^{175}Lu(n,γ) E=res 1970Wa20

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 107, 791 (2006)	15-Sep-2005

Others: 1978Al12, 1980Be05, 1981Al17, 1981Mc05, 1984Be34.

Target: natural lutetium and 99.93% enriched ^{175}Lu. Measured Eγ and Iγ for primary γ rays from 15 neutron resonances between 2.6 eV and 50.2 eV. Neutrons were selected by the time-of-flight technique. Detectors:Ge(Li), FWHM=7.5 keV for 6053.8γ. γ rays between 3000 keV and 5000 keV are sum peaks. They were not analyzed, and therefore, are not presented here. Measured also Eγ and Iγ for E≤800 keV; these data were also used by authors for assigning J$^\pi$ to some neutron resonances.

^{176}Lu Levels

E(level)[†]	J$^\pi$[‡]	Comments
235.770 *4*	3,4	E(level): from ^{175}Lu(n,γ) E=thermal.
304.8 *17*	(2)$^-$[#]	
433.3 *17*	(2)$^-$[#]	
437.6 *17*	(5)$^-$[#]	
449.0 *17*	3,4	
464.5 *17*	3,4	
505.4 *17*	3,4	
533.0 *17*	(5)	J$^\pi$: J$^\pi$=(4)$^+$ in Adopted Levels.
596.3 *17*	3,4	
658.4 *17*	3,4	
688.2 *17*	3,4	J$^\pi$: J$^\pi$=(2)$^-$ in Adopted Levels.
715.3 *17*	3,4	J$^\pi$: J$^\pi$=(5)$^-$ in Adopted Levels.
723.0 *17*	3,4	
752.3 *17*	3,4	
763.9 *17*	3,4	
788.8 *17*	(2)	J$^\pi$: J$^\pi$=(4)$^-$ in Adopted Levels.
833.4 *17*	3,4	
843.5 *17*	3,4	
860.3 *17*	3,4	
869.4 *17*	3,4	J$^\pi$: J$^\pi$=(5)$^-$ in Adopted Levels.
883.9 *17*	3,4	
907.5 *17*	(5)	J$^\pi$: J$^\pi$=(4)$^-$ in Adopted Levels.
921.8 *17*	(5)	
945.0 *17*	3,4	
958.1 *17*	3,4	
988.4 *17*	(5)	
1030.9 *17*	3,4	
1042.5 *17*	(5)	
1053.9 *17*	3,4	
1067.0 *17*	3,4	
1079.8 *17*	(5)	
1098.8 *17*	(2)	J$^\pi$: J$^\pi$=(3)$^-$ in Adopted Levels.
1104.1 *17*	(2)	
1129.6 *17*	(2)	
1168.5 *17*	3,4	
1225.2 *17*	3,4	
1236.8 *17*	3,4	
6289.6 *12*		Neutron capture state. J$^\pi$=3$^+$,4$^+$ for s-wave neutrons. E(level): deduced by evaluator using E=235.911 keV *8* for the J$^\pi$=3$^-$ level populated by 6053.8γ. ΔE=1.2 keV does not include a 1.4 keV systematic uncertainty in the 235.911 level from ^{175}Lu(n,γ) E=thermal.

[†] Deduced by evaluator using an energy of 6289.6 keV *12* for the neutron capture state.

Continued on next page (footnotes at end of table)

^{175}Lu(n,γ) E=res 1970Wa20 (continued)

^{176}Lu Levels (continued)

‡ Based on the spin of the following resonances (1970Wa20,1984MuZY): J=4 for the 2.6-, 4.8-, 15.4-, 30.0-, and 50.2-eV resonances; J=3 for the 5.2-, 11.2-, 13.8-, 20.7-, 23.7-, 36.5-, 40.6-, 31.0, and 49.5-eV resonances; and on the assumption that primary γ rays carry one unit of angular momentum. J=3,4 for levels populated from both J=3 and J=4 resonances. J=2,5 are assigned on the bases of statistical arguments (1970Wa20). There is an≈93% probability that a level with J=2 will not be populated from any of the J=4 resonances; or an≈98% probability that a level with J=5 will not be populated from any of the J=3 resonances.

From Adopted Levels.

γ(^{176}Lu)

E_γ †	I_γ ‡#	E_i(level)	E_f	J^π_f	E_γ †	I_γ ‡#	E_i(level)	E_f	J^π_f
5052.8	2.3 *8*	6289.6	1236.8	3,4	5446.1	12.7 *43*	6289.6	843.5	3,4
5064.4	6.0 *22*	6289.6	1225.2	3,4	5456.2	5.2 *17*	6289.6	833.4	3,4
5121.1	5.9 *21*	6289.6	1168.5	3,4	5500.8	2.4 *9*	6289.6	788.8	(2)
5160.0	4.7 *17*	6289.6	1129.6	(2)	5525.7	3.2 *11*	6289.6	763.9	3,4
5185.5	1.0 *4*	6289.6	1104.1	(2)	5537.3	5.6 *21*	6289.6	752.3	3,4
5190.8	2.0 *7*	6289.6	1098.8	(2)	5566.6	8.2 *27*	6289.6	723.0	3,4
5209.8	1.7 *6*	6289.6	1079.8	(5)	5574.3	1.7 *6*	6289.6	715.3	3,4
5222.6	5.4 *19*	6289.6	1067.0	3,4	5601.4	4.2 *14*	6289.6	688.2	3,4
5235.7	8.8 *32*	6289.6	1053.9	3,4	5631.2	6.7 *23*	6289.6	658.4	3,4
5247.1	5.2 *18*	6289.6	1042.5	(5)	5693.3	3.7 *13*	6289.6	596.3	3,4
5258.7	2.8 *10*	6289.6	1030.9	3,4	5756.6	1.1 *4*	6289.6	533.0	(5)
5301.2	2.5 *9*	6289.6	988.4	(5)	5784.2	3.6 *12*	6289.6	505.4	3,4
5331.5	14.8 *49*	6289.6	958.1	3,4	5825.1	3.1 *11*	6289.6	464.5	3,4
5344.6	5.2 *18*	6289.6	945.0	3,4	5840.6	2.0 *7*	6289.6	449.0	3,4
5367.8	1.1 *4*	6289.6	921.8	(5)	5852.0	2.5 *8*	6289.6	437.6	$(5)^-$
5382.1	2.5 *9*	6289.6	907.5	(5)	5856.3	2.2 *8*	6289.6	433.3	$(2)^-$
5405.7	5.6 *19*	6289.6	883.9	3,4	5984.8	4.0 *13*	6289.6	304.8	$(2)^-$
5420.2	3.7 *13*	6289.6	869.4	3,4	6053.8 *12*	9.0 *30*	6289.6	235.770	3,4
5429.3	3.4 *12*	6289.6	860.3	3,4					

† ΔE=1 keV, unless otherwise specified.

‡ Intensity per 100 neutron captures. Values are averages from all measured resonances. $\Delta I\gamma$ represents the deviation due to the finite size of the statistical sample, rather than the uncertainty of the experimental measurement (1970Wa20).

Intensity per 100 neutron captures.

^{175}Lu(n,γ) E=res 1970Wa20

Level Scheme

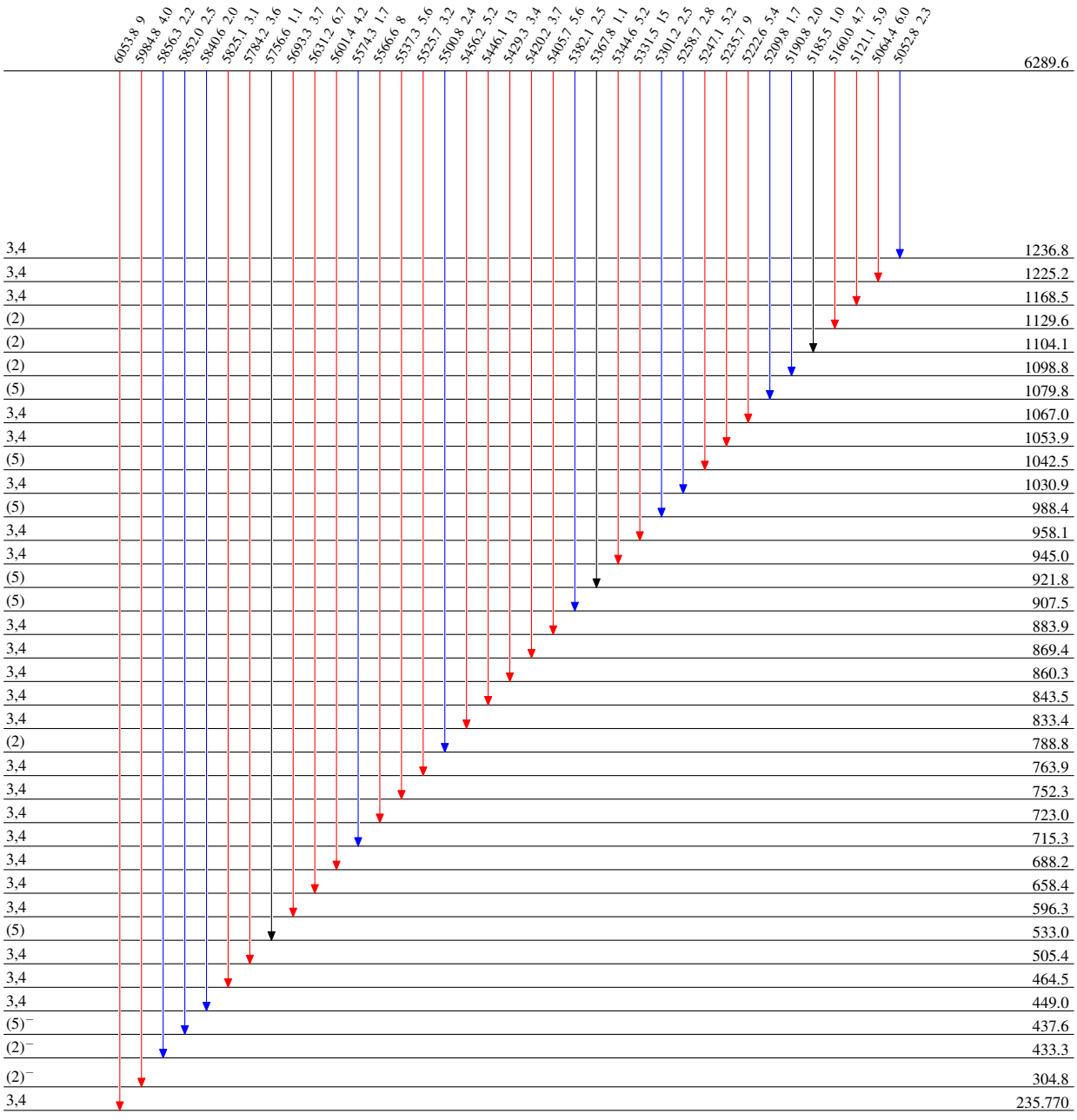
Intensities: Iγ per 100 neutron captures.

Legend

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

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

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



$^{176}_{71}Lu_{105}$