^{237}Np(n,γ) E=th:primary γ's 1979Io01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 127, 191 (2015)	1-Jun-2014

Additional information 1.
$J^{\pi}(^{237}Np)=5/2^+$ so the capturing state has $J^{\pi}=2^+$ or 3^+, and decays to levels with J=1 to 4.

^{238}Np Levels

E(level)[†]	J$^{\pi}$[‡]
0	2^+
136.03 *25*	3^-
182.4 *6*	2^-
216.5 *10*	3^-
249.98 *25*	$(2)^-$
258.7 *6*	4^-
285.8 *10*	
325.2[#]	
334.3 *8*	1^- to 3^-
347.5 *4*	1^- to 3^-
368.0 *5*	$(2)^-$
372.8 *6*	$(1)^-$
386.4 *4*	
441.7 *3*	$(4)^-$
457.5 *3*	1^- to 3^-
528.0 *6*	3^-
567.6 *6*	3^-
584.2 *4*	1^- to 4^-
601.5 *7*	1^- to 3^-
619.5 *3*	
647.0 *7*	1^- to 3^-
673.6 *3*	1^- to 3^-
692.5 *6*	1^- to 3^-
709.24 *25*	
722.4 *7*	
764.1 *6*	
782.4 *6*	
797.4 *4*	
800.4 *8*	
809.8 *3*	
813.9 *7*	
834.7 *6*	
869.0 *5*	
903.3 *4*	
916.6 *8*	
929.1? *6*	
948.9? *6*	
970.7? *6*	
986.5? *4*	
1026.6? *6*	
1033.4? *7*	
1046.5? *6*	
1065.2? *5*	
1081.0? *6*	
1089.0? *6*	
1107.8 *7*	
1119.6?[@] *7*	

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^{237}Np(n,γ) E=th:primary γ's 1979Io01 (continued)

^{238}Np Levels (continued)

E(level)[†]	Comments
1143.0 *6*	
1163.1[&] *4*	
1176.1 *6*	
1256.1 *3*	
1260.5 *6*	
1276.1 *5*	
1291.3 *4*	
1313.5 *3*	
1330.7 *6*	
1364.8 *7*	
1369.8 *7*	
1375.6 *4*	
1384.6 *3*	
1392.8 *5*	
1408.5 *6*	
1445.7 *6*	
1484.1 *8*	
1492.8? *7*	
1509.0 *5*	
1546.5 *7*	
1711.5 *5*	
1822.5 *6*	
2104.3 *6*	
2109.5 *5*	
2857.4 *6*	
5488.32 *20*	S(n)=5488.32 keV *20* (2012Wa38).

[†] From Eγ with S(n)=5488.09 *20*. Recoil corrections have been applied.
[‡] From Adopted Levels. J=1 to 4 for levels with no J^{π} given.
[#] Rounded-off value from Adopted Levels. Primary γ present in spectrum, but peak is weak.
[@] The authors' value of 1197.6 in table I is a misprint.
[&] The authors' value of 1153.1 is a misprint, or else Eγ is incorrect.

γ(^{238}Np)

E$_\gamma$[†]	I$_\gamma$[†&]	E$_i$(level)	E$_f$	E$_\gamma$[†]	I$_\gamma$[†&]	E$_i$(level)	E$_f$
2630.7 *6*	22 *7*	5488.32	2857.4	4123.3 *7*	15 *4*	5488.32	1364.8
3378.6 *4*	19 *5*	5488.32	2109.5	4157.4 *5*	28 *3*	5488.32	1330.7
3383.8 *5*	16 *4*	5488.32	2104.3	4174.6 *2*	24 *3*	5488.32	1313.5
3665.6 *5*	13 *4*	5488.32	1822.5	4196.8 *3*	17 *3*	5488.32	1291.3
3776.6 *4*	20 *4*	5488.32	1711.5	4212.0 *4*	16 *3*	5488.32	1276.1
3941.6 *7*	14 *3*	5488.32	1546.5	4227.6 *6*	13 *3*	5488.32	1260.5
3979.1 *4*	13 *3*	5488.32	1509.0	4232.0 *2*	48 *3*	5488.32	1256.1
3995.3 *7*	8 *3*	5488.32	1492.8?	4312.0 *5*	10.4 *24*	5488.32	1176.1
4004.0[@] *8*	13[@] *3*	5488.32	1484.1	4325.0 *4*	27 *3*	5488.32	1163.1
4042.4 *6*	12 *3*	5488.32	1445.7	4345.1 *5*	11 *3*	5488.32	1143.0
4079.6 *5*	17 *3*	5488.32	1408.5	4368.5[a] *7*	10 *3*	5488.32	1119.6?
4095.3 *4*	13 *3*	5488.32	1392.8	4380.3[@] *7*	17[@] *3*	5488.32	1107.8
4103.5 *2*	30 *4*	5488.32	1384.6	4399.1[a] *6*	8 *2*	5488.32	1089.0?
4112.5 *3*	20 *4*	5488.32	1375.6	4407.1[a] *6*	6 *2*	5488.32	1081.0?
4118.3 *7*	13 *4*	5488.32	1369.8	4422.9[a] *4*	11 *2*	5488.32	1065.2?

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^{237}Np(n,γ) E=th:primary γ's 1979Io01 (continued)

$\gamma(^{238}Np)$ (continued)

E_γ [†]	I_γ [†&]	E_i(level)	E_f	J_f^π	Comments
4441.6[a] 6	6.9 20	5488.32	1046.5?		
4454.7[a] 7	7 2	5488.32	1033.4?		
4461.5[a] 6	8 2	5488.32	1026.6?		
4501.6[a] 3	20.3 24	5488.32	986.5?		
4517.4[a] 6	7 2	5488.32	970.7?		
4539.2[a] 5	12 3	5488.32	948.9?		
4559.0[a] 6	8 2	5488.32	929.1?		
4571.5 8	9 2	5488.32	916.6		
4584.8 3	21 2	5488.32	903.3		
4619.1[@] 4	19[@] 2	5488.32	869.0		
4653.4 5	22 2	5488.32	834.7		
4674.2 7	11 3	5488.32	813.9		
4678.3 2	42 4	5488.32	809.8		
4687.7 8	15 6	5488.32	800.4		
4690.7 3	16[#] 6	5488.32	797.4		
4705.6 5	9 2	5488.32	782.4		
4723.9 6	7.4 19	5488.32	764.1		
4765.6 7	10 2	5488.32	722.4		
4778.80 15	54 3	5488.32	709.24		
4795.5 5	5.0 15	5488.32	692.5	1^- to 3^-	
4814.4 2	33.5 23	5488.32	673.6	1^- to 3^-	
4841.0[‡] 7	7[‡] 2	5488.32	647.0	1^- to 3^-	
4868.5 2	32.4 25	5488.32	619.5		
4886.5 7	9 2	5488.32	601.5	1^- to 3^-	
4903.8 3	18.5[#] 30	5488.32	584.2	1^- to 4^-	
4920.4[@] 5	8[@] 2	5488.32	567.6	3^-	
4960.0 6	9 2	5488.32	528.0	3^-	
5030.55 15	57 3	5488.32	457.5	1^- to 3^-	
5046.3 2	39 3	5488.32	441.7	$(4)^-$	
5101.6 3	16 2	5488.32	386.4		
5115.2 6	14 3	5488.32	372.8	$(1)^-$	
5120.0 5	21 3	5488.32	368.0	$(2)^-$	
5140.5 4	11.5 19	5488.32	347.5	1^- to 3^-	
5153.7[‡] 8	4.2[‡] 15	5488.32	334.3	1^- to 3^-	
5162.8		5488.32	325.2		E_γ: from E(level) and S(n). Peak seen but is weak.
5202.2 10		5488.32	285.8		E_γ: reported only in the authors' BNL experiment.
5229.3[‡] 5	7.5[‡] 15	5488.32	258.7	4^-	
5238.05 15	35.6 23	5488.32	249.98	$(2)^-$	
5271.5 10	6 2	5488.32	216.5	3^-	E_γ,I_γ: doublet. One component is an impurity line from ^{15}N.
5305.7 6	8.0 16	5488.32	182.4	2^-	
5352.00 15	100 4	5488.32	136.03	3^-	
5488.32 20	5.7 9	5488.32	0	2^+	Additional information 2.

[†] From authors' table 1. These are data taken at Fribourg with a pair spectrometer. FWHM=2.7 keV at 2200 increasing linearly to 4.6 keV at 5500. Data are also given in table 3 from an experiment at BNL using a Ge(Li) detector with FWHM=7 keV at 5000.

[‡] Questioned by authors; however the transition defines a level with energy corresponding to a level seen in arc and/or in resonance neutron capture.

[#] An Al background contribution has been subtracted.

[@] Possible background contribution.

[&] For intensity per 100 neutron captures, multiply by ≈0.01.

[a] Placement of transition in the level scheme is uncertain.

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Level Scheme

Intensities: I_γ per 100 neutron captures

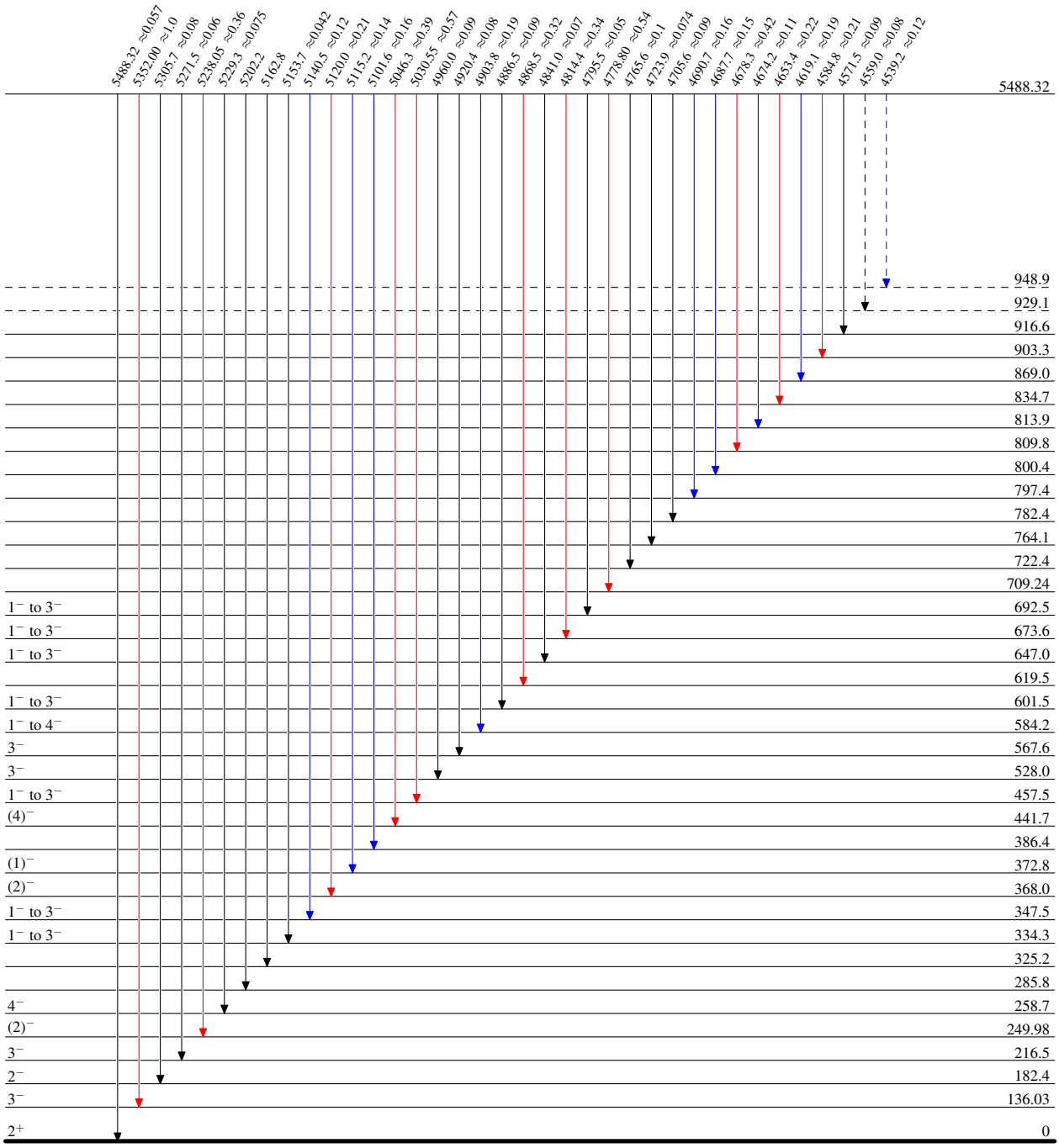
Legend

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

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

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

γ Decay (Uncertain)



$^{238}_{93}Np_{145}$

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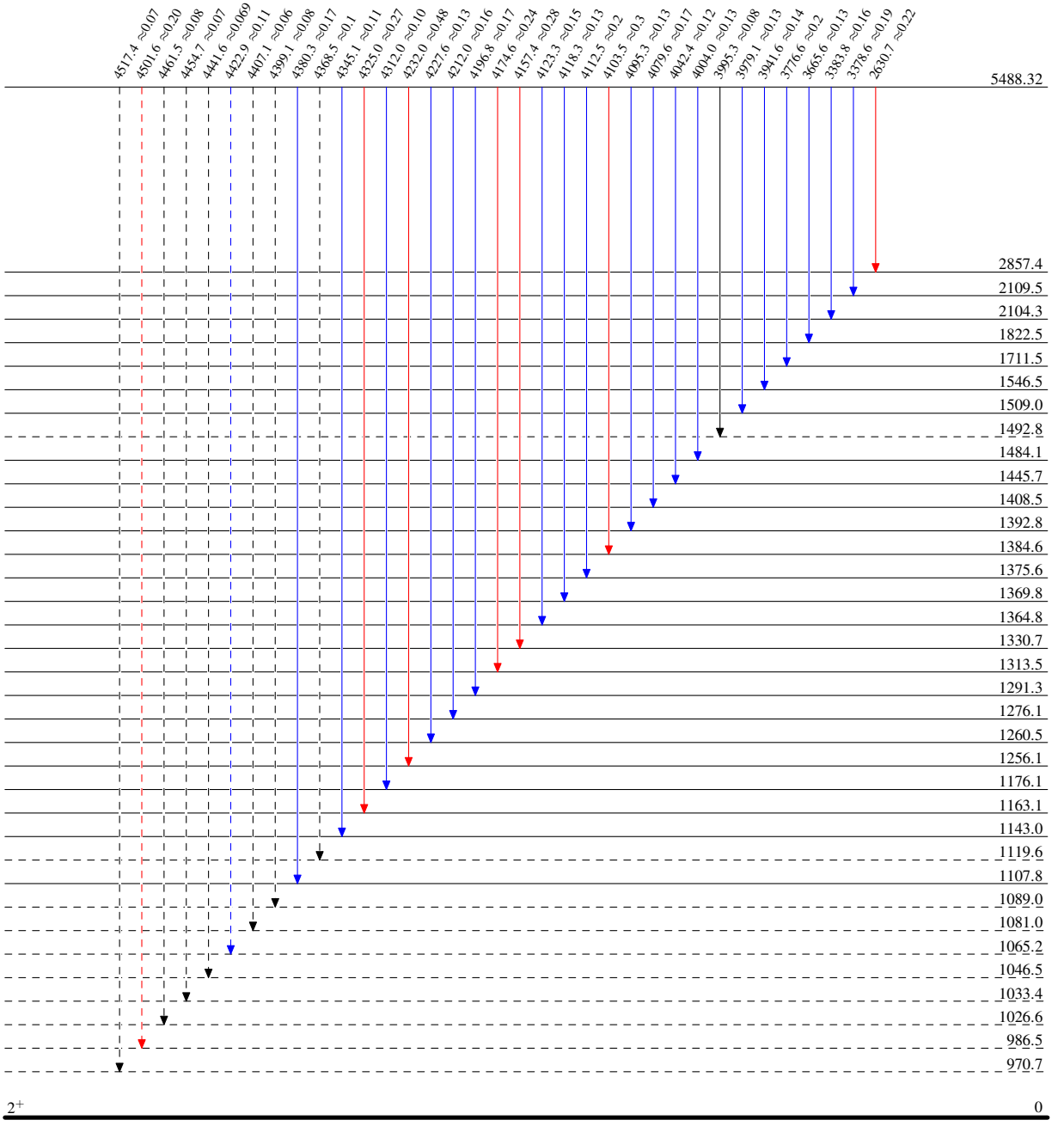
Level Scheme (continued)

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)



$^{238}_{93}Np_{145}$