^{175}Lu(γ,γ') 1997He16,1962De02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 102, 719 (2004)	1-Jun-2004

1997He16: Target: 2277 mg Lu_2O_3 of natural isotopic abundance (97.4% ^{175}Lu). Bremsstrahlung end-point beam energies were 2.6 & 4.1 MeV for nuclear resonance fluorescence.
1962De02: Moving source, centrifuge method. Lu_2O_3 powder scatterer. Scintillation detector.

^{175}Lu Levels

E(level)#@	J$^{\pi}$[a]	$T_{1/2}$	$g\Gamma_0/E_\gamma^3$ [b]	Comments
0.0†	$7/2^+$			
113.6† *5*	$9/2^+$			
343.4& *10*	$5/2^+$	0.33 ns *3*		$T_{1/2}$: from $\tau(343\gamma)$=0.47 ns *4* (1962De02), using $\Gamma_{\gamma0}^2/\Gamma$ and adopted $\Gamma_{\gamma0}/\Gamma$=0.887 *3*.
1544.8‡ *8*	$7/2^-$		4.0 *2*	
1588.0 *10*			0.53 *6*	
1611.3‡ *8*	$9/2^-$		1.09 *25*	
1689.0 *10*			0.29 *5*	
1693.0 *10*			0.29 *5*	
1715.0 *10*			0.21 *5*	
1725.0 *10*			0.17 *5*	
1816.0 *10*			0.15 *5*	
1827.0 *10*			0.28 *5*	
1874.0 *10*			0.69 *5*	
1931.0 *10*			0.14 *3*	
1944.9 *8*			0.51 *7*	
1949.0 *10*			0.84 *5*	
1992.0 *10*			0.28 *4*	
2011.9 *8*			0.36 *7*	
2089.0 *10*			0.42 *4*	
2123.0 *10*			0.28 *4*	
2285.9 *8*			0.81 *8*	
2297.0 *10*			0.25 *4*	
2320.0 *10*			0.28 *4*	
2335.0 *10*			1.10 *6*	
2378.9 *8*			0.79 *8*	
2386.0 *10*			0.10 *3*	
2394.0 *10*			0.10 *3*	
2410.0 *10*			0.78 *6*	
2419.0 *10*			0.66 *5*	
2441.9 *8*			0.52 *10*	
2497.0 *10*			0.32 *5*	
2548.0 *10*			0.26 *4*	
2707.0 *10*			2.0 *1*	
2713.0 *10*			0.38 *9*	
2742.0 *10*			1.12 *8*	
2760.0 *10*			0.56 *8*	
2833.0 *10*			0.66 *7*	
2843.0 *10*			0.54 *7*	
2865.0 *10*			0.41 *7*	
2890.0 *10*			0.44 *7*	
2897.0 *10*			0.28 *6*	
2952.0 *10*			0.32 *6*	
2998.0 *10*			0.40 *10*	
3002.0 *10*			0.56 *11*	
3011.0 *10*			0.74 *17*	

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^{175}Lu(γ,γ') 1997He16,1962De02 (continued)

^{175}Lu Levels (continued)

E(level)#@	$g\Gamma_0/E_\gamma^3$. b	E(level)#@	$g\Gamma_0/E_\gamma^3$. b	E(level)#@	$g\Gamma_0/E_\gamma^3$. b	E(level)#@	$g\Gamma_0/E_\gamma^3$. b
3022.0 *10*	0.18 *8*	3243.0 *10*	0.36 *6*	3329.0 *10*	0.69 *7*	3404.0 *10*	0.15 *5*
3029.0 *10*	0.26 *9*	3267.0 *10*	0.55 *8*	3333.0 *10*	0.82 *8*	3524.0 *10*	0.53 *9*
3066.0 *10*	0.41 *8*	3286.0 *10*	0.42 *6*	3343.0 *10*	0.46 *7*		
3172.0 *10*	0.29 *7*	3293.0 *10*	0.34 *6*	3347.0 *10*	0.47 *7*		
3238.0 *10*	0.29 *6*	3300.0 *10*	0.31 *6*	3398.0 *10*	0.38 *6*		

† 7/2[404] band.
‡ $0^-\otimes$7/2[404] Vibrational band.
# From 1997He16, except as noted.
@ Deduced by evaluator from a least-squares fit to γ-ray energies using ΔE=1 keV for all γ-rays.
& From 1962De02.
a Assignment is based on Alaga rules, except as noted.
b Reduced ground state transition width (meV/MeV^3).

$\gamma(^{175}Lu)$

Experimental reduced transition probability ratios are B(1431 keV,7/2$^-$ to 9/2$^+$)/B(1545 keV,7/2$^-$ to 7/2$^+$) =0.28 *4*, Alaga rule gives 0.286, and B(1498 keV, 9/2$^-$ to 9/2$^+$)/B(1611 keV, 9/2$^-$ to 7/2$^+$) = 2.8 *6*, Alaga rule gives 2.784.

E_γ †	I_γ &	E_i(level)	J_i^π	E_f	J_f^π	Comments
(113)		113.6	9/2$^+$	0.0	7/2$^+$	
343.4‡		343.4	5/2$^+$	0.0	7/2$^+$	δ: from $\gamma(\theta)$ (A_2=−0.20 *28*) the following limits are obtained: $-0.3\le\delta\le0.1$ or $-30\le\delta\le-2$ (1962De02).
1431	22 *3*	1544.8	7/2$^-$	113.6	9/2$^+$	Reduced transition probability B(E1;[J_i,K_i])=1.04 *16* $10^{-3}e^2fm^2$ (1997He16).
1498	45	1611.3	9/2$^-$	113.6	9/2$^+$	Reduced transition probability B(E1;[J_i,K_i])=2.4 *7* $10^{-3}e^2fm^2$ (1997He16).
1545	100	1544.8	7/2$^-$	0.0	7/2$^+$	Reduced transition probability B(E1;[J_i,K_i])=3.77 *19* $10^{-3}e^2fm^2$ (1997He16).
1588@		1588.0		0.0	7/2$^+$	
1611	100 *21*	1611.3	9/2$^-$	0.0	7/2$^+$	Reduced transition probability B(E1;[J_i,K_i])=0.83 *19* $10^{-3}e^2fm^2$ (1997He16).
1689#		1689.0		0.0	7/2$^+$	
1693#		1693.0		0.0	7/2$^+$	
1715#		1715.0		0.0	7/2$^+$	
1725#		1725.0		0.0	7/2$^+$	
1816#		1816.0		0.0	7/2$^+$	
1827#		1827.0		0.0	7/2$^+$	
1831.2#	26 *10*	1944.9		113.6	9/2$^+$	
1874@		1874.0		0.0	7/2$^+$	
1898.2#	55 *18*	2011.9		113.6	9/2$^+$	
1931#		1931.0		0.0	7/2$^+$	
1945#	100	1944.9		0.0	7/2$^+$	
1949@		1949.0		0.0	7/2$^+$	
1992#		1992.0		0.0	7/2$^+$	
2012#	100	2011.9		0.0	7/2$^+$	
2089@		2089.0		0.0	7/2$^+$	
2123@		2123.0		0.0	7/2$^+$	
2172.2#	41 *7*	2285.9		113.6	9/2$^+$	

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^{175}Lu(γ,γ') 1997He16,1962De02 (continued)

$\gamma(^{175}Lu)$ (continued)

E_γ †	I_γ &	E_i(level)	J_i^π	E_f	J_f^π	Comments
2265.2#	29 *8*	2378.9		113.6	$9/2^+$	
2286#	100	2285.9		0.0	$7/2^+$	
2297#		2297.0		0.0	$7/2^+$	
2320#		2320.0		0.0	$7/2^+$	
2328.2#	94 *21*	2441.9		113.6	$9/2^+$	
2335@		2335.0		0.0	$7/2^+$	
2379#	100	2378.9		0.0	$7/2^+$	
2386#		2386.0		0.0	$7/2^+$	
2394#		2394.0		0.0	$7/2^+$	
2410@		2410.0		0.0	$7/2^+$	
2419@		2419.0		0.0	$7/2^+$	
2442#	100	2441.9		0.0	$7/2^+$	
2497#		2497.0		0.0	$7/2^+$	
2548#		2548.0		0.0	$7/2^+$	
2707		2707.0		0.0	$7/2^+$	
2713		2713.0		0.0	$7/2^+$	
2742		2742.0		0.0	$7/2^+$	
2760		2760.0		0.0	$7/2^+$	
2833		2833.0		0.0	$7/2^+$	
2843		2843.0		0.0	$7/2^+$	E_γ: This entry from authors′ table, according to the numerical order of the table it may be a typo for 2943γ.
2865		2865.0		0.0	$7/2^+$	
2890		2890.0		0.0	$7/2^+$	
2897		2897.0		0.0	$7/2^+$	
2952		2952.0		0.0	$7/2^+$	
2998		2998.0		0.0	$7/2^+$	
3002		3002.0		0.0	$7/2^+$	
3011		3011.0		0.0	$7/2^+$	
3022		3022.0		0.0	$7/2^+$	
3029		3029.0		0.0	$7/2^+$	
3066		3066.0		0.0	$7/2^+$	
3172		3172.0		0.0	$7/2^+$	
3238		3238.0		0.0	$7/2^+$	
3243		3243.0		0.0	$7/2^+$	
3267		3267.0		0.0	$7/2^+$	
3286		3286.0		0.0	$7/2^+$	
3293		3293.0		0.0	$7/2^+$	
3300		3300.0		0.0	$7/2^+$	
3329		3329.0		0.0	$7/2^+$	
3333		3333.0		0.0	$7/2^+$	
3343		3343.0		0.0	$7/2^+$	
3347		3347.0		0.0	$7/2^+$	
3398		3398.0		0.0	$7/2^+$	
3404		3404.0		0.0	$7/2^+$	
3524		3524.0		0.0	$7/2^+$	

† From 1997He16 using 4.1 MeV Bremsstrahlung end-point energy, except as noted.
‡ From 1962De02.
# Using 2.6 MeV Bremsstrahlung end-point energy.

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^{175}Lu(γ,γ') 1997He16,1962De02 (continued)

$\gamma(^{175}Lu)$ (continued)

@ Using 2.6 MeV and 4.1 MeV Bremsstrahlung end-point energies.
& Deduced from given R_{exp} values using the relation $R_{exp}= (\Gamma_i E^3_{\gamma 0})/(\Gamma_0 E^3_{\gamma i})$.

^{175}Lu(γ,γ') 1997He16,1962De02

Level Scheme

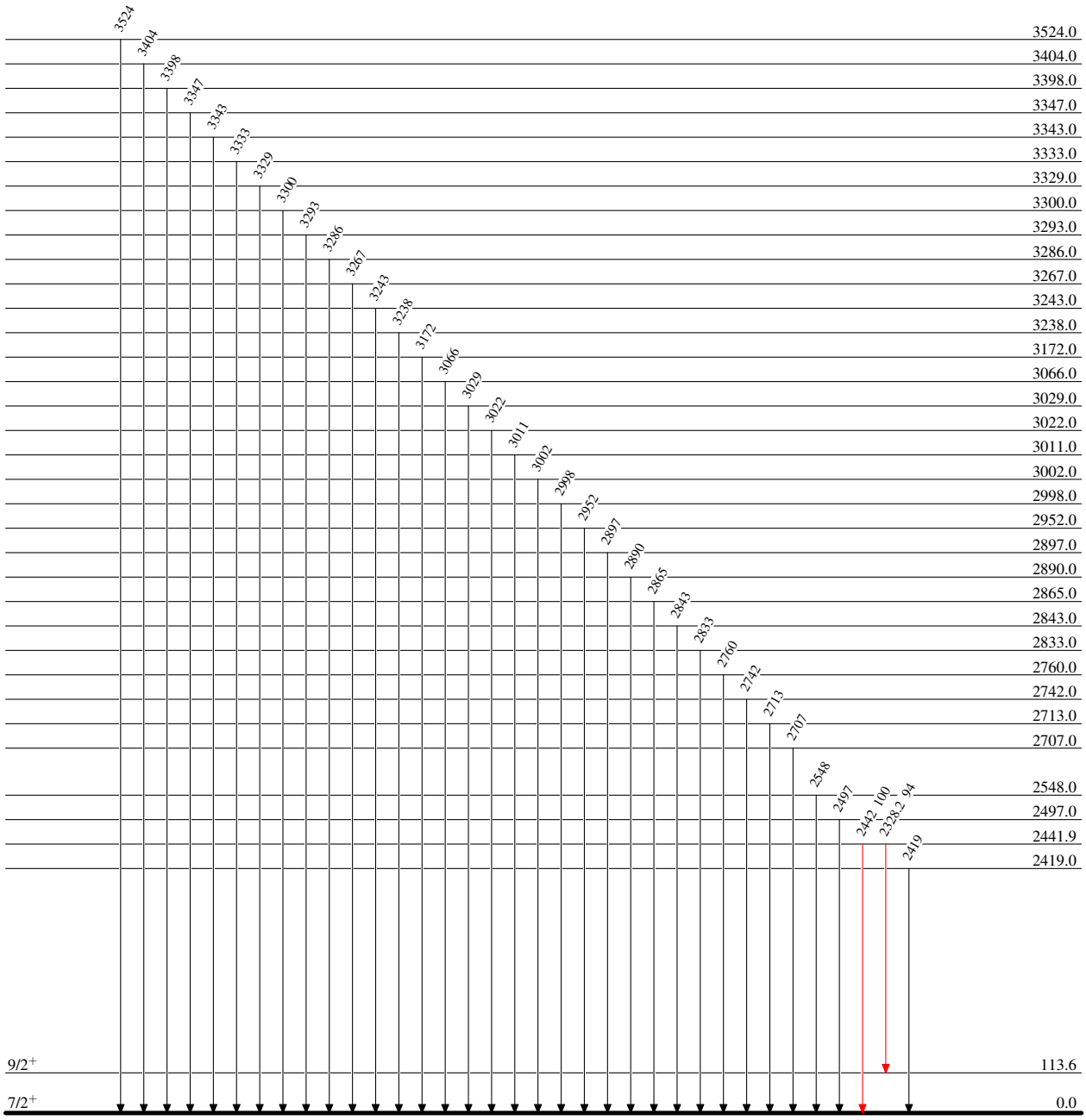
Intensities: Relative I_γ

Legend

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

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

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



$^{175}_{71}Lu_{104}$

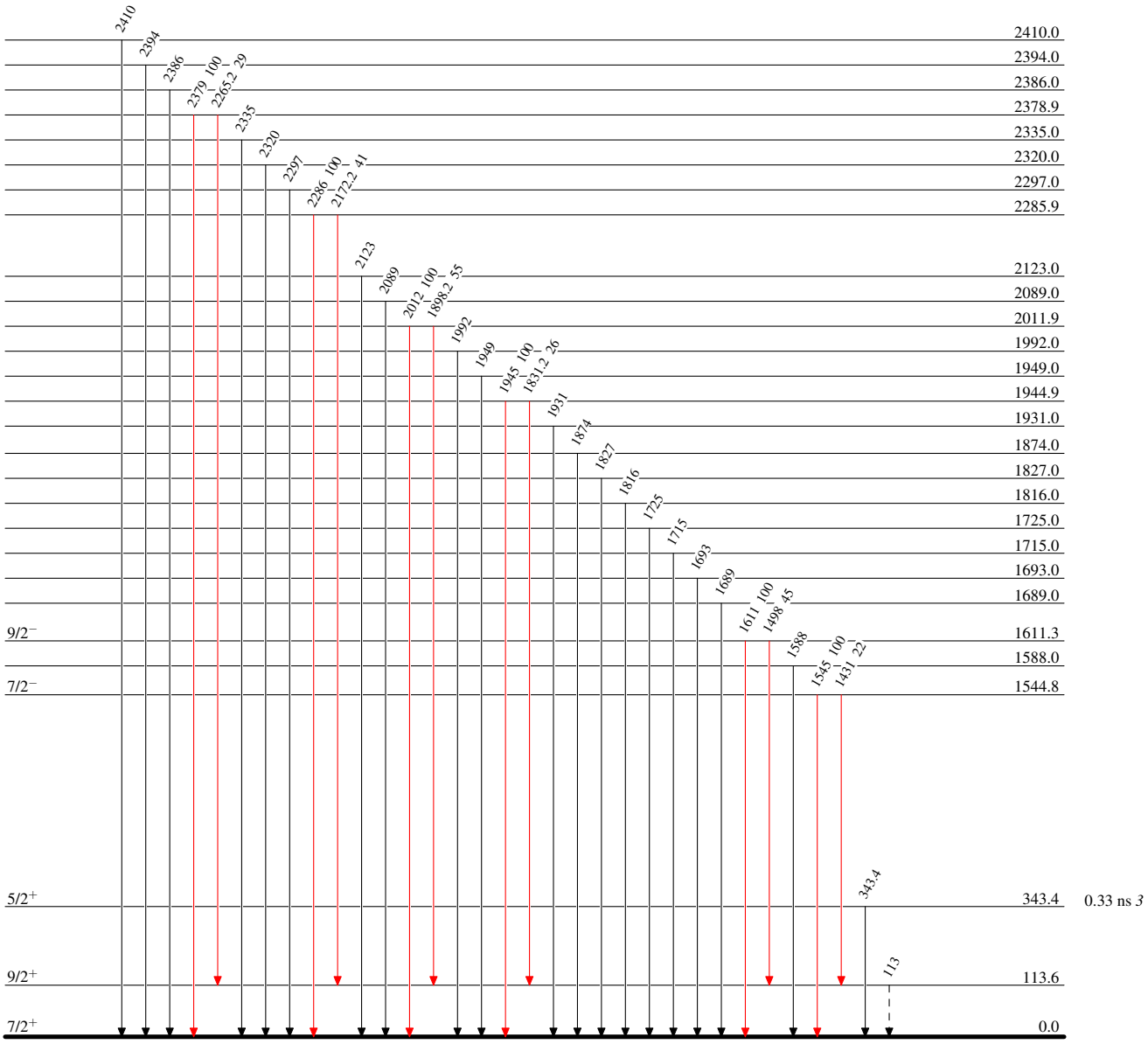
^{175}Lu(γ,γ′) 1997He16,1962De02

Level Scheme (continued)

Intensities: Relative I_γ

Legend

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



$^{175}_{71}Lu_{104}$