

$^{148}\text{Nd}(\text{n},\text{n}'\gamma)$ [1984GoZQ,1982DeYW](#)

<u>Type</u>	<u>Author</u>	<u>History Citation</u>	<u>Literature Cutoff Date</u>
Full Evaluation	N. Nica	NDS 117, 1 (2014)	1-Oct-2013

Fast reactor neutrons.

Measured: γ , $\gamma(\theta)$ ([1982DeYW](#)), linear pol of γ ([1984GoZQ](#)).

 ^{148}Nd Levels

<u>E(level)</u>	<u>$J^{\pi\dagger}$</u>	<u>Comments</u>
0.0	0^+	
301.60 7	2^+	
752.18 10	4^+	
916.81 11	0^+	
999.21 10	3^-	
1023.12 7	1^-	
1170.90 10	2^+	
1242.14 13	5^-	J=5, or (3) with J=5 preferred.
1248.81 8	2^+	
1279.69 14	6^+	J=6.
1511.51 11	3^+	J=3.
1521.46 18	1	J=1.
1645.4 2		J=1,2.
1659.6 2	2^+	J=2.
1683.3 2	4^+	J=1-3.
1687.91 14	$(3,4,5)^+$	J=3,4.
1729.0 2	3^+	J=2,3.
1808.6 4		
1824.4		J=2-4.
1858.6 3	$(2^+,3)$	J=3.

[†] Adopted values; supported by $\gamma(\theta)$ and linear-polarization data from this data set. J assignments by [1982DeYW](#) are given in comments.

¹⁴⁸Nd(n,n'γ) 1984GoZQ,1982DeYW (continued)

$\gamma(^{148}\text{Nd})$										
E_γ †	I_γ ‡	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	δ	α &	Comments	
246.2 2	0.68 7	999.21	3 ⁻	752.18	4 ⁺					
297.5 3	1.0 3	1808.6		1511.51	3 ⁺					
301.60 7	113 10	301.60	2 ⁺	0.0	0 ⁺					
418.2 4	0.20 9	1170.90	2 ⁺	752.18	4 ⁺					
450.58 7	24.7 15	752.18	4 ⁺	301.60	2 ⁺					
489.96 8	4.5 4	1242.14	5 ⁻	752.18	4 ⁺	E1(+M2) [#]	+0.03 2	0.00418 10	$\alpha=0.00418$ 10; $\alpha(K)=0.00358$ 8; $\alpha(L)=0.00047$ 1; $\alpha(M)=9.8\times 10^{-5}$ 3 Mult.: $A_2=-0.20$ 4, $A_4=+0.04$ 5; lin pol=2.35 19.	
527.51 10	2.8 2	1279.69	6 ⁺	752.18	4 ⁺	E2 [#]		0.0103	$\alpha(K)=0.0085$ 3; $\alpha(L)=0.00136$ 4 Mult.: lin pol=3.4 9.	
605.2 3	0.48 10	1521.46	1	916.81	0 ⁺					
615.21 8	4.6 4	916.81	0 ⁺	301.60	2 ⁺					
637.3 7	0.47 16	1808.6		1170.90	2 ⁺					
660.0 5	0.51 15	1659.6	2 ⁺	999.21	3 ⁻					
697.61 7	11.3 8	999.21	3 ⁻	301.60	2 ⁺					
721.43 8	4.3 4	1023.12	1 ⁻	301.60	2 ⁺					
759.32 18	0.62 7	1511.51	3 ⁺	752.18	4 ⁺	M1+E2 [#]		0.0054 13	$\alpha=0.0054$ 13; $\alpha(K)=0.0046$ 11; $\alpha(L)=0.00063$ 12 Mult.: $A_2=-0.28$ 9, $A_4=+0.07$ 11; lin pol=0.7 3. δ : +0.35 15 or +5.0 +15-22. Mult.: $A_2=-0.31$ 9, $A_4=+0.06$ 11; lin pol=1.7 6.	
825.23 15	0.70 12	1824.4		999.21	3 ⁻					
869.23 7	7.1 6	1170.90	2 ⁺	301.60	2 ⁺	M1+E2 [#]	+8 +12-2	0.00309 2	$\alpha=0.00309$ 2; $\alpha(K)=0.00260$ 2; $\alpha(L)=0.00037$ Mult.: $A_2=+0.01$ 4, $A_4=+0.02$ 5; lin pol=0.75 7. Mult.: $A_2=-0.16$ 13, $A_4=+0.01$ 14; lin pol=0.73.	
^x 912										
935.83 10	1.85 14	1687.91	(3,4,5) ⁺	752.18	4 ⁺	M1+E2 [#]		0.0033 8	$\alpha=0.0033$ 8; $\alpha(K)=0.0028$ 7; $\alpha(L)=0.00038$ 8 Mult.: $A_2=+0.01$ 4, $A_4=-0.03$ 6; lin pol=0.58 14. δ : -0.53 +8-10 or +3.0 5.	
947.09 10	2.2 2	1248.81	2 ⁺	301.60	2 ⁺	M1+E2 [#]		0.0032 7	$\alpha=0.0032$ 7; $\alpha(K)=0.0027$ 6; $\alpha(L)=0.00037$ 7 Mult.: $A_2=-0.06$ 4, $A_4=+0.01$ 4; lin pol=0.95 14. δ : >+100,<-9.	
976.8 2	0.67 11	1729.0	3 ⁺	752.18	4 ⁺	(M1(+E2)) [@]	+0.00 +13-14	0.0030 7	$\alpha=0.0030$ 7; $\alpha(K)=0.0026$ 6; $\alpha(L)=0.00034$ 7 Mult.: $A_2=-0.08$ 10, $A_4=+0.03$ 12.	
1023.18 7	6.0 4	1023.12	1 ⁻	0.0	0 ⁺					
1071.9 7	0.28 10	1824.4		752.18	4 ⁺					
1106.0 10	0.4 2	1858.6	(2 ⁺ ,3)	752.18	4 ⁺					
1171.06 15	1.27 12	1170.90	2 ⁺	0.0	0 ⁺					
1209.92 8	2.74 18	1511.51	3 ⁺	301.60	2 ⁺	M1+E2 [#]		0.0019 4	$\alpha=0.0019$ 4; $\alpha(K)=0.0016$ 3; $\alpha(L)=0.00021$ 4 Mult., δ : $A_2=+0.05$ 5, $A_4=+0.06$ 6; lin pol=1.7 4; $\delta>+100,<-28$ or +0.20 4.	
1248.89 8	5.0 3	1248.81	2 ⁺	0.0	0 ⁺					
1343.8 2	1.40 18	1645.4		301.60	2 ⁺				Mult.: $A_2=+0.09$ 6, $A_4=+0.04$ 7.	

¹⁴⁸Nd(n,n'γ) [1984GoZQ](#),[1982DeYW](#) (continued)

γ(¹⁴⁸Nd) (continued)

$E_\gamma^\dagger$	$I_\gamma^\ddagger$	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	δ	$\alpha^\&$	Comments
1358.0 2	1.28 15	1659.6	2 ⁺	301.60	2 ⁺	(M1(+E2)) [@]			Mult., δ : A ₂ =+0.22 6, A ₄ =+0.00 7; δ =+0.02 2 or +2.2 +5-4.
1381.7 2	1.06 14	1683.3	4 ⁺	301.60	2 ⁺				Mult.: A ₂ =+0.09 5, A ₄ =+0.00 5.
1386.1 5	0.16 6	1687.91	(3,4,5) ⁺	301.60	2 ⁺				
1427.4 2	0.81 12	1729.0	3 ⁺	301.60	2 ⁺	M1+E2 [#]	+0.37 5	0.00147 1	α =0.00147 1; α (K)=0.00126 1; α (L)=0.00016
1521.46 18	1.1 1	1521.46	1	0.0	0 ⁺				Mult.: A ₂ =+0.20 5, A ₄ =+0.02 6; lin pol=0.6 3.
1557.0 3	0.69 17	1858.6	(2 ⁺ ,3)	301.60	2 ⁺	(M1+E2) [@]			Mult.: A ₂ =+0.13 7, A ₄ =+0.01 8.
1645.6 10	0.26 9	1645.4		0.0	0 ⁺				Mult.: A ₂ =-0.52 10, A ₄ =+0.07 11; -1.9< δ <-0.26.

[†] 73 more γ's were observed. Eγ's are not given ([1982DeYW](#)).

[‡] Iγ(125°) in relative units.

[#] From γ(θ) and linear-polarization data ([1984GoZQ](#)).

[@] From γ(θ) and ΔJ^π.

[&] Total theoretical internal conversion coefficients, calculated using the BrIcc code ([2008Ki07](#)) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

^x γ ray not placed in level scheme.

