^{252}Cf SF decay 2012Zh03

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	S. K. Basu, A. A. Sonzogni	NDS 114, 435 (2013)	1-Apr-2013

Parent: ^{252}Cf: E=0; $J^\pi=0^+$; $T_{1/2}$=2.645 y *8*; %SF decay=3.092 *8*

^{252}Cf source of ≈60 μCi. Prompt γ-rays detected by the Gammasphere array consisting of 101 Compton suppressed Ge detectors. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma\gamma(\theta)$. Deduced levels, J, π, multipolarity, B(E1)/B(E2) branching ratios and bands.

Earlier experimental work: 1995Zh39, 1988Ph02, 1974SeZZ, 1973Kh05, 1974Ar20, 1977ArZS, 1977Pf01, 1980ChZM, 1980KeZQ, 1992ZhZT.

1999Sm05: Measured g-factors of excited states in Ba and Ce fission fragments using time-integral perturbed angular correlation technique.

^{150}Ce Levels

E(level)[†]	J^π	Comments
0[‡]	0^+	
97.4[‡] *3*	2^+	
306.5[‡] *5*	4^+	g=0.8 *4*
607.2[‡] *6*	6^+	
983.4[‡] *6*	8^+	
1386.4[#] *6*	7^-	
1423.4[‡] *6*	10^+	
1498.0 *6*		
1619.6 *6*		
1704.7[@] *6*	(6^-)	
1733.5[#] *6*	9^-	B(E1)(750.1γ)/B(E2)(347.1γ)=0.031×10^{-6} *3*.
1760.9 *6*		
1785.2 *6*		
1793.1[&] *6*	(7)	
1919.3[‡] *6*	12^+	
1977.1[@] *6*	(8^-)	
2026.7[a] *6*	(8)	
2058.5[&] *6*	(9)	
2154.4[#] *6*	11^-	B(E1)(731.0γ)/B(E2)(420.9γ)=0.056×10^{-6} *5*.
2280.1[@] *7*	(10^-)	
2336.6 *6*		
2369.3[a] *6*	(10)	
2386.9[&] *6*	(11)	
2465.8[‡] *7*	14^+	
2639.9[#] *7*	(13^-)	B(E1)(720.6γ)/B(E2)(420.9γ)=0.030×10^{-6} *3*.
2652.0[@] *7*	(12^-)	
2725.6 *7*	(11)	
2769.8[a] *6*	(12)	
2784.2[&] *7*	(13)	
3059.0[‡] *7*	16^+	
3093.3[@] *8*	(14^-)	
3168.2 *7*	(13)	
3178.5[#] *7*	(15^-)	B(E1)(712.7γ)/B(E2)(538.6γ)=0.043×10^{-6} *7*.
3695.0[‡] *8*	18^+	

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^{252}Cf SF decay 2012Zh03 (continued)

^{150}Ce Levels (continued)

E(level)[†]	Jπ
3745.1[#] *8*	(17⁻)
4368.1[‡] *9*	20⁺

† From least-squares fit to Eγ data, assuming 0.3 keV uncertainty for each γ ray.
‡ Band(A): Ground state band.
# Band(B): Band based on 7⁻.
@ Band(C): Band based on (6⁻).
& Band(D): Band based on (7).
a Band(E): Band based on (8).

γ(^{150}Ce)

Eγ	Iγ	Ei(level)	J_i^π	Ef	J_f^π	Mult.	Comments
97.4	49.0 *17*	97.4	2⁺	0	0⁺	E2	Mult.: K/L=1.8 (1973Kh05). Eγ: 97.2 (1995Zh39), 97.1 (1988Ph02).
209.1	100.0 *6*	306.5	4⁺	97.4	2⁺	E2	Eγ: 208.6 (1995Zh39), 209.0 (1988Ph02).
232.5	1.47 *9*	2386.9	(11)	2154.4	11⁻		
235.1	0.17 *3*	2154.4	11⁻	1919.3	12⁺	E1	
265.4	0.53 *3*	2058.5	(9)	1793.1	(7)	(E2)	
272.4	0.95 *4*	1977.1	(8⁻)	1704.7	(6⁻)	E2	
300.7	86.7 *12*	607.2	6⁺	306.5	4⁺	E2	Eγ: 300.7 (1995Zh39,1988Ph02).
303.0	2.12 *9*	2280.1	(10⁻)	1977.1	(8⁻)	E2	
310.1	1.29 *7*	1733.5	9⁻	1423.4	10⁺	E1	
325.0	1.54 *2*	2058.5	(9)	1733.5	9⁻		
328.4	1.46 *13*	2386.9	(11)	2058.5	(9)	(E2)	
342.6	0.71 *6*	2369.3	(10)	2026.7	(8)	(E2)	
347.1	2.00 *15*	1733.5	9⁻	1386.4	7⁻	E2	
371.9	1.20 *11*	2652.0	(12⁻)	2280.1	(10⁻)	E2	
376.2	61.5 *5*	983.4	8⁺	607.2	6⁺	E2	Eγ: 375.9 (1995Zh39), 376.4 (1988Ph02).
397.3	3.0 *4*	2784.2	(13)	2386.9	(11)	(E2)	
400.5	1.3 *3*	2769.8	(12)	2369.3	(10)	(E2)	
403.0	1.21 *7*	1386.4	7⁻	983.4	8⁺	E1	
406.7	1.42 *11*	1793.1	(7)	1386.4	7⁻		
420.9	1.59 *13*	2154.4	11⁻	1733.5	9⁻	E2	
440.0	35.9 *3*	1423.4	10⁺	983.4	8⁺	E2	Eγ: 439.7 (1995Zh39), 440.2 (1988Ph02).
441.3	0.58 *7*	3093.3	(14⁻)	2652.0	(12⁻)	E2	
442.6	0.13 *2*	3168.2	(13)	2725.6	(11)	(E2)	
485.5	2.01 *13*	2639.9	(13⁻)	2154.4	11⁻	(E2)	
495.9	15.8 *3*	1919.3	12⁺	1423.4	10⁺	E2	Eγ: 495.6 (1995Zh39), 496.7 (1988Ph02).
538.6	2.02 *25*	3178.5	(15⁻)	2639.9	(13⁻)	(E2)	
546.5	7.62 *17*	2465.8	14⁺	1919.3	12⁺	E2	Eγ: 545.9 (1995Zh39), 545.5 (1988Ph02).
566.6	0.08 *2*	3745.1	(17⁻)	3178.5	(15⁻)	(E2)	
590.7	0.99 *9*	1977.1	(8⁻)	1386.4	7⁻	(M1+E2)	
593.2	2.92 *12*	3059.0	16⁺	2465.8	14⁺	E2	Eγ: 592.6 (1995Zh39).
615.4	0.67 *8*	2769.8	(12)	2154.4	11⁻		
635.8	0.31 *4*	2369.3	(10)	1733.5	9⁻		
636.0	1.12 *8*	3695.0	18⁺	3059.0	16⁺	E2	Eγ: 636.5 (1995Zh39).
640.3	0.36 *7*	2026.7	(8)	1386.4	7⁻		
673.1	0.44 *5*	4368.1	20⁺	3695.0	18⁺	E2	Eγ: 675.0 (1995Zh39).
712.7	0.90 *7*	3178.5	(15⁻)	2465.8	14⁺	(E1)	
720.6	1.08 *8*	2639.9	(13⁻)	1919.3	12⁺	(E1)	

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^{252}Cf SF decay 2012Zh03 (continued)

$\gamma(^{150}Ce)$ (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
731.0	3.44 *13*	2154.4	11^-	1423.4	10^+	E1	(731.0γ)(440.0γ)(θ): A_2=−0.086 *41*, A_4=−0.044 *63*.
750.1	6.64 *17*	1733.5	9^-	983.4	8^+	E1	(750.1γ)(376.2γ)(θ): A_2=−0.118 *24*, A_4=−0.002 *38*.
779.2	4.06 *11*	1386.4	7^-	607.2	6^+	E1	Mult.: (779.2γ)(300.7γ)(θ): A_2=−0.065 *36*, A_4=−0.040 *55*.
801.8	0.46 *5*	1785.2		983.4	8^+		
850.5	1.05 *8*	2769.8	(12)	1919.3	12^+		
890.8	1.24 *7*	1498.0		607.2	6^+		
913.2	0.17 *3*	2336.6		1423.4	10^+		
945.9	1.03 *8*	2369.3	(10)	1423.4	10^+		
963.5	0.36 *4*	2386.9	(11)	1423.4	10^+		
993.7	3.14 *13*	1977.1	(8^-)	983.4	8^+	(E1)	
1012.4	2.34 *9*	1619.6		607.2	6^+		
1043.3	1.61 *9*	2026.7	(8)	983.4	8^+		
1075.1	1.14 *8*	2058.5	(9)	983.4	8^+		
1097.5	2.33 *9*	1704.7	(6^-)	607.2	6^+	(E1)	
1153.7	0.95 *7*	1760.9		607.2	6^+		
1178.0	1.34 *8*	1785.2		607.2	6^+		
1185.9	1.58 *8*	1793.1	(7)	607.2	6^+		
1248.9	0.46 *5*	3168.2	(13)	1919.3	12^+		
1302.2	0.52 *7*	2725.6	(11)	1423.4	10^+		
1353.2	0.51 *5*	2336.6		983.4	8^+		

^{252}Cf SF decay 2012Zh03

Level Scheme

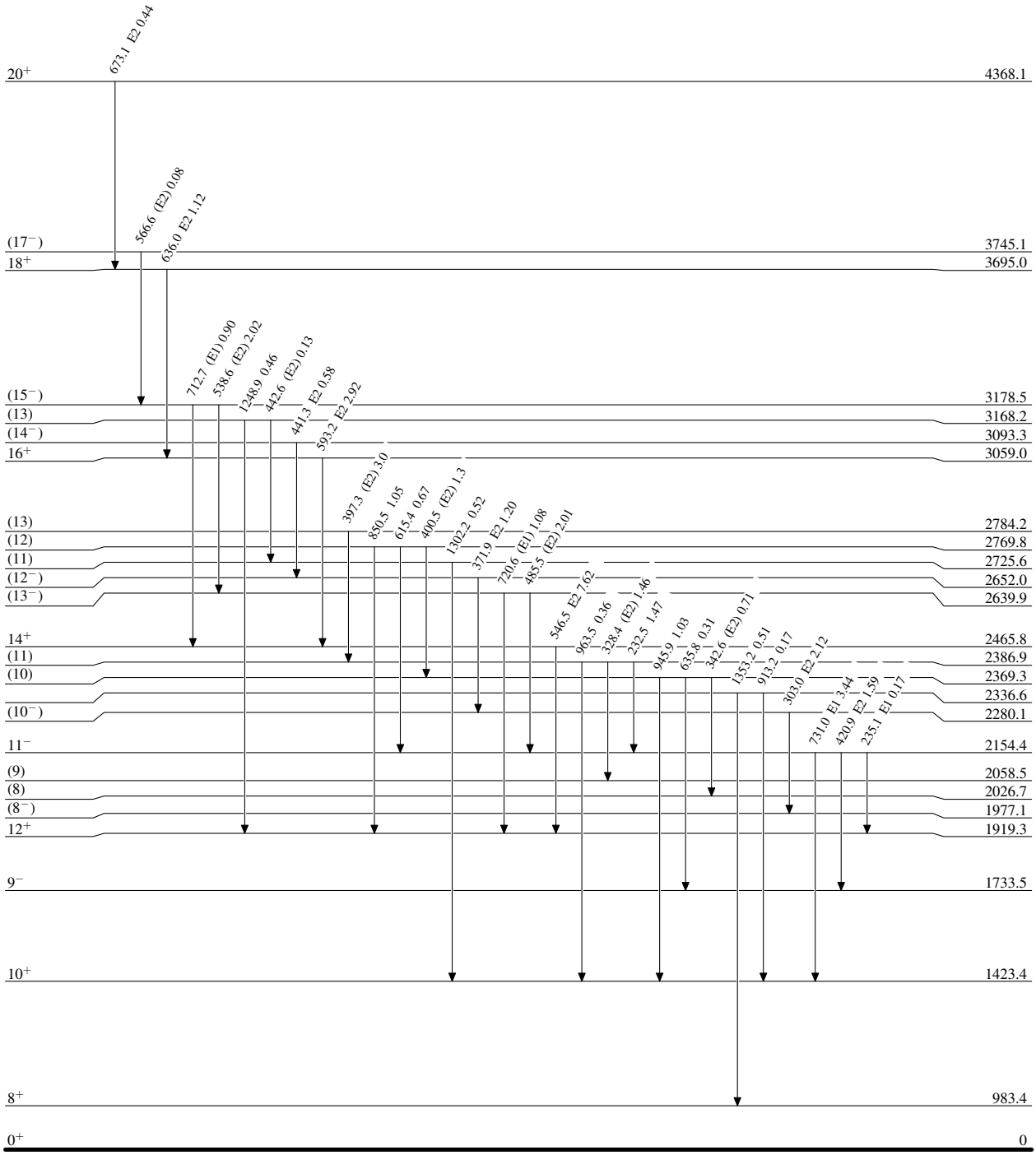
Intensities: Type not specified

Legend

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

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

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

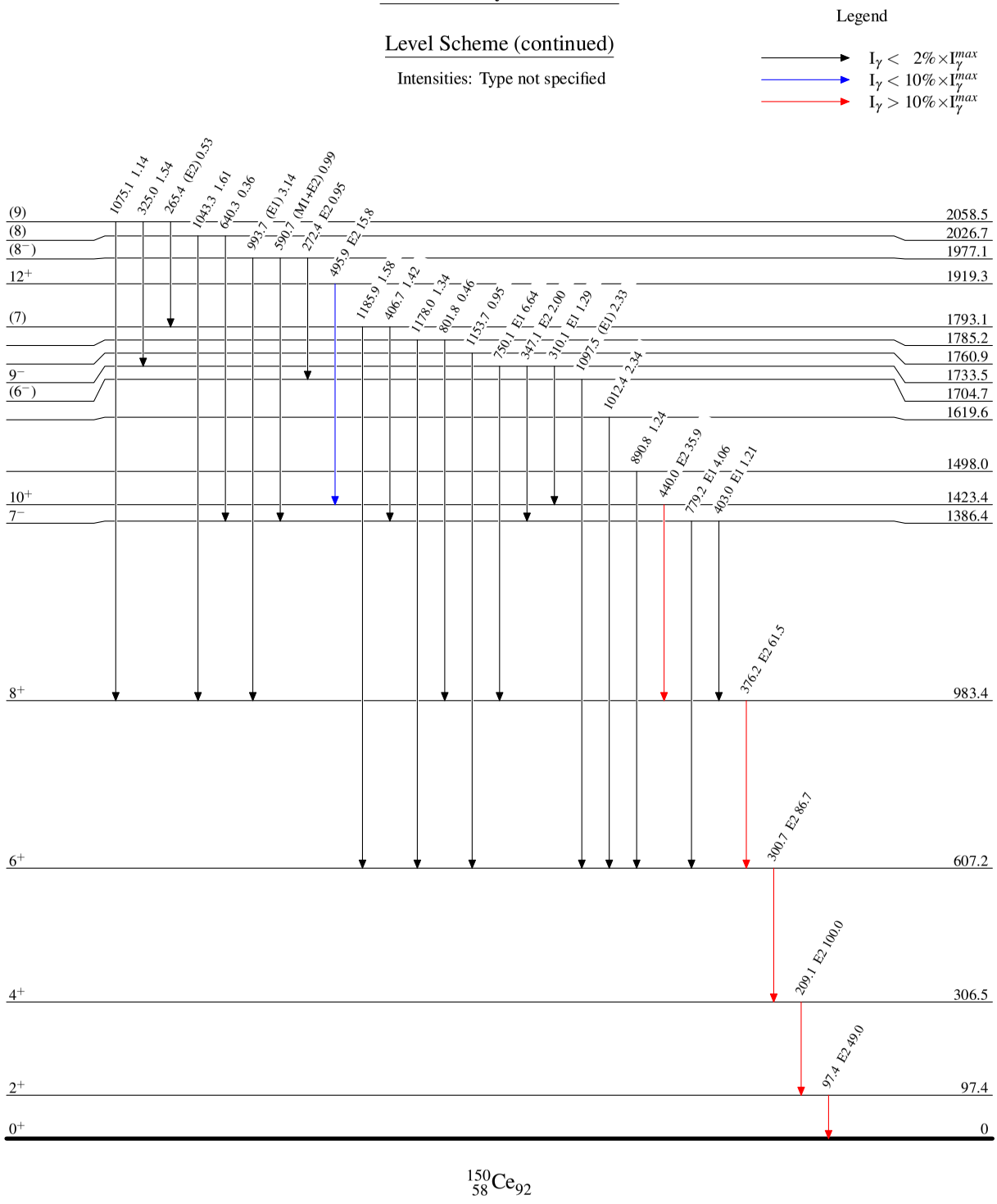


$^{150}_{58}Ce_{92}$

^{252}Cf SF decay 2012Zh03

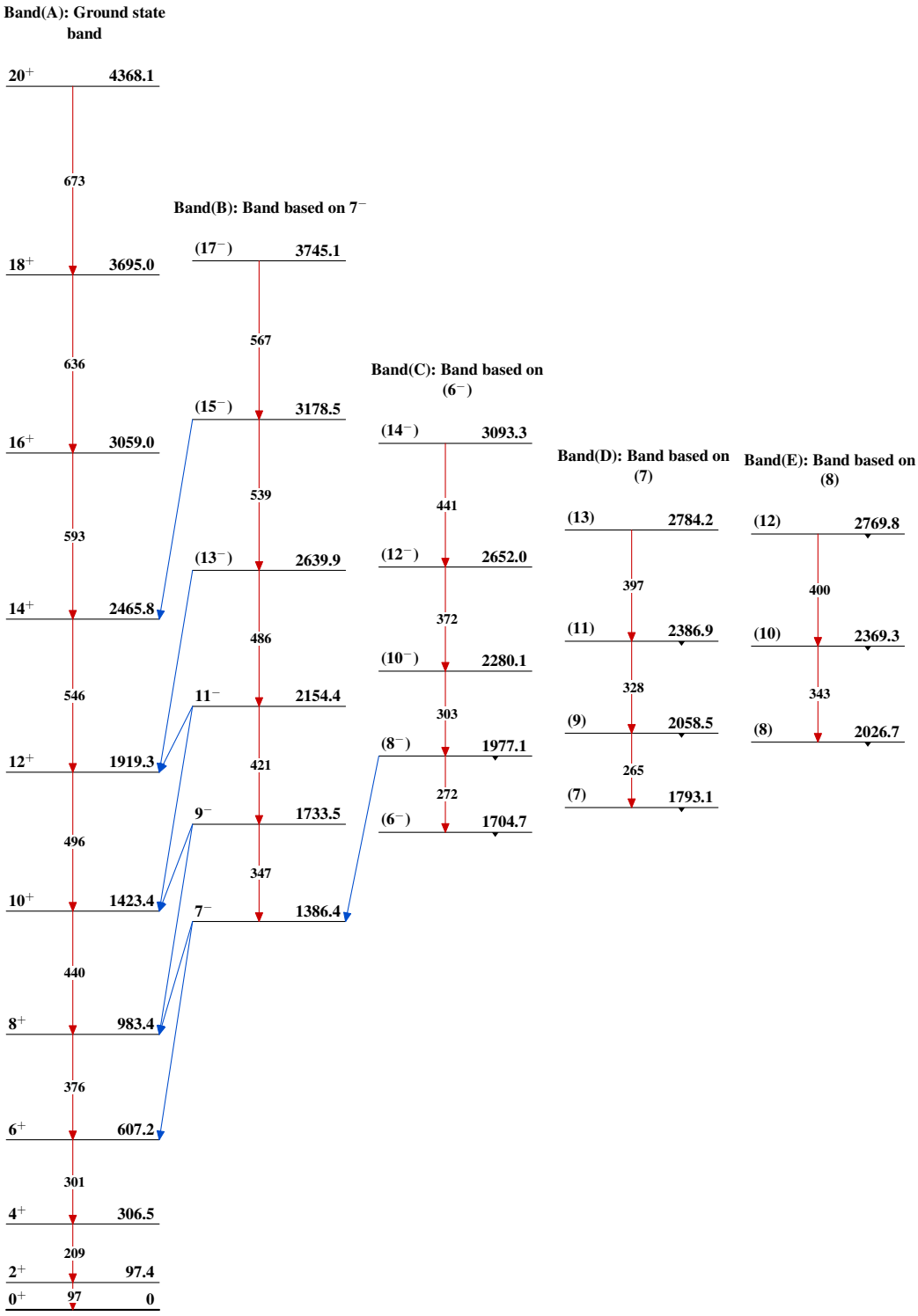
Level Scheme (continued)

Intensities: Type not specified



$^{150}_{58}Ce_{92}$

^{252}Cf SF decay 2012Zh03



$^{150}_{58}Ce_{92}$