			Type	Author	History	Literature Cutoff Date
		Full	Evaluation	N Nica	NDS 195 1 (2024)	19-Sep-2023
$Q(\beta^{-})=1599 \ 4; S(2n)=12481 \ 4,$ Additional inform	S(n)=684 S(2p)=18 mation 1	46 4; S(p)=977 8625 4 (2021♥	$^{18} 11; Q(\alpha) =$ Va16).	=-1454 6	2021Wa16	15 500 2025
					¹⁶² Gd Levels	
Additional info	ormation	2.				
				Cross	Reference (XREF) Fla	igs
				162	$F_{11} \rho^{-}$ decays mixed a	
				B 160 C 252	Gd(t,p) Cf SF decay	burce
E(level) [†]	$J^{\pi \ddagger}$	T _{1/2}	XREF			Comments
0.0	0+ #	8.4 min 2	ABC 9	$\delta \beta^{-} = 100$		
]	$\Gamma_{1/2}$: weight Other: 10.	ed average of 8.2 min 4 min 2 (1967Wa05).	3 (1970Ch02) and 8.55 min 28 (1982Ge07).
71.54 ^{&} 15	(2+)	2.76 ns 6	ABC 7	$\Gamma_{1/2}$: From 1	least- χ^2 fit of β - γ time	interval spectrum (2010NaZY).
236.53 ^{&} 16	(4 ⁺)		ABC			
490.09 ^{&} 16	(6 ⁺)		ABC			
826.29 ^{&} 17	(8+)		A C			
863.0 ^{<i>a</i>} 3	2+ @		AB			
$927.36^{\mu} 24$	(3^+)		AB			
1012.7^{a} 3 1118.66 ^{<i>a</i>} 25	(4^{+}) (5^{+})		AD			
1238.0 ^{&} 11	(10^+)		° C			
1243.5 ^{<i>a</i>} 3	(6+)		Α			
1354.1 ^d 3	(4+)		A c	configuration	n: <i>v</i> 3/2[411]⊗ <i>v</i> 5/2[413]	(2021Wa04).
1388.6 ^{<i>a</i>} 4	(7^{+})		Α			
1427.6 [°] 11	$0^{+\#}$		AB			
1448.6 ⁰ 3	(6 ⁻)	99 μs 5	A 1 c	Γ _{1/2} : measure configuration	red by β time difference 1: $v5/2[523] \otimes v7/2[633]$	where with 205γ and 330γ . (2021Wa04 and 2018Ha19).
1456.7 ^d 3	(5^+)		AB	7 -		
1493.10 /	(21)		AB J	^{<i>n</i>} : From end 2^+ member $K^{\pi}=0^+$ ba	ergy spacings and similar of the g.s. band, 198 and at 1427 keV.	larity of angular distribution with that for the $36Lo15$ propose this to be the 2^+ member of the
1519.7 4			Α			
1579.0 ^d 4	(6 ⁺)		Α			
1581.5 ^b 4	(7-)		Α			
1645.3 [°] 6	(4 ⁺)		AB			
1701.0 ^e 11	0+ #		AB			
1/14.0 <i>4</i> 1718 7 <mark>& 15</mark>	(12^{+})		A			
1710.7 = 13 1720.8 d A	(12)		ر ۵			
1720.0 4 $1733 3^{b} 4$	(7) (8 ⁻)		л А			
1155.5 4	(0)		л			

Continued on next page (footnotes at end of table)

					¹⁶² Gd Levels (continued)			
E(level) [†]	$J^{\pi \ddagger}$	XREF	E(level) [†]	XREF	E(level) [†]	$J^{\pi \ddagger}$	XREF	
1749 7		В	2304.6 11	A	2655.1 11		A	
1781.0 ^e 11	(2^{+})	Α	2321.3? 13	Α	2857.2 ^{&} 20	(16^{+})	С	
1898.0 ^C 7	(6^{+})	Α	2337.0 6	Α	3423.6 11		Α	
1975.4 5		Α	2346 7	В	3510.6 11		Α	
2014.5 11		Α	2413.6 11	Α	3572.6 11		Α	
2030.5 11		Α	2417.6 11	Α	3596.2 8		Α	
2148?		Α	2432 7	В	3660.3 8		Α	
2163 7		В	2464 7	В				
2260.3 ^{&} 18	(14^{+})	С	2590.6 11	Α				

Adopted Levels, Gammas (continued)

[†] From a least-squares fit to $E\gamma$ data.

[‡] Assignments are based on those given in 1986Lo15 from the ¹⁶⁰Gd(t,p) reaction and 2004Jo17 from the ²⁵²Cf SF decay, on top of which 2021Wa04 assigned J^{π} values in the newest ¹⁶²Eu β^{-} decay dataset based on band structures, assigned configurations and other theoretical arguments. The L=0 (and L=2) angular distributions uniquely define the levels with $J^{\pi}=0^{+}$ (and 2⁺, respectively) seen in (t,p), while the other members of the ground-state band are assigned from the energy spacings and the (t,p) populations. The γ -vibrational band assignments are based on comparison with the (t,p) results for the well-known levels in ¹⁶⁰Gd. The assignments from the SF decay are based largely on the structure expected for the g.s. band in a strongly deformed nucleus in this mass region. Most assignments are made tentative by the evalutor.

- [#] L=0 in the (t,p) reaction (1986Lo15).
- [@] L=2 in the (t,p) reaction (1986Lo15).
- [&] Band(A): $K^{\pi} = 0^+$ ground-state band.
- ^{*a*} Band(B): $K^{\pi} = 2^+ \gamma$ -vibrational band.
- ^{*b*} Band(C): $K^{\pi} = (6^{-})$ band.
- ^{*c*} Band(D): $K^{\pi} = 0^{+} \beta$ -vibrational band.
- ^{*d*} Band(E): $K^{\pi} = (4^{+})$ band.
- ^{*e*} Band(F): K^{π} = Second 0⁺ band.

$\gamma(^{162}\text{Gd})$

Additional information 3.

E _i (level)	\mathbf{J}_i^{π}	E_{γ}^{\dagger}	I_{γ}	$\mathbf{E}_f = \mathbf{J}_f^{\pi}$	Mult.	α^{\ddagger}	Comments
71.54	(2+)	71.55 15	100	0.0 0+	[E2]	8.92 14	B(E2)(W.u.)=210 6 $\alpha(K)=2.48 4; \alpha(L)=4.97.9; \alpha(M)=1.176.20$
							$\alpha(N)=0.262\ 5;\ \alpha(O)=0.0339\ 6;\ \alpha(P)=0.0001255\ 18$ E : from 2020Ur03
236.53	(4^{+})	165.00 5	100	71.54 (2+)		E_{γ} : from 2020Ur03.
490.09	(6+)	253.55 5	100	236.53 (4+)		E_{γ}' : from 2020Ur03.
826.29	(8^{+})	336.20 5	100	490.09 (6+)		E_{γ} : from 2020Ur03.
863.0	2+	791.4 5	100 11	71.54 (2+)		,
		862.9 5	82 4	$0.0 0^+$			
927.36	(3^{+})	64.4 [#] 2	<3.5	863.0 2+			
		691.4 <i>4</i>	17.9 14	236.53 (4+)		
		855.7 <i>5</i>	100 10	71.54 (2+)		
1012.7	(4^{+})	776.5 5	100 9	236.53 (4+)		
		940.7 5	13 4	71.54 (2+)		
1118.66	(5^{+})	191.4 2	2.3 5	927.36 (3+)		
		628.4 4	21.1 16	490.09 (6+)		
		881.9 5	100 5	236.53 (4+)		

Adopted Levels, Gammas (continued)

$\gamma(^{162}\text{Gd})$ (continued)

E _i (level)	\mathbf{J}_i^π	E_{γ}^{\dagger}	I_{γ}	$E_f \qquad J_f^{\pi}$	Mult.	α^{\ddagger}	Comments
1238.0 1243.5	(10 ⁺) (6 ⁺)	411.7 125 <i>I</i> 230.7 <i>3</i> 753.7 5	100 <5.0 8.0 10 100 10 75 6	826.29 (8 ⁺) 1118.66 (5 ⁺) 1012.7 (4 ⁺) 490.09 (6 ⁺) 236.53 (4 ⁺)			
1354.1	(4+)	341.9 <i>3</i> 426.5 <i>3</i> 491.0 <i>3</i>	10.8 <i>15</i> 41.5 <i>23</i> 100 <i>15</i>	$\begin{array}{c} 230.33 & (4^{+}) \\ 1012.7 & (4^{+}) \\ 927.36 & (3^{+}) \\ 863.0 & 2^{+} \end{array}$			
1388.6	(7+)	270.0 <i>3</i> 898.2 <i>5</i>	20 <i>6</i> 100 <i>12</i>	$\begin{array}{c} 1118.66 & (5^+) \\ 490.09 & (6^+) \end{array}$			
1427.6	0^{+}	1356.1 10	100	71.54 (2+)			
1448.6	(6 ⁻)	205.2 2	21.2 12	1243.5 (6 ⁺)	[E1]	0.0424 6	$\alpha(K)=0.0359 5; \alpha(L)=0.00509 7; \alpha(M)=0.001099 16 \alpha(N)=0.000250 4; \alpha(O)=3.77\times10^{-5} 5; \alpha(P)=2.206\times10^{-6} 31 B(E1)(Wu)=4.57\times10^{-11} + 39-36 $
		329.9 <i>3</i>	100 5	1118.66 (5 ⁺)	[E1]	0.01258 18	$\begin{aligned} \alpha(\text{K}) = 0.01070 \ 15; \ \alpha(\text{L}) = 0.001474 \\ 21; \ \alpha(\text{M}) = 0.000318 \ 5 \\ \alpha(\text{N}) = 7.27 \times 10^{-5} \ 10; \\ \alpha(\text{O}) = 1.107 \times 10^{-5} \ 16; \\ \alpha(\text{P}) = 6.86 \times 10^{-7} \ 10 \\ \text{P(E1)}(\text{W}; n) = 5 \ 10 \times 10^{-11} + 20 \ 27 \end{aligned}$
1456.7	(5 ⁺)	102.7 2 443.4 3 529 8 4	100 <i>23</i> 35 8 77 <i>1</i> 5	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$			B(E1)(W.U.)=3.19×10 +29-27
1493.1	(2^{+})	1256.6 10	100	$236.53 (4^+)$			
1519.7		71.1 2	100	1448.6 (6-)			
1579.0	(6 ⁺)	122.2 2	100	1456.7 (5 ⁺)			
1581.5	(7^{-})	133.1 2	100	$1448.6 (6^{-})$			
1645.3	(4 ')	152.2 2	$1.0 \times 10^2 \ 10$	1493.1 (2')			
1701.0	0^{+}	1408.8 10	<0.0×10 ⁻ 100	$230.33 (4^{\circ})$ 863.0 2 ⁺			
1714.6	0	133.1 2	100	1581.5 (7 ⁻)			
1718.7	(12^{+})	480.7	100	1238.0 (10+	.)		
1720.8	(7^{+})	141.6 2	100 40	1579.0 (6 ⁺)			
1722.2	(0=)	264.5 3	65 18	$1456.7 (5^+)$			
1/33.3	(8)	152.1 2	100 <i>15</i> 62 <i>15</i>	1581.5 (7) $1448.6 (6^{-})$			
1781.0	(2^{+})	918 <i>I</i>	100	863.0 2 ⁺			
1898.0	(6+)	252.7 3	<100	1645.3 (4+)			
		1407.9 10	<100	490.09 (6 ⁺)			
		1661.5 [#] 10	<83	236.53 (4+)			
1975.4		526.8 4	100	$1448.6 (6^{-})$			
2014.5		1//8/	100	$236.53 (4^+)$ $236.53 (4^+)$			
2030.5		$21/8^{\#}$ 1	100	230.33 (+)			
2260.3 2304.6	(14 ⁺)	541.6 2233 <i>I</i>	100 100 100	$\begin{array}{ccc} 0.0 & 0 \\ 1718.7 & (12^{+}) \\ 71.54 & (2^{+}) \end{array}$.)		
2321.3?		874 ^{#} 1	100	1448.6 (6 ⁻)			
2337.0		755.5 5	100	1581.5 (7-)			
2413.6		2342 1	100	71.54 (2 ⁺)			
2417.6		2346 1	100	$71.54 (2^+)$			
2390.0 2655-1		2334 I 2165 I	100	230.33 (4') 490.09 (6 ⁺)			
2000.1		2105 1	100	170.07 (0)			

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

$\gamma(^{162}\text{Gd})$ (continued)

E _i (level)	\mathbf{J}_i^{π}	E_{γ}^{\dagger}	I_{γ}	E_f	\mathbf{J}_f^{π}	E _i (level)	\mathbf{J}_i^{π}	E_{γ}^{\dagger}	Iγ	E_f	\mathbf{J}_{f}^{π}
2857.2 3423.6	(16 ⁺)	596.9 3187 <i>1</i>	100 100	2260.3 236.53	(14^+) (4^+)	3596.2 3660.3	_	3106 <i>1</i> 1339 <i>1</i>	100 27 <48	490.09 2321.3?	(6+)
3510.6 3572.6 3596.2		3274 <i>1</i> 3501 <i>1</i> 2770 <i>1</i>	100 100 41 <i>12</i>	236.53 71.54 826.29	(4^+) (2^+) (8^+)			3170 <i>I</i> 3424 <i>I</i>	100 29 49 19	490.09 236.53	(6 ⁺) (4 ⁺)

[†] Unless mentioned otherwise values from ¹⁶²Eu β⁻ decay.
[‡] Additional information 4.
[#] Placement of transition in the level scheme is uncertain.

Legend

Level Scheme

Intensities: Relative photon branching from each level

 $--- \rightarrow \gamma$ Decay (Uncertain)



 $^{162}_{64}\text{Gd}_{98}$

Adopted Levels, Gammas Legend Level Scheme (continued) Intensities: Relative photon branching from each level $\rightarrow \gamma$ Decay (Uncertain) _ + 233 100 | ⁵⁴/₁,6 100 2304.6 (14+) 1 001 8812 L 2260.3 -@-1001 82/1 _ _ _2148 56.100 1294 2030.5 ĉ È 2014.5 1661 S 0.2051 1975.4 | 901 | | 001 | رجي جي: (6⁺) 8 1898.0 8--0 P.6. 3 $\frac{(2^+)}{(8^-)} \\ \overline{(7^+)} \\ \overline{(12^+)}$ ŝ ŝ 1781.0 6 1733.3 1733.5 1720.8 1718.7 1714.6 $\frac{\overline{(4^+)}}{(7^-)} \\ \overline{(6^+)}$ 1645.3 1581.5 1579.0 $\frac{(5^+)}{(6^-)}$ 1456.7 1448.6 99 μs 5 (10^{+}) 1238.0 863.0 2^{+} (6+) 490.09 (4^{+}) 236.53 (2^{+}) 71.54 2.76 ns 6 0.0 8.4 min 2 0^+

 $^{162}_{64}\text{Gd}_{98}$

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

 $--- \rightarrow \gamma$ Decay (Uncertain)



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 $^{162}_{64}Gd_{98}$