^{110}Pd(^{7}Li,3nγ) 2011Li43

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 113, 515 (2012)	1-Jan-2012

2011Li43: ^{7}Li beam, E=22, 24, 26, 28 MeV. Target=2.45 mg/cm^2 thick ^{110}Pd enriched to 97.2%. Experiment performed at the HI-13 tandem accelerator of the China Institute of Atomic Energy. Gamma rays detected by twelve Compton-suppressed HPGe detectors and two planar-type HPGe detectors. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$(DCO). Deduced levels, J, π, multipolarities.

1976Ei04: E(^{7}Li) not given by the authors Measured: σ(e,eγ), $\gamma(\theta)$, $\gamma\gamma$ The level scheme given by 1976Ei04 was very preliminary, they propose level scheme only until 1217 Kev.

^{114}In Levels

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$[#]	Comments
0	1$^+$[@]		
190.2686 *8*	5$^+$[@]	49.51 d	%IT=96.75 *24*; %ε+%β^+=3.25 *24*
501.934[a] *6*	8$^-$[@]	43.1 ms	%IT=100
640.3[a] *3*	(9$^-$)		
641.6 *4*	7$^+$	4.3 ns	
687.4 *4*	(8$^+$)[@]		
1216.7[a] *3*	(10$^-$)		
1674.6[e] *6*	(8$^-$)		
1858.0 *4*	(10$^-$)		
1912.6[a] *4*	(11$^-$)		
2081.5 *4*	(10$^+$)		
2340.9[d] *6*	(11$^-$)		
2505.2[a] *5*	(12$^-$)		
2521.0[f] *6*	(9$^-$)		
2531.5[b] *4*	(11$^+$)		
2629.1[d] *5*	(12$^-$)		
2679.9[b] *5*	(12$^+$)		
2846.3[e] *9*	(10$^-$)		
2874.2[d] *6*	(13$^-$)		
2930.6[b] *6*	(13$^+$)		
3051.8[c] *6*	(12$^-$)		
3093.0[a] *6*	(13$^-$)		
3195.7 *6*	(13$^-$)		
3257.5[c] *10*	(13$^-$)		
3298.9[b] *9*	(14$^+$)		
3311.3[a] *7*	(14$^-$)		
3344.7 *8*	(14$^+$)		
3503.7[d] *7*	(14$^-$)		
3516.3 *9*	(15$^+$)		
3576.5[c] *12*	(14$^-$)		
3631.7[a] *10*	(15$^-$)		
3759.0[f] *10*	(11$^-$)		
3767.5 *10*	(16$^+$)		
3791.5[b] *11*	(15$^+$)		
3832.3[d] *10*	(15$^-$)[&]		
3852.1 *11*	(15$^+$)		
3982.9[c] *14*	(15$^-$)		
4042.4[e] *12*	(12$^-$)		

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^{110}Pd(^{7}Li,3nγ) 2011Li43 (continued)

^{114}In Levels (continued)

E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]
4153.6[d] *12*	(16⁻)	4376.5[a] *13*	(16⁻)	4625.6[d] *14*	(17⁻)
4255.7[b] *13*	(16⁺)	4606.3[f] *12*	(13⁻)	4828.8[e] *14*	(14⁻)
				5485.0[e] *16*	(16⁻)

† From least-squares fit to Eγ data.
‡ Based on mult assignments from DCO ratios and comparison with neighboring nuclei (2011Li43).
# From Adopted Levels for ^{114}In.
@ From Adopted Levels for ^{114}In.
& (17⁻) in table 1 of 2011Li43 seems a misprint.
[a] Band(A): ΔJ=1 band based on 8⁻. Proposed (2011Li43) configuration=$\pi g_{9/2}^{-1}\otimes \nu[(g_{7/2}/d_{5/2})^2(h_{11/2})]$; $\pi g_{9/2}^{-1}\otimes\nu h_{11/2}$ after the backbend.
[b] Band(B): ΔJ=1 band based on (11⁺). Proposed (2011Li43) configuration=$\pi g_{9/2}^{-1}\otimes \nu[(g_{7/2}/d_{5/2})(h_{11/2}^2)]$, with possible magnetic-dipole rotational (shears band) character.
[c] Band(C): ΔJ=1 band based on (12⁻). Proposed (2011Li43) configuration=$\pi g_{9/2}^{-1}\otimes \nu[(g_{7/2}/d_{5/2})^2(h_{11/2})]$.
[d] Band(D): ΔJ=1 band based on (11⁻). Proposed (2011Li43) configuration=$\pi g_{9/2}^{-1}\otimes\nu h_{11/2}^3$.
[e] Band(E): ΔJ=2 band based on (8⁻). Proposed (2011Li43) configuration=$\pi[(g_{9/2})^{-2}d_{5/2}]\otimes\nu h_{11/2}$.
[f] Band(F): ΔJ=2 band based on (9⁻). Proposed (2011Li43) configuration=$\pi[(g_{9/2})^{-2}g_{7/2}]\otimes\nu h_{11/2}$.

γ(^{114}In)

DCO obtained from a gate on the ΔJ=1, dipole transition, unless otherwise stated. Expected DCO values are 1.6 for ΔJ=2, Q and 1.0 for ΔJ=1, dipole. When the gate is on ΔJ=2,Q; expected DCO values are 1.0 for ΔJ=2, Q and 0.6 for ΔJ=1, dipole.

Eγ[†]	Iγ	Ei(level)	J_i^π	Ef	J_f^π	Mult.[#]	Comments
45.78[‡] *3*		687.4	(8⁺)	641.6	7⁺	M1+E2[‡]	
115.6 *7*	1.9 *2*	3311.3	(14⁻)	3195.7	(13⁻)	M1+E2	
138.4 *3*	100.0 *7*	640.3	(9⁻)	501.934	8⁻	M1+E2	DCO=1.08 *4*
148.4 *3*	23.3 *25*	2679.9	(12⁺)	2531.5	(11⁺)	M1+E2	DCO=0.92 *15* DCO=0.46 *12*, gate on ΔJ=2,Q transition.
171.6 *7*	4.1 *3*	3516.3	(15⁺)	3344.7	(14⁺)	M1+E2	DCO=0.99 *13*
185.3 *5*	13.9 *13*	687.4	(8⁺)	501.934	8⁻	E1	DCO=0.59 *7*, gate on ΔJ=2,Q transition.
190.2684[‡] *8*		190.2686	5⁺	0	1⁺	E4[‡]	
205.7 *7*	0.8 *2*	3257.5	(13⁻)	3051.8	(12⁻)	M1+E2	
217.4 *7*	4.6 *6*	3516.3	(15⁺)	3298.9	(14⁺)	M1+E2	DCO=1.12 *10*
218.3 *7*	1.7 *3*	3311.3	(14⁻)	3093.0	(13⁻)	M1+E2	
245.1 *7*	4.0 *2*	2874.2	(13⁻)	2629.1	(12⁻)	M1+E2	DCO=0.94 *16* DCO=0.63 *6*, gate on ΔJ=2,Q transition.
250.7 *3*	22.4 *13*	2930.6	(13⁺)	2679.9	(12⁺)	M1+E2	DCO=0.99 *10*
251.2 *5*	7.6 *18*	3767.5	(16⁺)	3516.3	(15⁺)	M1+E2	
288.2 *7*	1.7 *4*	2629.1	(12⁻)	2340.9	(11⁻)	M1+E2	DCO=1.0 *2*
311.665[‡] *6*	224 *20*	501.934	8⁻	190.2686	5⁺	E3[‡]	
319.0 *7*	0.6 *2*	3576.5	(14⁻)	3257.5	(13⁻)	M1+E2	
320.4 *7*	2.4 *2*	3631.7	(15⁻)	3311.3	(14⁻)	M1+E2	DCO=0.99 *7*
321.3 *7*	2.0 *3*	4153.6	(16⁻)	3832.3	(15⁻)	M1+E2	DCO=0.96 *10*
328.6 *7*	2.6 *2*	3832.3	(15⁻)	3503.7	(14⁻)	M1+E2	DCO=0.97 *22*
368.3 *7*	13.5 *7*	3298.9	(14⁺)	2930.6	(13⁺)	M1+E2	DCO=1.02 *13* DCO=0.61 *3*, gate on ΔJ=2,Q transition.

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^{110}Pd(^{7}Li,3nγ) 2011Li43 (continued)

$\gamma(^{114}In)$ (continued)

E_γ [†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult. [#]	Comments
369.0 *7*	1.3 *4*	2874.2	(13$^-$)	2505.2	(12$^-$)	M1+E2	
406.4 *7*	0.5 *5*	3982.9	(15$^-$)	3576.5	(14$^-$)	M1+E2	
410.7 *7*		3503.7	(14$^-$)	3093.0	(13$^-$)	M1+E2	
414.1 *5*	8.7 *6*	3344.7	(14$^+$)	2930.6	(13$^+$)	M1+E2	DCO=1.15 *7* DCO=0.59 *4*, gate on ΔJ=2,Q transition.
450.6 *7*	3.3 *5*	2531.5	(11$^+$)	2081.5	(10$^+$)	M1+E2	
451.1 *7*	18.0 *10*	641.6	7$^+$	190.2686	5$^+$	E2	
464.2 *7*	1.1 *2*	4255.7	(16$^+$)	3791.5	(15$^+$)	M1+E2	
472.0 *7*	0.9 *2*	4625.6	(17$^-$)	4153.6	(16$^-$)	M1+E2	
492.6 *7*	2.6 *2*	3791.5	(15$^+$)	3298.9	(14$^+$)	M1+E2	DCO=1.0 *2*
520.3 *7*	0.9 *3*	3051.8	(12$^-$)	2531.5	(11$^+$)	E1	
553.2 *7*	1.5 *3*	3852.1	(15$^+$)	3298.9	(14$^+$)	M1+E2	
576.5 *3*	85.5 *12*	1216.7	(10$^-$)	640.3	(9$^-$)	M1+E2	DCO=1.04 *10*
587.8 *7*	3.6 *2*	3093.0	(13$^-$)	2505.2	(12$^-$)	M1+E2	DCO=1.1 *3*
592.6 *5*	15.6 *14*	2505.2	(12$^-$)	1912.6	(11$^-$)	M1+E2	DCO=0.92 *8* DCO=0.56 *17*, gate on ΔJ=2,Q transition.
618.9 *7*	3.3 *5*	2531.5	(11$^+$)	1912.6	(11$^-$)	E1	DCO=0.96 *7*
629.5 *7*	4.0 *5*	3503.7	(14$^-$)	2874.2	(13$^-$)	M1+E2	DCO=0.87 *7*
641.3 *7*	2.5 *2*	1858.0	(10$^-$)	1216.7	(10$^-$)	M1+E2	DCO=0.94 *11*
656.2 *7*	0.4 *1*	5485.0	(16$^-$)	4828.8	(14$^-$)	E2	
673.5 *5*	11.2 *2*	2531.5	(11$^+$)	1858.0	(10$^-$)	E1	DCO=0.97 *10* DCO=0.51 *7*, gate on ΔJ=2,Q transition.
690.5 *7*	3.5 *3*	3195.7	(13$^-$)	2505.2	(12$^-$)	M1+E2	DCO=1.13 *20*
695.9 *3*	34.1 *11*	1912.6	(11$^-$)	1216.7	(10$^-$)	M1+E2	DCO=0.95 *7*
716.5 *7*	4.6 *6*	2629.1	(12$^-$)	1912.6	(11$^-$)	M1+E2	DCO=0.97 *18*
744.8 *7*	0.9 *3*	4376.5	(16$^-$)	3631.7	(15$^-$)	M1+E2	
786.4 *7*	0.7 *1*	4828.8	(14$^-$)	4042.4	(12$^-$)	E2	
846.5 *7*	2.3 *4*	2521.0	(9$^-$)	1674.6	(8$^-$)	M1+E2	
847.3 *7*	1.7 *3*	4606.3	(13$^-$)	3759.0	(11$^-$)	E2	
865.4 *5*	5.7 *3*	2081.5	(10$^+$)	1216.7	(10$^-$)	E1	DCO=0.96 *15*
961.6 *7*	3.8 *5*	2874.2	(13$^-$)	1912.6	(11$^-$)	E2	DCO=1.6 *3*
1124.2 *5*	10.4 *7*	2340.9	(11$^-$)	1216.7	(10$^-$)	M1+E2	DCO=1.19 *19*
1139.2 *7*	2.0 *5*	3051.8	(12$^-$)	1912.6	(11$^-$)	M1+E2	
1171.7 *7*	2.2 *2*	2846.3	(10$^-$)	1674.6	(8$^-$)	E2	
1172.7 *7*	4.6 *5*	1674.6	(8$^-$)	501.934	8$^-$	M1+E2	
1180.4 *7*	1.7 *3*	3093.0	(13$^-$)	1912.6	(11$^-$)	E2	
1196.1 *7*	2.2 *2*	4042.4	(12$^-$)	2846.3	(10$^-$)	E2	
1217.7 *7*	3.4 *5*	1858.0	(10$^-$)	640.3	(9$^-$)	M1+E2	
1237.9 *7*	4.3 *2*	3759.0	(11$^-$)	2521.0	(9$^-$)	E2	DCO=1.6 *3*
1272.3 *5*	13.0 *5*	1912.6	(11$^-$)	640.3	(9$^-$)	E2	DCO=1.8 *3*
1283.1 *7*	1.6 *3*	3195.7	(13$^-$)	1912.6	(11$^-$)	E2	
1288.5 *5*	5.5 *4*	2505.2	(12$^-$)	1216.7	(10$^-$)	E2	DCO=1.7 *3*
1304.3 *7*	2.1 *2*	2521.0	(9$^-$)	1216.7	(10$^-$)	M1+E2	DCO=1.1 *3*
1314.5 *5*	7.1 *2*	2531.5	(11$^+$)	1216.7	(10$^-$)	E1	DCO=0.86 *13*
1356.2 *5*	19.4 *3*	1858.0	(10$^-$)	501.934	8$^-$	E2	DCO=1.77 *16*
1393.8 *5*	13.9 *2*	2081.5	(10$^+$)	687.4	(8$^+$)	E2	DCO=1.04 *8*, gate on ΔJ=2,Q transition.
1412.4 *7*	4.0 *6*	2629.1	(12$^-$)	1216.7	(10$^-$)	E2	DCO=1.7 *3*

[†] 2011Li43 state that uncertainty for strong γ rays is <0.3 keV and 0.7 keV for weak γ rays. Evaluator assign 0.3 keV for Iγ>20, 0.5 keV for Iγ=5-20 and 0.7 keV for Iγ<5.

[‡] From Adopted Gammas for ^{114}In.

[#] As listed in 2011Li43, partly based on DCO ratios and others on comparison with neighboring nuclei.

^{110}Pd(^{7}Li,3nγ) 2011Li43

Level Scheme

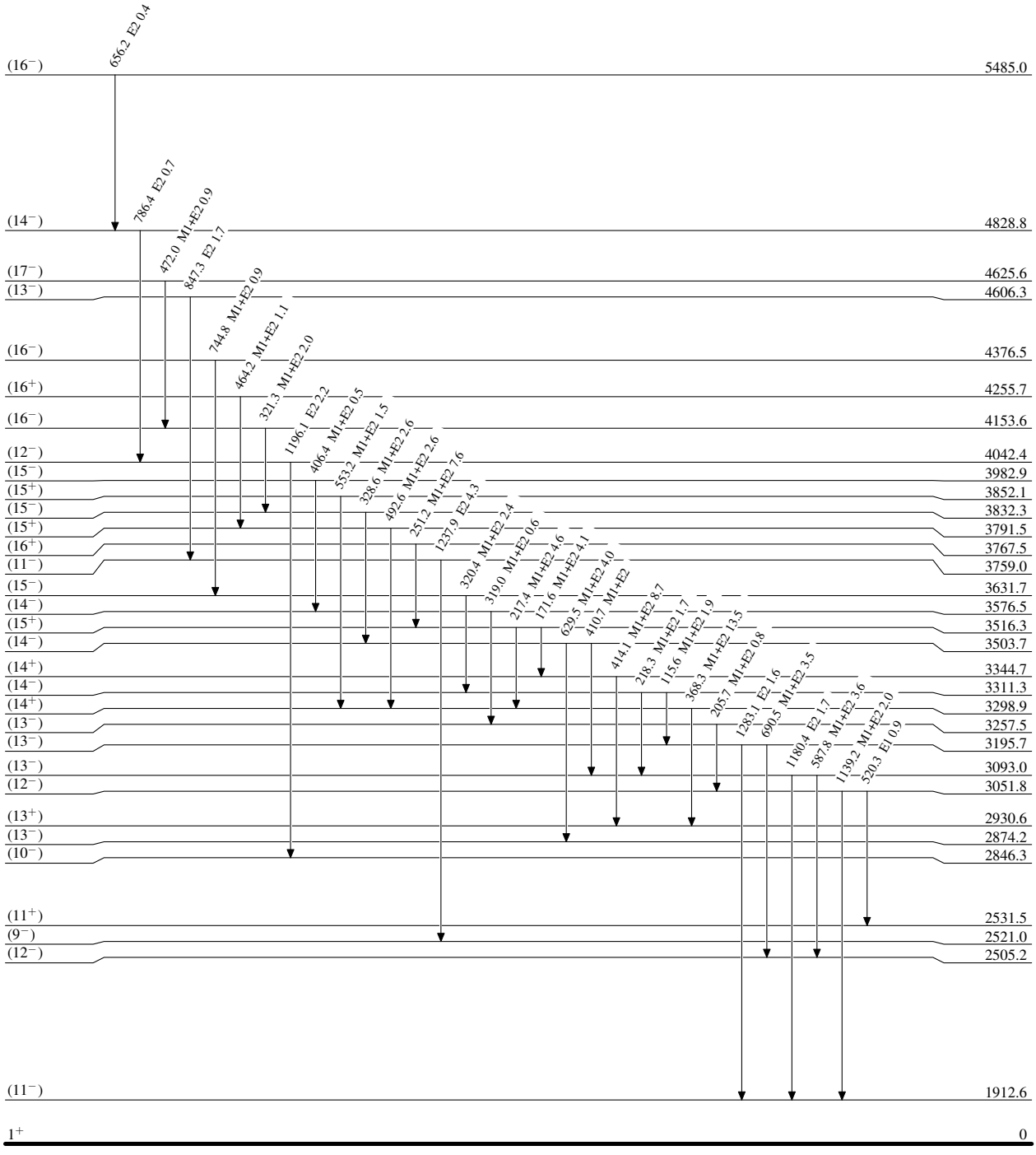
Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$

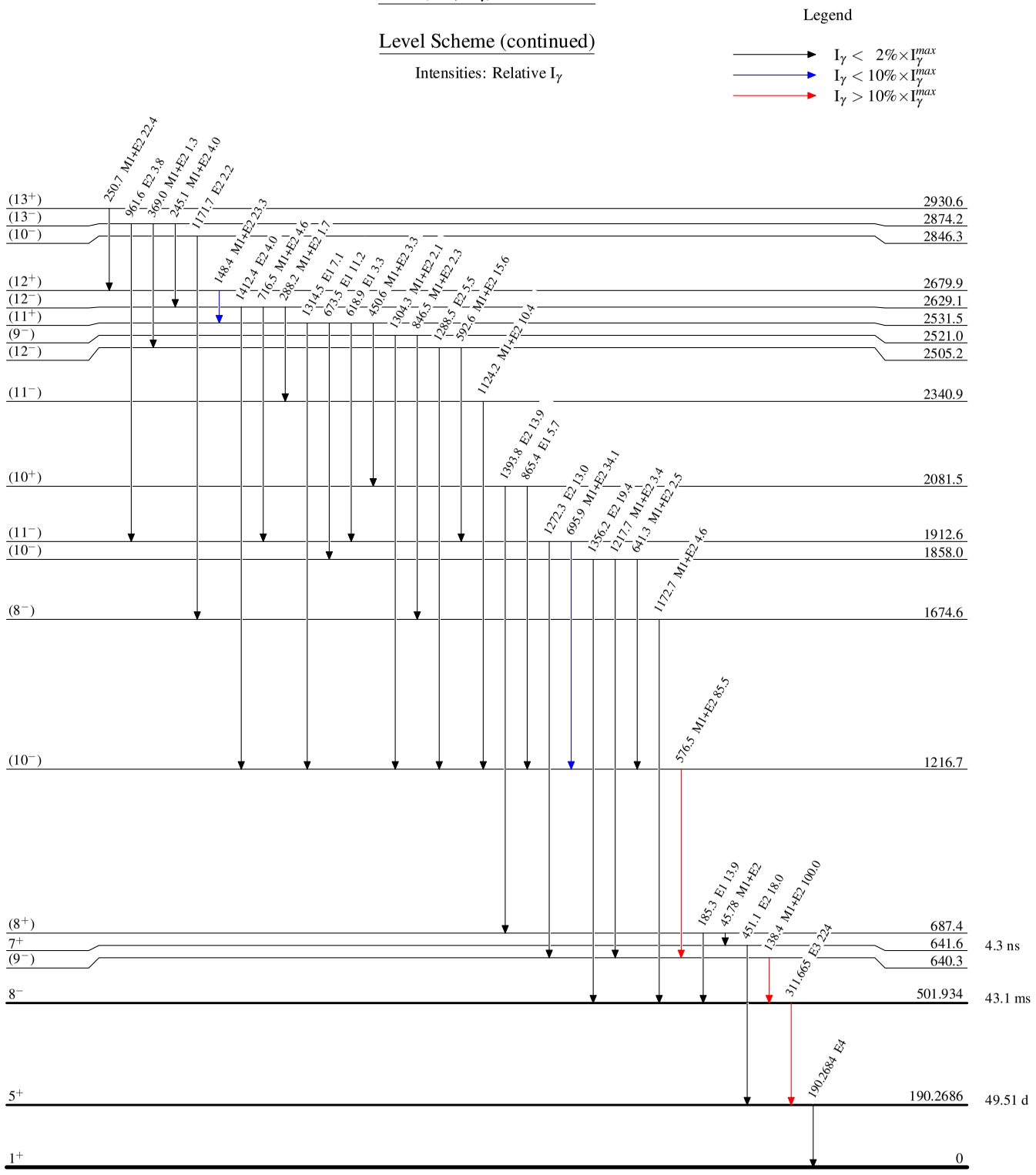


$^{114}_{49}In_{65}$

^{110}Pd(^{7}Li,3nγ) 2011Li43

Level Scheme (continued)

Intensities: Relative I_γ



$^{114}_{49}In_{65}$

^{110}Pd(^{7}Li,3nγ) 2011Li43