^{249}Cf(^{208}Pb,^{208}Pb′γ) 2014Ho16

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. D. Nesaraja	NDS 195,718 (2024)	12-Oct-2023

Includes ^{249}Cf(^{207}Pb,^{207}Pbγ).

2014Ho16: ^{207}Pb beam at energy of ≈15% above the Coulomb barrier from ATLAS accelerator at ANL was scattered off ^{249}Cf. The target was sandwiched between layers of ^{197}Au, 150 μg/cm^2 in front and 50 mg/cm^2 in the back. The γ-rays were detected using the Gammasphere array with 100 Compton-suppressed Ge detectors. Measured Eγ, γγ, (x ray)γ coin and γγγ. Deduced high-spin levels, J^π, bands, alignment plots, configurations, $(g_K-g_R)/Q_0$ ratios. Comparisons were made with Woods-Saxon Cranked shell model calculations.

2010Ta22: Single-neutron transfer experiment was carried out at the ATLAS facility of Argonne National Laboratory. A target of ^{249}Cf of 200 μg/cm^2 was bombarded with ^{209}Bi beam at energy of 1430 MeV. The target was backed on a 50 mg/cm^2 Au substrate and covered with a 200 μg/cm^2 Au foil. x-ray and γ coincidences along with cross coincidence with the 569 and 319 keV transition in ^{207}Pb and ^{210}Bi allowed unambiguous band assignments. The γ-rays were detected using the Gammasphere array with 100 Compton-suppressed Ge detectors. Measured Eγ, Iγ, γγ, (x ray)γ coin and γγγ. Eγ>180 keV are from email reply on 14 May, 2021 to the evaluator from first author (S. Tandel) in 2010Ta22. Eγ<181 keV were not observed by 2010Ta22.

^{249}Cf Levels

E(level)†	J^π	E(level)†	J^π	E(level)†	J^π	E(level)†	J^π
0‡	9/2−	546.3‡ *9*	21/2−	1434.2@ *11*	29/2+	2645.1@ *14*	41/2+
62.47# *5*	11/2−	583.6@ *10*	17/2+	1495.6‡ *10*	33/2−	2810.3‡ *12*	45/2−
136.2‡ *8*	13/2−	677.2# *8*	23/2−	1613.3& *12*	31/2+	2879.1& *14*	43/2+
144.99@ *6*	5/2+	697.6& *11*	19/2+	1690.7# *10*	35/2−	3057.5# *13*	47/2−
187.99& *8*	7/2+	819.2‡ *9*	25/2−	1801.0@ *12*	33/2+	3116.5@ *15*	45/2+
221.7# *5*	15/2−	823.3@ *10*	21/2+	1896.1‡ *10*	37/2−	3317.8‡ *13*	49/2−
243.13@ *10*	9/2+	960.2& *11*	23/2+	2000.0& *12*	35/2+	3365.2& *15*	47/2+
310.2& *9*	11/2+	972.4# *9*	27/2−	2110.3# *11*	39/2−	3577.7# *14*	51/2−
318.4‡ *9*	17/2−	1107.6@ *11*	25/2+	2205.6@ *13*	37/2+	3614.5@ *18*	49/2+
390.0@ *9*	13/2+	1136.0‡ *9*	29/2−	2335.2‡ *11*	41/2−	3852.8‡ *17*	53/2−
426.9# *7*	19/2−	1266.0& *11*	27/2+	2422.7& *13*	39/2+	3875.2& *18*	51/2+
480.3& *11*	15/2+	1310.8# *9*	31/2−	2567.0# *11*	43/2−	4124.7# *17*	55/2−

† From least-squares fit to Eγ data by the evaluator, assuming 0.5 keV uncertainty when Eγ stated to tenth of a keV, 1 keV otherwise.
‡ Band(A): ν9/2[734],α=+1/2.
# Band(a): ν9/2[734],α=−1/2.
@ Band(B): ν5/2[622],α=+1/2.
& Band(b): ν5/2[622],α=−1/2.

γ(^{249}Cf)

E_γ†	E_i(level)	J_i^π	E_f	J_f^π	E_γ†	E_i(level)	J_i^π	E_f	J_f^π
(43.00‡ *5*)	187.99	7/2+	144.99	5/2+	(136.2‡)	136.2	13/2−	0	9/2−
(55.14‡ *5*)	243.13	9/2+	187.99	7/2+	137	960.2	23/2+	823.3	21/2+
62	62.47	11/2−	0	9/2−	142	819.2	25/2−	677.2	23/2−
(98.2‡)	243.13	9/2+	144.99	5/2+	(144.99‡ *6*)	144.99	5/2+	0	9/2−
(122.0‡)	310.2	11/2+	187.99	7/2+	147#	390.0	13/2+	243.13	9/2+
126	823.3	21/2+	697.6	19/2+	147#	1107.6	25/2+	960.2	23/2+

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^{249}Cf(^{208}Pb,^{208}Pb′γ) 2014Ho16 (continued)

γ(^{249}Cf) (continued)

E_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Comments
153	972.4	27/2$^-$	819.2	25/2$^-$	
159	1266.0	27/2$^+$	1107.6	25/2$^+$	
159.3	221.7	15/2$^-$	62.47	11/2$^-$	
164	1136.0	29/2$^-$	972.4	27/2$^-$	
168	1434.2	29/2$^+$	1266.0	27/2$^+$	
170	480.3	15/2$^+$	310.2	11/2$^+$	
175	1310.8	31/2$^-$	1136.0	29/2$^-$	
179	1613.3	31/2$^+$	1434.2	29/2$^+$	
182.2 *5*	318.4	17/2$^-$	136.2	13/2$^-$	E_γ: 181 (2010Ta22).
185	1495.6	33/2$^-$	1310.8	31/2$^-$	
188	1801.0	33/2$^+$	1613.3	31/2$^+$	
193.7	583.6	17/2$^+$	390.0	13/2$^+$	
195	1690.7	35/2$^-$	1495.6	33/2$^-$	
199	2000.0	35/2$^+$	1801.0	33/2$^+$	
205	1896.1	37/2$^-$	1690.7	35/2$^-$	
205.2	426.9	19/2$^-$	221.7	15/2$^-$	E_γ: 205.4 (2010Ta22).
214	2110.3	39/2$^-$	1896.1	37/2$^-$	
217.2	697.6	19/2$^+$	480.3	15/2$^+$	
225	2335.2	41/2$^-$	2110.3	39/2$^-$	
227.8	546.3	21/2$^-$	318.4	17/2$^-$	E_γ: 228.1 (2010Ta22).
232	2567.0	43/2$^-$	2335.2	41/2$^-$	
239.7	823.3	21/2$^+$	583.6	17/2$^+$	
250.4	677.2	23/2$^-$	426.9	19/2$^-$	E_γ: 250.1 (2010Ta22).
262.5	960.2	23/2$^+$	697.6	19/2$^+$	
272.9	819.2	25/2$^-$	546.3	21/2$^-$	E_γ: 272.9 (2010Ta22).
284.4	1107.6	25/2$^+$	823.3	21/2$^+$	
295.2	972.4	27/2$^-$	677.2	23/2$^-$	E_γ: 295.2 (2010Ta22).
305.8	1266.0	27/2$^+$	960.2	23/2$^+$	
316.8	1136.0	29/2$^-$	819.2	25/2$^-$	E_γ: 316.7 (2010Ta22).
326.5	1434.2	29/2$^+$	1107.6	25/2$^+$	
338.3	1310.8	31/2$^-$	972.4	27/2$^-$	E_γ: 338.3 (2010Ta22).
347.4	1613.3	31/2$^+$	1266.0	27/2$^+$	
359.6	1495.6	33/2$^-$	1136.0	29/2$^-$	E_γ: 359.4 (2010Ta22).
366.7	1801.0	33/2$^+$	1434.2	29/2$^+$	
379.9	1690.7	35/2$^-$	1310.8	31/2$^-$	E_γ: 380.1 (2010Ta22).
386.7	2000.0	35/2$^+$	1613.3	31/2$^+$	
400.5	1896.1	37/2$^-$	1495.6	33/2$^-$	E_γ: 400.8 (2010Ta22).
404.6	2205.6	37/2$^+$	1801.0	33/2$^+$	
419.6	2110.3	39/2$^-$	1690.7	35/2$^-$	E_γ: 419.3 (2010Ta22).
422.7	2422.7	39/2$^+$	2000.0	35/2$^+$	
439.2	2335.2	41/2$^-$	1896.1	37/2$^-$	E_γ: 438.9 (2010Ta22).
439.5	2645.1	41/2$^+$	2205.6	37/2$^+$	
456.4	2879.1	43/2$^+$	2422.7	39/2$^+$	
456.6	2567.0	43/2$^-$	2110.3	39/2$^-$	E_γ: 456.9 (2010Ta22).
471.4	3116.5	45/2$^+$	2645.1	41/2$^+$	
475.1	2810.3	45/2$^-$	2335.2	41/2$^-$	E_γ: 474.8 (2010Ta22).
486.1	3365.2	47/2$^+$	2879.1	43/2$^+$	
490.5	3057.5	47/2$^-$	2567.0	43/2$^-$	E_γ: 490.1 (2010Ta22).
498	3614.5	49/2$^+$	3116.5	45/2$^+$	
507.5	3317.8	49/2$^-$	2810.3	45/2$^-$	E_γ: 506.3 (2010Ta22).
510[@]	3875.2	51/2$^+$	3365.2	47/2$^+$	
520.2	3577.7	51/2$^-$	3057.5	47/2$^-$	
535	3852.8	53/2$^-$	3317.8	49/2$^-$	
547[@]	4124.7	55/2$^-$	3577.7	51/2$^-$	

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^{249}Cf(^{208}Pb,^{208}Pb′γ) 2014Ho16 (continued)

$\gamma(^{249}Cf)$ (continued)

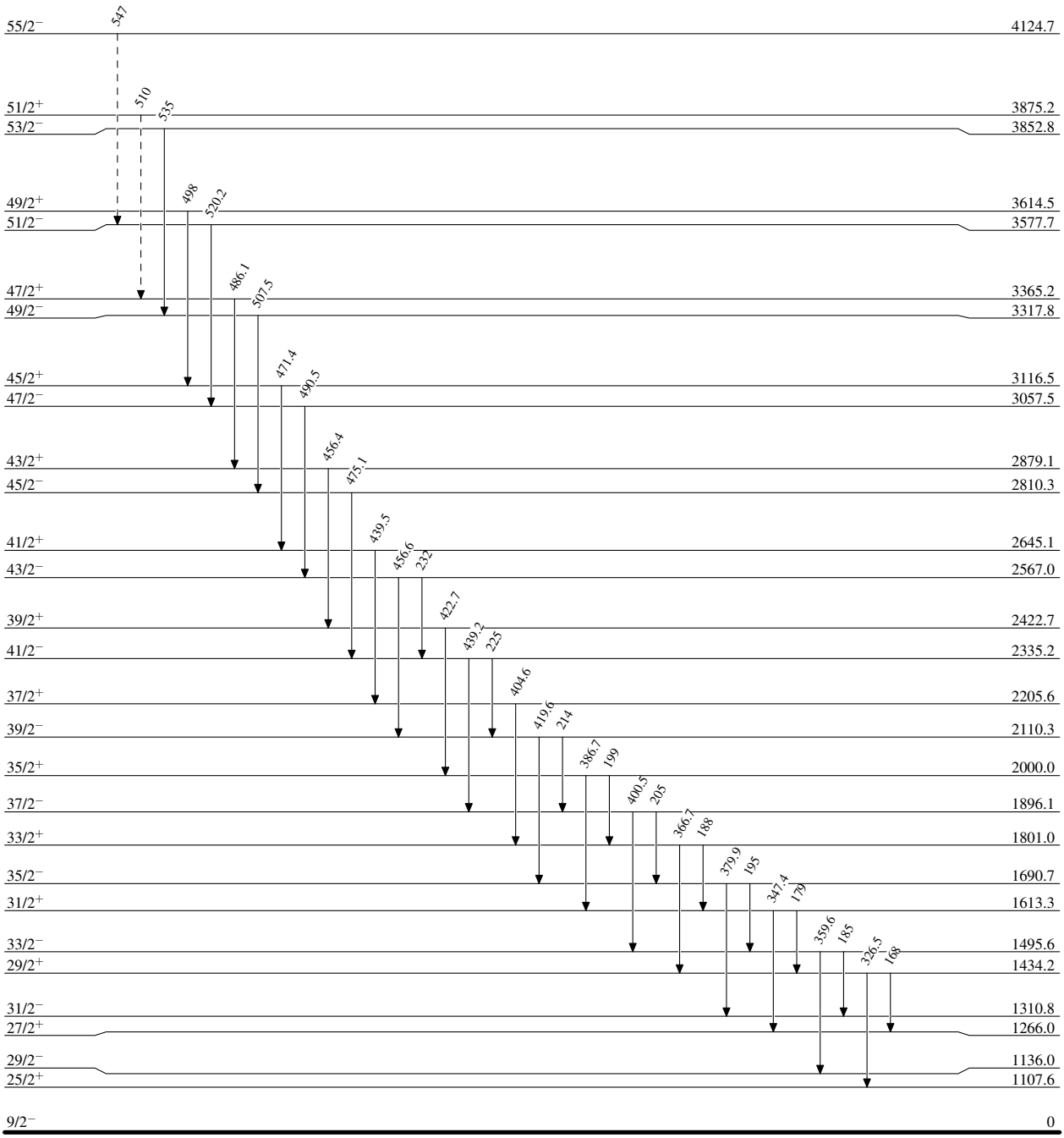
† From 2014Ho16. Data from 2010Ta22 for Eγ>180 keV are provided in the comments.
‡ From Adopted Gammas, γ not observed by 2014Ho16.
# Multiply placed.
@ Placement of transition in the level scheme is uncertain.

Legend

^{249}Cf(^{208}Pb,^{208}Pb′γ) **2014Ho16**

Level Scheme

– – – – – – ► γ Decay (Uncertain)



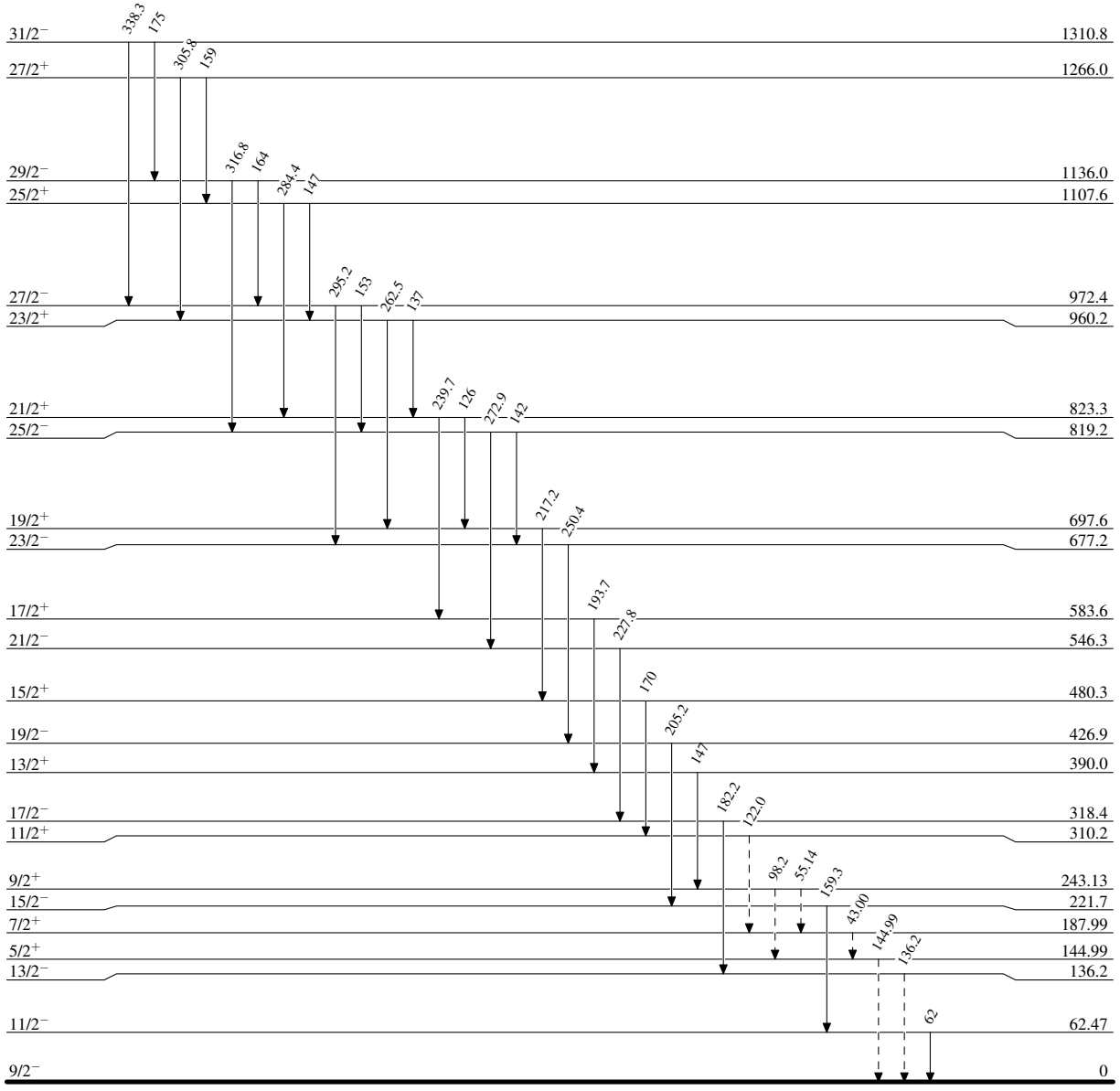
$^{249}_{98}Cf_{151}$

^{249}**Cf(**^{208}**Pb,**^{208}**Pb′**γ**) 2014Ho16**

Legend

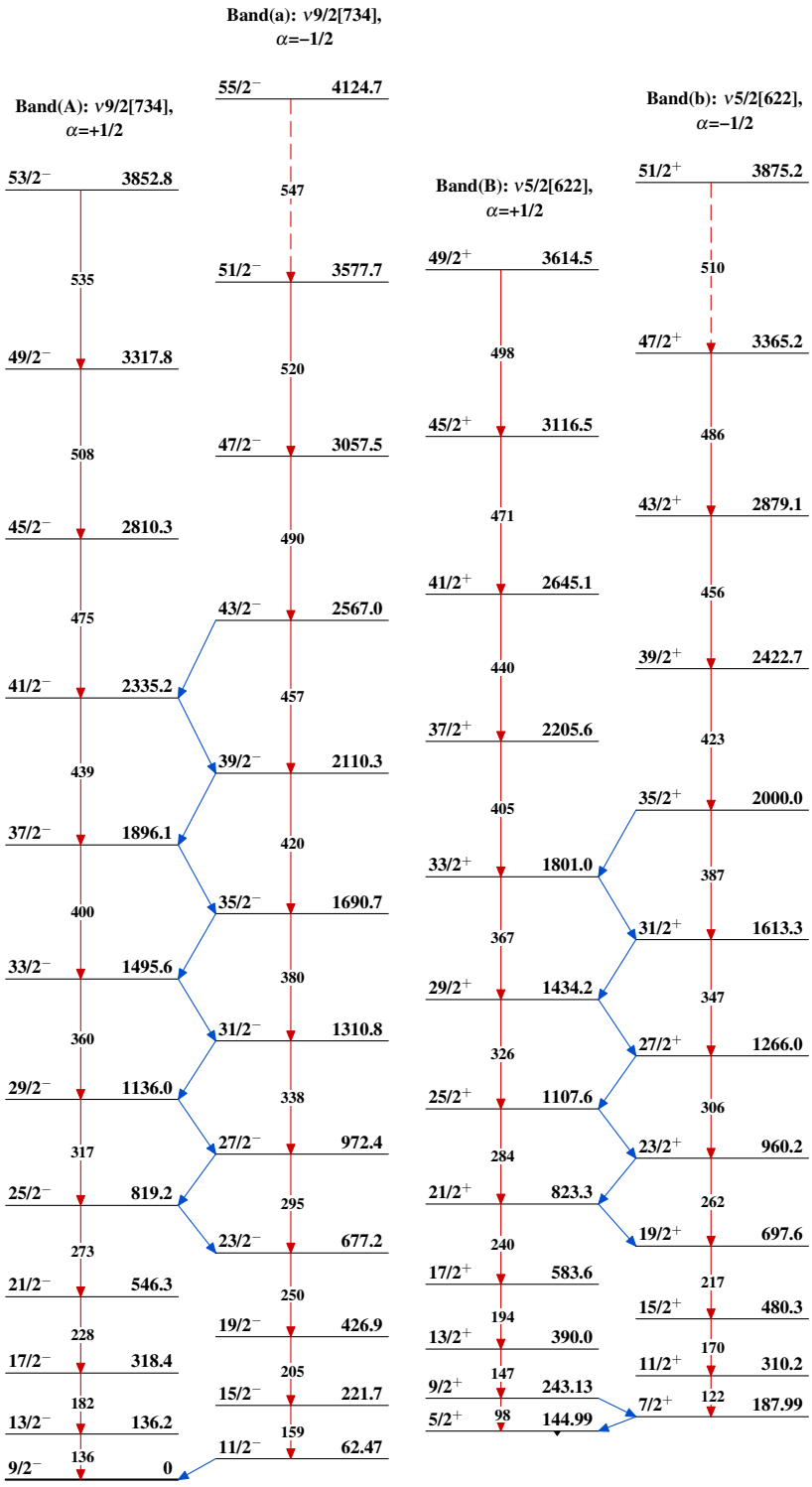
γ Decay (Uncertain)

Level Scheme (continued)



$^{249}_{98}Cf_{151}$

^{249}Cf(^{208}Pb,^{208}Pb′γ) 2014Ho16



$^{249}_{98}Cf_{151}$