^{43}Ca(n,γ) E=thermal 1972Wh02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 190,1 (2023)	20-Jun-2023

1972Wh02: thermal neutron was produced from the Livermore pool-type reactor with a flux of 5x10^7 n/cm^{2}sec at the target. Target was $CaCO_3$ enriched to 81.1% in ^{43}Ca. γ-rays were detected with Ge(Li)-NaI(Tl) pair Compton suppression spectrometers. Measured Eγ, Iγ, $\gamma\gamma$ Deduced levels.

Others: 1969ArZT, 1971Cr02, 1966Cr06.

2007ChZX: compilation of Eγ, Iγ from neutron capture for nuclei of Z=1-92. Measurements at Budapest to deduce elemental cross sections (using natural targets) for seven secondary γ rays.

J^π(^{43}Ca g.s.)=7/2$^-$.

All data from 1972Wh02, unless otherwise noted.

^{44}Ca Levels

E(level)[†]	J$^\pi$[#]	T$_{1/2}$[@]	E(level)[†]	J$^\pi$[#]	T$_{1/2}$[@]
0.0	0^+		4651.0 *4*	2^+	
1156.93 *14*	2^+	<0.35 ns	4690.0 *5*	$(1^-,2,3,4^+)$	
1883.4 *4*	0^+		4803.5 *5*	$(1^-,2,3,4^+)$	
2283.06 *17*	4^+	<0.35 ns	4904.5 *4*	3^-	
2656.40 *18*	2^+	<0.76 ns	5005.6 *3*	4^+	
3044.33 *18*	4^+	<2.1 ns	5096.8 *4*	$3^-,4^-$	
3285.04 *19*	6^+	<0.76 ns	5130.1 *3*	$(2,3)^+$	
3301.5 *4*	2^+	<0.69 ns	5230.3 *3*	$2^+,3^+,4^+,5^+$	<4.2 ns
3307.55 *18*	3^-	<0.35 ns	5289.2 *4*		
3357.21 *20*	$(2^+,3,4^+)$	<0.62 ns	5300.4 *4*		
3676.2 *3*	(2^+)		5342.1 *6*	$(2)^+$	
3711.85 *20*	4^-	<0.42 ns	5374.9 *6*	$(2,3,4)^+$	
3776.3 *5*	2^-	<0.69 ns	5458.8 *5*	$(2,3,4)^+$	
3913.74 *20*	5^-		5548.8 *3*	$(2,3,4)^+$	
3922.66 *21*	5^-	<0.56 ns	5733.3 *3*	$(4,5)^+$	<3.5 ns
4011.3 *5*			5775.6 *3*	$(2,3,4)^+$	
4092.11 *23*	(6^+)		5866.3 *4*	$(4^+,5^+)$	
4195.7 *4*	2^+	<0.69 ns	6039.9 *6*	$2^+,3^+,4^+,5^+$	
4358.2 *3*	3^-		6146.1 *4*	$(4,5)^+$	
4399.1 *6*	3^-		6211.3 *5*		
4479.8 *5*	2^+		6672.9 *4*		
4564.81 *22*	(5^-)		(11131.54[‡] *19*)	$3^-,4^-$[‡]	
4584.04 *24*	$(2^+,3,4^+)$	<3.5 ns			

[†] From a least-squares fit to γ-ray energies.

[‡] Energy from least squares fit to level scheme. 11131.16 *23* from 2021Wa16. Observed de-exciting intensity is 49% of g.s. feeding. J^π from s-wave capture in 7/2$^-$ g.s. of ^{43}Ca.

[#] From the Adopted Levels.

[@] From $\gamma\gamma$(t).

γ(^{44}Ca)

Iγ normalization: normalized assuming Iγ(g.s.)=100.

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^{43}Ca(n,γ) E=thermal 1972Wh02 (continued)

γ(^{44}Ca) (continued)

E_γ [†]	I_γ [a]	E_i(level)	J_i^π	E_f	J_f^π	Comments
[x]204.3 *4*	0.10					
[x]264.8 *4*	0.03					
299.5 *4*	0.11	4011.3		3711.85	4^-	
[x]302.1 *4*	0.05					
368.8 *3*	0.53	3676.2	(2^+)	3307.55	3^-	
[x]372.3 *4*	0.11					
374.4[‡c] *4*	0.11	3676.2	(2^+)	3301.5	2^+	
404.34 *10*	4.53	3711.85	4^-	3307.55	3^-	
[x]418.7 *3*	0.21					
[x]440.6 *6*	0.39					
[x]443.6 *6*	0.41					
[x]472.9 *3*	0.42					
[x]476.4 *6*	0.20					
[x]594.3 *6*	0.10					
[x]597.4 *6*	0.12					
[x]606.0 *6*	0.09					
628.69 *10*	2.46	3913.74	5^-	3285.04	6^+	
637.63 *12*	1.60	3922.66	5^-	3285.04	6^+	
651.07[b] *12*	1.89[b]	3307.55	3^-	2656.40	2^+	
651.07[b] *12*	1.89[b]	4564.81	(5^-)	3913.74	5^-	
726.5 *3*	0.40	1883.4	0^+	1156.93	2^+	
761.19 *10*	6.51	3044.33	4^+	2283.06	4^+	Eγ=761.02 *13*, σ=0.00067 b *9* (2007ChZX).
806.95 *15*	1.41	4092.11	(6^+)	3285.04	6^+	
869.45 *15*	2.45	3913.74	5^-	3044.33	4^+	
878.10 *20*	1.45	3922.66	5^-	3044.33	4^+	
[x]966.53 *20*	1.13					
1001.85 *15*	6.59	3285.04	6^+	2283.06	4^+	Eγ=1001.61 *12*, σ=0.00065 b *8* (2007ChZX).
1017.8[‡c] *7*	0.38	3676.2	(2^+)	2656.40	2^+	
1024.66 *20*	1.99	3307.55	3^-	2283.06	4^+	
1050.54 *20*	0.62	4358.2	3^-	3307.55	3^-	
1074.13 *15*	11.13	3357.21	$(2^+,3,4^+)$	2283.06	4^+	Eγ=1074.04 *13*, σ=0.00091 b *11* (2007ChZX).
1092.2 *7*	0.16	5005.6	4^+	3913.74	5^-	
1126.03 *15*	54.12	2283.06	4^+	1156.93	2^+	Eγ=1126.03 *7*, σ=0.00470 b *23* (2007ChZX).
1156.89 *15*	96.97	1156.93	2^+	0.0	0^+	Eγ=1156.87 *6*, σ=0.0088 b *4* (2007ChZX).
1183.1 *4*	0.62	5096.8	$3^-,4^-$	3913.74	5^-	
[x]1266.4 *8*	0.33					
1276.0 *8*	0.18	4584.04	$(2^+,3,4^+)$	3307.55	3^-	
[x]1283.2 *8*	0.14					
[x]1314.6 *8*	0.19					
1428.56 *25*	2.00	3711.85	4^-	2283.06	4^+	
[x]1442.4 *8*	0.13					
1496[@c]		4803.5	$(1^-,2,3,4^+)$	3307.55	3^-	
1499.30[#] *18*	5.46[#]	2656.40	2^+	1156.93	2^+	
1539.40 *25*	0.77	4584.04	$(2^+,3,4^+)$	3044.33	4^+	
[x]1543.8 *8*	0.15					
[x]1577.5 *4*	0.39					
1588.7 *4*	0.53	5300.4		3711.85	4^-	
[x]1623.5 *10*	0.33					
1640.7[b] *5*	0.73[b]	3922.66	5^-	2283.06	4^+	
1640.7[b] *5*	0.73[b]	5733.3	$(4,5)^+$	4092.11	(6^+)	
1648.1 *5*	1.65	5005.6	4^+	3357.21	$(2^+,3,4^+)$	
[x]1658.7 *10*	0.99					
[x]1729.8 *10*	0.85					

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^{43}Ca(n,γ) E=thermal 1972Wh02 (continued)

γ(^{44}Ca) (continued)

E_γ †	I_γ [a]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
1773.3 [b] 5	0.65 [b]	5130.1	$(2,3)^+$	3357.21	$(2^+,3,4^+)$		
1773.3 [b] 5	0.65 [b]	5866.3	$(4^+,5^+)$	4092.11	(6^+)		
1808.9 5	0.68	4092.11	(6^+)	2283.06	4^+		
1872.7 [b] 3	2.91 [b]	5230.3	$2^+,3^+,4^+,5^+$	3357.21	$(2^+,3,4^+)$		
1872.7 [b] 3	2.91 [b]	5548.8	$(2,3,4)^+$	3676.2	(2^+)		
(1883.47)		1883.4	0^+	0.0	0^+	E0	Additional information 1.
1887.3 3	5.74	3044.33	4^+	1156.93	2^+		
[x]1901.2 10	0.16						
[x]1912.9 5	0.41						
[x]1983.8 10	0.48						
1994.2 10	0.76	4651.0	2^+	2656.40	2^+		
2053.9 5	0.57	6146.1	$(4,5)^+$	4092.11	(6^+)		
2088.2 5	0.87	6672.9		4584.04	$(2^+,3,4^+)$		
2099.3 5	0.53	5775.6	$(2,3,4)^+$	3676.2	(2^+)		
2144.5 5	1.75	3301.5	2^+	1156.93	2^+		
2150.9 3	6.44	3307.55	3^-	1156.93	2^+		
[x]2178.8 10	0.29						
2186.2 10	0.27	5230.3	$2^+,3^+,4^+,5^+$	3044.33	4^+		
2200.1 3	1.62	3357.21	$(2^+,3,4^+)$	1156.93	2^+		
2223.3 20		6146.1	$(4,5)^+$	3922.66	5^-		E_γ: resolved to be a doublet (1972Wh02).
2248.2 5	0.52	4904.5	3^-	2656.40	2^+		
2281.7 5	0.45	4564.81	(5^-)	2283.06	4^+		
[x]2293.1 6	0.24						
2297.5 6	0.20	6211.3		3913.74	5^-		
2300.6 5	0.79	4584.04	$(2^+,3,4^+)$	2283.06	4^+		
[x]2343.4 6	0.11						
2376.1 5	0.29	5733.3	$(4,5)^+$	3357.21	$(2^+,3,4^+)$		
[x]2415.6 6	0.17						
[x]2447.4 6	0.19						
[x]2467.9 6	0.18						
2474.9 [c] 6	0.27	5775.6	$(2,3,4)^+$	3301.5	2^+		
2509.2 6	0.15	5866.3	$(4^+,5^+)$	3357.21	$(2^+,3,4^+)$		
2518.9 5	1.78	3676.2	(2^+)	1156.93	2^+		
[x]2549.9 6	0.31						
[x]2582.0 6	0.19						
[x]2612.9 6	0.58						
2619.1 5	1.46	3776.3	2^-	1156.93	2^+		
2656.2 5	0.72	2656.40	2^+	0.0	0^+		
2682.8 6	0.24	6039.9	$2^+,3^+,4^+,5^+$	3357.21	$(2^+,3,4^+)$		
2688.7 5	0.37	5733.3	$(4,5)^+$	3044.33	4^+		
2722.4 3	2.38	5005.6	4^+	2283.06	4^+		
2730.7 6	0.36	5775.6	$(2,3,4)^+$	3044.33	4^+		
[x]2746.4 6	0.23						
[x]2786.2 6	0.13						
[x]2815.0 6	0.33						
2846.8 3	1.93	5130.1	$(2,3)^+$	2283.06	4^+		
[x]2862.0 5	0.14						
2891.2 [c] 6	0.34	5548.8	$(2,3,4)^+$	2656.40	2^+		
2896.7 [c] 6	0.16	6672.9		3776.3	2^-		
2947.4 3	3.92	5230.3	$2^+,3^+,4^+,5^+$	2283.06	4^+		
[x]2969.7 5	0.10						
[x]2995.1 6	0.13						
3006.0 4	1.14	5289.2		2283.06	4^+		
3038.7 4	2.02	4195.7	2^+	1156.93	2^+		

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^{43}Ca(n,γ) E=thermal 1972Wh02 (continued)

γ(^{44}Ca) (continued)

E_γ †	I_γ [a]	E_i(level)	J_i^π	E_f	J_f^π
x3052.6 *6*	0.45				
x3100.8 *7*	0.11				
x3109.1 *9*	0.22				
x3115.5 *9*	0.20				
3120.5 [c] *15*	0.14	5775.6	$(2,3,4)^+$	2656.40	2^+
x3149.8 *7*	0.23				
x3158.9 *7*	0.23				
3176.2 *7*	0.44	5458.8	$(2,3,4)^+$	2283.06	4^+
3200.1 ‡ [c] *7*	0.33	4358.2	3^-	1156.93	2^+
x3203.7 *7*	0.56				
x3219.5 *7*	0.13				
x3234.5 *7*	0.33				
3242.1 *7*	0.56	4399.1	3^-	1156.93	2^+
x3259.2 *7*	0.31				
3265.4 *7*	0.54	5548.8	$(2,3,4)^+$	2283.06	4^+
3301.5 *6*	0.70	3301.5	2^+	0.0	0^+
x3312.4 *7*	0.17				
3322.8 *6*	0.63	4479.8	2^+	1156.93	2^+
x3335.5 *7*	0.16				
x3354.9 *6*	0.31				
x3367.7 *6*	0.47				
x3395.9 *7*	0.13				
3427.5 *4*	1.96	4584.04	$(2^+,3,4^+)$	1156.93	2^+
3450.3 *4*	1.74	5733.3	$(4,5)^+$	2283.06	4^+
x3467.0 *7*	0.13				
3492.9 *4*	1.09	5775.6	$(2,3,4)^+$	2283.06	4^+
x3508.9 *7*	0.37				
x3516.5 *7*	0.27				
3532.9 *6*	0.75	4690.0	$(1^-,2,3,4^+)$	1156.93	2^+
x3545.1 *7*	0.14				
x3565.3 *7*	0.27				
3583.4 *6*	0.65	5866.3	$(4^+,5^+)$	2283.06	4^+
x3622.2 *6*	0.78				
3628.9 *7*	0.30	6672.9		3044.33	4^+
3647.2 *6*	0.56	4803.5	$(1^-,2,3,4^+)$	1156.93	2^+
x3661.4 *7*	0.22				
x3672.8 *7*	0.40				
x3712.3 *7*	0.10				
x3717.8 *7*	0.07				
x3723.6 *7*	0.24				
3747.2 *6*	0.82	4904.5	3^-	1156.93	2^+
x3756.6 *7*	0.20				
x3808.5 *6*	0.48				
x3826.8 *7*	0.16				
3848.9 *7*	0.29	5005.6	4^+	1156.93	2^+
3861.7 *7*	0.66	6146.1	$(4,5)^+$	2283.06	4^+
x3870.0 *7*	0.41				
x3874.4 *7*	0.17				
x3892.3 *7*	0.27				
x3903.4 *6*	0.58				
x3923.2 *7*	0.21				
x3957.3 *6*	0.52				
3973.1 *4*	1.61	5130.1	$(2,3)^+$	1156.93	2^+
x4025.9 *8*	0.38				

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^{43}Ca(n,γ) E=thermal 1972Wh02 (continued)

γ(^{44}Ca) (continued)

E_γ [†]	I_γ [a]	E_i(level)	J_i^π	E_f	J_f^π	Comments
x4034.4 8	0.58					
x4075.4 7	0.14					
x4131.1 8	0.19					
x4150.0 8	0.29					
x4168.8 7	0.53					
4185.6 8	0.13	5342.1	$(2)^+$	1156.93	2^+	
x4209.1 7	1.10					
4217.9 8	0.69	5374.9	$(2,3,4)^+$	1156.93	2^+	
x4264.7 7	0.44					
x4276.8 8	0.18					
x4284.3 8	0.22					
4301.7 7	0.22	5458.8	$(2,3,4)^+$	1156.93	2^+	
x4318.1 8	0.22					
x4345.4 8	0.12					
x4376.8 8	0.16					
x4383.4 7	0.39					
4391.5 7	0.39	5548.8	$(2,3,4)^+$	1156.93	2^+	
x4436.3 7	0.47					
4457.9 7	1.90	(11131.54)	$3^-,4^-$	6672.9		
x4462.7 8	0.54					
x4488.4 8	0.05					
x4499.4 8	0.16					
x4502.6 8	0.23					
x4530.9 8	0.12					
x4554.3 8	0.39					
4565.1[c] 8	0.44	4564.81	(5^-)	0.0	0^+	Placement of this transition is considered unlikely by evaluators from the implied high mult=E5.
x4577.6 8	0.18					
x4599.1 7	0.24					
4618.0 8	0.40	5775.6	$(2,3,4)^+$	1156.93	2^+	
x4625.1 8	0.72					
x4638.3 8	0.24					
4651.0 5	1.09	4651.0	2^+	0.0	0^+	
x4678.6 8	0.08					
x4686.9 8	0.16					
x4716.1 8	0.06					
x4748.3 7	0.28					
x4775.6 8	0.09					
x4808.1 7	0.37					
x4814.9 8	0.22					
x4849.8 8	0.12					
x4872.1 8	0.09					
x4890.6 7	0.33					
x4905.5 7	0.38					
4919.9 7	0.90	(11131.54)	$3^-,4^-$	6211.3		
x4974.6 8	0.15					
4984.4 5	1.12	(11131.54)	$3^-,4^-$	6146.1	$(4,5)^+$	
x5006.9 7	0.27					
x5039.1 7	0.39					
x5068.4 8	0.09					
5091.6 8	0.40	(11131.54)	$3^-,4^-$	6039.9	$2^+,3^+,4^+,5^+$	
x5119.3 8	0.11					
x5136.0 7	0.45					
x5160.3 8	0.17					

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^{43}Ca(n,γ) E=thermal 1972Wh02 (continued)

γ(^{44}Ca) (continued)

E_γ [†]	I_γ [a]	E_i(level)	J_i^π	E_f	J_f^π
[x]5196.0 *5*	0.62				
[x]5223.9 *7*	0.26				
[x]5239.7 *7*	0.21				
5264.4 *5*	1.19	(11131.54)	3^-,4^-	5866.3	$(4^+,5^+)$
[x]5281.6 *8*	0.08				
[x]5287.3 *8*	0.15				
[x]5304.2 *7*	0.26				
[x]5315.7 *8*	0.08				
[x]5348.9 *8*	0.47				
5355.7 *5*	2.88	(11131.54)	3^-,4^-	5775.6	$(2,3,4)^+$
5397.8 *5*	3.75	(11131.54)	3^-,4^-	5733.3	$(4,5)^+$
[x]5472.5 *7*	0.31				
[x]5478.8 *8*	0.12				
[x]5538.2 *5*	0.81				
[x]5558.6 *7*	0.26				
5582.4 *5*	0.99	(11131.54)	3^-,4^-	5548.8	$(2,3,4)^+$
[x]5592.2 *8*	0.15				
[x]5629.7 *7*	0.26				
5673.0 *7*	0.50	(11131.54)	3^-,4^-	5458.8	$(2,3,4)^+$
[x]5689.9 *8*	0.11				
[x]5723.3 *8*	0.16				
[x]5735.3 *7*	0.51				
5756.3 *7*	0.85	(11131.54)	3^-,4^-	5374.9	$(2,3,4)^+$
5789.5 *7*	0.35	(11131.54)	3^-,4^-	5342.1	$(2)^+$
5831.4 *7*	1.00	(11131.54)	3^-,4^-	5300.4	
5841.9 *5*	1.17	(11131.54)	3^-,4^-	5289.2	
5900.9 *5*	6.97	(11131.54)	3^-,4^-	5230.3	2^+,3^+,4^+,5^+
6001.3 *6*	3.39	(11131.54)	3^-,4^-	5130.1	$(2,3)^+$
6034.4 *6*	1.18	(11131.54)	3^-,4^-	5096.8	3^-,4^-
[x]6039.7 *10*	0.26				
[x]6071.1 *10*	0.07				
[x]6104.7 *8*	0.66				
6125.3 *6*	3.72	(11131.54)	3^-,4^-	5005.6	4^+
6145.6[c] *10*	0.05	6146.1	$(4,5)^+$	0.0	0^+
[x]6151.1 *8*	0.16				
[x]6186.8 *10*	0.04				
[x]6197.7 *10*	0.08				
6226.7 *8*	0.84	(11131.54)	3^-,4^-	4904.5	3^-
[x]6248.5 *10*	0.09				
[x]6298.7 *10*	0.07				
6328.3[&] *6*	0.59	(11131.54)	3^-,4^-	4803.5	$(1^-,2,3,4^+)$
[x]6335.6 *10*	0.10				
[x]6352.2 *8*	0.23				
[x]6393.5 *10*	0.05				
6441.1 *8*	0.39	(11131.54)	3^-,4^-	4690.0	$(1^-,2,3,4^+)$
6480.2 *6*	2.30	(11131.54)	3^-,4^-	4651.0	2^+
6546.6 *6*	2.36	(11131.54)	3^-,4^-	4584.04	$(2^+,3,4^+)$
6566.4 *6*	0.56	(11131.54)	3^-,4^-	4564.81	(5^-)
[x]6591.7 *10*	0.08				
6651.3 *8*	0.42	(11131.54)	3^-,4^-	4479.8	2^+
6731.9 *10*	0.14	(11131.54)	3^-,4^-	4399.1	3^-
6772.3 *6*	0.75	(11131.54)	3^-,4^-	4358.2	3^-
[x]6868.6 *10*	0.03				
6935.2 *6*	0.88	(11131.54)	3^-,4^-	4195.7	2^+

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^{43}Ca(n,γ) E=thermal 1972Wh02 (continued)

$\gamma(^{44}Ca)$ (continued)

E_γ [†]	I_γ [a]	E_i(level)	J_i^π	E_f	J_f^π
[x]6963.5 *10*	0.03				
[x]6980.7 *10*	0.07				
[x]7080.8 *10*	0.07				
7119.7 *10*	0.08	(11131.54)	3^-,4^-	4011.3	
7208.1 *6*	1.55	(11131.54)	3^-,4^-	3922.66	5^-
[x]7247.3 *10*	0.07				
7354.2 *8*	0.49	(11131.54)	3^-,4^-	3776.3	2^-
7418.8 *6*	0.74	(11131.54)	3^-,4^-	3711.85	4^-
7454.4 *10*	0.08	(11131.54)	3^-,4^-	3676.2	(2^+)
[x]7712.0 *10*	0.03				
7773.4 *6*	3.04	(11131.54)	3^-,4^-	3357.21	$(2^+,3,4^+)$
7822.3 *10*	0.17	(11131.54)	3^-,4^-	3307.55	3^-
7829.3 *8*	0.60	(11131.54)	3^-,4^-	3301.5	2^+
[x]7916.7 *10*	0.04				
8086.4 *7*	0.67	(11131.54)	3^-,4^-	3044.33	4^+
8474.3 *10*	0.07	(11131.54)	3^-,4^-	2656.40	2^+
8848.0 *7*	0.37	(11131.54)	3^-,4^-	2283.06	4^+
9974.3 *8*	0.11	(11131.54)	3^-,4^-	1156.93	2^+

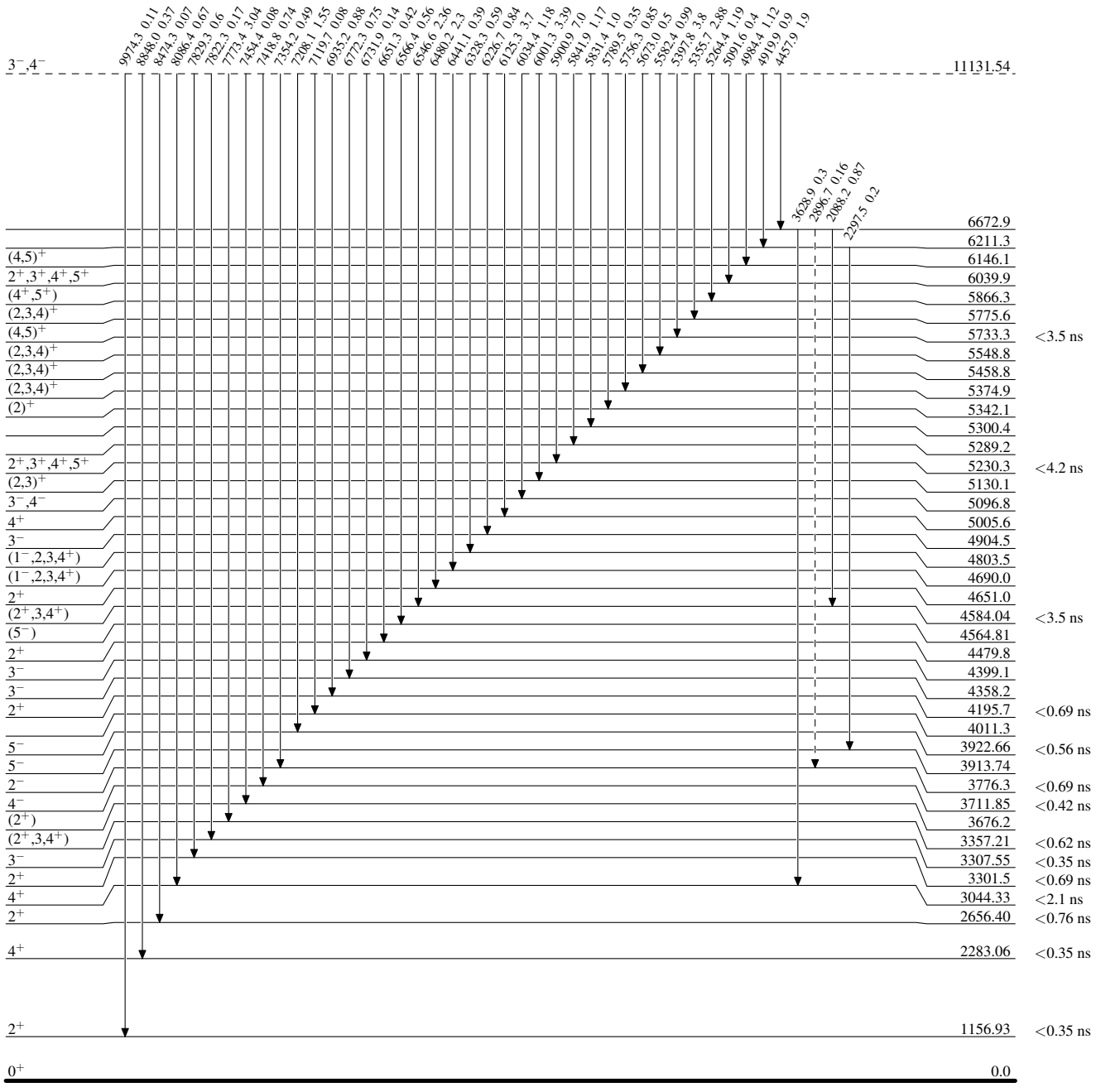
[†] Gamma energies in 1972Wh02 have been compared with those available in the PGAA database at the IAEA-NDS (2007ChZX).
[‡] Tentative placement (by evaluators) based on ^{44}K β^- decay.
[#] Small component belongs to 1496γ from 4804 level.
[@] Part of 1499.3 doublet.
[&] Poor fit. Level energy difference=6325.0.
[a] For intensity per 100 neutron captures, multiply by 1.0.
[b] Multiply placed with undivided intensity.
[c] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

^{43}Ca(n,γ) E=thermal 1972Wh02

Level Scheme

Intensities: I_γ per 100 neutron captures

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)



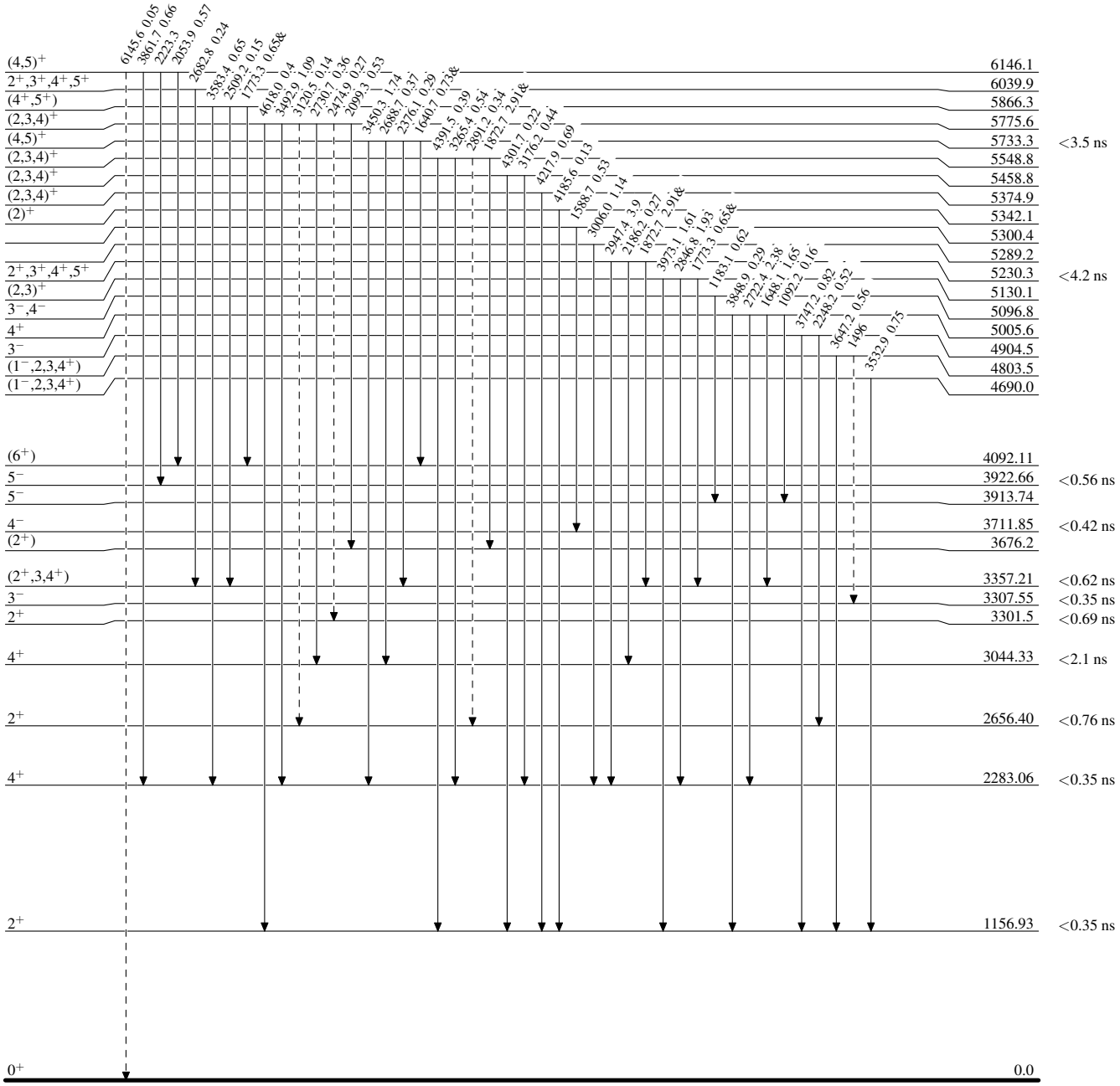
$^{44}_{20}Ca_{24}$

^{43}Ca(n,γ) E=thermal 1972Wh02

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)



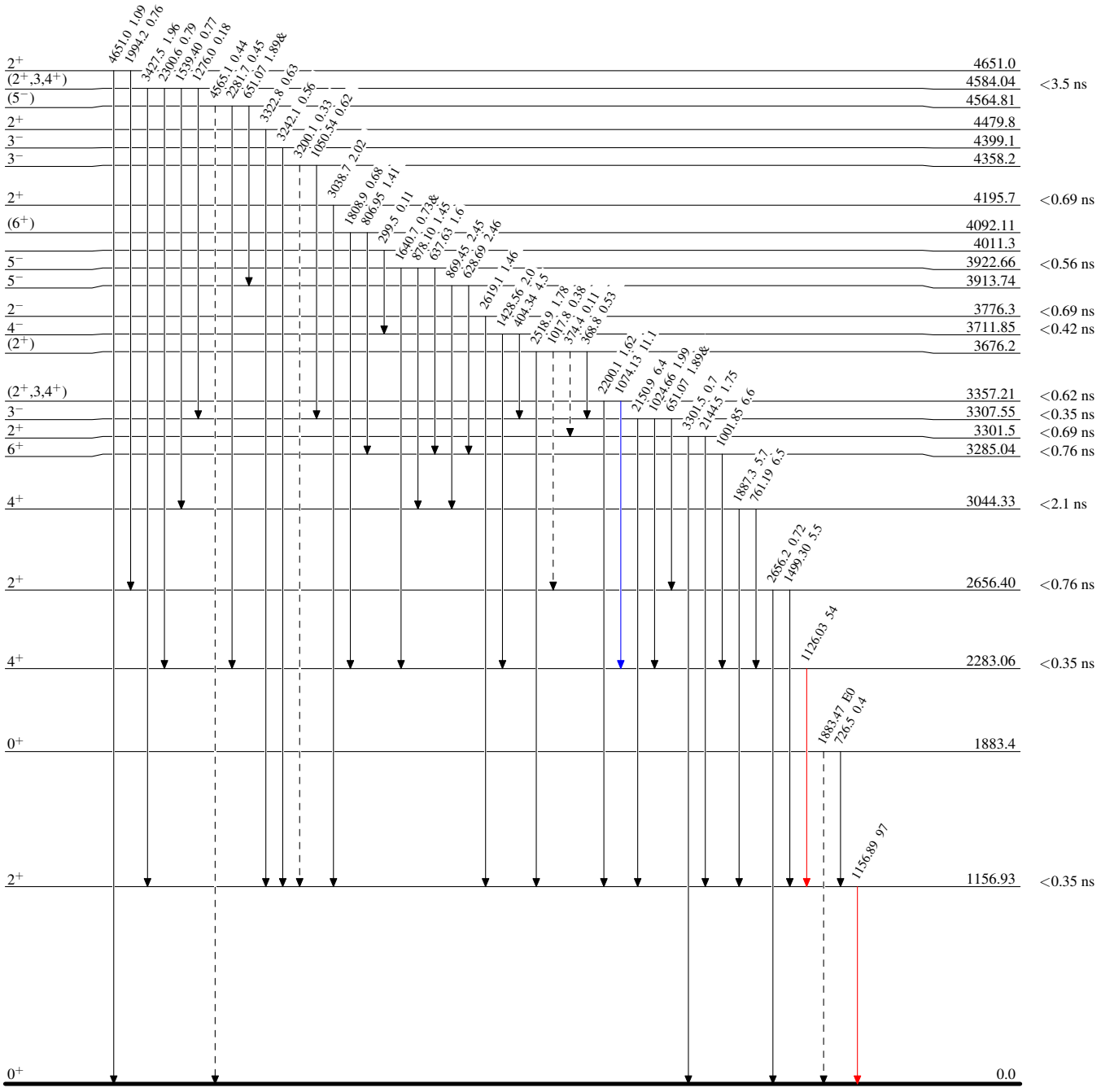
$^{44}_{20}Ca_{24}$

^{43}Ca(n,γ) E=thermal 1972Wh02

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)



$^{44}_{20}Ca_{24}$