^{248}Cm(n,γ)E=th:secondary γ's 1982Ho07

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

1982Ho07 (earlier reports by the same authors 1978HoZG, 1981HoZW): The thermal neutron capture on 96.6% high purity ^{248}Cm was performed at the high flux reactor of the Institut Laue-Langevin at Grenoble. Secondary gammas were measured with curved-crystal spectrometers. Measured Eγ and Iγ.

^{249}Cm Levels

Band with configuration 1/2[761] assigned to 470.209-keV, 494.486-keV and 546.857-keV by 2008Is05 does not support the simple formula for rotational bands. This suggests that the band is perturbed due to the Coriolis force interaction with nearby rotational bands.

E(level)†	J$^\pi$‡	E(level)†	J$^\pi$‡	E(level)†	J$^\pi$‡
0#	1/2$^+$	470.209 *8*	3/2$^-$	917.545[c] *27*	(1/2$^-$)
26.230# *7*	3/2$^+$	494.4853 *29*	(1/2$^-$,3/2$^-$)	963.107[c] *25*	(3/2$^-$)
48.203# *9*	5/2$^+$	529.634[a] *21*	(5/2$^+$)	971.160[c] *25*	(5/2$^-$)
48.766@ *15*	(7/2$^+$)	546.855 *9*	(5/2$^-$)	1047.807 *25*	(1/2,3/2)
110.160# *9*	7/2$^+$	578.422[a] *11*	(7/2$^+$)	1153.35 *4*	(1/2,3/2)
208.000& *6*	3/2$^+$	772.750[b] *33*	(3/2$^-$)	1175.87 *5*	(1/2,3/2)
242.006& *20*	5/2$^+$	818.877[b] *14*	(5/2$^-$)	1269.50 *15*	(1/2,3/2)
289.016& *15*	7/2$^+$	858.974 *18*	(1/2,3/2)		

† From least-squares fit to Eγ data by the evaluator. ΔEγ values of poor-fit gammas have been automatically adjusted to reduce the chi-square.
‡ From Adopted Levels.
# Band(A): 1/2[620].
@ Band(B): 7/2[613].
& Band(C): 3/2[622].
[a] Band(D): 5/2[622].
[b] Band(E): 3/2[752].
[c] Band(F): 1/2[501].

γ(^{249}Cm)

Iγ normalization: γ's normalized to the absolute intensities of the 560.4 and 634.3 γ's in ^{249}Cm β^- decay; Iγ(560.47)=0.84 % *6* and Iγ(634.31)=1.5 % *1*.

E$_\gamma$‡	I$_\gamma$#&	E$_i$(level)
[x]40.111 *7*	1.8 *7*	
[x]40.146 *6*	2.0 *7*	
[x]41.554 *4*	1.50 *15*	
[x]57.963 *6*	1.7 *3*	
[x]58.060 *8*	1.5 *4*	
[x]59.282 *5*	4.3 *6*	
[x]59.368 *7*	2.5 *6*	
[x]65.139 *8*	1.1 *3*	
[x]66.808 *10*	1.5 *3*	

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^{248}Cm(n,γ)E=th:secondary γ's 1982Ho07 (continued)

γ(^{249}Cm) (continued)

E_γ ‡	I_γ #&	E_i(level)	J_i^π	E_f	J_f^π	Comments
x66.901 *10*	1.00 *23*					
x67.209 *11*	0.91 *25*					
x68.179 *14*	0.8 *3*					
x75.736 *3*	1.44 *23*					
x75.87 *8*	0.82 *20*					
76.647[a] *4*	0.63[a] *13*	546.855	(5/2$^-$)	470.209	3/2$^-$	
76.647[a] *4*	0.63[a] *13*	1047.807	(1/2,3/2)	971.160	(5/2$^-$)	
x78.392 *5*	0.64 *17*					
83.922 *7*	0.41 *12*	110.160	7/2$^+$	26.230	3/2$^+$	
84.700 *6*	0.64 *14*	1047.807	(1/2,3/2)	963.107	(3/2$^-$)	
97.799@†b *10*	0.44 *7*	208.000	3/2$^+$	110.160	7/2$^+$	E_γ: uncertainty multiplied by a factor of 2 in the fitting; level-energy difference=97.841.
x100.395 *12*	0.29 *9*					
x102.664@ *7*	3.8 *6*					
x102.783 *8*	2.9 *4*					
x111.113 *16*	0.24 *7*					
x114.86 *3*	0.78 *12*					
x115.06 *5*	1.56 *23*					
x115.31 *5*	0.45 *8*					
x116.338@ *15*	0.28 *10*					
x116.775 *25*	0.38 *9*					
x117.706 *7*	0.48 *8*					
x125.061 *16*	0.53 *19*					
x126.90 *5*						
x129.149@ *20*	0.8 *3*					
x129.862 *15*	1.1 *4*					
130.260 *12*	1.5 *4*	1047.807	(1/2,3/2)	917.545	(1/2$^-$)	
x133.66 *3*	1.4 *6*					
x137.19 *4*	0.63 *8*					
x137.822 *14*	1.13 *24*					
x138.360 *14*	0.87 *16*					
x146.479 *19*	0.77 *22*					
x147.84@ *3*	0.40 *19*					
x148.155 *18*	0.57 *13*					
x149.738 *9*	0.46 *7*					
x150.266 *16*	0.99 *18*					
x153.85 *3*	0.39 *14*					
x158.54 *3*	0.99 *19*					
x158.879@ *17*	0.53 *5*					
159.215 *21*	0.99 *24*	208.000	3/2$^+$	48.766	(7/2$^+$)	
159.765 *16*	0.90 *18*	208.000	3/2$^+$	48.203	5/2$^+$	
x161.39 *3*	0.63 *11*					
x162.314 *14*	0.80 *9*					
x165.823 *24*	0.57 *7*					
x167.65 *4*	0.49 *7*					
x171.585 *14*	0.87 *11*					
181.778 *11*	1.03 *22*	208.000	3/2$^+$	26.230	3/2$^+$	
182.15@b *4*	0.30 *3*	1153.35	(1/2,3/2)	971.160	(5/2$^-$)	
193.24@b *6*	0.55 *13*	242.006	5/2$^+$	48.766	(7/2$^+$)	
193.805 *20*	0.80 *12*	242.006	5/2$^+$	48.203	5/2$^+$	
x194.33 *4*	0.22 *3*					
x198.95@ *6*	0.22 *3*					

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^{248}Cm(n,γ)E=th:secondary γ's 1982Ho07 (continued)

γ(^{249}Cm) (continued)

E_γ ‡	I_γ #&	E_i(level)	J_i^π	E_f	J_f^π	Comments
208.011 *7*	1.58 *22*	208.000	3/2$^+$	0	1/2$^+$	
x214.98@ *4*	0.34 *10*					
x216.53 *5*	0.27 *9*					
x218.702 *23*	0.57 *11*					
225.94 *7*	0.42 *14*	772.750	(3/2$^-$)	546.855	(5/2$^-$)	
x227.38 *3*	0.24 *6*					
228.95@b *3*	0.31 *5*	1047.807	(1/2,3/2)	818.877	(5/2$^-$)	
x229.343 *25*	0.20 *3*					
x230.64@ *5*	0.79 *22*					
x236.78 *5*	0.48 *13*					
240.253 *9*	0.59 *9*	289.016	7/2$^+$	48.766	(7/2$^+$)	
240.451 *10*	0.30 *6*	818.877	(5/2$^-$)	578.422	(7/2$^+$)	
240.618 *15*	1.18 *20*	529.634	(5/2$^+$)	289.016	7/2$^+$	
240.780 *20*	0.93 *17*	289.016	7/2$^+$	48.203	5/2$^+$	
242.01 *8*	0.28 *4*	242.006	5/2$^+$	0	1/2$^+$	
257.74@b *5*	1.6 *5*	546.855	(5/2$^-$)	289.016	7/2$^+$	
x265.72 *6*	0.46 *9*					
x267.16 *3*	1.3 *3*					
x269.67 *3*	1.23 *24*					
x269.91 *3*	1.22 *21*					
272.04 *5*	0.22 *13*	818.877	(5/2$^-$)	546.855	(5/2$^-$)	
x275.388 *23*	0.73 *14*					
278.23 *7*	0.32 *10*	772.750	(3/2$^-$)	494.4853	(1/2$^-$,3/2$^-$)	
x280.77@ *4*	0.90 *23*					
302.59 *7*	0.9 *3*	772.750	(3/2$^-$)	470.209	3/2$^-$	
x307.39@ *19*	0.32 *14*					
312.120 *16*	0.53 *13*	858.974	(1/2,3/2)	546.855	(5/2$^-$)	
x314.16 *4*	0.67 *18*					
x316.33 *5*	0.60 *14*					
321.9@b *4*	0.37 *25*	529.634	(5/2$^+$)	208.000	3/2$^+$	
339.23† *12*	0.41 *11*	546.855	(5/2$^-$)	208.000	3/2$^+$	E_γ: uncertainty multiplied by a factor of 2 in the fitting; level-energy difference=338.855.
x340.01 *10*	1.2 *3*					
x340.369 *10*	1.04 *19*					
x343.02 *10*	0.60 *13*					
x343.17 *7*	0.48 *16*					
348.75 *4*	0.72 *19*	818.877	(5/2$^-$)	470.209	3/2$^-$	
x349.56 *10*	0.52 *15*					
x349.827 *14*	0.66 *14*					
x353.77 *6*	0.39 *11*					
x357.68@ *17*	0.56 *16*					
x366.69 *11*	0.7 *3*					
x373.89 *3*	0.48 *15*					
x400.20 *5*	1.19 *12*					
x400.40 *6*	1.4 *3*					
x400.58 *4*	1.7 *4*					
x400.82 *4*	1.3 *3*					
x401.63 *16*	0.67 *6*					
x415.07 *14*	0.44 *11*					
x418.07 *14*	0.33 *11*					
422.015 *6*	3.6 *6*	470.209	3/2$^-$	48.203	5/2$^+$	
422.94 *10*	0.74 *19*	917.545	(1/2$^-$)	494.4853	(1/2$^-$,3/2$^-$)	

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^{248}Cm(n,γ)E=th:secondary γ's 1982Ho07 (continued)

γ(^{249}Cm) (continued)

E_γ[‡]	I_γ[#&]	E_i(level)	J_i^π	E_f	J_f^π	Comments
[x]434.01[@] 6	0.58 6					
441.55 11	0.28 8	971.160	(5/2⁻)	529.634	(5/2⁺)	
444.10[@b] 8	0.25 8	470.209	3/2⁻	26.230	3/2⁺	
447.31 7	0.44 14	917.545	(1/2⁻)	470.209	3/2⁻	
[x]452.36 11	0.25 11					
468.259[a] 8	2.1[a] 4	494.4853	(1/2⁻,3/2⁻)	26.230	3/2⁺	
468.259[a] 8	2.1[a] 4	578.422	(7/2⁺)	110.160	7/2⁺	
470.198 9	3.0 7	470.209	3/2⁻	0	1/2⁺	
[x]490.56 16	0.33 11					
494.484 3	2.7 6	494.4853	(1/2⁻,3/2⁻)	0	1/2⁺	
[x]497.38 6	0.66 17					
[x]505.95 3	1.1 4					
[x]524.55 5	1.05 25					
531.7[@b] 5	1.00 10	772.750	(3/2⁻)	242.006	5/2⁺	
[x]535.55 5	0.77 11					
[x]539.36[@] 19	0.97 10					
[x]548.63[@] 13	0.53 14					
[x]550.30 2	1.19 17					
[x]575.58 7	0.36 8					
[x]588.92 3	1.9 4					
[x]589.84 13	0.96 19					
[x]602.24[@] 6	0.85 17					
606.73 14	0.30 8	1153.35	(1/2,3/2)	546.855	(5/2⁻)	
[x]621.6[@] 3	1.23 22					
[x]630.19 8	0.80 19					
[x]658.45 6	1.0 3					
683.35 16	0.30 11	1153.35	(1/2,3/2)	470.209	3/2⁻	
705.65 5	1.0 3	1175.87	(1/2,3/2)	470.209	3/2⁻	
724.44[@b] 7	2.2 7	772.750	(3/2⁻)	48.203	5/2⁺	
[x]743.07 5	1.10 22					
772.80[@b] 10	1.2 3	772.750	(3/2⁻)	0	1/2⁺	
[x]778.44 11	0.63 17					
[x]786.29 12	2.8 4					
[x]787.35[@] 15	0.69 22					
[x]819.58 5	1.7 3					
[x]830.70 6	4.6 6					
[x]831.06 5	5.0 15					
832.70 10	2.4 4	858.974	(1/2,3/2)	26.230	3/2⁺	
[x]846.23 25	5.9 12					
860.80 13	1.2 3	971.160	(5/2⁻)	110.160	7/2⁺	
[x]861.39 24	0.94 19					
891.25 21	1.3 4	917.545	(1/2⁻)	26.230	3/2⁺	
[x]899.92 9	1.4 3					
914.74 11	1.4 3	963.107	(3/2⁻)	48.203	5/2⁺	
[x]941.96 10	3.6 9					
[x]957.63 21	0.77 19					
963.06 9	0.80 19	963.107	(3/2⁻)	0	1/2⁺	
968.23[†] 12	1.5 4	1175.87	(1/2,3/2)	208.000	3/2⁺	E_γ: uncertainty multiplied by a factor of 2 in the fitting; level-energy difference=967.87.
[x]981.68 11	8.0 17					
[x]982.13 10	9.3 18					
[x]983.06 3	11.7 22					

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^{248}Cm(n,γ)E=th:secondary γ's 1982Ho07 (continued)

γ(^{249}Cm) (continued)

E_γ[‡]	I_γ[#&]	E_i(level)	J_i^π	E_f	J_f^π
[x]983.92 *8*	8.3 *14*				
[x]1012.19 *12*	5.2 *9*				
[x]1013.69 *5*	8.8 *16*				
[x]1014.87 *13*	5.0 *8*				
[x]1073.59 *19*	1.7 *3*				
1127.37 *22*	0.4	1153.35	(1/2,3/2)	26.230	3/2$^+$
[x]1135.01 *24*	2.8 *4*				
1175.8 *3*	2.1 *4*	1175.87	(1/2,3/2)	0	1/2$^+$
[x]1186.71 *21*	4.0 *7*				
[x]1193.7 *3*	2.2 *4*				
[x]1225.2 *5*	3.0 *7*				
[x]1239.8 *5*	1.5 *4*				
[x]1252.3 *3*	2.2 *4*				
1269.50 *15*	3.8 *8*	1269.50	(1/2,3/2)	0	1/2$^+$
[x]1279.0 *3*	2.8 *6*				
[x]1283.46 *19*	9.2 *15*				
[x]1284.8 *3*	3.0 *6*				
[x]1313.51 *14*	3.2 *6*				
[x]1334.56 *23*	3.6 *7*				
[x]1342.02 *17*	2.6 *5*				
[x]1365.2 *5*	2.7 *7*				
[x]1408.3 *3*	19.5 *28*				
[x]1435.7 *5*	3.4 *9*				
[x]1480.1 *3*	1.2 *3*				
[x]1525.7 *3*	8.1 *14*				
[x]1590.5 *12*	5.7 *17*				
[x]1622.91 *13*	16.1 *29*				

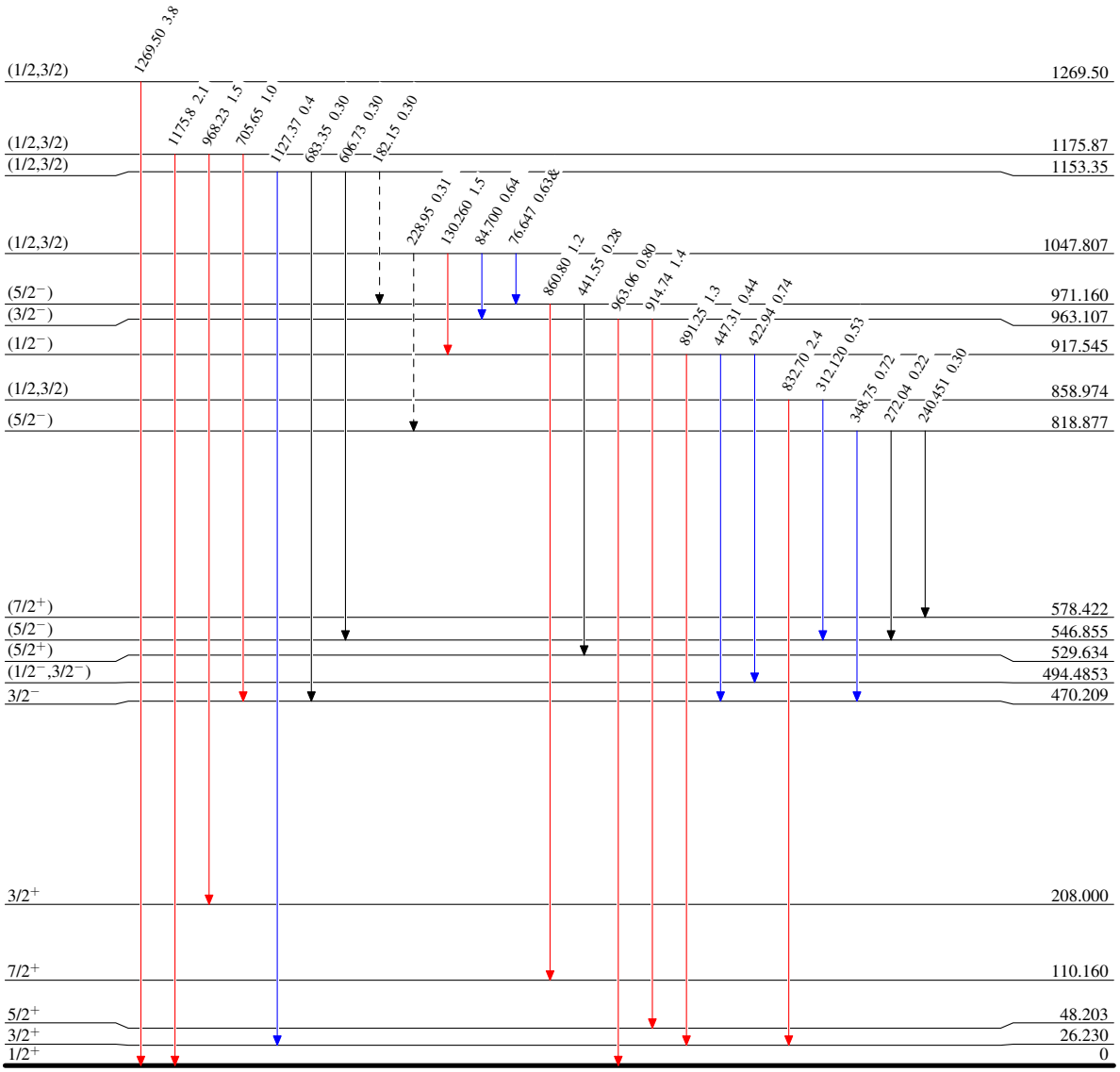
[†] Poor fit; uncertainty multiplied by a factor in the fitting.
[‡] Eγ calibration linked to Eγ=411.8042 for ^{198}Au decay line (Eγ=411.80205 *17* in Adopted Gammas of ^{198}Hg (2016Hu04)).
[#] From 1982Ho07. Values given in Table II (1982Ho07) are absolute intensity per 1000 n captures. The evaluator has converted the values to intensity per 100 n capture.
[@] Assignment of the γ to this nucleus tentative.
[&] Intensity per 100 neutron captures.
[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}Cm(n,γ)E=th:secondary γ's 1982Ho07

Level Scheme

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

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



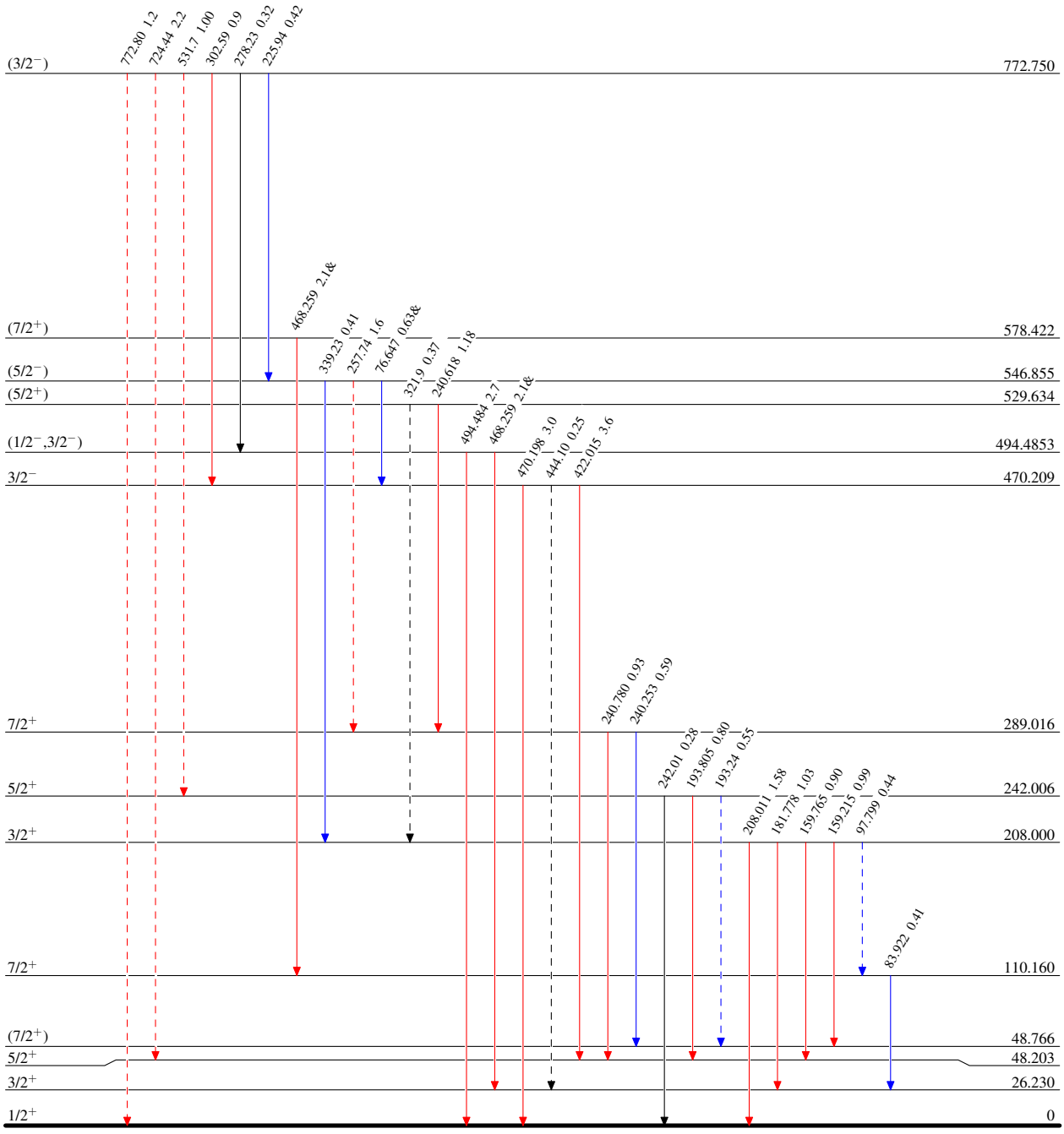
$^{249}_{96}Cm_{153}$

^{248}Cm(n,γ)E=th:secondary γ's 1982Ho07

Level Scheme (continued)

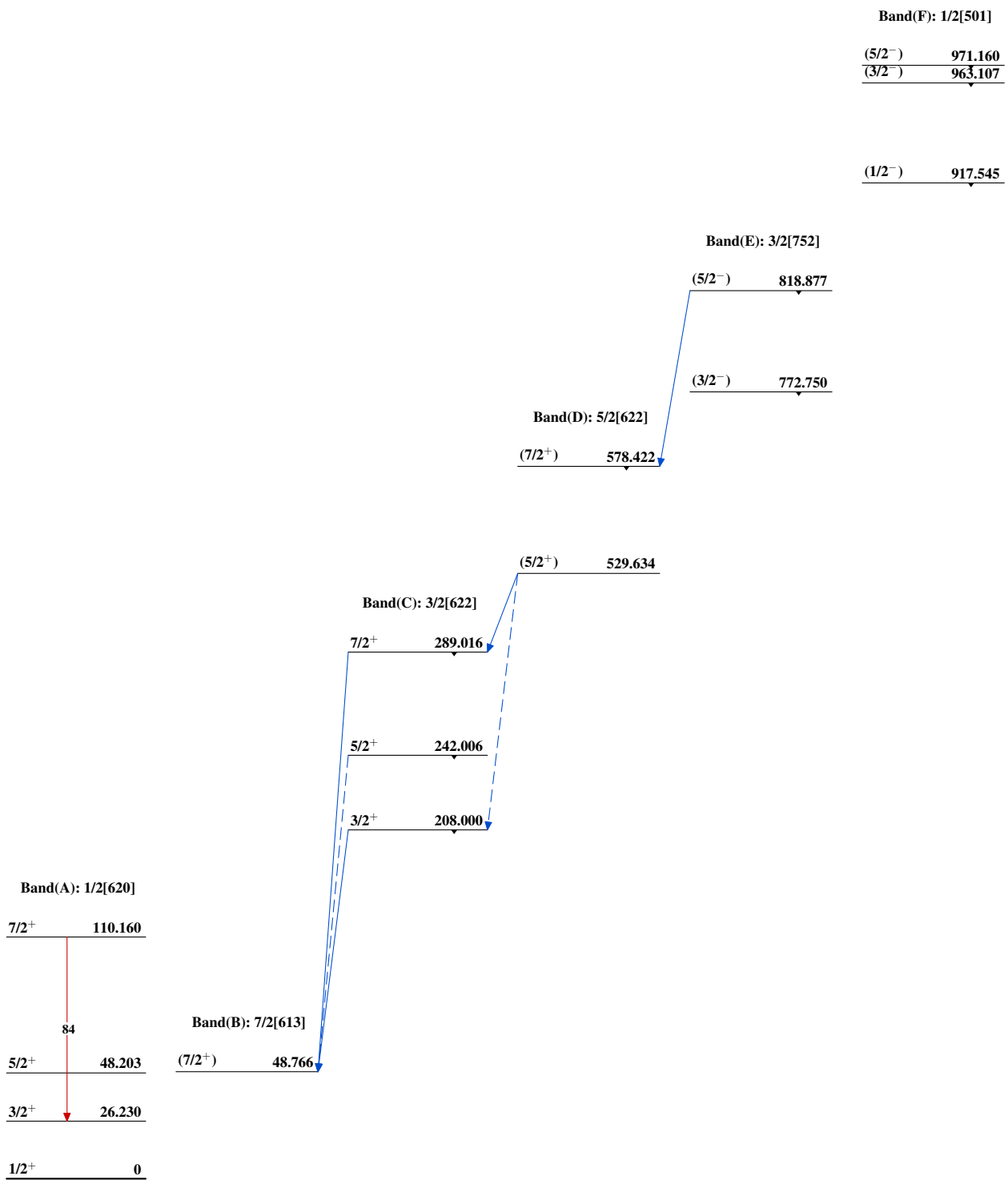
Intensities: I_γ per 100 neutron captures
& Multiply placed: undivided intensity given

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



$^{249}_{96}Cm_{153}$

^{248}Cm(n,γ)E=th:secondary γ's 1982Ho07



$^{249}_{96}Cm_{153}$