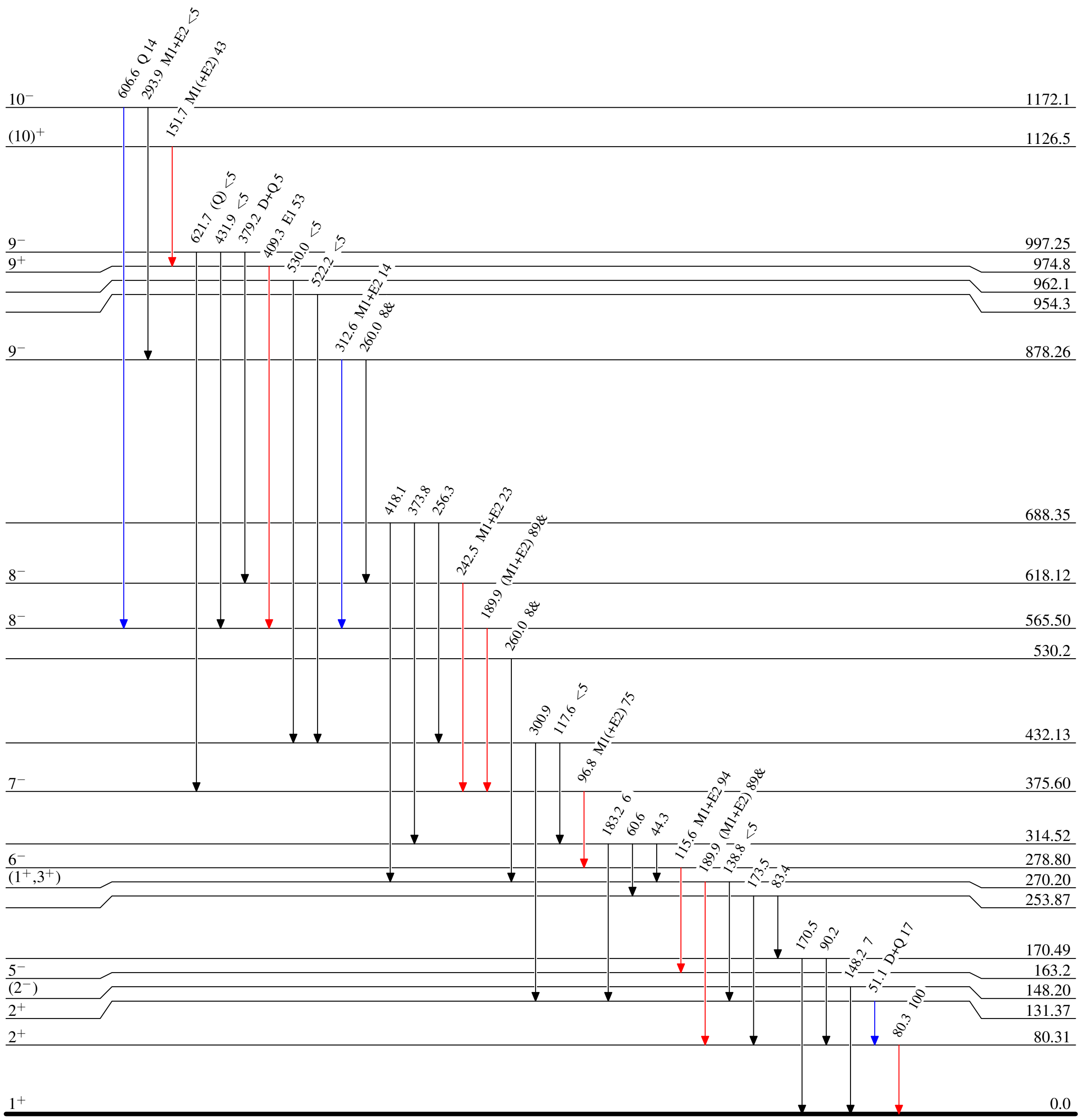
& Multiply placed: undivided intensity given

Legend

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

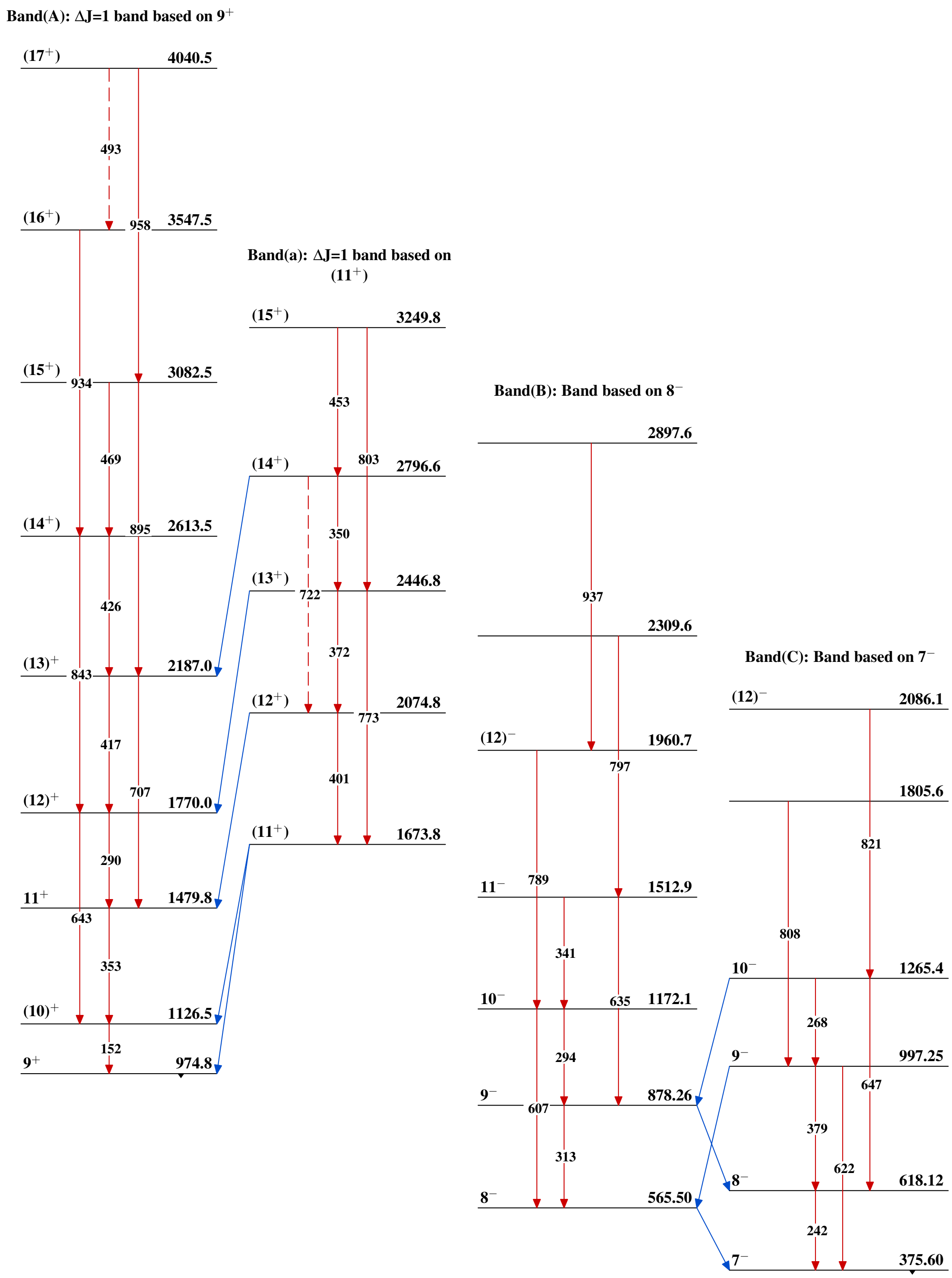
$I_\gamma < 10\% \times I_\gamma^{max}$

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



$^{130}_{55}Cs_{75}$

$^{124}Sn(^{10}B,4n\gamma),^{128}Te(^{6}Li,4n\gamma)$ 1991Sa25,2001St04



$^{130}_{55}Cs_{75}$