^{252}Cf SF decay 2010Ye10,1998Zh12,1998Ga12

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. J. Martin	NDS 114, 1497 (2013)	31-Aug-2013

Parent: ^{252}Cf: E=0.0; $J^\pi=0^+$; $T_{1/2}$=2.645 y; %SF decay=3.092 *8*
The work of 1998Zh12 supersedes that reported in 1995Zh39.

^{152}Nd Levels

E(level)[†]	J^π	$T_{1/2}$	Comments
0.0[‡]	0^+		
73.0[‡] *5*	2^+		
237.3[‡] *7*	4^+		
484.5[‡] *8*	6^+		
806.6[‡] *9*	8^+		
1196.6[‡] *10*	10^+		
1239.1[#] *11*	(3^-)		
1406.0[#] *10*	(5^-)		
1542.4[@] *10*	(2^-)		
1600.4[@] *10*	(3^-)		
1649.1[‡] *11*	12^+		
1652.3 *9*			
1683.1[@] *8*	(4^-)		
1782.7[@] *10*	(5^-)		
1827.1[&] *10*	(3^+)		
1898.1[&] *11*	(4^+)		
1905.0[@] *9*	(6^-)		
1987.9 *11*	$(5^-,6^-)$		
2038.8 *9*			
2159.4[‡] *12*	14^+		
2203.1[@] *9*	(8^-)		
2222.6 *11*	$(6^+,7,8^+)$		E(level): Probably fed from the 80-ns 2241 level, but the expected 20-keV transition is below the author's detection threshold.
2243.6[a] *9*	(7^-)	63 ns *7*	$T_{1/2}$: From 2010Ye10. Other: 80 ns *15* (1998Ga12).
2391.2[a] *10*	(8^-)		
2560.1[a] *11*	(9^-)		
2572.5[@] *10*	(10^-)		
2723.7[‡] *13*	16^+		
2746.3[a] *12*	(10^-)		
3005.4[@] *11*	(12^-)		
3338.6[‡] *14*	18^+		
4001.0[‡] *15*	20^+		

[†] From a least-squares fit to the Eγ data.
[‡] Band(A): $K^\pi=0^+$ ground-state band.
[#] Band(B): $K^\pi=0^-$ band.
[@] Band(C): $K^\pi=2^-$ band.
[&] Band(D): $K^\pi=3^+$ band.
[a] Band(E): $K^\pi=7^-$ band.

^{252}Cf SF decay 2010Ye10,1998Zh12,1998Ga12 (continued)

γ(^{152}Nd)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[b]	$I_{(\gamma+ce)}$ &a	Comments
73.0 *5*		73.0	2^+	0.0	0^+	E2	7.16	>0.6	E_γ: Value of 75.9 *5* reported by 1971Ch44 is discrepant. Eγ=72.40 *5* is reported in β^- decay. Mult.: From K/L≈1.5 (1974KhZV – read by the evaluator from authors′ fig. 5). Theory values are 6.7 (E1), 0.83 (E2), and 7.1 (M1).
140.7 *5*	3.6 *10*	1683.1	(4^-)	1542.4	(2^-)				
144.0#	#	1827.1	(3^+)	1683.1	(4^-)				
147.6 *5*	@	2391.2	(8^-)	2243.6	(7^-)				
164.3 *5*	100 *2*	237.3	4^+	73.0	2^+			0.51 *13*	
168.9 *5*	@	2560.1	(9^-)	2391.2	(8^-)				
186.2 *5*	@	2746.3	(10^-)	2560.1	(9^-)				
204.8 *5*	1.1 *5*	2243.6	(7^-)	2038.8					
214.8#	#	1898.1	(4^+)	1683.1	(4^-)				
222.0 *5*	4.4 *7*	1905.0	(6^-)	1683.1	(4^-)				
226.4#	#	1827.1	(3^+)	1600.4	(3^-)				
247.3 *5*	74.9 *23*	484.5	6^+	237.3	4^+			0.35 *9*	
255#	#	2243.6	(7^-)	1987.9	$(5^-,6^-)$				
284.9#	#	1827.1	(3^+)	1542.4	(2^-)				
297.8#	#	1898.1	(4^+)	1600.4	(3^-)				
298.1 *5*	1.7 *3*	2203.1	(8^-)	1905.0	(6^-)				
304‡	‡	1987.9	$(5^-,6^-)$	1683.1	(4^-)				
322.1 *5*	49.3 *17*	806.6	8^+	484.5	6^+			0.30 *8*	
338.6 *5*	2.0 *2*	2243.6	(7^-)	1905.0	(6^-)				
361.3#	#	1600.4	(3^-)	1239.1	(3^-)				
369.4 *5*	2.3 *3*	2572.5	(10^-)	2203.1	(8^-)				
376.8#	#	1782.7	(5^-)	1406.0	(5^-)				
386.5 *5*	0.8 *3*	2038.8		1652.3					
390.0 *5*	34.8 *13*	1196.6	10^+	806.6	8^+				
432.9 *5*	1.6 *3*	3005.4	(12^-)	2572.5	(10^-)				E_γ: 1998Zh12 report E=435.4, but the transition is uncertain.
452.5 *5*	18.1 *17*	1649.1	12^+	1196.6	10^+				
510.3 *5*	9.7 *4*	2159.4	14^+	1649.1	12^+				
564.3 *5*	3.9 *3*	2723.7	16^+	2159.4	14^+				
614.9 *5*	1.2 *1*	3338.6	18^+	2723.7	16^+				
662.4 *5*	0.7 *1*	4001.0	20^+	3338.6	18^+				E_γ: 1998Zh12 report E=669.3, but the transition is uncertain.
921.7#	#	1406.0	(5^-)	484.5	6^+				
1001.7#	#	1239.1	(3^-)	237.3	4^+				
1167.8 *5*	1.1 *2*	1652.3		484.5	6^+				
1168.6#	#	1406.0	(5^-)	237.3	4^+				
1298.0#	#	1782.7	(5^-)	484.5	6^+				
1363.0#	3.2#	1600.4	(3^-)	237.3	4^+				
1375.9 *5*	0.5 *1*	2572.5	(10^-)	1196.6	10^+				
1396.5 *5*	1.0 *1*	2203.1	(8^-)	806.6	8^+				
1416‡	‡	2222.6	$(6^+,7,8^+)$	806.6	8^+				
1420.5 *5*	3.6 *3*	1905.0	(6^-)	484.5	6^+				
1437.0 *5*	2.2 *1*	2243.6	(7^-)	806.6	8^+				
1445.8 *5*	4.5 *10*	1683.1	(4^-)	237.3	4^+				

Continued on next page (footnotes at end of table)

^{252}Cf SF decay 2010Ye10,1998Zh12,1998Ga12 (continued)

$\gamma(^{152}Nd)$ (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π
1469.4[c] *5*	3.7 *7*	1542.4	(2^-)	73.0	2^+
1545.4#	#	1782.7	(5^-)	237.3	4^+
1554.3‡ *5*	1.1‡ *2*	2038.8		484.5	6^+
1738‡	‡	2222.6	$(6^+,7,8^+)$	484.5	6^+
1759.1 *5*	1.2 *2*	2243.6	(7^-)	484.5	6^+

† From 2010Ye10, except where noted otherwise. The uncertainties in these data were communicated to the evaluator from the first author of this work.
‡ From 1998Ga12. No uncertainties are given.
# From 1998Zh12. No uncertainties are given.
@ The 2244 level is isomeric, so the transitions within this band cannot be normalized to the other transitions. Iγ= 100 *15*, 49 *10*, and 37 *33* for the 147.6, 168.9, and 186.2γ's, respectively.
& Label=Iγ.
[a] Photon intensities per fission, corrected for internal conversion and for delayed components, have been reported by 1971Ch44 for members of the g.s. band up to 8^+. These data are in units of %/fission.
[b] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
[c] Placement of transition in the level scheme is uncertain.

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Level Scheme

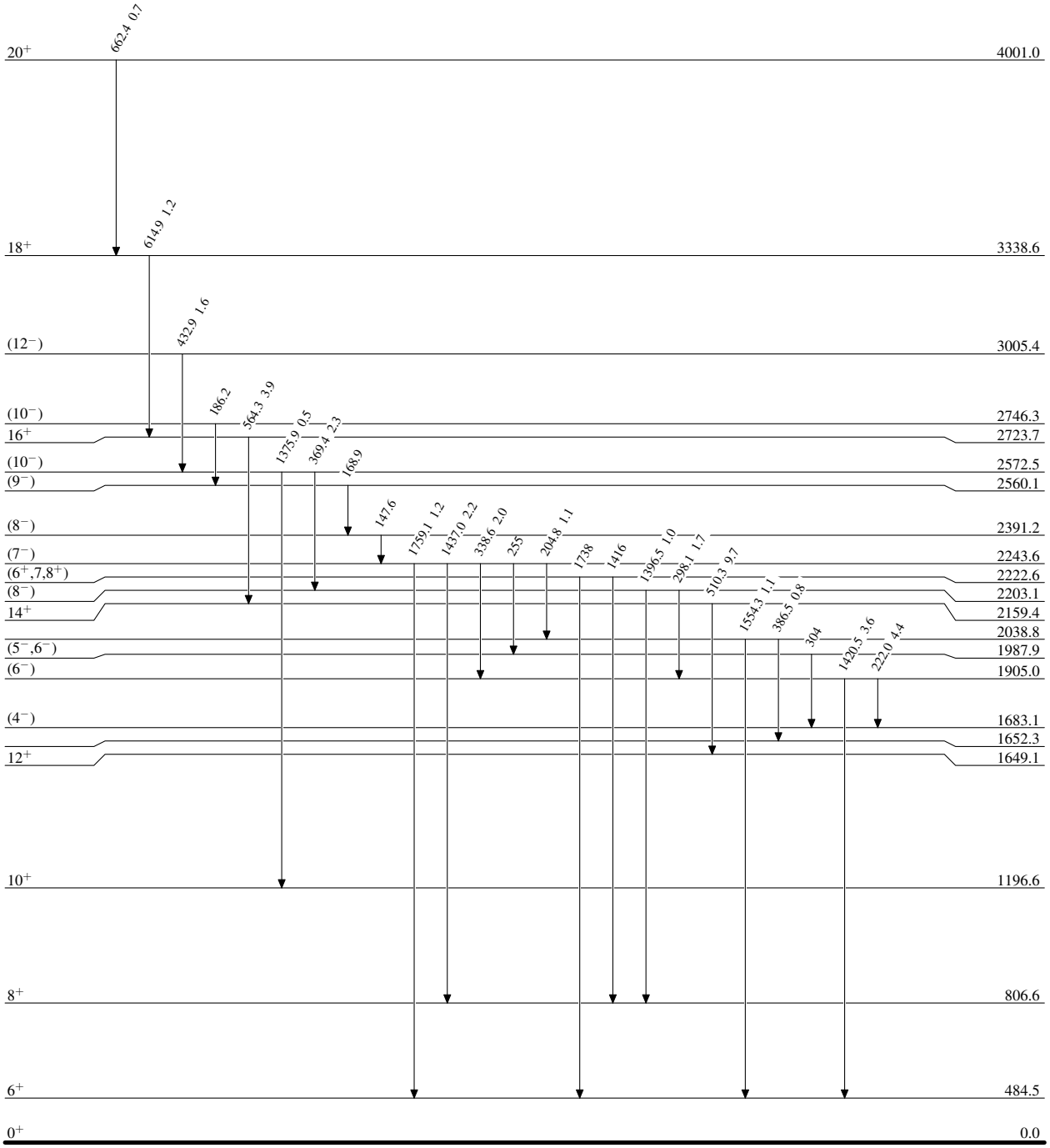
Intensities: Relative I_γ

Legend

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

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

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



$^{152}_{60}Nd_{92}$

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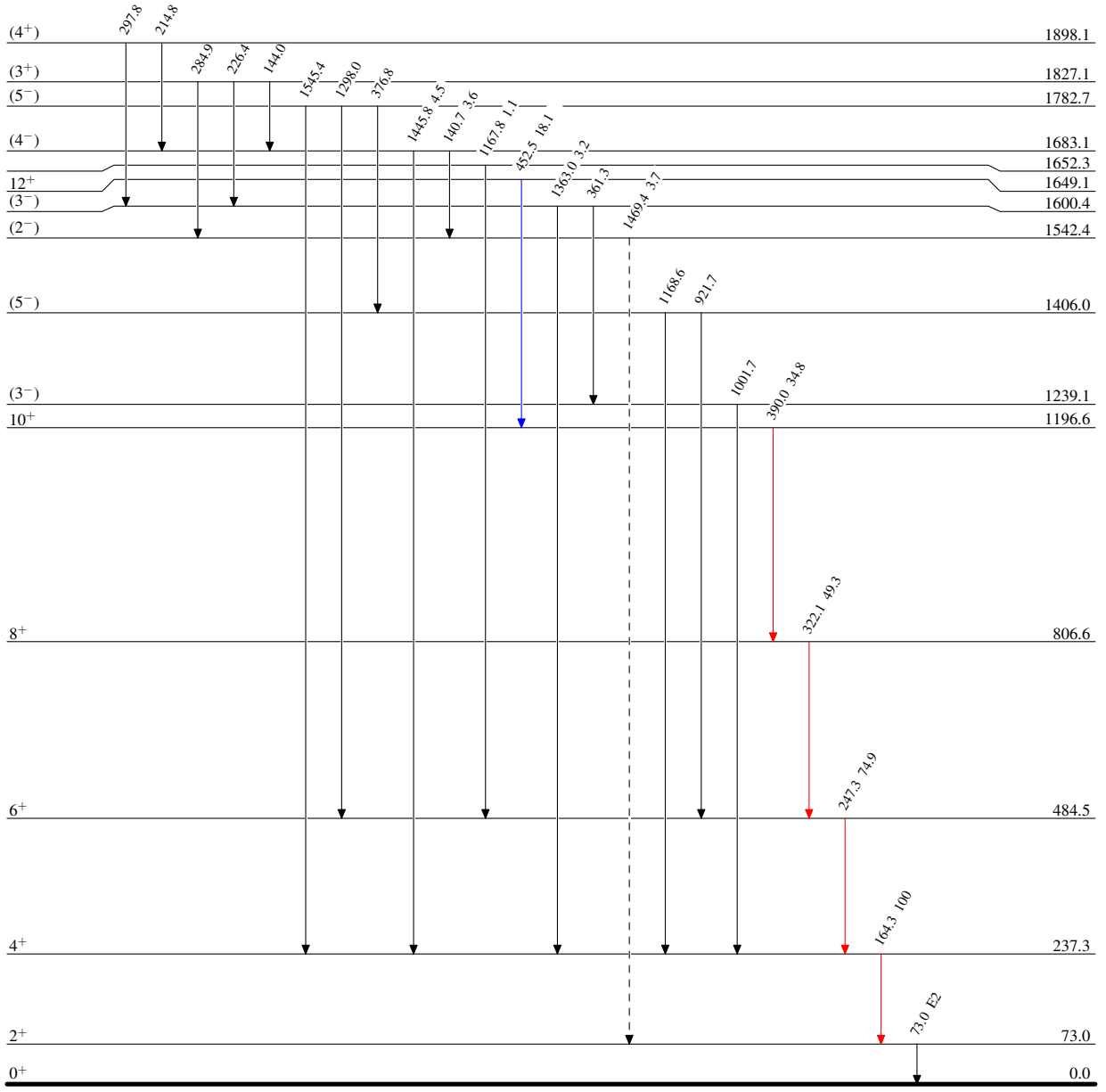
Level Scheme (continued)

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)



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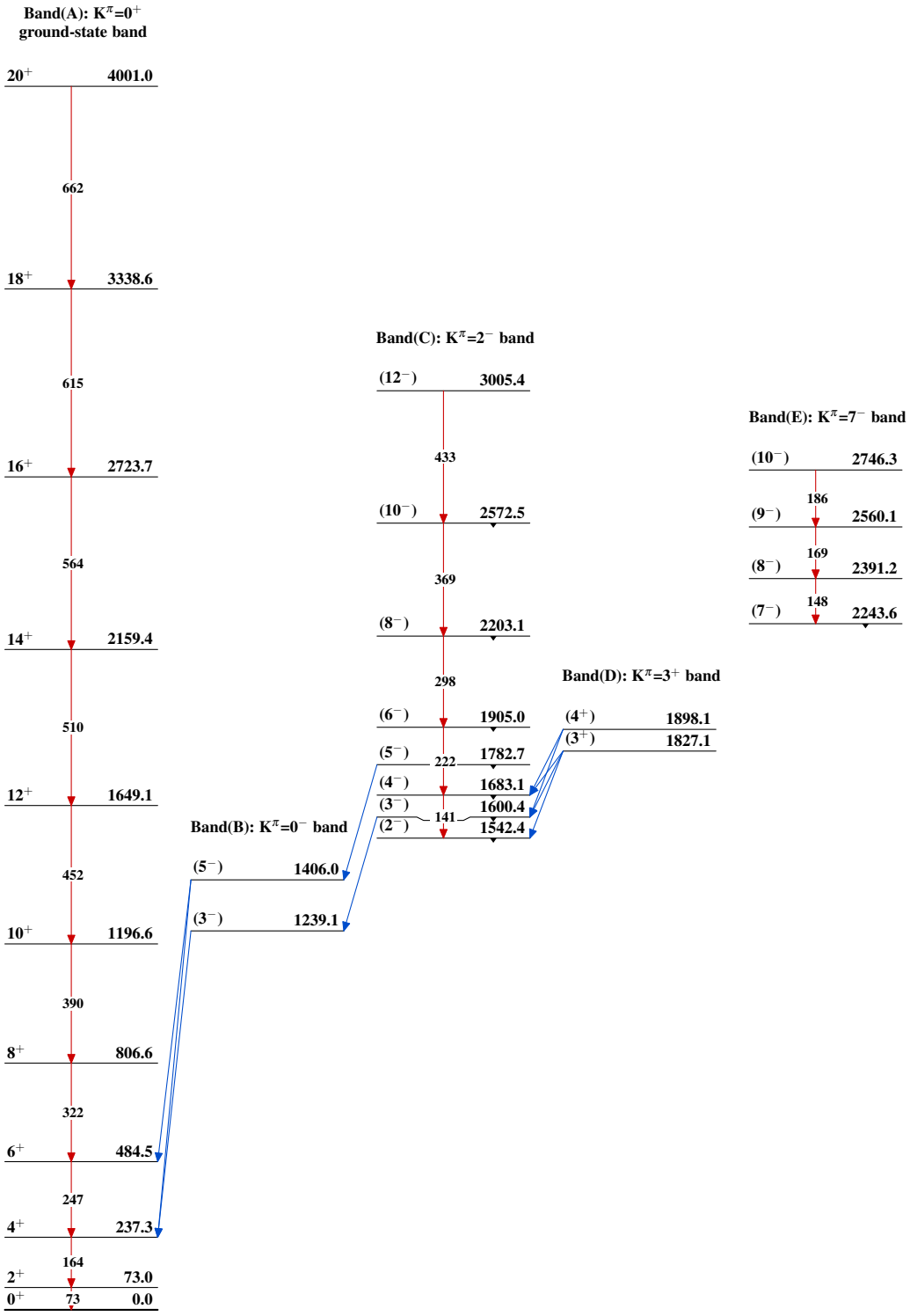

$^{152}_{60}Nd_{92}$