^{115}In(n,γ) E=th 1976Al06,1972Ra39,1973Sc23

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 111, 717 (2010)	1-Dec-2009

The 936, 977 levels (1972Ra39) are not confirmed by $\gamma\gamma$ data of 1976Al06.
The capture-state spins are $4^+,5^+$.
Enriched and natural targets, thermal and resonant neutron capture. Measured γ (semi), (bent-crystal spectrometer), $\gamma\gamma$ (semi), Ce(magnetic spectrometer). 1973Sc23 studied ce-spectra up to E(ce)=500.
Other works: 1969Fu02, 1970AlZJ, 1970Ei04, 1970Wa22, 1970Lo09, 1972AlYP, 1972EmZX.
Earlier works: 1952Ha45, 1953Ba76, 1958Gr01, 1958Sk07, 1959Dr75, 1959Ha18, 1963Jo16, 1965Ba19.

^{116}In Levels

E(level)	J$^\pi$‡	$T_{1/2}$†	E(level)	J$^\pi$‡	$T_{1/2}$†
0.0	1^+	14.10 s *3*	920.81 *10*	$^+$	
127.267 *6*	5^+	54.15 min *6*	949.305 *10*	$4^+,5^+$	
223.330 *6*	4^+	<139 ps	951.476 *15*	4^-	
272.966 *2*	2^+	<69 ps	970.302 *8*	$3^+,4^+,5^+$	
289.660 *6*	8^-	2.18 s *4*	972.9 *8*		
313.476 *5*	$4^+,5^+$	631 ps *70*	1007.663 *13*	6^-	
350.576 *6*	7^-		1015.495 *21*	$4^-,5^-$	
366.418 *6*	$7^-,8^-,9^-$		1019.038 *12*	$3^-,4^-,5^-$	<104 ps
373.373 *9*	6^-		1031.226 *25*	4^+	
425.930 *5*	4^+	<208 ps	1052.680 *19*	5^-	
448.032 *4*	$1^-,2^-,3^-$		1057.340 *19*	$^+$	
458.942 *9*	5^-		1070.89 *10*	$3^+,(4,5)^+$	
460.000 *6*	$4^+,5^+$	<139 ps	1072.37 *17*	$4^-,5^-$	
508.241 *4*	3^+	<104 ps	1081.58 *18*	6^-	
554.979 *10*	$4^-,5^-$	<139 ps	1081.871 *24*	$5^+,(4)^+$	
556.849 *25*	2^-		1095.4 *21*		
648.916 *9*	$6^+,(4^+,5^+)$		1121.8 *17*		
658.073 *8*	3^+	<139 ps	1152.40 *8*	$6^-,(6^+)$	
665.616 *10*	$7^+,8^+$		1167.040 *10*	$^+$	
728.865 *11*	3^-	<104 ps	1187.27		
735.688 *10*	$4^+,5^+$		1204.36 *10*	$6^+,(7^+)$	
744.823 *8*	3^+		1213.456 *28*	$4^+,5^+$	
760.997 *10*	$6^+,7^+$		1252.65		
771.14 *10*	$(0^+,1^+,2^+,3^+)$		1285.692		
787.188 *40*	$(1^-,2^-,3^-)$		1285.83 *8*	$4^-,5^-$	
789.372 *9*	$5^+,6^+,7^+$		1304.43	$4,5^+$	
790.921 *18*	3^+		1341.8 *14*		
813.346 *8*	4^+		1374.43 *12*	$4^-,5^-$	
829.131 *8*	4^+	<139 ps	1399.77 *8*	5^+	
850.491 *23*	3^-		1426.4		
875.287 *33*	3^-		1437.7		
892.667 *12*	$4^-,5^-$		1451.07		
910.77 *10*	2^+		1465.9		
914.5 *5*			(6784.3# *9*)	$5^+,4^+$	

† From 1975Ra07 for E(level)>220, (except 290 isomer).
‡ From Adopted Levels.
# Av of S(n)=6784.2 *12* (1972Ra39), 6784.4 *11* (1974Co35). Other: 6783.7 *10* (1972StYZ).

^{115}In(n,γ) E=th 1976Al06,1972Ra39,1973Sc23 (continued)

$\gamma(^{116}In)$

Many other γ's from 5296.2 to 4578.6 are reported by 1972Ra39. If primary transitions, these gammas would populate levels from 1487.8 to 2205.4.

E_γ[#]	I_γ[†&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	α[a]	Comments
22.800 *8*	45 *15*	373.373	6^-	350.576	7^-	M1	5.20	α(L)=4.22 *6*; α(M)=0.820 *12*; α(N+..)=0.1606 *23* α(N)=0.1496 *21*; α(O)=0.01094 *16* Mult.: L1/L2/L3=80:6<:6<(1973Sc23).
42.15[‡] *5*	1.3 *3*	892.667	4^-,5^-	850.491	3^-	M1	6.18	α(K)=5.34 *8*; α(L)=0.684 *10*; α(M)=0.1330 *20*; α(N+..)=0.0261 *4* α(N)=0.0243 *4*; α(O)=0.00178 *3* α(K)exp=5.4 *25*; α(L1)exp=1.5 *8* (1973Sc23)
45.00[‡] *5*	1.1 *3*	1052.680	5^-	1007.663	6^-	M1	5.11	α(K)=4.41 *7*; α(L)=0.564 *9*; α(M)=0.1097 *16*; α(N+..)=0.0215 *3* α(N)=0.0200 *3*; α(O)=0.001471 *22* α(K)exp=9 *4*; α(L1)exp=1.1 *4* (1973Sc23)
[x]53.83[‡] *10*	0.3 *2*							
60.916 *1*	135 *40*	350.576	7^-	289.660	8^-	M1	2.11	α(K)exp=1.9 *2*; α(L1)exp=0.27 *10*; α(M)exp=0.06 *2* (1973Sc23); α(K)exp=1.8 *3* (1976Al06) α(K)=1.83 *3*; α(L)=0.233 *4*; α(M)=0.0452 *7*; α(N+..)=0.00888 *13* α(N)=0.00827 *12*; α(O)=0.000608 *9*
76.758 *2*	2.8 *4*	366.418	7^-,8^-,9^-	289.660	8^-	M1	1.085	α(K)=0.938 *14*; α(L)=0.1191 *17*; α(M)=0.0232 *4*; α(N+..)=0.00455 *7* α(N)=0.00424 *6*; α(O)=0.000312 *5* α(K)exp=2.4 *8* (1973Sc23); α(K)exp=1.0 *2* (1976Al06)
82.313 *3*	1.0 *2*	508.241	3^+	425.930	4^+	M1		α(K)exp=3.0 *15* (1973Sc23); α(K)exp=1.1 *2* (1976Al06) B(M1)(W.u.)>0.0081
84.308 *2*	3.8 *6*	829.131	4^+	744.823	3^+	M1		α(L1)exp=0.10 *4* (1973Sc23); α(K)exp=0.92 *14* (1976Al06) B(M1)(W.u.)>0.023
85.569 *2*	157 *11*	458.942	5^-	373.373	6^-	M1		α(K)exp=0.66 *5*; α(L1)exp=0.08 *1*; α(M)exp=0.026 *6* (1973Sc23) α(K)exp=0.74 *7* (1976Al06)
[x]85.948 *6*	1.5 *2*							I_γ: Iγ from 1976Al06, normalized to data of 1972Ra39 at the 293γ.
90.150 *4*	0.38 *15*	313.476	4^+,5^+	223.330	4^+	M1,E1		
95.380 *4*	6 *2*	760.997	6^+,7^+	665.616	7^+,8^+	M1,E1		α(L)exp=0.07 *7* (1973Sc23); α(K)exp<0.8 (1976Al06) Mult.: L(d,p)=2 for 760.997 level, consistent with mult.=M1, not E1.
96.040 *5*	70 *6*	554.979	4^-,5^-	458.942	5^-	M1		α(K)exp=0.47; α(L1)exp=0.057 *6*; α(M)exp=0.010 *3* (1973Sc23); α(K)exp=0.63 *5* (1976Al06) B(M1)(W.u.)>0.18
96.066 *5*	109 *8*	223.330	4^+	127.267	5^+	M1	0.572	B(M1)(W.u.)>0.18 I_γ: doublet Iγ(96.04)/Iγ(96.07)=0.64 *5* (1976Al06).
[x]99.45 *5*	1.1 *2*					M1,(E1)	0.35 *17*	α(K)exp=0.42 *17* (1976Al06)
[x]101.02 *5*	0.6 *3*							
101.16 *4*	1.1 *5*	1052.680	5^-	951.476	4^-	M1		α(K)exp=0.45 *17* (1976Al06)
[x]108.3[‡] *2*	0.15 *10*							
[x]110.778 *4*	1.7 *2*					M1		α(K)exp=0.5 *2* (1973Sc23); α(K)exp=0.35 *7* (1976Al06)

From ENSDF

$^{116}_{49}In_{67}$-2

^{115}In(n,γ) E=th 1976Al06,1972Ra39,1973Sc23 (continued)

γ(^{116}In) (continued)

E_γ[#]	I_γ[†&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	Comments
112.082 *6*	1.4 *5*	760.997	$6^+,7^+$	648.916	$6^+,(4^+,5^+)$		
112.456 *3*	7.0 *7*	425.930	4^+	313.476	$4^+,5^+$	M1	α(K)exp=0.58 *8* (1973Sc23); α(K)exp=0.24 *6* (1976Al06) B(M1)(W.u.)>0.0068
114.997 *3*	3.0 *3*	1007.663	6^-	892.667	$4^-,5^-$	E2	α(K)exp=0.67 *10*; α(L)exp=0.13 *5* (1973Sc23); α(K)exp=0.73 *6* (1976Al06) α(L)exp=0.19 *2* (1976Al06)
126.372 *2*	24.7 *12*	1019.038	$3^-,4^-,5^-$	892.667	$4^-,5^-$	M1	α(K)exp=0.20 *2*; α(L1)exp=0.05 *2* (1973Sc23); α(K)exp=0.23 *1* (1976Al06) B(M1)(W.u.)>0.089
132.94 *15*	0.9 *3*	790.921	3^+	658.073	3^+		
[x]136.3[‡] *2*	0.2 *1*						
140.456 *2*	12.3 *20*	789.372	$5^+,6^+,7^+$	648.916	$6^+,(4^+,5^+)$	M1	α(K)exp=0.14 *6* (1973Sc23); α(K)exp=0.19 *2* (1976Al06)
141.171 *2*	13.7 *20*	970.302	$3^+,4^+,5^+$	829.131	4^+	M1	α(K)exp=0.19 *2* (1976Al06)
143.55[‡] *10*	0.2 *1*	1019.038	$3^-,4^-,5^-$	875.287	3^-		
146.524 *2*	1.2 *2*	460.000	$4^+,5^+$	313.476	$4^+,5^+$		
149.670 *2*	4.0 *3*	920.81	$^+$	771.14	$(0^+,1^+,2^+,3^+)$	M1	α(K)exp=0.15 *6* (1973Sc23); α(K)exp=0.16 *2* (1976Al06)
155.270 *3*	14.2 *20*	813.346	4^+	658.073	3^+	M1	α(K)exp=0.12 *2*; α(L)exp=0.03 *1* (1973Sc23,1976Al06)
156.955 *4*	1.3 *2*	970.302	$3^+,4^+,5^+$	813.346	4^+		
159.932 *4*	3.0 *5*	949.305	$4^+,5^+$	789.372	$5^+,6^+,7^+$		
162.393 *3*	147 *10*	289.660	8^-	127.267	5^+	E3	α(K)exp=1.1 *1*; α(L)exp=0.59 *6*; α(M)exp=0.12 *2* B(E3)(W.u.)=0.234 *5* α(K)exp: K/L/M=100:46:11 (1973Sc23).
163.809 *11*	2.2 *5*	892.667	$4^-,5^-$	728.865	3^-		
171.074 *9*	17.4 *15*	829.131	4^+	658.073	3^+	M1	α(K)exp=0.08 *3* (1973Sc23); α(K)exp=0.094 *5* (1976Al06) B(M1)(W.u.)>0.012
[x]173.48 *43*	2.7 *11*						
173.889 *6*	22 *3*	728.865	3^-	554.979	$4^-,5^-$	M1	α(K)exp=0.11 *3* (1973Sc23); α(K)exp=0.078 *11* (1976Al06) B(M1)(W.u.)>0.040
175.066 *4*	5.0 *6*	448.032	$1^-,2^-,3^-$	272.966	2^+	E1	α(K)exp=0.06 *3* (1973Sc23); α(K)exp=0.033 *7* (1976Al06)
[x]176.826 *14*	1.9 *3*						
180.954 *21*	1.0 *2*	970.302	$3^+,4^+,5^+$	789.372	$5^+,6^+,7^+$		
186.210 *3*	138 *11*	313.476	$4^+,5^+$	127.267	5^+	M1	α(K)exp=0.09 *2*; α(L)exp=0.010 *1* (1973Sc23); α(L)exp=0.0073 *6* (1976Al06) B(M1)(W.u.)=0.0054 *9*
[x]193.44 *8*	0.6 *3*						
196.738 *5*	4.0 *5*	1167.040	$^+$	970.302	$3^+,4^+,5^+$	M1,E2	α(K)exp=0.11 *1* (1976Al06)
202.154 *16*	1.7 *5*	1015.495	$4^-,5^-$	813.346	4^+		
202.154 *16*	1.7 *5*	1052.680	5^-	850.491	3^-		
202.605 *6*	10.3 *11*	425.930	4^+	223.330	4^+	M1	α(K)exp=0.07 *2* (1973Sc23); α(K)exp=0.055 *6* (1976Al06) B(M1)(W.u.)>0.0017
[x]208.89[‡] *6*	1.8 *4*						
213.638 *20*	3.6 *5*	949.305	$4^+,5^+$	735.688	$4^+,5^+$	M1,(E1)	α(K)exp=0.06 *5* (1973Sc23); α(K)exp=0.038 *12* (1976Al06)
[x]216.488 *25*	3.1 *5*					M1	α(K)exp=0.14 *5* (1973Sc23); α(K)exp=0.035 *10* (1976Al06)
217.87 *3*	0.5 *3*	1031.226	4^+	813.346	4^+		
222.62 *3*	0.6 *3*	951.476	4^-	728.865	3^-		

From ENSDF

$^{116}_{49}In_{67}$-3

^{115}In(n,γ) E=th 1976Al06,1972Ra39,1973Sc23 (continued)

$\gamma(^{116}In)$ (continued)

E_γ[#]	I_γ[†&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	Comments
225.47 *3*	0.6 *3*	970.302	$3^+,4^+,5^+$	744.823	3^+		
230.33 *4*	0.6 *3*	787.188	$(1^-,2^-,3^-)$	556.849	2^-	M1	α(K)exp=0.037 *15* (1976Al06)
234.603 *10*	4.3 *13*	970.302	$3^+,4^+,5^+$	735.688	$4^+,5^+$		α(K)exp=0.047 *8*
235.278 *4*	19.1 *16*	508.241	3^+	272.966	2^+	M1	α(K)exp=0.034 *4* (1976Al06) B(M1)(W.u.)>0.0066
240.31 *4*	1.7 *3*	1031.226	4^+	790.921	3^+	M1,(E2)	α(K)exp=0.033 *14* (1976Al06)
243.16 *3*	0.7 *2*	1213.456	$4^+,5^+$	970.302	$3^+,4^+,5^+$	M1,(E2)	α(K)exp=0.039 *8* (1976Al06)
246.099 *15*	1.4 *3*	373.373	6^-	127.267	5^+	E1	α(K)exp<0.015 (1976Al06)
252.75 *12*	0.6 *2*	910.77	2^+	658.073	3^+		
[x]262.22 *5*	2.4 *5*						
267.97 *4*	2.4 *6*	1057.340	$^+$	789.372	$5^+,6^+,7^+$		
272.966 *2*	204 *10*	272.966	2^+	0.0	1^+	M1	α(K)exp=0.027 *2*; α(L)exp=0.004 *1* (1973Sc23,1976Al06) B(M1)(W.u.)>0.016
[x]282.82 *4*	1.1 *4*						
284.903 *7*	26.8 *15*	508.241	3^+	223.330	4^+	M1	α(K)exp=0.026 *3* (1973Sc23); α(K)exp=0.024 *2* (1976Al06) B(M1)(W.u.)>0.0052
290.950 *15*	15.6 *8*	1081.871	$5^+,(4)^+$	790.921	3^+	E2,(M1)	α(K)exp=0.045 *10* (1973Sc23); α(K)exp=0.028 *2* (1976Al06)
293.19[‡] *15*	2.5 *8*	951.476	4^-	658.073	3^+		
293.641 *12*	6.0 *10*	850.491	3^-	556.849	2^-	M1	α(K)exp=0.04 *2* (1973Sc23); α(K)exp=0.017 *1* (1976Al06)
295.52 *3*	17.9 *11*	850.491	3^-	554.979	$4^-,5^-$	M1	α(K)exp=0.020 *6* (1973Sc23); α(K)exp=0.016 *2* (1976Al06)
298.659 *5*	59 *3*	425.930	4^+	127.267	5^+	M1	α(K)exp=0.024 *2*; α(L)exp=0.004 *2* (1973Sc23); α(K)exp=0.019 *2* (1976Al06) B(M1)(W.u.)>0.0031
299.5[‡] *5*	1.3 *8*	665.616	$7^+,8^+$	366.418	$7^-,8^-,9^-$		
300.25[‡] *15*	3.2 *8*	949.305	$4^+,5^+$	648.916	$6^+,(4^+,5^+)$		
[x]303.06 *5*	0.7 *2*						
305.130 *12*	6.0 *5*	813.346	4^+	508.241	3^+	M1	α(K)exp=0.016 *2* (1976Al06)
[x]307.97 *2*	0.52 *12*						
315.005 *30*	4.2 *4*	665.616	$7^+,8^+$	350.576	7^-	E1	α(K)exp=0.007 *2* (1976Al06)
318.56 *9*	3.1 *6*	875.287	3^-	556.849	2^-	(M1)	α(K)exp=0.013 *3* (1976Al06)
[x]319.42 *9*	2.7 *10*					M1,E2	α(K)exp=0.019 *4* (1976Al06)
320.907 *16*	9.1 *11*	829.131	4^+	508.241	3^+	M1,E2	α(K)exp=0.05 *1* (1973Sc23); α(K)exp=0.015 *3* (1976Al06)
321.65 *2*	4.0 *16*	1057.340	$^+$	735.688	$4^+,5^+$	M1,E2	α(K)exp=0.020 *4* (1976Al06)
[x]331.62 *20*	2.5 *5*						
335.458 *13*	59 *4*	648.916	$6^+,(4^+,5^+)$	313.476	$4^+,5^+$	M1,E2	α(K)exp=0.016 *2* (1973Sc23); α(K)exp=0.019 *1* (1976Al06)
335.80[‡] *4*	2.0 *15*	892.667	$4^-,5^-$	556.849	2^-		
337.717 *23*	15.6 *16*	892.667	$4^-,5^-$	554.979	$4^-,5^-$	M1,E2	α(K)exp=0.018 *4* (1973Sc23); α(K)exp=0.017 *2* (1976Al06)
339.26[‡] *10*	2.9 *5*	787.188	$(1^-,2^-,3^-)$	448.032	$1^-,2^-,3^-$		
[x]349.64[‡] *10*	1.7 *4*					M1,E2	α(K)exp=0.028 *9* (1976Al06)
[x]358.76 *4*	1.9 *4*					M1,E2	α(K)exp=0.026 *9* (1976Al06)
[x]359.46 *4*	1.0 *3*						
365.16 *7*	3.3 *5*	790.921	3^+	425.930	4^+	M1,E2	α(K)exp=0.013 *2* (1976Al06)

From ENSDF

$^{116}_{49}In_{67}$-4

^{115}In(n,γ) E=th 1976Al06,1972Ra39,1973Sc23 (continued)

$\gamma(^{116}In)$ (continued)

E_γ[#]	I_γ[†&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	Comments
368.57 *8*	0.8 *4*	1399.77	5^+	1031.226	4^+		
[x]369.9 *1*	0.5 *3*						
[x]372.66 *20*	2.7 *5*						
373.34 *20*	2.2 *4*	1031.226	4^+	658.073	3^+	M1,E2	α(K)exp=0.013 *2* (1976Al06)
[x]374.85 *14*	3.5 *10*						
375.95 *2*	16.6 *16*	665.616	7^+,8^+	289.660	8^-	E1	α(K)exp=0.0032 *8* (1976Al06)
[x]379.58 *6*	6.2 *6*					M1,E2	α(K)exp=0.013 *4* (1976Al06)
384.41 *5*	18 *4*	892.667	4^-,5^-	508.241	3^+		α(K)exp=0.009 *1*; α(L)exp=0.004 *1* (1973Sc23) Mult.: α(K)exp suggests mult=E2 or M1; however, placement requires $\Delta\pi$=yes.
385.099 *12*	58 *6*	658.073	3^+	272.966	2^+	M1,E2	α(L)exp=0.0013 *1* (1976Al06)
387.67 *7*	0.5 *3*	760.997	6^+,7^+	373.373	6^-		
393.12[‡] *12*	2.5 *3*	1285.83	4^-,5^-	892.667	4^-,5^-		
394.7[‡] *3*	1.5 *2*	949.305	4^+,5^+	554.979	4^-,5^-		
396.43 *3*	2.3 *3*	951.476	4^-	554.979	4^-,5^-	M1,E2	α(K)exp=0.018 *3* (1976Al06)
402.3[‡] *3*	0.6 *3*	910.77	2^+	508.241	3^+		
410.394 *15*	4.6 *13*	760.997	6^+,7^+	350.576	7^-		
422.204 *19*	8.8 *6*	735.688	4^+,5^+	313.476	4^+,5^+	M1,E2	α(K)exp=0.0084 *8* (1976Al06)
433.713 *14*	35.4 *16*	892.667	4^-,5^-	458.942	5^-	M1,E2	α(K)exp=0.008 *3* (1973Sc23)
[x]435.97 *30*	1.8 *5*						
443.26 *4*	2.7 *6*	951.476	4^-	508.241	3^+		
447.36 *15*	1.4 *4*	760.997	6^+,7^+	313.476	4^+,5^+		
[x]448.9 *1*	1.1 *4*						
[x]452.59[‡] *18*	1.3 *3*						
[x]458.3 *1*	3.5 *13*					M1,E2	α(K)exp=0.009 *3* (1976Al06)
[x]459.4 *1*	2.2 *4*						
[x]465.53 *10*	3.5 *5*					M1,E2	α(K)exp=0.011 *2* (1976Al06)
468.62 *10*	1.8 *4*	1213.456	4^+,5^+	744.823	3^+	M1,E2	α(K)exp=0.008 *2* (1976Al06)
471.824 *19*	25.2 *13*	760.997	6^+,7^+	289.660	8^-	M1,E1	α(K)exp=0.008 *4* (1973Sc23); α(K)exp=0.0087 *8* (1976Al06) E_γ: could be placed also from 744.8 level.
[x]474.22 *10*	4.1 *8*						
475.88 *3*	9.0 *16*	789.372	5^+,6^+,7^+	313.476	4^+,5^+	M1,E2	α(K)exp=0.005 *2* (1976Al06)
[x]476.69 *6*	3.8 *16*						
[x]485.57[‡] *17*	2.6 *4*						
490.03 *20*	4.9 *5*	949.305	4^+,5^+	458.942	5^-		
[x]491.6 *3*	2 *1*						
492.528 *14*	17.7 *13*	951.476	4^-	458.942	5^-	M1,E2	α(K)exp=0.007 *4* (1973Sc23)
497.70 *6*	2.7 *5*	1052.680	5^-	554.979	4^-,5^-	M1,E2	α(K)exp=0.006 *2* (1976Al06)
500.16 *30*	1.5 *8*	813.346	4^+	313.476	4^+,5^+		
515.68 *30*	4 *1*	829.131	4^+	313.476	4^+,5^+		
515.94[‡] *13*	1.5 *10*	1070.89	3^+,$(4,5)^+$	554.979	4^-,5^-		
517.946 *20*	17 *2*	790.921	3^+	272.966	2^+	M1,E2	α(K)exp=0.006 *4* (1973Sc23)
518.1[‡] *2*	1.5 *10*	1167.040	$^+$	648.916	6^+,$(4^+,5^+)$		

From ENSDF

$^{116}_{49}In_{67}$-5

^{115}In(n,γ) E=th 1976Al06,1972Ra39,1973Sc23 (continued)

γ(^{116}In) (continued)

E_γ[#]	I_γ[†&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	Comments
521.5 *5*	1.0 *6*	648.916	6^+,(4^+,5^+)	127.267	5^+		
521.59[‡] *5*	11.2 *15*	744.823	3^+	223.330	4^+	M1,E2	α(K)exp=0.0056 *11* (1976Al06)
[x]524.3[‡] *5*	1.5 *6*						
540.48 *8*	3.8 *5*	813.346	4^+	272.966	2^+	E2	α(K)exp=0.0012 *8* (1976Al06)
[x]545.5[‡] *4*	2.5 *4*						
548.69 *3*	11.6 *11*	1007.663	6^-	458.942	5^-	M1,E2	α(K)exp=0.0034 *3* (1976Al06)
[x]553.0[‡] *5*	1.9 *4*						
555.45 *12*	5 *3*	1204.36	6^+,(7^+)	648.916	6^+,(4^+,5^+)		
556.15[‡] *10*	10 *5*	829.131	4^+	272.966	2^+		
556.75 *3*	20 *5*	556.849	2^-	0.0	1^+	E1	α(K)exp=0.0017 *2* (1976Al06)
559.93 *12*	4.1 *13*	1019.038	3^-,4^-,5^-	458.942	5^-	M1,E2	α(K)exp=0.0049 *7* (1976Al06)
[x]564.16 *10*	2.7 *8*					M1,E2	α(K)exp=0.0050 *17* (1976Al06)
[x]565.0[‡] *4*	2.0 *1*						
567.75 *10*	5.6 *6*	790.921	3^+	223.330	4^+	M1,E2,E1	α(K)exp=0.0023 *9* (1976Al06)
[x]573.7[‡] *3*	1.7 *3*						
[x]576.2[‡] *4*	2.7 *13*						
577.51 *5*	10.7 *13*	850.491	3^-	272.966	2^+	E1	α(K)exp=0.0013 *3* (1976Al06)
586.36[‡] *23*	1.7 *3*	1399.77	5^+	813.346	4^+	M1,E2	α(K)exp=0.010 *3* (1976Al06)
[x]589.4 *2*	2.6 *4*					M1,E2	α(K)exp=0.0069 *18* (1976Al06)
[x]592.88[‡] *18*	2.8 *4*						
[x]597.38 *12*	3.2 *5*					M1,E2	α(K)exp=0.0029 *9* (1976Al06)
[x]599.5[‡] *47*	1.4 *3*						
602.30 *4*	16 *2*	875.287	3^-	272.966	2^+	E1	α(K)exp=0.0013 *2* (1976Al06)
[x]605.22[‡] *15*	3.2 *5*						
608.36 *5*	18.8 *27*	735.688	4^+,5^+	127.267	5^+	M1,E2	α(K)exp=0.0033 *3* (1976Al06)
617.9[‡] *4*	1.2 *3*	744.823	3^+	127.267	5^+		
622.64 *18*	3.5 *5*	1081.58	6^-	458.942	5^-	M1,E2	α(K)exp=0.0034 *6* (1976Al06)
632.40 *13*	8.0 *16*	760.997	6^+,7^+	127.267	5^+		
634.07 *11*	7.7 *16*	1007.663	6^-	373.373	6^-	M1,E2,E1	α(K)exp=0.002 *1* (1976Al06)
[x]645.62 *24*	2.4 *4*					M1,E2	α(K)exp=0.006 *2* (1976Al06)
647.98[‡] *17*	5.3 *7*	920.81	$^+$	272.966	2^+	M1,E2	α(K)exp=0.0030 *8* (1976Al06)
654.92[‡] *20*	3.0 *4*	1399.77	5^+	744.823	3^+		
657.15 *12*	7.2 *6*	1007.663	6^-	350.576	7^-	M1,E2	α(K)exp=0.0045 *8* (1976Al06)
662.16[‡] *25*	1.3 *3*	789.372	5^+,6^+,7^+	127.267	5^+		
[x]669.8[‡] *5*	1.1 *3*						
[x]672.2[‡] *6*	0.7 *3*						
[x]679.6[‡] *5*	0.6 *2*						
[x]685.5[‡] *3*	1.3 *3*						

From ENSDF

$^{116}_{49}In_{67}$-6

^{115}In(n,γ) E=th 1976Al06,1972Ra39,1973Sc23 (continued)

$\gamma(^{116}In)$ (continued)

E_γ[#]	I_γ[†&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	Comments
693.44 *12*	7.3 *11*	1152.40	6^-,(6^+)	458.942	5^-	M1,E2	α(K)exp=0.0034 *8* (1976Al06)
x703.0‡ *3*	1.4 *3*					M1,E2	α(K)exp=0.0032 *9* (1976Al06).
706.22 *25*	2.4 *4*	1451.07		744.823	3^+		
x711.27‡ *22*	3.0 *5*						
x713.8‡ *3*	3.2 *5*						
x717.2‡ *4*	3.9 *10*						
x718.96‡ *21*	6.8 *14*					M1,E2	α(K)exp=0.0018 *7* (1976Al06)
x730.85‡ *16*	8.4 *13*					M1,E2	α(K)exp=0.0028 *6* (1976Al06)
x737.2‡ *3*	1.4 *4*						
x744.50‡ *23*	4.0 *8*					M1,E2	α(K)exp=0.0023 *8* (1976Al06).
747.3‡ *8*	2.6 *8*	970.302	3^+,4^+,5^+	223.330	4^+	M1,E2	α(K)exp=0.0024 *11* (1976Al06).
x749.62‡ *20*	8.3 *17*					M1,E2	α(K)exp<0.0010 (1976Al06)
x758.89‡ *17*	6.0 *12*					D,E2	α(K)exp=0.0020 *10* (1976Al06)
x764.54‡ *16*	8.8 *11*					E1	α(K)exp<0.0012 (1976Al06)
771.00‡ *16*	7.3 *10*	771.14	(0^+,1^+,2^+,3^+)	0.0	1^+	M1,E2	α(K)exp=0.0036 *8* (1976Al06).
x779.18‡ *19*	4.0 *5*						
x782.71‡ *24*	2.2 *4*						
x788.44‡ *21*	2.6 *4*						
791.5‡ *6*	6.7 *7*	1015.495	4^-,5^-	223.330	4^+	E1	α(L)exp<0.0012 (1976Al06).
x796.40‡ *17*	4.4 *5*						
x801.15‡ *20*	4.6 *6*					M1,E2	α(K)exp=0.0020 *5* (1976Al06)
808.6‡ *10*	2.7 *10*	1031.226	4^+	223.330	4^+		
x814.07‡ *27*	5.2 *12*						
819.5‡ *2*	5 *2*	1374.43	4^-,5^-	554.979	4^-,5^-	M1,E2	α(K)exp=0.0023 *8* (1976Al06).
x822.6‡ *3*	5.9 *16*						
x827.7‡ *7*	0.6 *3*						
x830.8‡ *5*	1.1 *4*						
x837.01‡ *23*	2.0 *4*						
x844.24‡ *24*	2.5 *4*						
847.53‡ *16*	10.5 *15*	1070.89	3^+,($4,5$)$^+$	223.330	4^+	M1,E2	α(K)exp=0.0020 *6* (1976Al06)
x852.30‡ *19*	3.1 *5*						
x859.26‡ *20*	2.6 *4*						
x874.31‡ *25*	2.4 *5*						
x877.2‡ *4*	1.6 *5*						
x885.06‡ *17*	5.4 *7*						

From ENSDF

$^{116}_{49}In_{67}$-7

^{115}In(n,γ) E=th 1976Al06,1972Ra39,1973Sc23 (continued)

$\gamma(^{116}In)$ (continued)

E_γ #	I_γ †&	E_i(level)	J_i^π	E_f	J_f^π
896.1 [b] 5	1.2 5	1451.07		554.979	$4^-,5^-$
x903.70 ‡ 20	6.4 6				
x910.8 ‡ 3	1.5 3				
x915.32 ‡ 17	4.6 5				
x925.29 ‡ 18	3.7 4				
x930.60 ‡ 24	2.3 4				
x934.11 ‡ 17	5.4 6				
x939.60 ‡ 18	3.9 5				
x944.27 ‡ 16	10.4 12				
x947.69 ‡ 18	5.5 6				
x956.3 ‡ 4	0.9 3				
x963.11 ‡ 20	4.9 6				
x965.7 ‡ 4	2.7 5				
x968.94 ‡ 20	4.3 5				
x972.52 ‡ 16	9.0 10				
x982.7 ‡ 5	1.1 4				
x986.0 ‡ 5	1.3 4				
992.10 [b] 17	5.6 6	1451.07		458.942	5^-
x997.7 ‡ 3	1.6 3				
x1001.51 ‡ 33	1.5 3				
x1019.50 ‡ 36	1.5 3				
x1023.37 ‡ 25	5.2 8				
x1025.99 ‡ 31	3.3 7				
x1030.54 ‡ 26	2.2 4				
x1039.55 ‡ 20	3.6 4				
x1047.66 ‡ 31	1.2 4				
x1053.24 ‡ 33	1.3 4				
x1077.09 ‡ 16	8.6 12				
5333.2 11	3.8 7	(6784.3)	$5^+,4^+$	1451.07	
5347.0 11	1.9 4	(6784.3)	$5^+,4^+$	1437.7	
5358.4 12	2.2 5	(6784.3)	$5^+,4^+$	1426.4	
5384.9 14	0.23 7	(6784.3)	$5^+,4^+$	1399.77	5^+
5409.9 11	2.5 5	(6784.3)	$5^+,4^+$	1374.43	$4^-,5^-$
5442.7 11	0.46 10	(6784.3)	$5^+,4^+$	1341.8	
5481.7 11	1.02 19	(6784.3)	$5^+,4^+$	1304.43	$4,5^+$
5499.1 20	1.5 3	(6784.3)	$5^+,4^+$	1285.83	$4^-,5^-$
5525.8 20	0.51 11	(6784.3)	$5^+,4^+$		
5532.1 20	0.11 5	(6784.3)	$5^+,4^+$	1252.65	
5570.7 11	0.86 17	(6784.3)	$5^+,4^+$	1213.456	$4^+,5^+$
5579.4 11	1.30 25	(6784.3)	$5^+,4^+$	1204.36	$6^+,(7^+)$
5596.3 16	0.10 4	(6784.3)	$5^+,4^+$	1187.27	
5617.3 14	0.14 4	(6784.3)	$5^+,4^+$	1167.040	$^+$
5662.5 14	0.15 5	(6784.3)	$5^+,4^+$	1121.8	
5688.4 19	0.10 5	(6784.3)	$5^+,4^+$	1095.4	
5703.1 16	0.16 5	(6784.3)	$5^+,4^+$	1081.58	6^-
5713.3 13	0.30 7	(6784.3)	$5^+,4^+$	1072.37	$4^-,5^-$
5731.3 12	0.57 12	(6784.3)	$5^+,4^+$	1052.680	5^-
5752.8 12	0.57 12	(6784.3)	$5^+,4^+$	1031.226	4^+
5769.3 12	1.4 3	(6784.3)	$5^+,4^+$	1015.495	$4^-,5^-$
5776.2 13	0.61 14	(6784.3)	$5^+,4^+$	1007.663	6^-
5807.0 35	0.07 7	(6784.3)	$5^+,4^+$	972.9	
5811.9 13	0.63 15	(6784.3)	$5^+,4^+$	970.302	$3^+,4^+,5^+$
5834.8 12	0.43 9	(6784.3)	$5^+,4^+$	949.305	$4^+,5^+$
5892.5 12	8.6 16	(6784.3)	$5^+,4^+$	892.667	$4^-,5^-$
5994.2 13	0.16 5	(6784.3)	$5^+,4^+$	790.921	3^+
6048.4 13	0.45 10	(6784.3)	$5^+,4^+$	735.688	$4^+,5^+$
6057.0 49		(6784.3)	$5^+,4^+$	728.865	3^-
6125.3 13	0.17 4	(6784.3)	$5^+,4^+$	658.073	3^+
6134.9 13	0.55 11	(6784.3)	$5^+,4^+$	648.916	$6^+,(4^+,5^+)$
6229.0 18	0.52 11	(6784.3)	$5^+,4^+$	554.979	$4^-,5^-$
6277.4 24	0.04 2	(6784.3)	$5^+,4^+$	508.241	3^+
6325.0 14	0.71 15	(6784.3)	$5^+,4^+$	458.942	5^-
6410.4 14	0.92 20	(6784.3)	$5^+,4^+$	373.373	6^-
6470.4 17	0.07 2	(6784.3)	$5^+,4^+$	313.476	$4^+,5^+$
6559.3 15	0.16 4	(6784.3)	$5^+,4^+$	223.330	4^+
6656.3 15	0.17 5	(6784.3)	$5^+,4^+$	127.267	5^+

From ENSDF

$^{116}_{49}In_{67}$-8

^{115}In(n,γ) E=th 1976Al06,1972Ra39,1973Sc23 (continued)

$\gamma(^{116}In)$ (continued)

† Photons per 1000 n-captures (1972Ra39) normalized to Iγ(5892γ)=8.6 *16*, an average of values of 1953Ba76 and 1958Gr01. The uncertainties are relative only and the additional uncertainty estimated by 1972Ra39 to be<15%.

‡ From 1972Ra39.

From 1976Al06 for the secondary γ's, except where noted otherwise. The values for the primary γ's are weighted averages of values of of 1970Lo09 and 1974Co35.

@ Deduced from α(K)exp,α(L)exp,L1/L2/L3 data. α(K)exp of 1976Al06 were normalized to theoretical values for the 60.9γ (M1) and 85.5γ (M1). α(K)exp of 1973Sc23 also included theoretical values for 162.4γ (E3) and 186.2γ (M1).

& For intensity per 100 neutron captures, multiply by 0.1.

a 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.

b Placement of transition in the level scheme is uncertain.

x γ ray not placed in level scheme.

From ENSDF

$^{116}_{49}In_{67}$-9

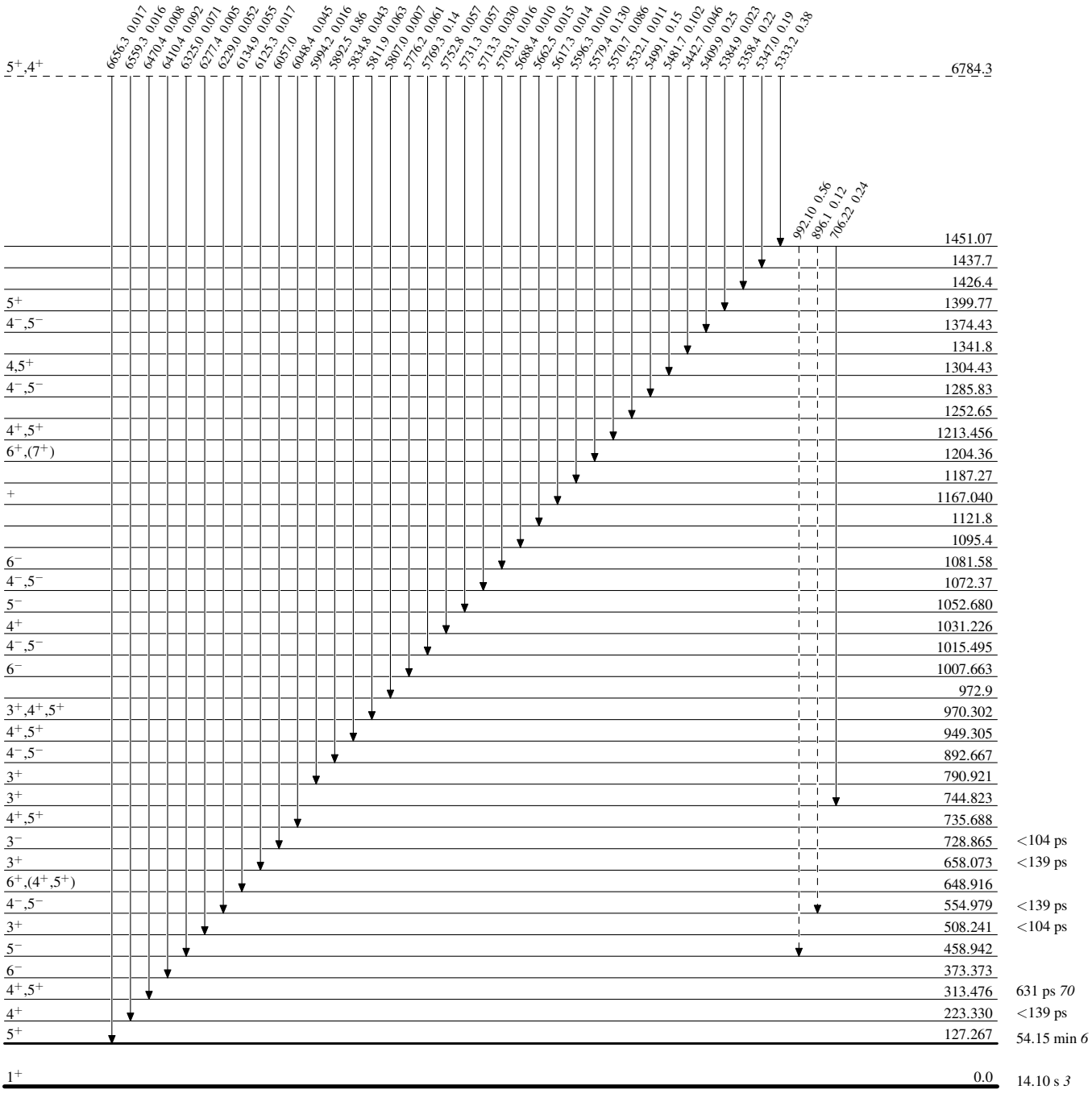
^{115}In(n,γ) E=th 1976Al06,1972Ra39,1973Sc23

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)

Level Scheme

Intensities: Photons per 1000 N-captures

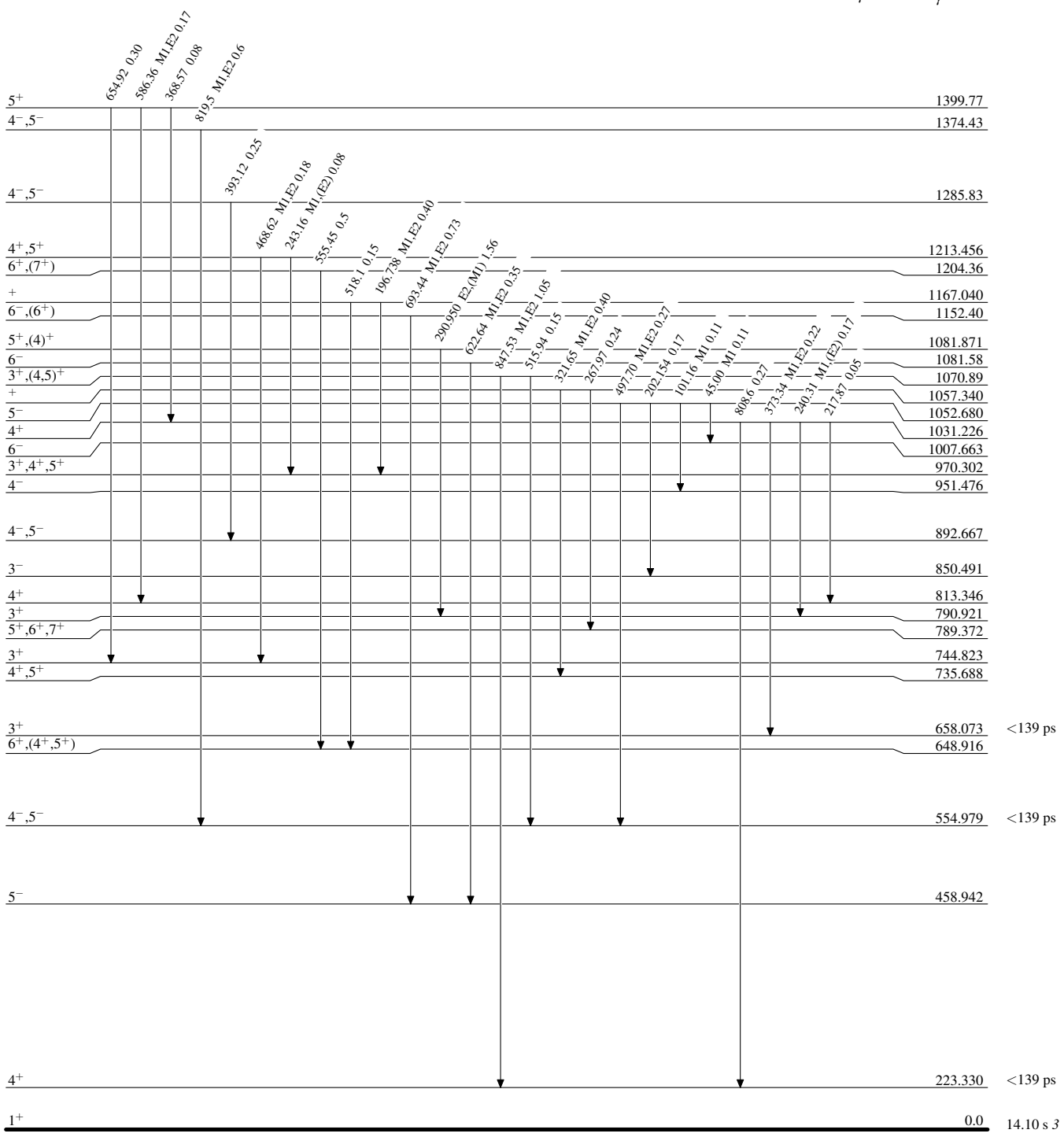


$^{116}_{49}In_{67}$

^{115}In(n,γ) E=th 1976Al06,1972Ra39,1973Sc23

Level Scheme (continued)

Intensities: Photons per 1000 N-captures

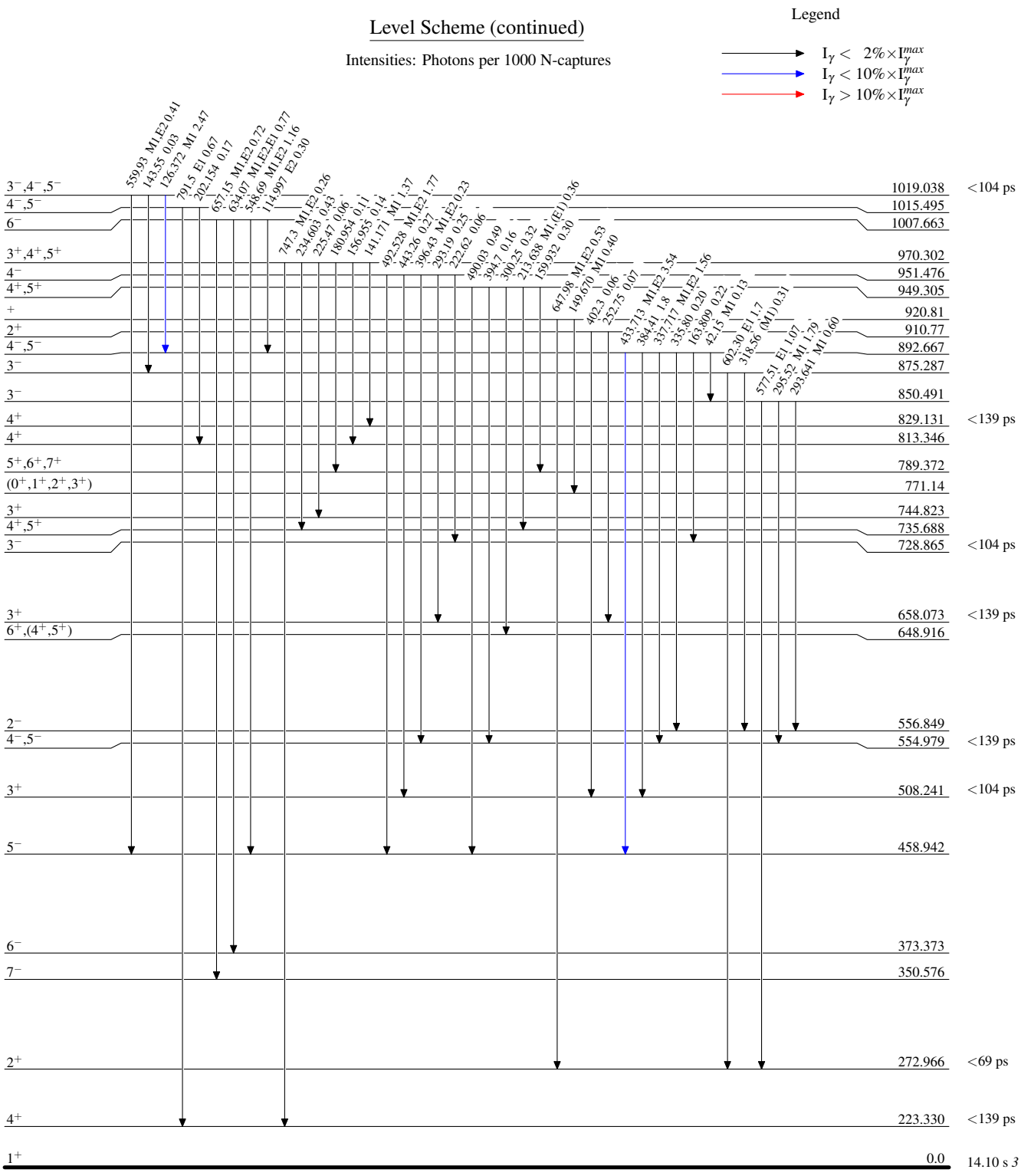


$^{116}_{49}In_{67}$

^{115}In(n,γ) E=th 1976Al06,1972Ra39,1973Sc23

Level Scheme (continued)

Intensities: Photons per 1000 N-captures

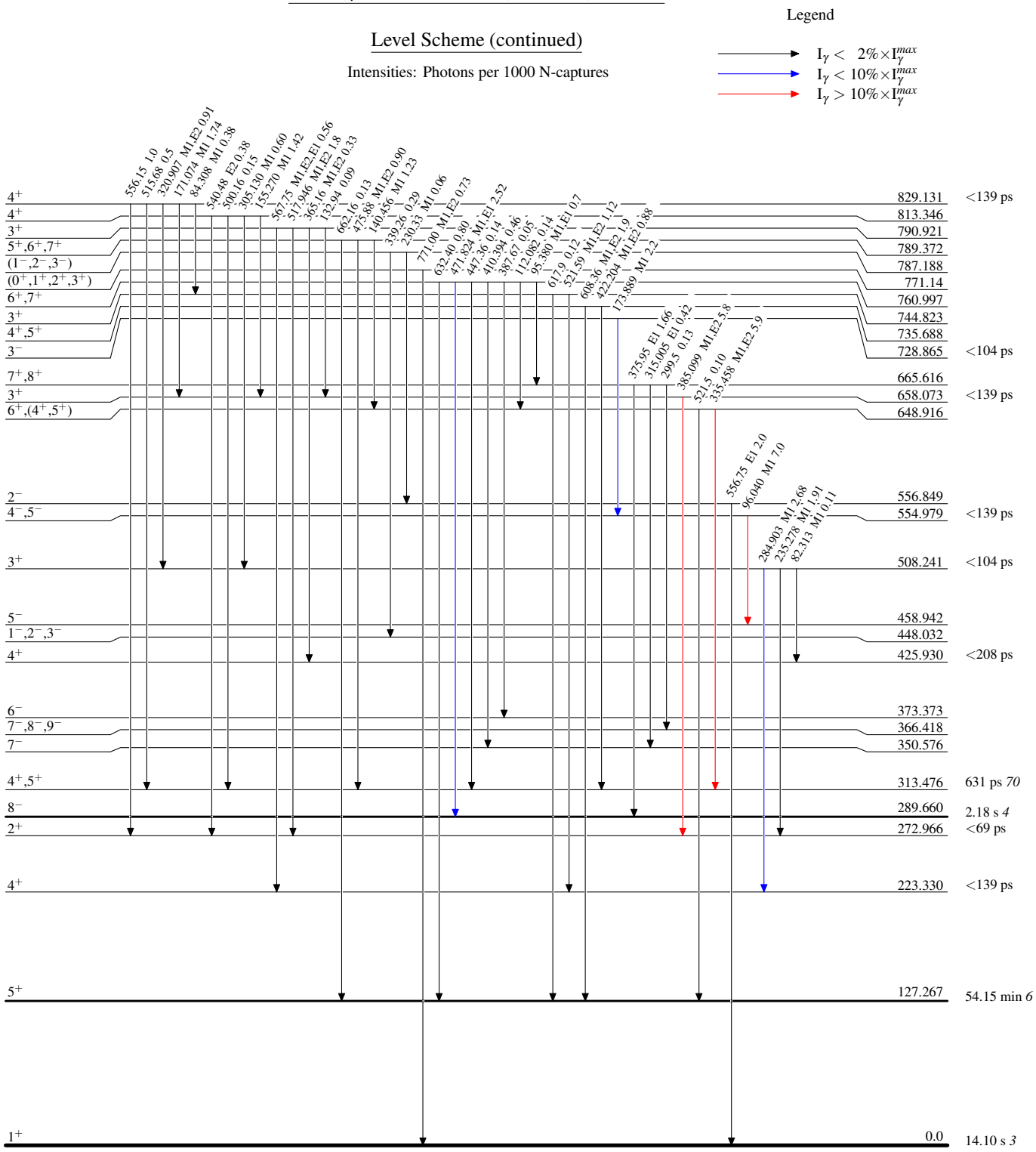


$^{116}_{49}In_{67}$

^{115}In(n,γ) E=th 1976Al06,1972Ra39,1973Sc23

Level Scheme (continued)

Intensities: Photons per 1000 N-captures

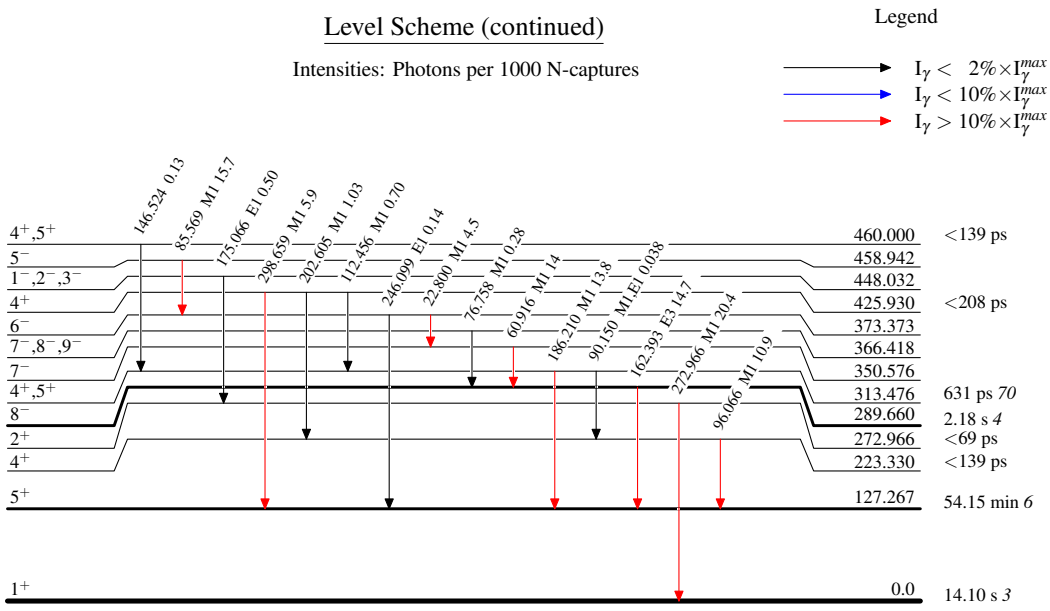


$^{116}_{49}In_{67}$

^{115}In(n,γ) E=th 1976Al06,1972Ra39,1973Sc23

Level Scheme (continued)

Intensities: Photons per 1000 N-captures



$^{116}_{49}In_{67}$