$^{145}\text{Nd}(n,n'\gamma)$ 1983Go15

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 110, 507 (2009)	1-Oct-2008

Reactor fast neutrons.
Measured: γ, Iγ, $\gamma(\theta)$.

^{145}Nd Levels

E(level)	J$^{\pi\dagger}$	E(level)	J$^{\pi\dagger}$	E(level)	J$^{\pi\dagger}$	E(level)	J$^{\pi\dagger}$
0.0	7/2$^-$	1084.9 *3*	3/2$^+$	1401.2 *15*	15/2$^-$	1874.3 *7*	
67.22	3/2$^-$	1150.4 *4*	7/2$^-$	1404.0 *3*	(5/2$^-$)	1917.5 *5*	5/2$^-$
72.23 *20*	5/2$^-$	1161.2 *3*	3/2$^-$,5/2,7/2$^-$	1427.8 *2*	13/2$^-$	1957.3 *4*	
657.61 *10*	11/2$^-$	1162.2 *3*	9/2$^-$	1527.1? *8*	9/2$^-$	1967.4 *3*	(5/2)$^-$
748.27 *10*	9/2$^-$	1213.3 *2*	(1/2)$^-$	1532.3 *2*	(5/2$^-$)	2004.1	3/2$^-$
780.40 *10*	3/2$^-$	1249.8 *2*	5/2$^-$	1576.0 *4*	5/2$^-$,7/2$^-$	2011.8 *7*	17/2$^-$
919.83 *11*	1/2$^-$	1285.6	5/2$^-$	1591.1 *5*	5/2$^-$,7/2$^-$	2071.2 *8*	17/2$^-$
920.9 *2*	9/2$^-$	1317.2 *3*	(3/2)$^-$	1592.6 *7*	3/2$^-$	2146.0 *6*	
936.89 *10*	5/2$^-$	1326.3 *2*	1/2$^+$	1654.0 *3*	(7/2)$^-$	2161.0 *3*	
1010.87 *15*	11/2$^{(+)}$	1338.7 *2*	5/2$^-$,7/2$^-$	1681.3 *7*	5/2$^-$,7/2$^-$	2270.8 *5*	3/2$^-$
1051.6 *2*	7/2$^-$,5/2$^-$	1400.9 *7*	3/2$^-$	1715.16	15/2$^{(+)}$	2427.3 *10*	

† Adopted values.

$\gamma(^{145}\text{Nd})$

E$_\gamma$	I$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.†	Comments
72.23 *20*		72.23	5/2$^-$	0.0	7/2$^-$		
^{x}149.2 *3*	5 *1*						
^{x}165.5 *3*	4 *1*						
^{x}243.5 *4*	1.0 *4*						
^{x}248.0 *4*	2.8 *8*						
^{x}252.6 *3*	2.4 *6*						
262.8$^@$ *4*	0.33$^@$	920.9	9/2$^-$	657.61	11/2$^-$		I$_\gamma$: from I(262γ)/I(920γ)=0.0036 in Coul. ex. and Iγ for doublet 262γ.
262.8$^@$ *4*	36$^@$ *12*	1010.87	11/2$^{(+)}$	748.27	9/2$^-$	D+(Q)	δ: -0.04 *5* or -5.64 $+144-275$.
^{x}308.6 *2*	4.4 *6*						
318.7$^{\#\&}$ *4*	2.6$^\#$	1404.0	(5/2$^-$)	1084.9	3/2$^+$		
318.7$^\#$ *4*	2.6$^\#$	1532.3	(5/2$^-$)	1213.3	(1/2)$^-$		
353.26$^@$ *10*	34$^@$	1010.87	11/2$^{(+)}$	657.61	11/2$^-$	D(+Q)	δ>-0.07<$+0.8$ I$_\gamma$: from I(353γ)/I(623γ)=1.9 in β^- decay and Iγ for doublet 353γ.
353.26$^@$ *10*	6$^@$	1404.0	(5/2$^-$)	1051.6	7/2$^-$,5/2$^-$		I$_\gamma$: from I(353γ)/I(623γ)=1.9 in β^- decay and Iγ for doublet 353γ.
^{x}356.4 *3*	1.6 *4*						
^{x}373.6 *5*	1.5 *6*						
^{x}427.0 *2*	2.2 *6*						
^{x}430.6 *3*	2.8 *8*						
^{x}448.1 *5*	2.2 *7*						
^{x}450.0 *5*	3.5 *9*						
474.9 *3*	1.0 *4*	1527.1?	9/2$^-$	1051.6	7/2$^-$,5/2$^-$		
492.76 *10*	6.3 *2*	1150.4	7/2$^-$	657.61	11/2$^-$		
504.6 *2*	6 *1*	1162.2	9/2$^-$	657.61	11/2$^-$		
515.7 *6*	2.2 *6*	1527.1?	9/2$^-$	1010.87	11/2$^{(+)}$		

^{145}Nd(n,n'γ)   **1983Go15** (continued)

γ(^{145}Nd) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ	Comments
^{x}525.2 3	0.9 4							
^{x}546.1 4	0.58 16							
552.5 4	1.0 5	2427.3		1874.3				
^{x}580.1 4	1.0 5							
584.0 5	4.7 19	2011.8	17/2$^-$	1427.8	13/2$^-$			
623.6 2	3.6 3	1404.0	(5/2$^-$)	780.40	3/2$^-$			
^{x}630.6‡	2.4 5							
^{x}633.2 4	0.8 4							
^{x}640.0 4	0.8 4							
643.4 4	1.8 7	2071.2	17/2$^-$	1427.8	13/2$^-$			
657.61 10	384 19	657.61	11/2$^-$	0.0	7/2$^-$	E2		
667.3 3	4.5 4	1917.5	5/2$^-$	1249.8	5/2$^-$			
675.75 10	92 9	748.27	9/2$^-$	72.23	5/2$^-$	E2		
679.5 2	9 3	1427.8	13/2$^-$	748.27	9/2$^-$			
704.29$^\#$ 1	0.5$^\#$ 2	1715.16	15/2$^{(+)}$	1010.87	11/2$^{(+)}$			
704.29$^\#$ 10	5$^\#$ 2	1917.5	5/2$^-$	1213.3	(1/2)$^-$			
707.9$^{@\&}$ 10	<10$^@$	1957.3		1249.8	5/2$^-$			I_γ: from $I\gamma$(707 component from 780 level) and $I\gamma$(707 doublet)=22 5.
707.91$^@$ 10	19$^@$ 2	780.40	3/2$^-$	72.23	5/2$^-$			I_γ: from $I\gamma$(707)/$I\gamma$(780)=2.44 27 in β^- decay.
713.23 10	17 1	780.40	3/2$^-$	67.22	3/2$^-$			
^{x}728.02 15	1.6 4							
^{x}732.7 3	2.6 6							
743.67 10	31 6	1401.2	15/2$^-$	657.61	11/2$^-$			
748.27 10	100	748.27	9/2$^-$	0.0	7/2$^-$	M1+E2	+1.30 45	δ>+0.85<+1.75
754.5$^{\#\&}$ 4	1.2$^\#$	1967.4	(5/2)$^-$	1213.3	(1/2)$^-$			
754.5$^\#$ 4	1.2$^\#$	2004.1	3/2$^-$	1249.8	5/2$^-$			
^{x}757.9 2	2.6 7							
^{x}763.0 4	2.4 7							
770.21 10	16 2	1427.8	13/2$^-$	657.61	11/2$^-$			
780.30 10	7 1	780.40	3/2$^-$	0.0	7/2$^-$			
784.1 4	1.3 4	1532.3	(5/2$^-$)	748.27	9/2$^-$			
^{x}788.2‡	0.9 3							
^{x}790.8 4	0.6 3							
^{x}792.9 4	0.36 18							
^{x}796.8 4	0.8 4							
^{x}812.2 5	3.1 8							
^{x}833.24 10	12 3							
847.9 4	33 10	920.9	9/2$^-$	72.23	5/2$^-$			
852.73 10	16 3	919.83	1/2$^-$	67.22	3/2$^-$			
864.44 10	20 4	936.89	5/2$^-$	72.23	5/2$^-$			
^{x}893.1 4	0.60 24							
^{x}904.1 4	1.2 6							
906.3 2	2.4 8	1654.0	(7/2)$^-$	748.27	9/2$^-$			
911.2 4	1.9 9	2161.0		1249.8	5/2$^-$			
915.8 4	1.5 8	1967.4	(5/2)$^-$	1051.6	7/2$^-$,5/2$^-$			
920.9 2	92 5	920.9	9/2$^-$	0.0	7/2$^-$	M1+E2		δ: −0.44 +16−22 or +1.6 +3−5.
^{x}930.08 10	2.0 3							
936.84 10	29 1	936.89	5/2$^-$	0.0	7/2$^-$	M1+E2		δ>+0.4<+4.1
979.0 3	33 8	1051.6	7/2$^-$,5/2$^-$	72.23	5/2$^-$	M1+E2		δ>−2.5<−0.17
984.8 3	2.4 8	2146.0		1161.2	3/2$^-$,5/2,7/2$^-$			
995.6 2	4.8 9	2146.0		1150.4	7/2$^-$			
^{x}1000.7 4	1.2 5							

^{145}Nd(n,n'γ)   **1983Go15** (continued)

$\gamma(^{145}$Nd) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.†	Comments
^{x}1002.7 _5_	2.5 _9_						
1012.7‡	8.8 _3_	1084.9	3/2$^+$	72.23	5/2$^-$		
1017.6 _3_	6.0 _2_	1084.9	3/2$^+$	67.22	3/2$^-$		
^{x}1021.5 _4_	3.5 _9_						
^{x}1029.0 _3_	2.5 _7_						
^{x}1047.2 _4_	4 _2_						
1051.6 _2_	24 _5_	1051.6	7/2$^-$,5/2$^-$	0.0	7/2$^-$		
^{x}1059.1 _4_	1.7 _8_						
^{x}1069.2 _3_	2.2 _6_						
^{x}1074.93 _15_	6.2 _8_						
1089.43 _20_	16 _4_	1162.2	9/2$^-$	72.23	5/2$^-$		
1094.0 _3_	6.3 _9_	1161.2	3/2$^-$,5/2,7/2$^-$	67.22	3/2$^-$		
^{x}1107.5 _3_	4.3 _9_						
1146.13 _1_	15 _2_	1213.3	(1/2)$^-$	67.22	3/2$^-$		
1150.4 _4_	37 _11_	1150.4	7/2$^-$	0.0	7/2$^-$	D+(Q)	δ: +0.02 +9−5 or +8 +3−22.
1162.1$^\#$ _3_	68$^\#$ _13_	1161.2	3/2$^-$,5/2,7/2$^-$	0.0	7/2$^-$		
1162.1$^\#$ _3_	68$^\#$ _13_	1162.2	9/2$^-$	0.0	7/2$^-$	D+Q	δ: +0.52 +10−6 or +3.2 +7−2.
^{x}1167.9 _4_	3 _1_						
1177.3$^@$ _3_	16$^@$ _5_	1249.8	5/2$^-$	72.23	5/2$^-$	D+(Q)	δ: −0.02 +17−14 or +1.75 +75−56. I_γ: I_γ from I_γ(1177)/I_γ(1182)=4.8 _10_ in β^- decay.
1177.3$^{@\&}$ _3_	9$^@$ _6_	1957.3		780.40	3/2$^-$		I_γ: I_γ from I_γ(1177 from 1249 level) and I_γ(1177 doublet)=25 _3_.
1182.3 _2_	3.3 _8_	1249.8	5/2$^-$	67.22	3/2$^-$		
^{x}1210.6 _4_	2.6 _7_						
1213.2 _2_	9 _2_	1285.6	5/2$^-$	72.23	5/2$^-$	D+(Q)	δ: +1.6 +10−7 or +0.01 +32−20.
1218.3 _2_	8.4 _16_	1285.6	5/2$^-$	67.22	3/2$^-$		δ: −0.11 +19−27 or −2.6 +12−22.
^{x}1228.9 _4_	1.5 _7_						
1240.1 _3_	7.8 _23_	2161.0		920.9	9/2$^-$		
1244.7 _2_	5 _2_	1317.2	(3/2)$^-$	72.23	5/2$^-$		
1249.9$^@$ _2_	10$^@$ _4_	1249.8	5/2$^-$	0.0	7/2$^-$	M1+E2	δ>−1.7<−0.4 I_γ: from I_γ(1249)/I_γ(1182)=3.0 _7_ in β^- decay.
1249.9$^@$ _2_	7$^@$ _7_	1317.2	(3/2)$^-$	67.22	3/2$^-$		I_γ: from I_γ(1249 from 1249 level)=10 _4_ and I_γ(1249 doublet)=17 _5_.
1259.1 _2_	14 _2_	1326.3	1/2$^+$	67.22	3/2$^-$		
1265.8$^@$ _2_	6.4$^@$ _22_	1338.7	5/2$^-$,7/2$^-$	72.23	5/2$^-$		I_γ: from I_γ(1271)=0.43 _13_ in β^- decay.
1265.8$^@$ _2_	≤5$^@$	2427.3		1161.2	3/2$^-$,5/2,7/2$^-$		I_γ: from I_γ(1265 from 1338) and I_γ(1265 doublet)=8.5 _7_.
1271.8 _2_	15 _3_	1338.7	5/2$^-$,7/2$^-$	67.22	3/2$^-$		δ: +0.10 _9_ or +5.7 +21−149.
1285.6 _2_	5.6 _8_	1285.6	5/2$^-$	0.0	7/2$^-$		
^{x}1307.92 _13_	3.9 _8_						
^{x}1314.1 _5_	2.0 _7_						
1332.1 _6_	<12	1404.0	(5/2$^-$)	72.23	5/2$^-$		I_γ: analysis of branching in (n,n'γ), (n,γ) and β^- decay suggests that part of the I_γ=12 _3_ is located elsewhere in the decay scheme.
1338.5 _5_	1.8 _7_	1338.7	5/2$^-$,7/2$^-$	0.0	7/2$^-$		
1350.6 _3_	2.2 _6_	2270.8	3/2$^-$	919.83	1/2$^-$		
^{x}1360.0 _4_	4 _1_						
^{x}1368.2 _2_	2.1 _5_						
^{x}1386.5 _4_	1.9 _6_						
^{x}1391.4 _3_	3.4 _8_						
1400.9 _7_	1.0 _5_	1400.9	3/2$^-$	0.0	7/2$^-$		

^{145}Nd(n,n′γ)　　**1983Go15** **(continued)**

$\gamma(^{145}$Nd) (continued)

E$_\gamma$	I$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[†]	Comments
^{x}1407.7 4	2.2 9						
^{x}1432.9 4	0.6 3						
^{x}1437.4 3	1.6 6						
^{x}1449.0 6	1.0 5						
1464.8 7	3.5 17	1532.3	(5/2$^-$)	67.22	3/2$^-$		
1490.8 2	1.7 4	2270.8	3/2$^-$	780.40	3/2$^-$		
1503.2$^\#$ 4	1.2$^\#$	1576.0	5/2$^-$,7/2$^-$	72.23	5/2$^-$		
1503.2$^{\#\&}$ 4	1.2$^\#$	2161.0		657.61	11/2$^-$		
1506.4 5	5 1	2427.3		920.9	9/2$^-$		
^{x}1511.84 14	6.3 15						
^{x}1516.48 15	7 3						
1525.4 7	7 3	1592.6	3/2$^-$	67.22	3/2$^-$		
1532.3 2	13.0 3	1532.3	(5/2$^-$)	0.0	7/2$^-$	D+Q	δ: +4.0 *+360−22* or +0.40 *+35−20.*
^{x}1543.0 6	1.4 7						
^{x}1550.2 4	1.8 9						
^{x}1561.2 7	1.7 8						
^{x}1569.4 4	2.2 8						
1576.3 4	7.6 22	1576.0	5/2$^-$,7/2$^-$	0.0	7/2$^-$		
^{x}1581.9 8	3 1						
1591.5 5	3.4 9	1591.1	5/2$^-$,7/2$^-$	0.0	7/2$^-$		
^{x}1643.6 3	3.6 14						
1654.0 4	2.3 6	1654.0	(7/2)$^-$	0.0	7/2$^-$		
^{x}1673.8 5	1.4 6						
1681.3 7	4.5 17	1681.3	5/2$^-$,7/2$^-$	0.0	7/2$^-$		
^{x}1696.7 4	1.3 5						
^{x}1701.9 2	5 1						
^{x}1733.5 4	1.8 6						
^{x}1749.8 5	6 2						
^{x}1762.0 4	7 2						
^{x}1765.8 5	5 2						
1769.0 6	3 1	2427.3		657.61	11/2$^-$		
^{x}1780.4 7	1.4 5						
^{x}1820.2 4	2.3 6						
^{x}1827.7 4	0.8 4						
^{x}1833.0 4	0.8 4						
^{x}1839.6 2	3.0 7						
^{x}1846.1 4	1.6 6						
^{x}1874.3 7	1.5 7						
1874.3 7	1.5 7	1874.3		0.0	7/2$^-$		
^{x}1883.7 4	2.4 6						
^{x}1894.3 2	7.0 9						
1900.7 4	1.5 6	1967.4	(5/2)$^-$	67.22	3/2$^-$		
^{x}1905.3 6	0.9 4						
^{x}1911.6 4	2.3 11						
1916.9 3	2.7 5	1917.5	5/2$^-$	0.0	7/2$^-$		
^{x}1923.5 4	1.8 7						
1936.8 3	1.5 4	2004.1	3/2$^-$	67.22	3/2$^-$		
1957.3 4	2.4 6	1957.3		0.0	7/2$^-$		
1967.4 3	3.0 9	1967.4	(5/2)$^-$	0.0	7/2$^-$		
^{x}1996.1 2	1.8 5						
2004.1 3	1.8 4	2004.1	3/2$^-$	0.0	7/2$^-$		
^{x}2069.8 4	2.9 8						
^{x}2091.1 3	5.0 9						I$_\gamma$: Iγ=5 *9* is probably misprint of Iγ=5.0 *9.*
^{x}2102.7 6	1.9 7						
^{x}2108.6 6	1.9 7						
^{x}2120.4 5	0.5 2						

^{145}Nd(n,n′γ)   **1983Go15** (continued)

γ(^{145}Nd) (continued)

E_γ	I_γ	E_i(level)	J^π_i	E_f	J^π_f	E_γ	I_γ	E_i(level)	E_f	J^π_f
2146.0 *6*	1.4 *5*	2146.0		0.0	7/2$^-$	^{x}2249.5 *8*	0.6 *3*			
^{x}2149.8 *6*	2.0 *8*					2428.1 *7*	0.9 *4*	2427.3	0.0	7/2$^-$
2160.9 *3*	3.7 *9*	2161.0		0.0	7/2$^-$	^{x}2439.4 *8*	0.6 *3*			
^{x}2244.7 *8*	2.0 *9*									

† Assuming that M2 cannot compete with E2, M1 and E1.
‡ Complex line.
$^\#$ Multiply placed with undivided intensity.
$^@$ Multiply placed with intensity suitably divided.
$^\&$ Placement of transition in the level scheme is uncertain.
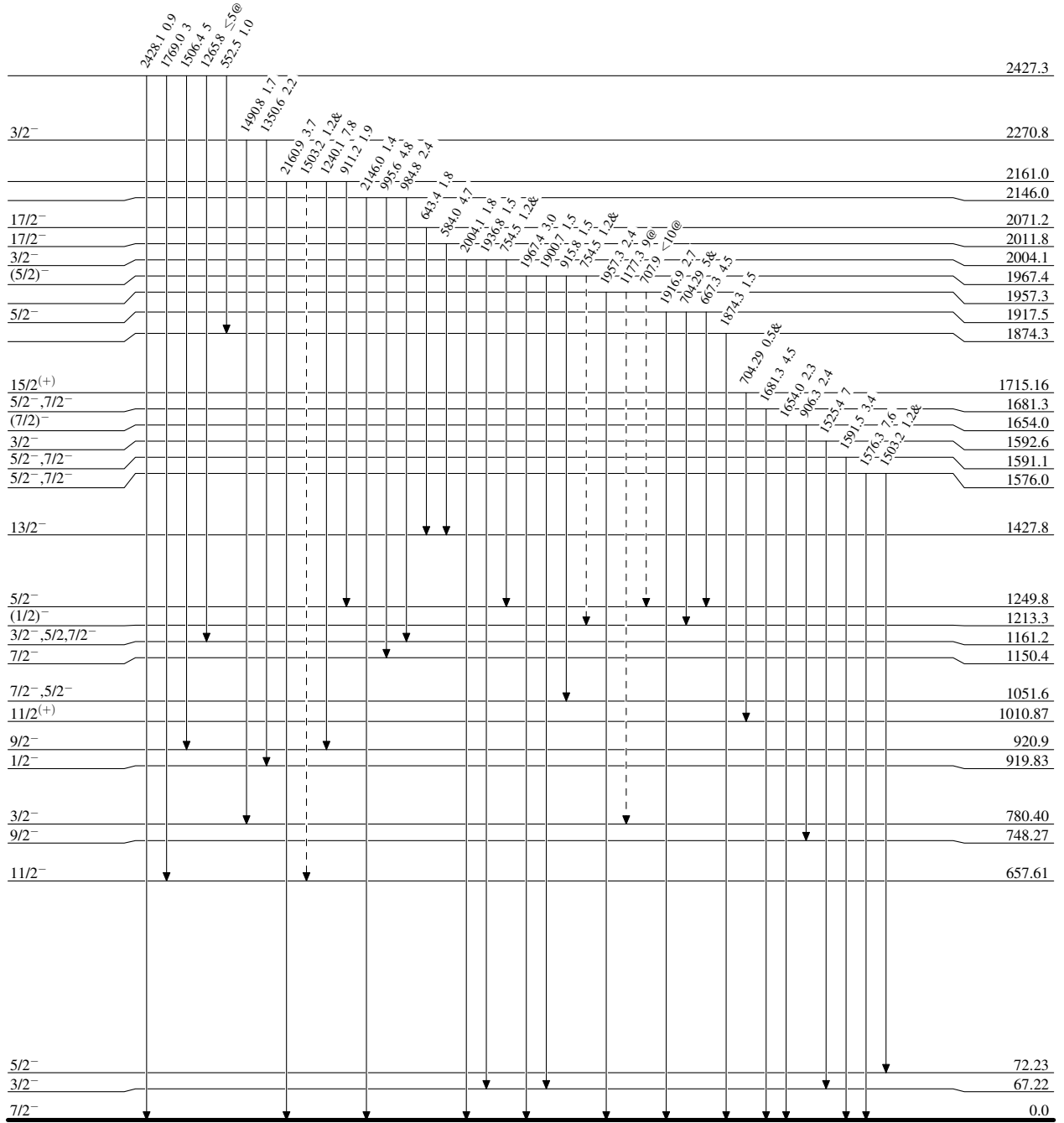^{x} γ ray not placed in level scheme.

${}^{145}\text{Nd}(n,n'\gamma)$ 1983Go15

Level Scheme

Intensities: Relative I_γ
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend

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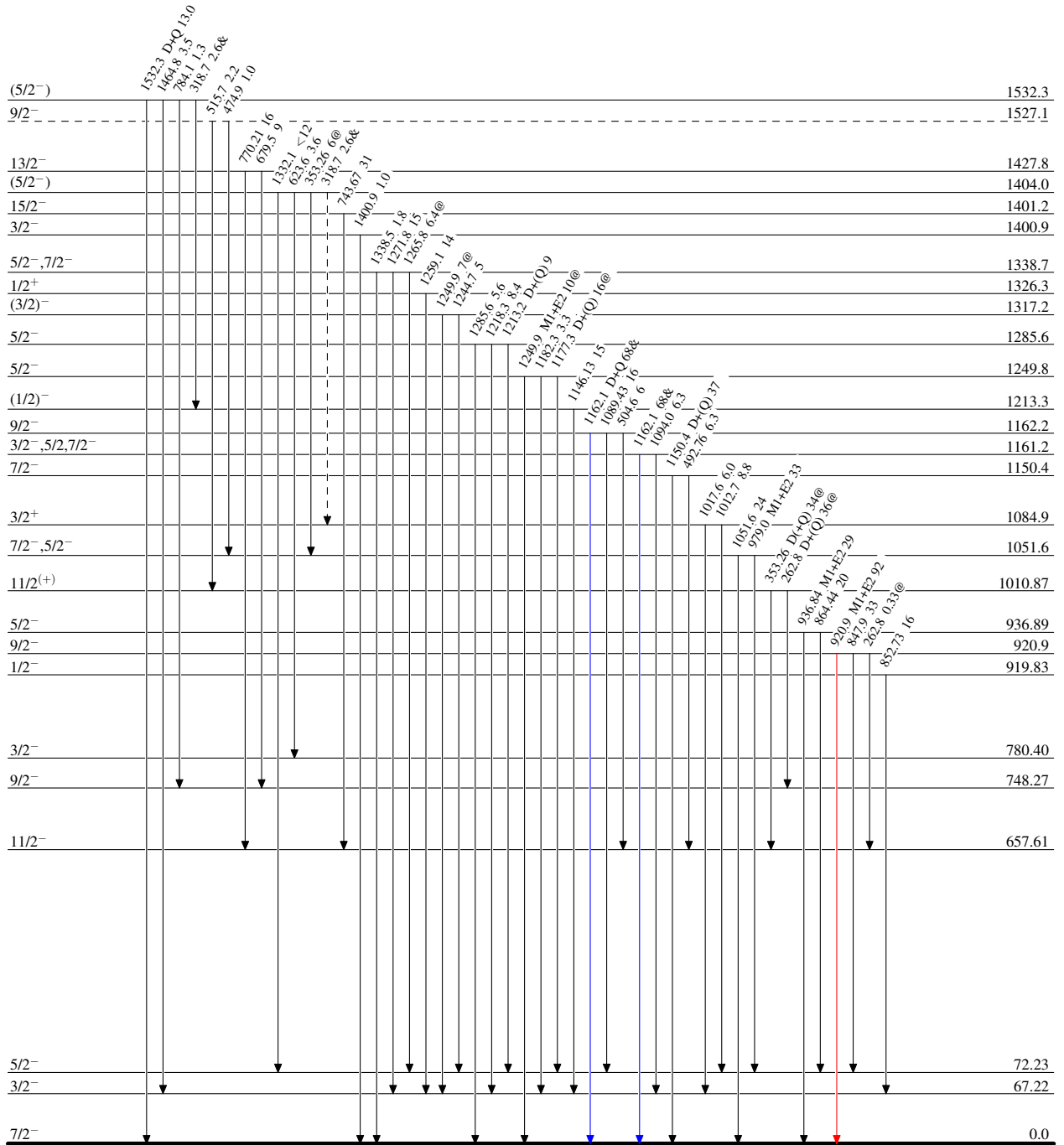----→ γ Decay (Uncertain)

${}^{145}_{60}\text{Nd}_{85}$

^{145}Nd(n,n'γ)　　**1983Go15**

Level Scheme (continued)

Intensities: Relative I$_γ$
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend

→	I$_γ$ < 2%×I$_γ^{max}$
→ (blue)	I$_γ$ < 10%×I$_γ^{max}$
→ (red)	I$_γ$ > 10%×I$_γ^{max}$
---→	γ Decay (Uncertain)

Level	Energy
(5/2$^-$)	1532.3
9/2$^-$	1527.1
13/2$^-$	1427.8
(5/2$^-$)	1404.0
15/2$^-$	1401.2
3/2$^-$	1400.9
5/2$^-$,7/2$^-$	1338.7
1/2$^+$	1326.3
(3/2)$^-$	1317.2
5/2$^-$	1285.6
5/2$^-$	1249.8
(1/2)$^-$	1213.3
9/2$^-$	1162.2
3/2$^-$,5/2,7/2$^-$	1161.2
7/2$^-$	1150.4
3/2$^+$	1084.9
7/2$^-$,5/2$^-$	1051.6
11/2$^{(+)}$	1010.87
5/2$^-$	936.89
9/2$^-$	920.9
1/2$^-$	919.83
3/2$^-$	780.40
9/2$^-$	748.27
11/2$^-$	657.61
5/2$^-$	72.23
3/2$^-$	67.22
7/2$^-$	0.0

$^{145}_{60}$Nd$_{85}$

^{145}**Nd(n,n′γ)**   **1983Go15**

Level Scheme (continued)

Intensities: Relative I$_\gamma$
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend

$\longrightarrow$ I$_\gamma <$ 2%×I$_\gamma^{max}$
$\longrightarrow$ I$_\gamma <$ 10%×I$_\gamma^{max}$
$\longrightarrow$ I$_\gamma >$ 10%×I$_\gamma^{max}$

3/2$^-$	780.40
9/2$^-$	748.27
11/2$^-$	657.61
5/2$^-$	72.23
3/2$^-$	67.22
7/2$^-$	0.0

780.30 7
713.23 17
707.91 19@
748.27 M1+E2 100
675.75 E2 92
657.61 E2 384
72.23

$^{145}_{60}$Nd$_{85}$