

$^{248}\text{Cm}(\text{n},\gamma) \text{E}=\text{th}$ **1982Ho07**

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Khalifeh Abusaleem	NDS	112, 2129 (2011)	31-Dec-2010

1982Ho07: γ curved-crystal; pair-spectrometer Ge(Li). 96.6% ^{248}Cm target, thermal neutron flux (**1982Ho07**).

Earlier reports by same authors: **1978HoZG**, **1981HoZW**.

 ^{249}Cm Levels

Configurations and band assignments are from **1982Ho07** and incorporate assignments by **1971Br27** from $^{248}\text{Cm}(\text{d},\text{p})$ reaction.

E(level) [†]	J π [‡]	E(level) [†]	J π [‡]	E(level) [†]	J π [‡]	E(level) [†]	J π [‡]
0 [#]	1/2 ⁽⁺⁾	306.9 ^e 5		818.888 ^c 14	(5/2 ⁻)	1175.90 5	(1/2,3/2)
26.235 [#] 7	3/2 ⁽⁺⁾	470.211 ^a 8	(3/2 ⁻)	858.976 18	(1/2,3/2)	1203.7 ^e 4	(1/2,3/2)
48.203 [#] 9	5/2 ⁽⁺⁾	494.486 ^a 3	(1/2 ⁻)	917.56 ^d 3	(1/2 ⁻)	1263.3? ^e 6	(1/2,3/2)
48.765 [@] 16	(7/2 ⁺)	529.633 ^b 22	(5/2 ⁺)	963.12 ^d 3	(3/2 ⁻)	1269.31 14	(1/2,3/2)
110.172 [#] 8	(7/2 ⁺)	546.857 ^a 9	(5/2 ⁻)	971.177 ^d 25	(5/2 ⁻)	1314.4 ^e 5	(1/2,3/2)
207.996 ^{&} 6	(3/2 ⁺)	578.434 ^b 11	(7/2 ⁺)	1011.3 ^e 5	(1/2,3/2)	4713.46 11	1/2 ⁺
242.007 ^{&} 20	(5/2 ⁺)	690.5 ^e 5		1047.823 25	(1/2,3/2)		
289.015 ^{&} 16	(7/2 ⁺)	772.75 ^c 4	(3/2 ⁻)	1153.36 5	(1/2,3/2)		

[†] From **1982Ho07**.

[‡] From Adopted Levels.

[#] Band(A): 1/2[620].

[@] Band(B): 7/2[613].

[&] Band(C): 3/2[622].

^a Band(D): 1/2[761].

^b Band(E): 5/2[622].

^c Band(F): 3/2[752].

^d Band(G): 1/2[501].

^e Existence of level not substantiated by observation of γ 's either feeding or depopulating level.

 $\gamma(^{249}\text{Cm})$

I γ normalization: γ 's normalized to the absolute intensities of the 560.47 and 634.31 γ 's in ^{249}Cm β^- decay; I γ (560.47)=0.84 % 6 and I γ (634.31)=1.50 % 10.

E γ [†]	I γ ^{‡&}	E i (level)
^x 40.111 7	18 7	
^x 40.146 6	20 7	
^x 41.554 4	15.0 15	
^x 57.963 6	17 3	
^x 58.060 8	15 4	
^x 59.282 5	43 6	
^x 59.368 7	25 6	
^x 65.139 8	11 3	
^x 66.808 10	15 3	
^x 66.901 10	10.0 23	
^x 67.209 11	9.1 25	

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$^{248}\text{Cm}(\text{n},\gamma) \text{E=th}$ **1982Ho07 (continued)** $\gamma(^{249}\text{Cm})$ (continued)

E_γ †	I_γ ‡&	$E_i(\text{level})$	J_i^π	E_f	J_f^π
$^{x}68.179$ 14	8 3				
$^{x}75.736$ 3	14.4 23				
$^{x}75.87$ 8	8.2 20				
$^{x}76.647^a$ 4	6.3^a 13	546.857	(5/2 ⁻)	470.211	(3/2 ⁻)
$^{x}76.647^a$ 4	6.3^a 13	1047.823	(1/2,3/2)	971.177	(5/2 ⁻)
$^{x}78.392$ 5	6.4 17				
$^{x}83.922$ 7	4.1 12	110.172	(7/2 ⁺)	26.235	3/2 ⁽⁺⁾
$^{x}84.700$ 6	6.4 14	1047.823	(1/2,3/2)	963.12	(3/2 ⁻)
$^{x}97.799@b$ 10	4.4 7	207.996	(3/2 ⁺)	110.172	(7/2 ⁺)
$^{x}100.395$ 12	2.9 9				
$^{x}102.664@$ 7	38 6				
$^{x}102.783$ 8	29 4				
$^{x}111.113$ 16	2.4 7				
$^{x}114.86$ 3	7.8 12				
$^{x}115.06$ 5	15.6 23				
$^{x}115.31$ 5	4.5 8				
$^{x}116.338@$ 15	2.8 10				
$^{x}116.775$ 25	3.8 9				
$^{x}117.706$ 7	4.8 8				
$^{x}125.061$ 16	5.3 19				
$^{x}126.90$ 5					
$^{x}129.149@$ 20	8 3				
$^{x}129.862$ 15	11 4				
$^{x}130.260$ 12	15 4	1047.823	(1/2,3/2)	917.56	(1/2 ⁻)
$^{x}133.66$ 3	14 6				
$^{x}137.19$ 4	6.3 8				
$^{x}137.822$ 14	11.3 24				
$^{x}138.360$ 14	8.7 16				
$^{x}146.479$ 19	7.7 22				
$^{x}147.84@$ 3	4.0 19				
$^{x}148.155$ 18	5.7 13				
$^{x}149.738$ 9	4.6 7				
$^{x}150.266$ 16	9.9 18				
$^{x}153.85$ 3	3.9 14				
$^{x}158.54$ 3	9.9 19				
$^{x}158.879@$ 17	5.3 5				
$^{x}159.215$ 21	9.9 24	207.996	(3/2 ⁺)	48.765	(7/2 ⁺)
$^{x}159.765$ 16	9.0 18	207.996	(3/2 ⁺)	48.203	5/2 ⁽⁺⁾
$^{x}161.39$ 3	6.3 11				
$^{x}162.314$ 14	8.0 9				
$^{x}165.823$ 24	5.7 7				
$^{x}167.65$ 4	4.9 7				
$^{x}171.585$ 14	8.7 11				
$^{x}181.778$ 11	10.3 22	207.996	(3/2 ⁺)	26.235	3/2 ⁽⁺⁾
$^{x}182.15@b$ 4	3.0 3	1153.36	(1/2,3/2)	971.177	(5/2 ⁻)
$^{x}193.24@b$ 6	5.5 13	242.007	(5/2 ⁺)	48.765	(7/2 ⁺)
$^{x}193.805$ 20	8.0 12	242.007	(5/2 ⁺)	48.203	5/2 ⁽⁺⁾
$^{x}194.33$ 4	2.2 3				
$^{x}198.95@$ 6	2.2 3				
$^{x}208.011$ 7	15.8 22	207.996	(3/2 ⁺)	0	1/2 ⁽⁺⁾
$^{x}214.98@$ 4	3.4 10				
$^{x}216.53$ 5	2.7 9				
$^{x}218.702$ 23	5.7 11				
$^{x}225.94$ 7	4.2 14	772.75	(3/2 ⁻)	546.857	(5/2 ⁻)

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$^{248}\text{Cm}(\text{n},\gamma) \text{E=th}$ **1982Ho07 (continued)** $\gamma(^{249}\text{Cm})$ (continued)

E_γ †	I_γ ‡&	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
$^{x227.38\ 3}$	2.4 6					
228.95 @b 3	3.1 5	1047.823	(1/2,3/2)	818.888	(5/2 ⁻)	
$^{x229.343\ 25}$	2.0 3					
$^{x230.64\ @\ 5}$	7.9 22					
$^{x236.78\ 5}$	4.8 13					
240.253 9	5.9 9	289.015	(7/2 ⁺)	48.765	(7/2 ⁺)	
240.451 10	3.0 6	818.888	(5/2 ⁻)	578.434	(7/2 ⁺)	
240.618 15	11.8 20	529.633	(5/2 ⁺)	289.015	(7/2 ⁺)	
240.780 20	9.3 17	289.015	(7/2 ⁺)	48.203	5/2 ⁽⁺⁾	
242.01 8	2.8 4	242.007	(5/2 ⁺)	0	1/2 ⁽⁺⁾	
257.74 @b 5	16 5	546.857	(5/2 ⁻)	289.015	(7/2 ⁺)	
$^{x265.72\ 6}$	4.6 9					
$^{x267.16\ 3}$	13 3					
$^{x269.67\ 3}$	12.3 24					
$^{x269.91\ 3}$	12.2 21					
272.04 5	2.2 13	818.888	(5/2 ⁻)	546.857	(5/2 ⁻)	
$^{x275.388\ 23}$	7.3 14					
278.23 7	3.2 10	772.75	(3/2 ⁻)	494.486	(1/2 ⁻)	
$^{x280.77\ @\ 4}$	9.0 23					
302.59 7	9 3	772.75	(3/2 ⁻)	470.211	(3/2 ⁻)	
$^{x307.39\ @\ 19}$	3.2 14					
312.120 16	5.3 13	858.976	(1/2,3/2)	546.857	(5/2 ⁻)	
$^{x314.16\ 4}$	6.7 18					
$^{x316.33\ 5}$	6.0 14					
321.9 @b 4	3.7 25	529.633	(5/2 ⁺)	207.996	(3/2 ⁺)	
339.23 12	4.1 11	546.857	(5/2 ⁻)	207.996	(3/2 ⁺)	poor fit In the level.
$^{x340.01\ 10}$	12 3					
$^{x340.369\ 10}$	10.4 19					
$^{x343.02\ 10}$	6.0 13					
$^{x343.17\ 7}$	4.8 16					
348.75 4	7.2 19	818.888	(5/2 ⁻)	470.211	(3/2 ⁻)	
$^{x349.56\ 10}$	5.2 15					
$^{x349.827\ 14}$	6.6 14					
$^{x353.77\ 6}$	3.9 11					
$^{x357.68\ @\ 17}$	5.6 16					
$^{x366.69\ 11}$	7 3					
$^{x373.89\ 3}$	4.8 15					
$^{x400.20\ 5}$	11.9 12					
$^{x400.40\ 6}$	14 3					
$^{x400.58\ 4}$	17 4					
$^{x400.82\ 4}$	13 3					
$^{x401.63\ 16}$	6.7 6					
$^{x415.07\ 14}$	4.4 11					
$^{x418.07\ 14}$	3.3 11					
422.015 6	36 6	470.211	(3/2 ⁻)	48.203	5/2 ⁽⁺⁾	
422.94 10	7.4 19	917.56	(1/2 ⁻)	494.486	(1/2 ⁻)	
$^{x434.01\ @\ 6}$	5.8 6					
441.55 11	2.8 8	971.177	(5/2 ⁻)	529.633	(5/2 ⁺)	
444.10 @b 8	2.5 8	470.211	(3/2 ⁻)	26.235	3/2 ⁽⁺⁾	
447.31 7	4.4 14	917.56	(1/2 ⁻)	470.211	(3/2 ⁻)	
$^{x452.36\ 11}$	2.5 11					
468.259 ^a 8	21 ^a 4	494.486	(1/2 ⁻)	26.235	3/2 ⁽⁺⁾	
468.259 ^a 8	21 ^a 4	578.434	(7/2 ⁺)	110.172	(7/2 ⁺)	
470.198 9	30 7	470.211	(3/2 ⁻)	0	1/2 ⁽⁺⁾	

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$^{248}\text{Cm}(n,\gamma) \text{E=th}$ **1982Ho07 (continued)** $\gamma(^{249}\text{Cm})$ (continued)

E_γ †	I_γ ‡&	$E_i(\text{level})$	J_i^π	E_f	J_f^π
$^{x490.56}_{16}$	3.3 11				
494.484 3	27 6	494.486	(1/2 ⁻)	0	1/2 ⁽⁺⁾
$^{x497.38}_{6}$	6.6 17				
$^{x505.95}_{3}$	11 4				
$^{x524.55}_{5}$	10.5 25				
531.7@ b 5	10.0 10	772.75	(3/2 ⁻)	242.007	(5/2 ⁺)
$^{x535.55}_{5}$	7.7 11				
$^{x539.36}_{@}$ 19	9.7 10				
$^{x548.63}_{@}$ 13	5.3 14				
$^{x550.30}_{2}$	11.9 17				
$^{x575.58}_{7}$	3.6 8				
$^{x588.92}_{3}$	19 4				
$^{x589.84}_{13}$	9.6 19				
$^{x602.24}_{@}$ 6	8.5 17				
606.73 14	3.0 8	1153.36	(1/2,3/2)	546.857	(5/2 ⁻)
$^{x621.6}_{@}$ 3	12.3 22				
$^{x630.19}_{8}$	8.0 19				
$^{x658.45}_{6}$	10 3				
683.35 16	3.0 11	1153.36	(1/2,3/2)	470.211	(3/2 ⁻)
705.65 5	10 3	1175.90	(1/2,3/2)	470.211	(3/2 ⁻)
724.44@ b 7	22 7	772.75	(3/2 ⁻)	48.203	5/2 ⁽⁺⁾
$^{x743.07}_{5}$	11.0 22				
772.80@ b 10	12 3	772.75	(3/2 ⁻)	0	1/2 ⁽⁺⁾
$^{x778.44}_{11}$	6.3 17				
$^{x786.29}_{12}$	28 4				
$^{x787.35}_{@}$ 15	6.9 22				
$^{x819.58}_{5}$	17 3				
$^{x830.70}_{6}$	46 6				
$^{x831.06}_{5}$	50 15				
832.70 10	24 4	858.976	(1/2,3/2)	26.235	3/2 ⁽⁺⁾
$^{x846.23}_{25}$	59 12				
860.80 13	12 3	971.177	(5/2 ⁻)	110.172	(7/2 ⁺)
$^{x861.39}_{24}$	9.4 19				
891.25 21	13 4	917.56	(1/2 ⁻)	26.235	3/2 ⁽⁺⁾
$^{x899.92}_{9}$	14 3				
914.74 11	14 3	963.12	(3/2 ⁻)	48.203	5/2 ⁽⁺⁾
$^{x941.96}_{10}$	36 9				
$^{x957.63}_{21}$	7.7 19				
963.06 9	8.0 19	963.12	(3/2 ⁻)	0	1/2 ⁽⁺⁾
968.23 12	15 4	1175.90	(1/2,3/2)	207.996	(3/2 ⁺)
$^{x981.68}_{11}$	80 17				
$^{x982.13}_{10}$	93 18				
$^{x983.06}_{3}$	117 22				
$^{x983.92}_{8}$	83 14				
$^{x1012.19}_{12}$	52 9				
$^{x1013.69}_{5}$	88 16				
$^{x1014.87}_{13}$	50 8				
$^{x1073.59}_{19}$	17 3				
1127.37 22	4	1153.36	(1/2,3/2)	26.235	3/2 ⁽⁺⁾
$^{x1135.01}_{24}$	28 4				
1175.8 3	21 4	1175.90	(1/2,3/2)	0	1/2 ⁽⁺⁾
$^{x1186.71}_{21}$	40 7				
$^{x1193.7}_{3}$	22 4				
$^{x1225.2}_{5}$	30 7				

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$^{248}\text{Cm}(n,\gamma) E=\text{th}$ **1982Ho07 (continued)** $\gamma(^{249}\text{Cm})$ (continued)

$E_\gamma^\dagger$	$I_\gamma^{\ddagger\&}$	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
^x 1239.8 5	15 4					
^x 1252.3 3	22 4					
1269.50 15	38 8	1269.31	(1/2,3/2)	0	1/2 ⁽⁺⁾	
^x 1279.0 3	28 6					
^x 1283.46 19	92 15					
^x 1284.8 3	30 6					
^x 1313.51 14	32 6					
^x 1334.56 23	36 7					
^x 1342.02 17	26 5					
^x 1365.2 5	27 7					
^x 1408.3 3	195 28					
^x 1435.7 5	34 9					
^x 1480.1 3	12 3					
^x 1525.7 3	81 14					
^x 1590.5 12	57 17					
^x 1622.91 13	161 29					
3399.0 4	10.5 [#] 11	4713.46	1/2 ⁺	1314.4	(1/2,3/2)	poor fit In the level.
3444.9 3	73 [#] 3	4713.46	1/2 ⁺	1269.31	(1/2,3/2)	
3450.1 @ ^b 5	6.7 [#] 13	4713.46	1/2 ⁺	1263.3?	(1/2,3/2)	
3509.7 3	37.9 [#] 19	4713.46	1/2 ⁺	1203.7	(1/2,3/2)	
3538.3 3	100.0 [#] 4	4713.46	1/2 ⁺	1175.90	(1/2,3/2)	
3560.6 10	36 [#] 5	4713.46	1/2 ⁺	1153.36	(1/2,3/2)	Interference from $^{27}\text{Al}(n,\gamma)$.
3663.5 3	29.5 [#] 18	4713.46	1/2 ⁺	1047.823	(1/2,3/2)	Energy fit in level scheme poor.
3702.1 ^b 4	9.2 [#] 8	4713.46	1/2 ⁺	1011.3	(1/2,3/2)	
3750.7 3	62 [#] 3	4713.46	1/2 ⁺	963.12	(3/2 ⁻)	
3796.1 3	21.2 [#] 12	4713.46	1/2 ⁺	917.56	(1/2 ⁻)	
3854.5 @ ^b 8	5.5 [#] 21	4713.46	1/2 ⁺	858.976	(1/2,3/2)	
4022.9 4	12.9 [#] 12	4713.46	1/2 ⁺	690.5		Complex line.
4219.0 3	57.1 [#] 24	4713.46	1/2 ⁺	494.486	(1/2 ⁻)	
4243.5 3	35.2 [#] 16	4713.46	1/2 ⁺	470.211	(3/2 ⁻)	
4406.5 4	7.5 [#] 7	4713.46	1/2 ⁺	306.9		
4505.0 3	12.4 [#] 8	4713.46	1/2 ⁺	207.996	(3/2 ⁺)	
4713.4 4	8.6 [#] 7	4713.46	1/2 ⁺	0	1/2 ⁽⁺⁾	

[†] E_γ calibration linked to $E_\gamma=411.8042$ for ^{198}Au decay line (adopted value $E_\gamma=411.80205$ 17 (**1995HeZZ**)).

[‡] Absolute intensity per 1000 n captures.

[#] Relative intensities.

@ Assignment of the γ to this nucleus tentative.

& For intensity per 100 neutron captures, multiply by 0.10.

^a Multiply placed with undivided intensity.

^b Placement of transition in the level scheme is uncertain.

^x γ ray not placed in level scheme.

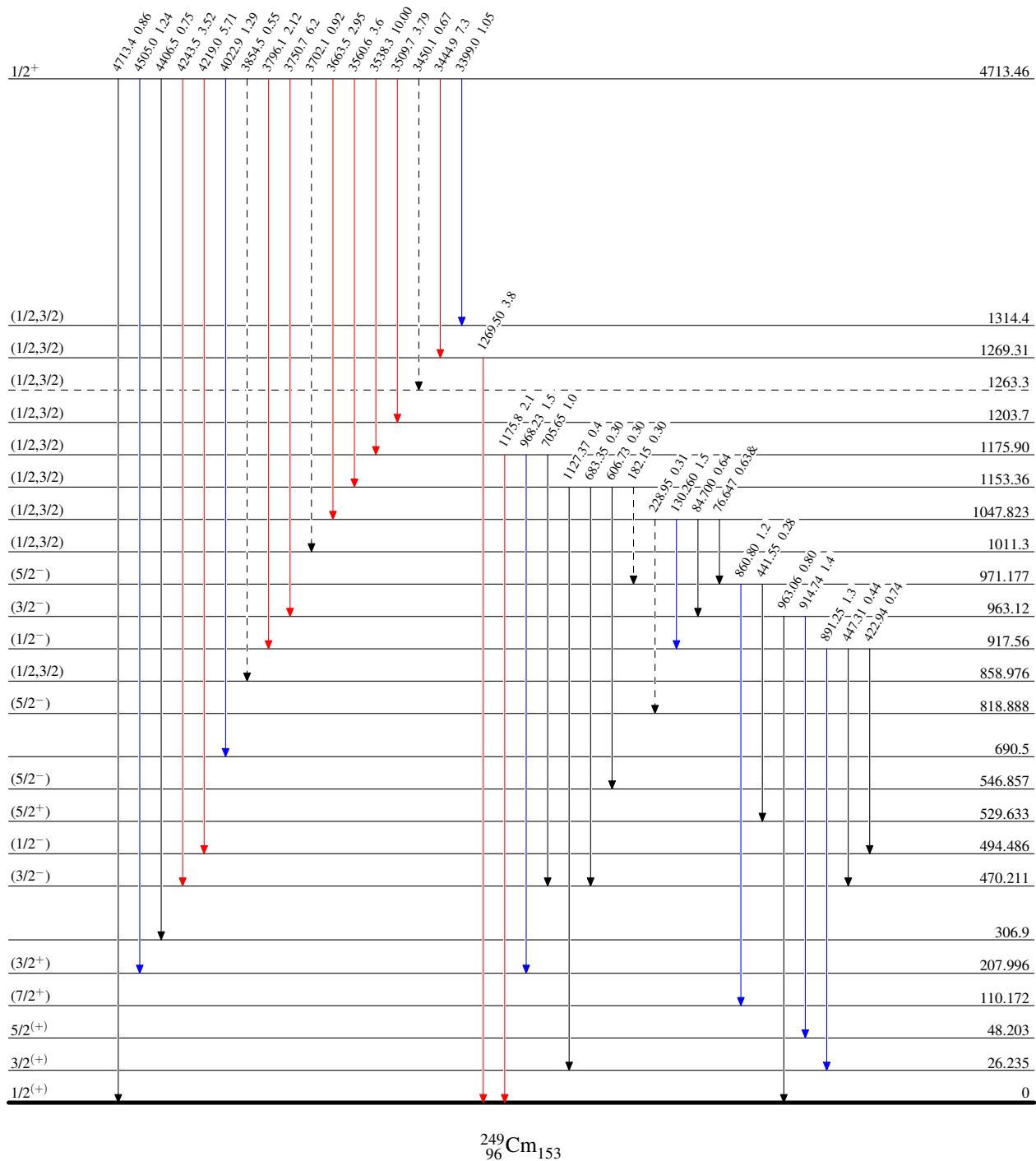
$^{248}\text{Cm}(n,\gamma) \text{E=th}$ 1982Ho07

Level Scheme

Intensities: I_γ per 100 neutron captures
& Multiply placed: undivided intensity given

Legend

- $\longrightarrow$ $I_\gamma < 2\% \times I_\gamma^{\max}$
 $\longrightarrow$ $I_\gamma < 10\% \times I_\gamma^{\max}$
 $\longrightarrow$ $I_\gamma > 10\% \times I_\gamma^{\max}$
 $-----\longrightarrow$ γ Decay (Uncertain)



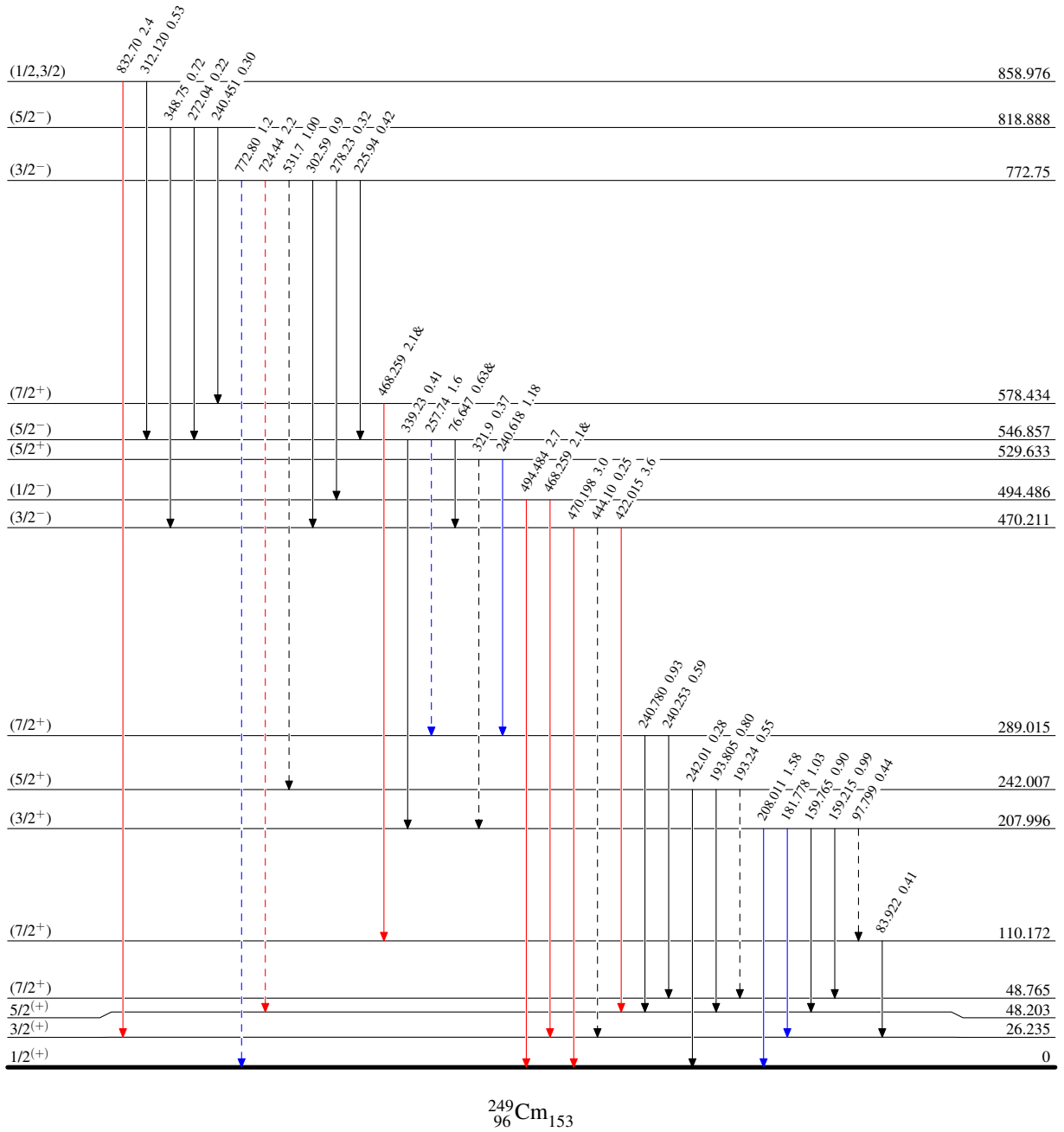
$^{248}\text{Cm}(n,\gamma) \text{E=th}$ 1982Ho07

Level Scheme (continued)

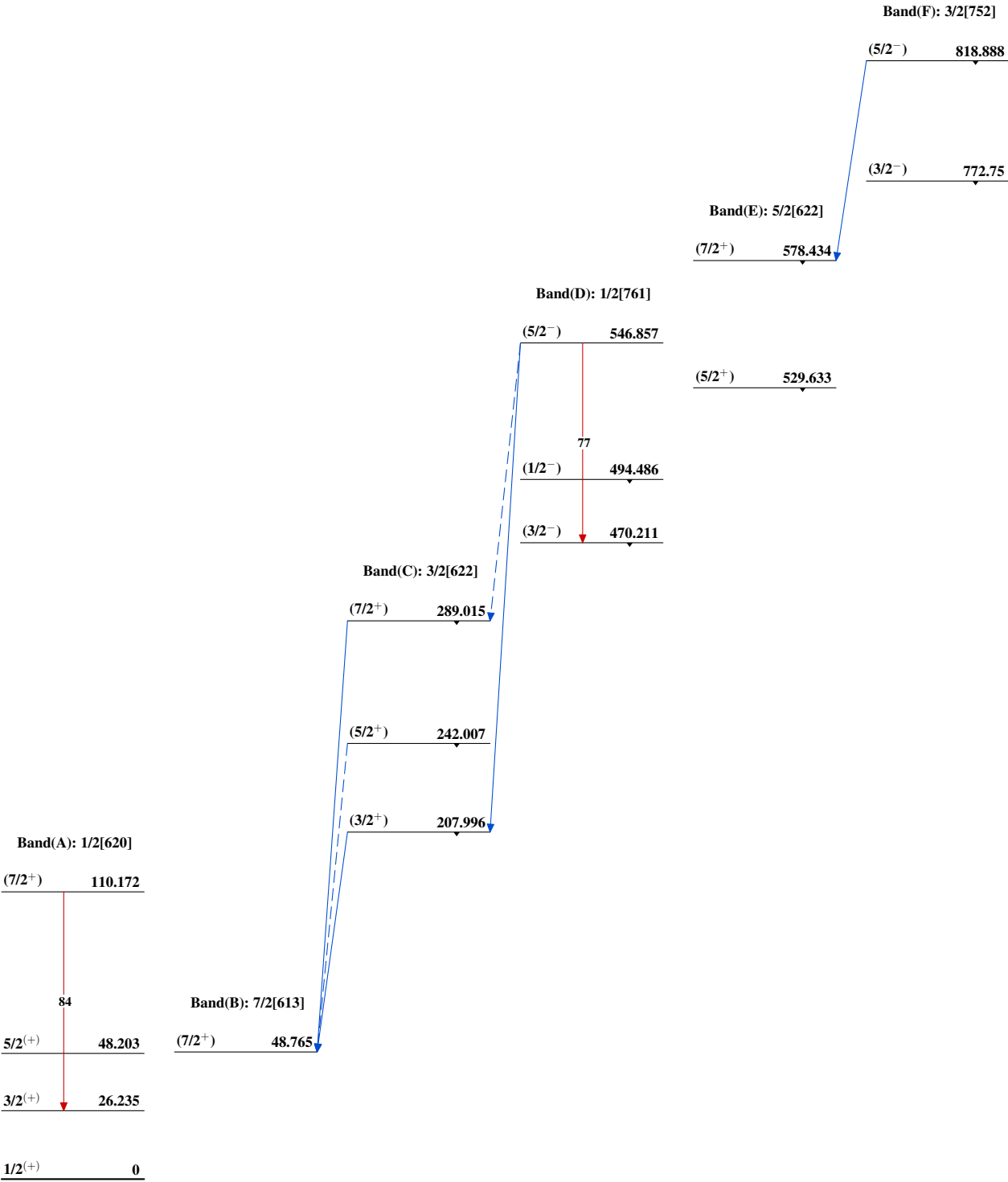
Intensities: I_γ per 100 neutron captures
& Multiply placed: undivided intensity given

Legend

- $\longrightarrow$ $I_\gamma < 2\% \times I_\gamma^{\max}$
 $\longrightarrow$ $I_\gamma < 10\% \times I_\gamma^{\max}$
 $\longrightarrow$ $I_\gamma > 10\% \times I_\gamma^{\max}$
 $\cdots\cdots\cdots\longrightarrow$ γ Decay (Uncertain)



$^{248}\text{Cm}(n,\gamma)$ E=th 1982Ho07



$^{248}\text{Cm}(\text{n},\gamma)$ E=th 1982Ho07 (continued)

Band(G): 1/2[501]

(5/2⁻) 971.177

↓

(3/2⁻) 963.12

↓

(1/2⁻) 917.56

↓

$^{249}_{96}\text{Cm}_{153}$