	History		
Туре	Author	Citation	Literature Cutoff Date
Full Evaluation	T. D. Johnson, D. Symochko(a), M. Fadil(b), and J. K. Tuli	NDS 112,1949 (2011)	1-Jun-2010

 $Q(\beta^{-}) = -1.04 \times 10^{4} 7$; $S(n) = 1.181 \times 10^{4} 4$; $S(p) = 4.32 \times 10^{3} 3$; $Q(\alpha) = 2.11 \times 10^{3} 3 2012$ Wa38

Note: Current evaluation has used the following Q record -1.04E+4 7 1.181×10^4 7 4.32×10^3 3 2110 300 2011AuZZ.

 $Q(\beta^{-}n) = -20490 \ 110, \ Q(\epsilon p) = 1690 \ 30 \ (syst.) \ 2011 AuZZ \ From \ 2003 Au03: \ Q(\beta^{-}) = -9.9 \times 10^{3} \ 3 \ (syst.), \ S(n) = 1.18 \times 10^{4} \ 3, \ S(p) = 4320 \ 3, \ Q(\alpha) = 2110 \ 11.$

Some recent nuclear structure, Theory, Calculations: 2009Pa21, 2009Pe03, 2009Pe30, 2008Bo15, 2008Ca16, 2008Pe24.

¹⁴²Gd Levels

Dipole bands may be associated with small oblate deformations.

ADO refers to angular distribution ratios.

An earlier level scheme based on 144 Sm(α ,6n) 142 Gd is in 1976Ma56. However, the sequence of transitions do not match subsequent measurements of 142 Gd and may belong to 141 Eu.

Cross Reference (XREF) Flags

۵	¹⁴² Th	e decav
n	10 0	e uccay

В	¹⁴³ Dy	εр	decay

B ¹⁴³Dy ε p c C (HI,xn γ)

E(level) [#]	J ^π @	T _{1/2} †	XREF	Comments
0.0&	0+	70.2 s 6	ABC	$\% \varepsilon + \% \beta^+ = 100$ $T_{1/2}$: from 1991Fi03. $\% \varepsilon = 52 5, \ \% \beta^+ = 48 5 \ (1991Fi03).$
515.20 ^{&} 8	2+		ABC	J^{π} : Based on excitation functions. Angular distributions (1986Lu07).
980.03 8	$1^+, 2^+$		AB	J^{π} : allowed log ft from 1 ⁺ , γ to 0 ⁺ .
1208.80 ^{&} 22	4+		ABC	J^{π} : Based on yrast band nature and angular distributions (1986Lu07).
1368.56 10	(0^{+})		Α	
1445.03 13			Α	
1914.53 11			Α	
2002.2 ^{&} 3	6+		BC	J^{π} : Based on yrast band nature and yrast band nature and angular distributions (1986Lu07).
2031.9 ^c 3	5-		С	J^{π} : From stretched E1 character of 823 transition and consistent with systematic comparison to ¹⁴⁰ Sm (1990Lu04).
2102.6 3			Α	
2279.59 16			Α	
2314.2 10			Α	
2342.0 [°] 3	(7-)		C	Assumed J^{π} from model configuration. DCO and ADO measurements not reported.
2343.6? 3			Α	
2535.3 5			С	
2753.3 11			C	
2758.0 ^{&} 4	8+		С	J^{π} : Supported by ADO, angular distribution and band placement.
2945.0 4	(8 ⁻)		С	
3069.8 [°] 4	(9 ⁻)		С	
3136.9 ^b 4	(10 ⁺)		С	J^{π} : Tentative E2 multipolarity transition from unreported DCO measurements (1988St02). Structure considerations lend further support.
3165.1 ^{<i>a</i>} 4	10^{+}		С	J^{π} : Based on yrast band placement and anisotropy measurement.
3304.1 9			С	

Continued on next page (footnotes at end of table)

¹⁴²Gd Levels (continued)

E(level)#	Jπ @	T _{1/2} †	XREF	Comments
3408.2 ^{&} 4	10^{+}		С	J^{π} : Based on ADO and consistent with band placement.
3709.5 ^a 4	12^{+}		С	ľ
3728.7 <mark>b</mark> 4	(12^{+})		С	
3737.3 15			С	
3750.0 11	(10)		С	
3788.5 4	(10^{-})		C	
3838.7 5	11-		C	
3939.9° 4	(12^{-})		C	
4008.4 9	(12)		C	π , from multiplatic set (0.4 informal from origination more and
4101.8 4	12		C	ground state band placement.
4450.9 ^a 4	14+	1.04 ps +16-12	С	
4466.6 <i>4</i>	13+	-	С	
4546.4 4	(11 ⁻)		С	
4550.0 15	(12)		C	
4768.48 4	12-		С	
4779.1° 5	(14^+)	0.80 ps 21	C	
4785.8 4	13^{-}		C	
4802.7 11	(13) (14^+)		C	
4800 1 48 5	(1+)	16 m + 1.2	c	
4099.4 5	(14) 13^{-}	1.0 ps +4-5	C	
5070.7 15	(14)		c	
5184.1 <mark>8</mark> 5	14-		C	J^{π} : Based on ADO measurements and α .
5229.0 18	(13)		С	
5278.4 4	15^{+}		С	
5285.2 ^{<i>a</i>} 4	16+	0.35 ps +7-5	С	
5301.7 18	(15)		C	
5326.0 18	(14)		C	
5418.6 5	15		C	J^{α} : Based on ADO measurements and α .
5420.1 11 5445 5 <mark>8</mark> 5	(13) 15^{-}		C	π : Resed on ADO and consistent with level scheme placement
541.0° 4	15		c	J. Dased on ADO and consistent with level scheme placement.
5604.9 ^b 5	(16^+)	1.8 ps +7-5	c	
$5611.2^{k}.5$	16-		C	J^{π} : Based on ADO and α .
5614.4 11	(16^{+})		c	
5638.8 15	(16 ⁺)		С	
5809.7 ^{&} 5	(16^{+})	0.55 ps +25-17	С	
5813.3 <mark>8</mark> 5	16-	0.35 ps +11-8	С	
5896.9 ^k 5	17-	0.90 [‡] ps 35	С	J^{π} : Based on ADO and polarization measurements.
5912.8 ^h 5	(16^{+})		С	J^{π} : Suggested by level scheme placement.
6126.7 ^{<i>a</i>} 5	18^{+}	0.38 ps 6	С	
6176.9 ^h 4	17+	1.5 [‡] ps +6−4	С	
6215.9 5	17^{+}		С	
6260.3 ^{<i>J</i>} 5	(18 ⁺)		С	J^{π} : Suggested by band placement.
6271.2 ^k 5	18-	0.76 [‡] ps 21	С	J^{π} : Based on ADO and polarization measurement.
6283.1 ^b 5	(18+)		С	
6287.0 ⁸ 5	17-	0.49 ps +17-10	С	
6398.9 11	(18)		С	
6477.5 ^h 4	18+	0.90 [‡] ps +28-21	C	J^{π} : Based on ADO and polarization measurement.

Continued on next page (footnotes at end of table)

¹⁴²Gd Levels (continued)

E(level) [#]	Jπ @	$T_{1/2}^{\dagger}$	XREF	Comments				
6566.3 ^k 5	19-	1.11 [‡] ps +35-21	С	J^{π} : Based on ADO and polarization measurement. B(M1)/B(E2)=9.7 +12-8 (2005Pa07).				
6620.8 <mark>8</mark> 6	18-	>1.0 ps	С					
6858.6 ^h 5	19+	0.37 [‡] ps +17-10	С	J^{π} : Based on ADO and polarization measurement. B(M1)/B(E2)=56 +83-8 (2005Pa07).				
6916.5 ^a 5	(20^{+})	0.49 ps +7-5	С	J^{π} : Based on band placement.				
7027.9 ^d 6	19+		С					
7071.3 <mark>8</mark> 7	19-	>1.0 ps	С					
7093.3 ^k 6	20^{-}	0.43 [‡] ps 9	С	B(M1)/B(E2)=14 + 5-2 (2005Pa07).				
7137.6 [†] 5	20^{+}		С					
7175.5 ^b 5	(20^{+})	1.18 ps 22	С					
7285.3 ^h 5	20+	0.36 [‡] ps +14–10	С	J^{π} : Based on ADO and polarization measurement. B(M1)/B(E2)=53 +25-8 (2005Pa07).				
7455.3 ⁸ 8	(20 ⁻)	>1.4 ps	С					
7502.0 5	(20^+)		C					
7531.8 10	(20^{-1})	0.40 [±] .12.10	C	D(M1)(D(D2) = 0.1 + 15 + 11 / 2005D(07))				
7559.1^{n} 0	21	0.49^{+} ps $+12-10$	C	B(MI)/B(E2)=8.1 + 13 - 11 (2005Pa07).				
7597.1° 0 7625 4° 7	(21^+) (21^+)	0.76 ps $+21-17$	C					
7645.6 ^h 5	(21^{-}) 21^{+}	0.65 [‡] ps +15-11	c	J^{π} : Based on ADO, polarization and α measurements. B(M1)/B(E2)=55 +20-9 (2005Pa07)				
7779.5 ⁱ 5	22^{+}		c	J^{π} : Based on ADO and α measurements.				
7827.1 ^{<i>a</i>} 6	(22^+)	0.26 ps 5	C					
7844.2 <mark>/</mark> 6	21-		С	J^{π} supported by ADO of stretched E2.				
8018.0 ^h 5	22^{+}	0.68 [‡] ps +28-17	С					
8093.1 ^f 6	(22^{+})		С					
8159.6 <i>11</i>	(22^{+})		С					
8198.7 <mark>1</mark> 6	22^{-}	0.30^{\ddagger} ps +14-12	С					
8249.0 ¹ 5	23+	0.23 [‡] ps 8	С					
8328.3 ^d 6 8568 2 ^e 7	(23^+)	0.58 ps 12	C					
$8502.7^{i}5$	(25)	0.44^{\ddagger} ns 10	C C	$R(M1)/R(F2) = 13.3 \pm 31 = 21.(2005P_{0}07)$				
8637 21 6	2 4 23-	0.53^{\ddagger} ps $\pm 17 - 14$	C C	B(M1)/B(E2) = 13.5 + 51 - 21 (2005Pa07) B(M1)/B(E2) = 2 + 23 - 4 (2005Pa07)				
8730.4 6	23 24 ⁺	0.55° ps +17-14	c	D(MT)/D(L2)-2.2+25-4 (2005) a07).				
8807.3 ^a 7	24+	0.236 ps 35	С					
8963.6 ^j 6	24-	0.83 [‡] ps +28-21	С	$B(M1)/B(E2)=2.6^{I14-7}$ (2005Pa07).				
9140.9 ⁱ 6	25+	0.24 [‡] ps <i>10</i>	С					
9222.8 ^f 10	(24+)		С					
9280.4 ^d 8	(25^+)	0.19 ps 8	С					
9475.1 ^j 6	(25 ⁻)		С	J^{π} : Suggested by level scheme placement. B(M1)/B(E2)=2.3 +16-6 (2005Pa07).				
9628.3 ^e 7	(25 ⁺)		С					
9700.5 ⁱ 8	26^{+}	0.19 [‡] ps <i>10</i>	С					
9747.0 ^a 7	(26 ⁺)	0.31 ps 7	С					
9858.8 ^J 7	26-		C	B(M1)/B(E2)=2.3 + 16-7 (2005Pa07).				
10096.8 8	(25 ⁺)		C					
10102.6 12	(26 ⁺)		C					
10311.9' 8	27+		C					

142Gd Levels (continued)

E(level) [#]	J ^π @	XREF	E(level)#	J ^π @	XREF	E(level)#	J ^π @	XREF
10395.5 ^d 9	(27 ⁺)	С	11123.4 10	(27 ⁺)	С	13134.8 ^a 13	(32 ⁺)	С
10703.1 ^{<i>a</i>} 8	(28^+)	С	11352.3 ^d 10	(29 ⁺)	С	14580.5 ^a 15	(34+)	С
10809.4 ^e 8	(27^{+})	С	11825.6 ^a 9	(30^{+})	С			
10989.5 ⁱ 9	(28^{+})	С	12384.3 ^d 11	(31 ⁺)	С			

[†] From DSA measurement (2008Li08), unless otherwise stated.

[‡] From DSA (2005Pa07).

[#] From least-squares fit to $E\gamma's$.

^(@) Based on multipolarity arguments from ADO measurements (2008Li08) unless otherwise noted, with additional considerations noted in the comments. When ADO measurement support a pure stretched quadrupole transition, the evaluators assume E2. & Band(A): g.s. band.

- ^{*a*} Band(B): $(\pi, \alpha) = (+, 0)$ band. Band based on 10⁺, Configuration= $(\nu h_{11/2})^{-2}$ corresponds to triaxial nuclear shape (1999LiZX). See also (1988St02).
- ^b Band(C): $(\pi, \alpha) = (+, 0)$ band. Configuration = $(\pi h_{11/2})^{+2}$ Band based on 10^+ , α .
- ^c Band(D): Band based on 5⁻, α =1.
- ^{*d*} Band(E): $\Delta J=2$ band based on 19⁺.
- ^e Band(F): $\Delta J=2$ band based on (21⁺).
- ^{*f*} Band(G): $\Delta J=2$ band based on 18⁺.
- ^g Band(H): Magnetic-dipole band based on 12⁻. Probable configuration= $vh_{11/2}^{-2}\pi(h_{11/2}g_{7/2}^{-1})$.
- ^{*h*} Band(I): Magnetic-dipole band based on 16⁺. Probable configuration= $vh_{11/2}^{-2}\pi h_{11/2}^2$ Possible interpretation as shears band (1997Su11).
- ^{*i*} Band(J): Magnetic-dipole band based on 22⁺. Probably originates from 16⁺ dipole band through band crossing due to a second $h_{11/2}$ neutron-hole pair.
- ^{*j*} Band(K): Magnetic-dipole band based on 21^- . Probably originates from 11^- dipole band through band crossing due to a second $h_{11/2}$ neutron-hole pair.
- ^k Band(L): Magnetic-dipole band based on 15⁻.

						Adopte	d Levels, Gamn	nas (continued)
							$\gamma(^{142}\text{Gd})$	
E (11)	īπ	F	т	Б	177	M-14 ±	. †	Commente
$E_i(level)$	J_i^{n}	Ľγ	Iγ	\mathbf{E}_{f}	\mathbf{J}_{f}^{n}	Mult.	α	Comments
515.20	2+	515.0 <i>1</i>	100.0	0.0	0+	E2	0.01291	$\alpha(K)=0.01053 \ 15; \ \alpha(L)=0.00186 \ 3; \ \alpha(M)=0.000413 \ 6; \ \alpha(N+)=0.0001088 \ 16$
		щ	ш					α (N)=9.41×10 ⁻⁵ 14; α (O)=1.394×10 ⁻⁵ 20; α (P)=7.08×10 ⁻⁷ 10
980.03	1+,2+	465.0 [#] 1 980.1 1	100 [#] 19 16 4	515.20 0.0	2^+ 0^+		0.00289	$\alpha(K)=0.0137 5; \alpha(L)=0.00255 8; \alpha(M)=0.00057 2; \alpha(N+)=0.00016 I \alpha(K)=0.00242 8; \alpha(L)=0.00035 I$
1208.80	4+	693.6 [#] 2	100.0 [#]	515.20	2+	E2	0.00618 9	$\alpha(K)=0.00514\ 8;\ \alpha(L)=0.000816\ 12;\ \alpha(M)=0.000179\ 3;\ \alpha(N+)=4.74\times10^{-5}\ 7$
								α (N)=4.09×10 ⁻⁵ 6; α (O)=6.17×10 ⁻⁶ 9; α (P)=3.52×10 ⁻⁷ 5 (1986Lu07) Stretched E2 consistent with anisotropy.
1368.56	(0^{+})	388.8 1	9.3 10	980.03	$1^+, 2^+$			
		853.1 1	100 9	515.20	2^{+}			
1445.03		465.0# 1	100.0#	980.03	$1^+, 2^+$			
1914.53		934 1	100.0.8	980.03 515.20	1',2' 2+			
		1915.0 2	24.4	0.0	0^{2}			
2002.2	6+	793.3 2	100.0	1208.80	4+	E2	0.00454 7	α (K)=0.00380 6; α (L)=0.000580 9; α (M)=0.0001269 18; α (N+)=3.37×10 ⁻⁵ 5
								$\alpha(N)=2.90\times10^{-5}$ 4; $\alpha(O)=4.41\times10^{-6}$ 7; $\alpha(P)=2.62\times10^{-7}$ 4 (1986Lu07) Stretched E2 consistent with anisotropy.
2031.9	5-	823.2 2	100.0	1208.80	4+	E1	0.001650 24	$\alpha(K)=0.001413\ 20;\ \alpha(L)=0.000186\ 3;\ \alpha(M)=4.00\times10^{-5}\ 6;\ \alpha(N+)=1.069\times10^{-5}\ I$
								$\alpha(N)=9.17\times10^{-6}$ 13; $\alpha(O)=1.418\times10^{-6}$ 20; $\alpha(P)=9.46\times10^{-8}$ 14
2102.6		1587.4 3	100.0	515.20	2+			
2279.59		1299.6 [@] 2	100 13	980.03	$1^+, 2^+$			
		1764.1 [@] 2	56 <i>13</i>	515.20	2+			
2314.2	(7 -)	1799 1	≈100.0	515.20	2+	$(\mathbf{D}\mathbf{Q})$	0.0544	
2342.0	(/)	310.2 2	100.1 11	2031.9	2	(E2)	0.0544	$\alpha(\mathbf{K})=0.0418$ 6; $\alpha(\mathbf{L})=0.009/8$ 14; $\alpha(\mathbf{M})=0.00221$ 4; $\alpha(\mathbf{N}+)=0.0005/5$ 9 $\alpha(\mathbf{N})=0.000501$ 8: $\alpha(\mathbf{O})=7.13\times10^{-5}$ 11: $\alpha(\mathbf{P})=2.63\times10^{-6}$ 4
		339.9 2	16.6 <i>15</i>	2002.2	6+	(E1)	0.01168	$\alpha(N)=0.0005013; \alpha(O)=7.15\times10^{-1}11; \alpha(T)=2.05\times10^{-4}4$ $\alpha(K)=0.00994$ 14; $\alpha(L)=0.001368$ 20; $\alpha(M)=0.000295$ 5; $\alpha(N+)=7.84\times10^{-5}$ 11
								$\alpha(N) = 6.75 \times 10^{-5} \ 10; \ \alpha(O) = 1.028 \times 10^{-5} \ 15; \ \alpha(P) = 6.39 \times 10^{-7} \ 9$
2343.6?		898.4 [@] 3	41 11	1445.03				
		1364.1 [@] 4	30 7	980.03	$1^+, 2^+$			
		1828.7 [@] 2	100 11	515.20	2+			
		2343.6 3	37 7	0.0	0^{+}			
2535.3		193.3 <i>3</i>	100.0	2342.0	(7^{-})			
2758.0	8+	²¹⁰ 755.6 2	100.0	2002.2	6+	E2	0.00507 8	$\alpha(K)=0.00424$ 6; $\alpha(L)=0.000655$ 10; $\alpha(M)=0.0001434$ 20;
	0		100.0		-			

From ENSDF

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 $^{142}_{64}\mathrm{Gd}_{78}$ -5

I

	Adopted Levels, Gammas (continued)										
						$\gamma(^{142}\text{Gd})$	(continued)				
E _i (level)	\mathbf{J}_i^π	E_{γ}	I_{γ}	$\mathbf{E}_f \qquad \mathbf{J}_f^{\pi}$	Mult. [‡]	α^{\dagger}	Comments				
							$\alpha(N+)=3.81\times10^{-5} 6$				
2945.0	(8 ⁻)	603.1 2	100.0	2342.0 (7 ⁻)	M1+E2	0.012 4	$\alpha(N)=3.28\times10^{-5} 5; \ \alpha(O)=4.97\times10^{-6} 7; \ \alpha(P)=2.91\times10^{-7} 4$ $\alpha(K)=0.010 4; \ \alpha(L)=0.0015 4; \ \alpha(M)=0.00033 7; \ \alpha(N+)=8.8\times10^{-5} 20$ $\alpha(N)=7.6\times10^{-5} 17; \ \alpha(O)=1.2\times10^{-5} 3; \ \alpha(P)=7.3\times10^{-7} 25$				
3069.8	(9-)	727.8 2	100.0	2342.0 (7-)	E2	0.00553 8	$\alpha(K) = 0.00461$ 7; $\alpha(L) = 0.000720$ 10; $\alpha(M) = 0.0001578$ 23; $\alpha(N+) = 4.19 \times 10^{-5}$ 6				
3136.9	(10+)	67.3 4	13.8 18	3069.8 (9 ⁻)	E1	0.840 18	$\alpha(N)=3.61\times10^{-5} 5; \ \alpha(O)=5.46\times10^{-6} 8; \ \alpha(P)=3.17\times10^{-7} 5$ $\alpha(K)=0.697 \ 15; \ \alpha(L)=0.1126 \ 25; \ \alpha(M)=0.0244 \ 6; \ \alpha(N+)=0.00632 \ 14$ $\alpha(N)=0.00549 \ 12; \ \alpha(O)=0.000786 \ 17; \ \alpha(P)=3.68\times10^{-5} \ 8$				
		378.7 2	100.0 12	2758.0 8+	E2	0.0301	$\alpha(K)=0.0238$ 4; $\alpha(L)=0.00490$ 7; $\alpha(M)=0.001100$ 16; $\alpha(K+)=0.000287$ 4				
3165.1	10+	407.1 <i>1</i>	100.0	2758.0 8+	E2	0.0244	$\alpha(N)=0.000250 \ 4; \ \alpha(O)=3.62\times10^{-3} \ 6; \ \alpha(P)=1.543\times10^{-6} \ 22$ $\alpha(K)=0.0195 \ 3; \ \alpha(L)=0.00386 \ 6; \ \alpha(M)=0.000864 \ 13; \ \alpha(N+)=0.000226 \ 4$ $\alpha(N)=0.000196 \ 3; \ \alpha(O)=2.86\times10^{-5} \ 4; \ \alpha(P)=1.278\times10^{-6} \ 18$ (19861 u07) Stretched F2 consistent with anisotropy				
3304.1		234		3069.8 (9-)			(1960Edd)) Succeded E2 consistent with ansolitopy.				
3408.2	10+	650.3 2	100.0	2758.0 8+	E2	0.00720 11	α (K)=0.00597 9; α (L)=0.000967 14; α (M)=0.000213 3; α (N+)=5.63×10 ⁻⁵ 8 α (N)=4.86×10 ⁻⁵ 7; α (O)=7.30×10 ⁻⁶ 11; α (P)=4.08×10 ⁻⁷ 6				
3709.5	12+	544.4 <i>1</i>	100.0	3165.1 10+	E2	0.01119	$\alpha(K)=0.00916\ 13;\ \alpha(L)=0.001585\ 23;\ \alpha(M)=0.000350\ 5;\ \alpha(N+)=9.24\times10^{-5}\ 13$ $\alpha(N)=7.99\times10^{-5}\ 12;\ \alpha(O)=1.188\times10^{-5}\ 17;\ \alpha(P)=6.19\times10^{-7}\ 9$				
3728.7	(12 ⁺)	591.7 2	100.0	3136.9 (10 ⁺)	E2	0.00907 13	$\alpha(K) = 0.00747 \ 11; \ \alpha(L) = 0.001251 \ 18; \ \alpha(M) = 0.000276 \ 4; \ \alpha(N+) = 7.29 \times 10^{-5} \ 11 \ \alpha(N) = 6.30 \times 10^{-5} \ 9; \ \alpha(O) = 9.41 \times 10^{-6} \ 14; \ \alpha(P) = 5.08 \times 10^{-7} \ 8$				
3737.3		984		2753.3							
3750.0	(10)	805	100 0 10	2945.0 (8 ⁻)	M1 . E2	0.0070.00					
3788.5	(10)	/18./ 5	100.0 18	3069.8 (9)	MI+E2	0.0079 23	$\alpha(K)=0.006720; \alpha(L)=0.0009723; \alpha(M)=0.000213; \alpha(N+)=5.6\times10^{-5}13$ $\alpha(N)=4.8\times10^{-5}11; \alpha(O)=7.4\times10^{-6}18; \alpha(P)=4.8\times10^{-7}16$				
		843.6 2	33.0 27	2945.0 (8 ⁻)	E2	0.00396 6	$\alpha(K)=0.00333\ 5;\ \alpha(L)=0.000500\ 7;\ \alpha(M)=0.0001091\ 16;\ \alpha(N+)=2.90\times10^{-5}\ 4$ $\alpha(N)=2.50\times10^{-5}\ 4;\ \alpha(O)=3.80\times10^{-6}\ 6;\ \alpha(P)=2.30\times10^{-7}\ 4$				
3838.7	11+	673.7 5	100.0	3165.1 10+	M1+E2	0.009 3	$\alpha(K)=0.0078\ 24;\ \alpha(L)=0.0011\ 3;\ \alpha(M)=0.00025\ 6;\ \alpha(N+)=6.6\times10^{-5}\ 15$ $\alpha(N)=5.7\times10^{-5}\ 13;\ \alpha(Q)=8.7\times10^{-6}\ 21;\ \alpha(P)=5.6\times10^{-7}\ 19$				
3939.9	11-	870.2 2	100.0	3069.8 (9-)	E2	0.00370 6	$\alpha(K) = 0.003115; \alpha(L) = 0.0004647; \alpha(M) = 0.000101215; \alpha(N+) = 2.69 \times 10^{-5} 4$ $\alpha(N) = 2.32 \times 10^{-5} 4; \alpha(Q) = 3.53 \times 10^{-6} 5; \alpha(P) = 2.15 \times 10^{-7} 3$				
4068.4	(12 ⁻)	764		3304.1			$u(1) = 2.52 \times 10^{-1}$, $u(0) = 5.55 \times 10^{-5}$, $u(1) = 2.15 \times 10^{-5}$				
4101.8	12+	693.6 [#] 2	100.0 [#]	3408.2 10+	(E2)	0.00618 9	α (K)=0.00514 8; α (L)=0.000816 12; α (M)=0.000179 3; α (N+)=4.74×10 ⁻⁵ 7 α (N)=4.09×10 ⁻⁵ 6; α (O)=6.17×10 ⁻⁶ 9; α (P)=3.52×10 ⁻⁷ 5				
4450.9	14+	741.4 2	100.0	3709.5 12+	E2	0.00530 8	B(E2)(W.u.) = 55 + 7 - 9 $\alpha(K) = 0.00427; \alpha(L) = 0.000687; 10; \alpha(M) = 0.0001505; 21; \alpha(N+) = 3.99 \times 10^{-5}; 6$				
4466.6	13+	628.0 2	53 10	3838.7 11+	E2	0.00784 11	$\alpha(N)=0.0001227, \alpha(L)=0.00003710, \alpha(M)=0.000130521, \alpha(N+)=3.99\times10^{-6} 0$ $\alpha(N)=3.44\times10^{-5} 5; \alpha(O)=5.21\times10^{-6} 8; \alpha(P)=3.04\times10^{-7} 5$ $\alpha(K)=0.00648 9; \alpha(L)=0.001062 15; \alpha(M)=0.000234 4; \alpha(N+)=6.18\times10^{-5} 9$ $\alpha(N)=5.34\times10^{-5} 8; \alpha(O)=8.01\times10^{-6} 12; \alpha(P)=4.42\times10^{-7} 7$				

From ENSDF

 $^{142}_{64}\mathrm{Gd}_{78}\text{--}6$

 $^{142}_{64}\text{Gd}_{78}\text{-}6$

$\gamma(^{142}\text{Gd})$ (continued)

E _i (level)	\mathbf{J}_i^{π}	Eγ	I_{γ}	$\mathbf{E}_f \qquad \mathbf{J}_f^{\pi}$	Mult. [‡]	$lpha^{\dagger}$	$I_{(\gamma+ce)}$	Comments
4466.6	13+	757.0 4	100 16	3709.5 12+	(M1+E2)	0.0070 20		$\alpha(K)=0.0059 \ 18; \ \alpha(L)=0.00085 \ 20; \ \alpha(M)=0.00018 \ 5; \\ \alpha(N+)=4.9\times10^{-5} \ 12 \\ \alpha(N)=4.2\times10^{-5} \ 10; \ \alpha(O)=6.5\times10^{-6} \ 16; \ \alpha(P)=4.2\times10^{-7} \ 14$
4546.4	(11-)	1381.3 4	100.0	3165.1 10+	E1	0.000757 11		$\begin{aligned} \alpha(\mathbf{N}) = 4.2 \times 10^{-10}, \ \alpha(\mathbf{U}) = 0.5 \times 10^{-10}, \ \alpha(\mathbf{M}) = 4.2 \times 10^{-11}, \ \alpha(\mathbf{K}) = 0.000546 \ 8; \ \alpha(\mathbf{L}) = 7.04 \times 10^{-5} \ 10; \ \alpha(\mathbf{M}) = 1.510 \times 10^{-5} \ 22; \\ \alpha(\mathbf{N}+) = 0.0001254 \\ \alpha(\mathbf{N}) = 3.47 \times 10^{-6} \ 5; \ \alpha(\mathbf{O}) = 5.39 \times 10^{-7} \ 8; \ \alpha(\mathbf{P}) = 3.68 \times 10^{-8} \ 6; \\ \alpha(\mathbf{IPF}) = 0.0001214 \ 18 \end{aligned}$
4550.0	(12)	800		3750.0 (10)				
4768.4	12-	222.0 <i>3</i>	19 2	4546.4 (11-)	M1+E2	0.19 3		$\alpha(K)=0.154; \alpha(L)=0.0305; \alpha(M)=0.0068 I2; \alpha(N+)=0.00183$
		828.4 4	21 2	3939.9 11-	M1+E2	0.0057 16		$\alpha(N)=0.00154\ 25;\ \alpha(O)=0.000224\ 25;\ \alpha(P)=1.0\times10^{-7}\ 4$ $\alpha(K)=0.0048\ 14;\ \alpha(L)=0.00068\ 16;\ \alpha(M)=0.00015\ 4;$ $\alpha(N+)=3.9\times10^{-5}\ 10$
		020 4 6	50.5	2020 7 11+	E1	0.001204.10		$\alpha(N)=3.4\times10^{-5}$ 8; $\alpha(O)=5.2\times10^{-6}$ 13; $\alpha(P)=3.4\times10^{-7}$ 11 $\alpha(K)=0.001118$ 16; $\alpha(L)=0.0001464$ 21; $\alpha(M)=2.14\times10^{-5}$ 5;
		929.4 0	32 3	3838.7 11	EI	0.001304 19		$\alpha(\mathbf{N})=0.001118\ 10;\ \alpha(\mathbf{L})=0.0001404\ 21;\ \alpha(\mathbf{M})=5.14\times10^{-5}\ 5;$ $\alpha(\mathbf{N}+)=8.41\times10^{-6}$ $\alpha(\mathbf{N})=7\ 22\times10^{-6}\ 11;\ \alpha(\mathbf{\Omega})=1\ 118\times10^{-6}\ 16;\ \alpha(\mathbf{P})=7\ 50\times10^{-8}\ 11$
		980.2 <i>3</i>	71 7	3788.5 (10 ⁻)	E2	0.00287 4		$\alpha(\mathbf{K}) = 0.00242 \ 4; \ \alpha(\mathbf{L}) = 0.000352 \ 5; \ \alpha(\mathbf{M}) = 7.65 \times 10^{-5} \ 11; \\ \alpha(\mathbf{N}+) = 2.04 \times 10^{-5} \ 3$
								$\alpha(N)=1.754\times10^{-5}$ 25; $\alpha(O)=2.69\times10^{-6}$ 4; $\alpha(P)=1.676\times10^{-7}$ 24
4770 1	(1.4+)	1058.7 3	100 14	$3709.5 12^+$	50	0.00240.4		$\mathbf{D}(\mathbf{r}\mathbf{O})(\mathbf{W} \rightarrow 12, 4)$
4779.1	(14)	1050.2 2	9.1 12	3728.7 (12)	E2	0.00249 4		B(E2)(W.U.)=13 4 $\alpha(K)=0.00210 \ 3; \ \alpha(L)=0.000301 \ 5; \ \alpha(M)=6.54\times10^{-5} \ 10; \ \alpha(N+)=1.746\times10^{-5} \ 25$
1785 8	13-	335		4450.9 14+				$\alpha(N)=1.501\times10^{-5}\ 21;\ \alpha(O)=2.30\times10^{-6}\ 4;\ \alpha(P)=1.456\times10^{-7}\ 21$
+705.0	15	717		4068.4 (12 ⁻)				
		845.9 2		3939.9 11-	E2	0.00394 6		α (K)=0.00331 5; α (L)=0.000497 7; α (M)=0.0001083 16; α (N+)=2.88×10 ⁻⁵ 4
		1076						$\alpha(N)=2.48\times10^{-5} 4; \ \alpha(O)=3.78\times10^{-6} 6; \ \alpha(P)=2.28\times10^{-7} 4$
1960 7	(12)	1076		$3709.5 12^+$ $3728.7 (12^+)$				
4802.7	(13) (14^+)	791		$4101.8 12^+$				
4899.4	(14^+)	797.8 3	100.0	4101.8 12 ⁺	E2	0.00449 7		B(E2)(W.u.)=25+5-7
								α (K)=0.00376 6; α (L)=0.000572 8; α (M)=0.0001251 18; α (N+)=3.32×10 ⁻⁵ 5
4000.9	12-	222.2.2	100.0	4769 4 12-	M1 . E2	0.10.2		$\alpha(N)=2.86\times10^{-5}$ 4; $\alpha(O)=4.35\times10^{-6}$ 6; $\alpha(P)=2.59\times10^{-7}$ 4
4990.8	13	222.3 2	100.0	4/68.4 12	MI+E2	0.19 3		$\alpha(\mathbf{N})=0.154; \ \alpha(\mathbf{L})=0.0305; \ \alpha(\mathbf{M})=0.006712; \ \alpha(\mathbf{N}+)=0.00183$ $\alpha(\mathbf{N})=0.0015325; \ \alpha(\mathbf{O})=0.00022323; \ \alpha(\mathbf{P})=1.0\times10^{-5}4$
5070.7 5184.1	(14) 14 ⁻	208 193.3 3	100.0	4862.7 (13) 4990.8 13 ⁻	M1+E2	0.28 4	4	$ce(K)/(\gamma+ce)=0.17$ 3; $ce(L)/(\gamma+ce)=0.038$ 9; $ce(M)/(\gamma+ce)=0.0086$
0.10111	÷ ·	1,0.00	100.0			0.20 /	•	

7

						A	dopted Level	s, Gammas (continued)	
$\gamma(^{142}\text{Gd})$ (continued)									
E _i (level)	\mathbf{J}_i^{π}	E_{γ}	I_{γ}	E_f	\mathbf{J}_f^{π}	Mult. [‡]	α^{\dagger}	Comments	
								22; ce(N+)/(γ +ce)=0.0022 6 ce(N)/(γ +ce)=0.0020 5; ce(O)/(γ +ce)=0.00028 6; ce(P)/(γ +ce)=1.2×10 ⁻⁵ 4 α (N)=0.0025 6; α (O)=0.00036 7; α (P)=1.5×10 ⁻⁵ 5	
5229.0	(13)	679		4550.0	(12)			5	
5278.4	15+	811.9 3	100 15	4466.6	13+	E2	0.00431 6	$\alpha(K) = 0.00361 \ 5; \ \alpha(L) = 0.000548 \ 8; \ \alpha(M) = 0.0001198 \ 17; \ \alpha(N+) = 3.18 \times 10^{-5} \ 5$ $\alpha(N) = 2.74 \times 10^{-5} \ 4; \ \alpha(O) = 4.17 \times 10^{-6} \ 6; \ \alpha(P) = 2.49 \times 10^{-7} \ 4$	
		828.1 9	34 <i>3</i>	4450.9	14+	M1+E2	0.0057 16	$\alpha(K)=0.0048 \ 14; \ \alpha(L)=0.00068 \ 16; \ \alpha(M)=0.00015 \ 4; \ \alpha(N+)=3.9\times10^{-5} \ 10 \ \alpha(N)=3.4\times10^{-5} \ 8; \ \alpha(O)=5.2\times10^{-6} \ 13; \ \alpha(P)=3.4\times10^{-7} \ 11$	
5285.2	16+	834.3 2	100.0	4450.9	14+	E2	0.00406 6	B(E2)(W.u.)=91 +13-19 α (K)=0.00341 5; α (L)=0.000513 8; α (M)=0.0001120 16; α (N+)=2.98×10 ⁻⁵ 5 α (N)=2.57×10 ⁻⁵ 4; α (O)=3.90×10 ⁻⁶ 6; α (P)=2.35×10 ⁻⁷ 4	
5301.7	(15)	231		5070.7	(14)				
5326.0 5418.6	(14) 15 ⁻	776 234.5 2	100.0	4550.0 5184.1	(12) 14 ⁻	M1+E2	0.16 3	$\alpha(K)=0.13 \ 3; \ \alpha(L)=0.025 \ 3; \ \alpha(M)=0.0056 \ 8; \ \alpha(N+)=0.00147 \ 18$	
								α (N)=0.00127 17; α (O)=0.000186 14; α (P)=9.E-6 3	
5426.1 5445.5	(15) 15^{-}	242 261.4 2	100.0	5184.1 5184.1	14 ⁻ 14 ⁻	M1+E2	0.115 23	$\alpha(K)=0.093\ 24;\ \alpha(L)=0.0175\ 10;\ \alpha(M)=0.0039\ 3;\ \alpha(N+)=0.00102\ 6$	
5541.0	15-	356.8 2	32.3 46	5184.1	14-	M1+E2	0.048 13	$\alpha(N)=0.000896; \alpha(O)=0.0001313; \alpha(P)=0.4\times10^{-2}23$ $\alpha(K)=0.04012; \alpha(L)=0.00666; \alpha(M)=0.0014511; \alpha(N+)=0.000394$ $\alpha(N)=0.000333; \alpha(O)=5.0\times10^{-5}6; \alpha(P)=2.8\times10^{-6}10$	
		755.3 2	100.0 77	4785.8	13-	E2	0.00508 8	$\alpha(N)=0.000355, \alpha(O)=5.0\times10^{-6}0, \alpha(I)=2.8\times10^{-1}0^{-7}$ $\alpha(K)=0.004246; \alpha(L)=0.00065610; \alpha(M)=0.000143521; \alpha(N+)=3.81\times10^{-5}6$ $\alpha(N)=2.28\times10^{-5}5; \alpha(O)=4.07\times10^{-6}7; \alpha(D)=2.02\times10^{-7}4$	
5604.9	(16 ⁺)	825.7 2	100.0	4779.1	(14 ⁺)	E2	0.00416 6	$a(N)=3.28\times10^{-5}$, $a(O)=4.97\times10^{-7}$, $a(F)=2.92\times10^{-4}$ B(E2)(W,u)=19 +6-8 $a(K)=0.00348$ 5: $a(L)=0.000526$ 8: $a(M)=0.0001140$ 17: $a(NL)=3.06\times10^{-5}$ 5	
								$\alpha(\mathbf{N}) = 0.00548 \ 5, \ \alpha(\mathbf{L}) = 0.000520 \ 6, \ \alpha(\mathbf{M}) = 0.0001149 \ 17, \ \alpha(\mathbf{N}+) = 5.00\times10^{-5} \ 5$ $\alpha(\mathbf{N}) = 2.63\times10^{-5} \ 4. \ \alpha(\mathbf{O}) = 4.00\times10^{-6} \ 6. \ \alpha(\mathbf{P}) = 2.40\times10^{-7} \ 4$	
5611.2	16-	70.0 4	10 2	5541.0	15-	M1+E2	7.7 21	$\alpha(K) = 2.65 \times 10^{-11} \alpha(L) = 3.1 \ 25; \ \alpha(M) = 0.7 \ 6; \ \alpha(N+) = 0.18 \ 15 \ \alpha(N) = 0.16 \ 13; \ \alpha(\Omega) = 0.021 \ 17; \ \alpha(P) = 0.00024 \ 12$	
		165.7 2	19 <i>4</i>	5445.5	15-	M1+E2	0.45 4	$\alpha(K) = 0.34 7; \alpha(L) = 0.09 3; \alpha(M) = 0.020 7; \alpha(N+) = 0.0051 17$ $\alpha(N) = 0.0044 15; \alpha(O) = 0.00063 18; \alpha(P) = 2.3 \times 10^{-5} 8$	
		192.6 <i>3</i>	100 13	5418.6	15-	M1+E2	0.28 4	$\alpha(K)=0.225; \alpha(L)=0.050 I2; \alpha(M)=0.011 3; \alpha(N+)=0.0029 7$ $\alpha(N)=0.0025 7; \alpha(Q)=0.00037 7; \alpha(P)=1.5 \times 10^{-5} 5$	
5614.4 5638.8	(16 ⁺) (16 ⁺)	715 746		4899.4 4892.8	(14 ⁺) (14 ⁺)			a(1)-0.00257, a(0)-0.000577, a(1)-1.5×10 5	
5809.7	(16+)	910.3 2	100.0	4899.4	(14+)	E2	0.00336 5	B(E2)(W.u.)=37 +12-17 α (K)=0.00283 4; α (L)=0.000417 6; α (M)=9.09×10 ⁻⁵ 13; α (N+)=2.42×10 ⁻⁵ 4 α (N)=2.08×10 ⁻⁵ 3; α (O)=3.18×10 ⁻⁶ 5; α (P)=1.05×10 ⁻⁷ 3	
5813.3	16-	367.7 2	100 18	5445.5	15-	M1+E2	0.044 12	$\alpha(K) = 0.037 \ 11; \ \alpha(L) = 0.0060 \ 7; \ \alpha(M) = 0.00133 \ 12; \ \alpha(N+) = 0.00035 \ 4$ $\alpha(K) = 0.0030 \ 3; \ \alpha(O) = 4.6 \times 10^{-5} \ 6; \ \alpha(P) = 2.6 \times 10^{-6} \ 10$	
		394.7 <i>3</i>	18 9	5418.6	15-	M1+E2	0.037 10	$\alpha(K) = 0.030 \ 10; \ \alpha(L) = 0.0049 \ 7; \ \alpha(M) = 0.00108 \ 12; \ \alpha(N+) = 0.00029 \ 4$ $\alpha(N) = 0.00025 \ 3; \ \alpha(O) = 3.7 \times 10^{-5} \ 6; \ \alpha(P) = 2.1 \times 10^{-6} \ 8$	

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From ENSDF

 $^{142}_{64}\mathrm{Gd}_{78}\text{--}8$

	Adopted Levels, Gammas (continued)									
$\gamma(^{142}\text{Gd})$ (continued)										
E _i (level)	\mathbf{J}_i^{π}	Eγ	I_{γ}	$\mathbf{E}_f \qquad \mathbf{J}_f^{\pi}$	Mult. [‡]	δ	α^{\dagger}	Comments		
5896.9	17-	285.6 2	100.0	5611.2 16-	M1(+E2)	-0.1 1	0.1086 19	$\alpha(K)=0.0919 \ 18; \ \alpha(L)=0.01306 \ 19; \ \alpha(M)=0.00283 \ 4; \ \alpha(N+)=0.000760 \ 11$		
5912.8	(16^{+})	627 4 4	63 5	5285.2 16+				α (N)=0.000652 <i>10</i> ; α (O)=0.0001012 <i>15</i> ; α (P)=6.79×10 ⁻⁶ <i>14</i> B(M1)(W.u.)=(0.9 <i>4</i>); B(E2)(W.u.)=(70 + <i>140</i> -70)		
5912.0	(10)	1013.5 5	100 11	4899.4 (14 ⁺)	(E2)		0.00268 4	α (K)=0.00226 4; α (L)=0.000326 5; α (M)=7.09×10 ⁻⁵ 10; α (N+)=1.89×10 ⁻⁵ 3		
		1462.1 10	37 5	4450.9 14+	(E2)		0.001349 19	$\alpha(N)=1.626\times10^{-5}\ 23;\ \alpha(O)=2.49\times10^{-6}\ 4;\ \alpha(P)=1.565\times10^{-7}\ 22$ $\alpha(K)=0.001097\ 16;\ \alpha(L)=0.0001498\ 21;\ \alpha(M)=3.24\times10^{-5}\ 5;$		
								$\alpha(N+)=7.03\times10^{-5}$ $\alpha(N)=7.43\times10^{-6} 11; \ \alpha(O)=1.149\times10^{-6} 17; \ \alpha(P)=7.61\times10^{-8} 11; \ \alpha(IPF)=6.19\times10^{-5} 10$		
6126.7	18+	841.5 2	100.0	5285.2 16+	E2		0.00399 6	B(E2)(W.u.)=80 13 α (K)=0.00334 5; α (L)=0.000503 7; α (M)=0.0001097 16; α (N)=)=2.92×10^{-5} 4		
6176.9	17+	264.0 <i>3</i>	27 4	5912.8 (16+)	(M1+E2)		0.112 23	$\alpha(N=2.51\times10^{-5} 4; \alpha(O)=3.82\times10^{-6} 6; \alpha(P)=2.31\times10^{-7} 4$ $\alpha(K)=0.091 24; \alpha(L)=0.0169 8; \alpha(M)=0.0038 3; \alpha(N+)=0.00099 6$		
		367.4 3	16 2	5809.7 (16+)	(M1+E2)		0.044 12	α (N)=0.00086 6; α (O)=0.0001265 23; α (P)=6.3×10 ⁻⁶ 22 α (K)=0.037 11; α (L)=0.0060 7; α (M)=0.00133 12; α (N+)=0.00035 4		
		892.0 <i>3</i>	16 2	5285.2 16+	(M1+E2)		0.0048 13	$\alpha(N)=0.00030 \ 3; \ \alpha(O)=4.6\times10^{-5} \ 6; \ \alpha(P)=2.6\times10^{-6} \ 10$ $\alpha(K)=0.0040 \ 11; \ \alpha(L)=0.00057 \ 13; \ \alpha(M)=0.00012 \ 3;$		
		898.6 2	100 11	5278.4 15+	E2		0.00345 5	$\alpha(N+)=3.3\times10^{-5} 8$ $\alpha(N)=2.8\times10^{-5} 7; \alpha(O)=4.4\times10^{-6} 11; \alpha(P)=2.9\times10^{-7} 9$ B(E2)(W,u)=9+3-4		
								$\alpha(K)=0.00291 \ 4; \ \alpha(L)=0.000430 \ 6; \ \alpha(M)=9.37\times10^{-5} \ 14; \ \alpha(N+)=2.50\times10^{-5} \ 4$		
6215.9	17+	937.4 4	100.0	5278.4 15+	E2		0.00316 5	$\alpha(N)=2.15\times10^{-5} 3; \ \alpha(O)=3.28\times10^{-6} 5; \ \alpha(P)=2.01\times10^{-7} 3 \alpha(K)=0.00266 4; \ \alpha(L)=0.000390 6; \ \alpha(M)=8.49\times10^{-5} 12; \alpha(N+1)=2.26\times10^{-5} 4$		
6260.3	(18+)	975.2 <i>3</i>	100.0	5285.2 16+	[E2]		0.00290 4	$\alpha(N)=1.94\times10^{-5} \ 3; \ \alpha(O)=2.97\times10^{-6} \ 5; \ \alpha(P)=1.84\times10^{-7} \ 3 \\ \alpha(K)=0.00245 \ 4; \ \alpha(L)=0.000356 \ 5; \ \alpha(M)=7.74\times10^{-5} \ 11;$		
(071.0	10-	274.4.2	100.0.53	5006.0 17-			0.042.12	$\alpha(N+)=2.06\times10^{-5} 3$ $\alpha(N)=1.775\times10^{-5} 25; \alpha(O)=2.72\times10^{-6} 4; \alpha(P)=1.694\times10^{-7} 24$		
62/1.2	18	3/4.4 2	100.0 53	5896.9 17	M1+E2		0.042 12	$\alpha(K)=0.055\ 11;\ \alpha(L)=0.0057\ 7;\ \alpha(M)=0.00126\ 12;\ \alpha(N+)=0.00033\ 4$ $\alpha(N)=0.00029\ 3;\ \alpha(O)=4.3\times10^{-5}\ 6;\ \alpha(P)=2.5\times10^{-6}\ 9$		
		660.2 3	12.3 18	5611.2 16-	E2		0.00695 10	$\alpha(K) = 0.00576 \ 8; \ \alpha(L) = 0.000929 \ 13; \ \alpha(M) = 0.000204 \ 3; \\ \alpha(N+) = 5.40 \times 10^{-5} \ 8$		

 $^{142}_{64} Gd_{78} \text{-} 9$

From ENSDF

 $^{142}_{64}{
m Gd}_{78}$ -9

					Ado	pted Leve	ls, Gammas (c	continued)
						$\gamma(^{142})$	Gd) (continued	<u>)</u>
E _i (level)	\mathbf{J}_i^{π}	Eγ	I_{γ}	$\mathbf{E}_f \qquad \mathbf{J}_f^{\pi}$	Mult. [‡]	δ	$lpha^\dagger$	Comments
								$\alpha(K)=0.00576 \ 8; \ \alpha(L)=0.000929 \ 13; \ \alpha(M)=0.000204 \ 3; \\ \alpha(N+)=5.40\times10^{-5} \ 8 \\ \alpha(N)=4.66\times10^{-5} \ 7; \ \alpha(O)=7.01\times10^{-6} \ 10; \ \alpha(P)=3.94\times10^{-7} \ 6 \\ B(E_2)(W_{\rm H})=14 \ 5 $
6283.1	(18+)	678.1 2	100.0	5604.9 (16 ⁺)	(E2)		0.00652 10	$\begin{array}{l} \alpha(\mathrm{K})=0.00542\ 8;\ \alpha(\mathrm{L})=0.000865\ 13;\ \alpha(\mathrm{M})=0.000190\ 3;\\ \alpha(\mathrm{N}+)=5.03\times10^{-5}\ 7\\ \alpha(\mathrm{N}+)=5.$
6287.0	17-	473.7 2	100.0	5813.3 16-	M1+E2		0.023 7	$\begin{aligned} \alpha(N) &= 4.34 \times 10^{-6} \ 6; \ \alpha(O) &= 0.54 \times 10^{-6} \ 70; \ \alpha(P) &= 5.71 \times 10^{-6} \ 6 \\ \alpha(K) &= 0.019 \ 6; \ \alpha(L) &= 0.0029 \ 6; \ \alpha(M) &= 0.00064 \ 11; \ \alpha(N+) &= 0.00017 \ 3 \\ \alpha(N) &= 0.000146 \ 25; \ \alpha(O) &= 2.2 \times 10^{-5} \ 5; \ \alpha(P) &= 1.3 \times 10^{-6} \ 5 \end{aligned}$
6398.9 6477.5	(18) 18 ⁺	502 261.5 <i>3</i>	88 8	5896.9 17 6215.9 17 ⁺	M1+E2		0.115 23	$\alpha(K)=0.093\ 24;\ \alpha(L)=0.0175\ 10;\ \alpha(M)=0.0039\ 3;\ \alpha(N+)=0.00102\ 6$
		300.7 2	100 10	6176.9 17+	M1+E2		0.077 18	$\alpha(N)=0.000890;\alpha(O)=0.0001305;\alpha(P)=0.4\times10^{-2.25}$ $\alpha(K)=0.06318;\alpha(L)=0.01123;\alpha(M)=0.002474;\alpha(N+)=0.000652$ 13
		350.9 4	14 2	6126.7 18+				α (N)=0.000564 9; α (O)=8.4×10 ⁻⁵ 5; α (P)=4.4×10 ⁻⁶ 16
		667.4 6	28 4	5809.7 (16 ⁺)	E2		0.00677 10	$\alpha(K)=0.00562 \ 8; \ \alpha(L)=0.000902 \ 13; \ \alpha(M)=0.000198 \ 3; \ \alpha(N+)=5.25\times10^{-5} \ 8$
								$\alpha(N)=4.53\times10^{-5}$ 7; $\alpha(O)=6.82\times10^{-6}$ 10; $\alpha(P)=3.84\times10^{-7}$ 6 B(E2)(W.u.)=12 4
		1192.0 5	10 2	5285.2 16+	E2		0.00193 3	$\begin{aligned} &\alpha(\mathbf{K}) = 0.001630 \ 23; \ \alpha(\mathbf{L}) = 0.000229 \ 4; \ \alpha(\mathbf{M}) = 4.96 \times 10^{-5} \ 7; \\ &\alpha(\mathbf{N}+) = 1.79 \times 10^{-5} \ 3 \\ &\alpha(\mathbf{N}) = 1.137 \times 10^{-5} \ 16; \ \alpha(\mathbf{O}) = 1.751 \times 10^{-6} \ 25; \ \alpha(\mathbf{P}) = 1.130 \times 10^{-7} \ 16; \\ &\alpha(\mathbf{IPF}) = 4.70 \times 10^{-6} \ 9 \end{aligned}$
6566.3	19-	295.1 2	100.0 46	6271.2 18-	M1(+E2)	-0.1 1	0.0995 18	B(E2)(W.u.)=0.23 +8-9 α (K)=0.0843 16; α (L)=0.01195 17; α (M)=0.00259 4; α (N+)=0.000696 10
		669.3 2	36.8 <i>34</i>	5896.9 17-	E2		0.00673 10	$\begin{aligned} &\alpha(\mathbf{N}) = 0.000597 \ 9; \ \alpha(\mathbf{O}) = 9.27 \times 10^{-5} \ 14; \ \alpha(\mathbf{P}) = 6.22 \times 10^{-6} \ 13 \\ &\mathbf{B}(\mathbf{M}1)(\mathbf{W}.\mathbf{u}.) = (0.52 + 11 - 17); \ \mathbf{B}(\mathbf{E}2)(\mathbf{W}.\mathbf{u}.) = (30 + 70 - 30) \\ &\alpha(\mathbf{K}) = 0.00558 \ 8; \ \alpha(\mathbf{L}) = 0.000896 \ 13; \ \alpha(\mathbf{M}) = 0.000197 \ 3; \\ &\alpha(\mathbf{N}+) = 5.21 \times 10^{-5} \ 8 \end{aligned}$
								α (N)=4.50×10 ⁻⁵ 7; α (O)=6.77×10 ⁻⁶ 10; α (P)=3.82×10 ⁻⁷ 6 B(E2)(W.u.)=22 +5-8
6620.8	18-	333.8 2	100.0	6287.0 17-	M1+E2		0.058 15	$\alpha(K)=0.047 \ 14; \ \alpha(L)=0.0081 \ 6; \ \alpha(M)=0.00178 \ 9; \ \alpha(N+)=0.00047 \ 3$ $\alpha(N)=0.000407 \ 23; \ \alpha(O)=6.1\times10^{-5} \ 6; \ \alpha(P)=3.3\times10^{-6} \ 12$
6858.6	19+	381.1 2	100 10	6477.5 18+	M1(+E2)	-0.1 1	0.0507 10	$B(M1)(W.u.)=(0.9 + 3-5); B(E2)(W.u.)=(40 + 80-40) \alpha(K)=0.0430 9; \alpha(L)=0.00604 10; \alpha(M)=0.001309 20; \alpha(N+)=0.000351 6$
		682.1 <i>4</i>	2 1	6176.9 17+	(E2)		0.00643 9	α (N)=0.000301 5; α (O)=4.68×10 ⁻⁵ 8; α (P)=3.16×10 ⁻⁶ 7 α (K)=0.00534 8; α (L)=0.000852 12; α (M)=0.000187 3;

From ENSDF

 $^{142}_{64}\mathrm{Gd}_{78}\text{--}10$

 $^{142}_{64}\text{Gd}_{78}\text{--}10$

					Ado	pted Leve	els, Gammas ((continued)			
	γ ⁽¹⁴² Gd) (continued)										
E _i (level)	\mathbf{J}_i^{π}	Eγ	I_{γ}	$\mathbf{E}_f \qquad \mathbf{J}_f^{\pi}$	Mult. [‡]	δ	α^{\dagger}	Comments			
								$\frac{\alpha(\text{N}+)=4.96\times10^{-5} 7}{\alpha(\text{N})=4.28\times10^{-5} 6; \alpha(\text{O})=6.44\times10^{-6} 9; \alpha(\text{P})=3.66\times10^{-7} 6}$ B(E2)(W.u.)=4.0 +23-28			
6858.6	19+	731.9 5	11 <i>1</i>	6126.7 18+	(M1+E2)		0.0076 22	$\alpha(K)=0.0064 \ 19; \ \alpha(L)=0.00092 \ 22; \ \alpha(M)=0.00020 \ 5; \\ \alpha(N+)=5.4\times10^{-5} \ 13 \\ \alpha(N)=4 \ 6\times10^{-5} \ 11; \ \alpha(O)=7 \ 1\times10^{-6} \ 18; \ \alpha(P)=4 \ 6\times10^{-7} \ 15$			
6916.5	(20 ⁺)	789.8 <i>3</i>	100.0	6126.7 18+	E2		0.00459 7	B(E2)(W.u.)=85 + 9 - 13 $\alpha(K)=0.00384 \ 6; \ \alpha(L)=0.000587 \ 9; \ \alpha(M)=0.0001283 \ 18;$ $\alpha(N+)=3.41 \times 10^{-5} \ 5$			
7027.9	19+	901.5 5	100.0	6126.7 18+	M1+E2		0.0046 13	$\alpha(N)=2.94\times10^{-5} 5; \ \alpha(O)=4.46\times10^{-6} 7; \ \alpha(P)=2.65\times10^{-7} 4$ $\alpha(K)=0.0039 \ 11; \ \alpha(L)=0.00055 \ 13; \ \alpha(M)=0.00012 \ 3; $ $\alpha(N+)=3.2\times10^{-5} 8$ $\alpha(N)=3.2\times10^{-5} 8$			
7071.3	19-	450.5 4	100.0	6620.8 18-	M1+E2		0.026 8	$\alpha(N)=2.8\times10^{-5}$; $\alpha(O)=4.3\times10^{-5}$ 11; $\alpha(P)=2.8\times10^{-5}$ 9 $\alpha(K)=0.021$ 7; $\alpha(L)=0.0034$ 6; $\alpha(M)=0.00073$ 12; $\alpha(N+)=0.00020$ 4 $\alpha(N)=0.00017$ 3: $\alpha(O)=2.6\times10^{-5}$ 5: $\alpha(P)=1.5\times10^{-6}$ 6			
7093.3	20^{-}	527.0 2	100.0 53	6566.3 19-	M1+E2		0.017 5	$\alpha(N)=0.00017$ 5, $\alpha(C)=2.0\times10^{-5}$ 5, $\alpha(I)=1.0\times10^{-6}$ 6 $\alpha(K)=0.014$ 5; $\alpha(L)=0.0022$ 5; $\alpha(M)=0.00047$ 9; $\alpha(N+)=0.000127$ 25 $\alpha(N)=0.000109$ 21; $\alpha(Q)=1.7\times10^{-5}$ 4; $\alpha(P)=1.0\times10^{-6}$ 4			
		822.3 4	11.8 26	6271.2 18-	E2		0.00419 6	$\begin{aligned} \alpha(\mathbf{K}) &= 0.00352 \ 5; \ \alpha(\mathbf{L}) = 0.000532 \ 8; \ \alpha(\mathbf{M}) = 0.0001161 \ 17; \\ \alpha(\mathbf{N}+) = 3.09 \times 10^{-5} \ 5 \\ \alpha(\mathbf{N}) = 2.66 \times 10^{-5} \ 4; \ \alpha(\mathbf{O}) = 4.04 \times 10^{-6} \ 6; \ \alpha(\mathbf{P}) = 2.42 \times 10^{-7} \ 4 \\ \mathbf{B}(\mathbf{E})(\mathbf{W} _{\mathbf{N}}) = 8 \ 3 \end{aligned}$			
7137.6	20+	877.3 4	100 33	6260.3 (18+)	E2		0.00364 6	$a(K)=0.00306 5; a(L)=0.000455 7; a(M)=9.92\times10^{-5} 14; a(N+)=2.64\times10^{-5} 4$			
		1010.9 3	95 12	6126.7 18+	E2		0.00269 4	$\alpha(N)=2.27\times10^{-4} ; \alpha(O)=3.47\times10^{-5} ; \alpha(P)=2.11\times10^{-5} ; \alpha(K)=0.00227 4; \alpha(L)=0.000328 5; \alpha(M)=7.13\times10^{-5} 10; \alpha(N+)=1.90\times10^{-5} 3$			
7175.5	(20 ⁺)	892.4 2	100.0	6283.1 (18 ⁺)	(E2)		0.00351 5	$\begin{aligned} \alpha(N) &= 1.635 \times 10^{-5} 23; \ \alpha(O) &= 2.51 \times 10^{-6} 4; \ \alpha(P) &= 1.574 \times 10^{-7} 22 \\ B(E2)(W.u.) &= 19 4 \\ \alpha(K) &= 0.00295 5; \ \alpha(L) &= 0.000437 7; \ \alpha(M) &= 9.53 \times 10^{-5} 14; \\ \alpha(N+) &= 2.54 \times 10^{-5} 4 \end{aligned}$			
7285.3	20+	426.9 2	100 10	6858.6 19+	M1(+E2)	-0.1 1	0.0378 7	$\alpha(N)=2.18\times10^{-5} 3; \alpha(O)=3.33\times10^{-6} 5; \alpha(P)=2.04\times10^{-7} 3 \alpha(K)=0.0320 7; \alpha(L)=0.00448 8; \alpha(M)=0.000971 16; \alpha(N+)=0.000261 5$			
		807.6 7	5 1	6477.5 18+	(E2)		0.00437 7	$\begin{aligned} \alpha(N) &= 0.000224 \ 4; \ \alpha(O) &= 5.48 \times 10^{-6} \ 6; \ \alpha(P) &= 2.55 \times 10^{-6} \ 5 \\ B(M1)(W.u.) &= (0.72 + 23 - 30); B(E2)(W.u.) &= (20 + 50 - 20) \\ \alpha(K) &= 0.00366 \ 6; \ \alpha(L) &= 0.000556 \ 8; \ \alpha(M) &= 0.0001214 \ 18; \\ \alpha(N+) &= 3.23 \times 10^{-5} \ 5 \\ \alpha(N) &= 2.78 \times 10^{-5} \ 4; \ \alpha(O) &= 4.22 \times 10^{-6} \ 6; \ \alpha(P) &= 2.52 \times 10^{-7} \ 4 \\ B(E2)(W.u.) &= 4.8 + 17 - 22 \end{aligned}$			

From ENSDF

 $^{142}_{64}\text{Gd}_{78}\text{--}11$

					Ac	dopted Le	vels, Gammas (continued)		
γ ⁽¹⁴² Gd) (continued)										
E _i (level)	\mathbf{J}_i^{π}	Eγ	I_{γ}	$\mathbf{E}_f \qquad \mathbf{J}_f^{\pi}$	Mult. [‡]	δ	$lpha^\dagger$	Comments		
7455.3	(20 ⁻)	384.0 4	100.0	7071.3 19-	(M1+E2)		0.039 11	α (K)=0.033 <i>10</i> ; α (L)=0.0053 <i>7</i> ; α (M)=0.00117 <i>12</i> ; α (N+)=0.00031 α (N)=0.00027 <i>3</i> ; α (O)=4.0×10 ⁻⁵ <i>6</i> ; α (P)=2.3×10 ⁻⁶ <i>9</i>		
7502.0	(20 ⁺)	1218.5 <i>3</i>	100.0	6283.1 (18 ⁺)	(E2)		0.00185 3	$\alpha(K) = 0.001561\ 22;\ \alpha(L) = 0.000218\ 3;\ \alpha(M) = 4.73 \times 10^{-5}\ 7; \\ \alpha(N+) = 2.03 \times 10^{-5}\ 3$		
7531.8	(20^{+})	1248 6 9	100.0	6283 1 (18+)	(F2)		0.001764.25	$\alpha(N)=1.085\times10^{-5} \ 16; \ \alpha(O)=1.672\times10^{-6} \ 24; \ \alpha(P)=1.082\times10^{-7} \ 16; \ \alpha(PF)=7.64\times10^{-6} \ 12 \ \alpha(K)=0.001488 \ 21; \ \alpha(I)=0.000207 \ 3; \ \alpha(M)=4.49\times10^{-5} \ 7;$		
7551.0	(20)	1240.0 7	100.0	0203.1 (10)	(L2)		0.001704 23	$\alpha(N)=0.001405\ 21,\ \alpha(D)=0.000207\ 3,\ \alpha(N)=4.47710^{-7}\ 7,\ \alpha(N+)=2.37\times10^{-5}\ 4 \\ \alpha(N)=1.030\times10^{-5}\ 15;\ \alpha(O)=1.588\times10^{-6}\ 23;\ \alpha(P)=1.032\times10^{-7}\ 15;$		
7559.7	21-	466.4 2	100 11	7093.3 20-	M1+E2		0.023 7	α (IPF)=1.169×10 ⁻⁵ 21 α (K)=0.020 6; α (L)=0.0030 6; α (M)=0.00067 11; α (N+)=0.00018 3 α (N)=0.00015 3: α (O)=2.3×10 ⁻⁵ 5: α (P)=1.4×10 ⁻⁶ 5		
		993.4 2	80 9	6566.3 19-	E2		0.00279 4	B(E2)(W.u.) = 12 + 3 - 4 $\alpha(K) = 0.00236 4; \alpha(L) = 0.000341 5; \alpha(M) = 7.42 \times 10^{-5} 11;$		
7597.1	(21+)	569.3 4	10 3	7027.9 19+	E2		0.00999 14	$\alpha(N+)=1.98\times10^{-5} 3$ $\alpha(N)=1.701\times10^{-5} 24; \ \alpha(O)=2.61\times10^{-6} 4; \ \alpha(P)=1.631\times10^{-7} 23$ $\alpha(K)=0.00821 \ I2; \ \alpha(L)=0.001394 \ 20; \ \alpha(M)=0.000308 \ 5;$ $\alpha(N+)=8.13\times10^{-5} \ I2$		
		680.5 2	100 15	6916.5 (20 ⁺)	M1+E2		0.009 <i>3</i>	$ \begin{array}{l} \alpha(\mathrm{N}) = 7.03 \times 10^{-5} \ 10; \ \alpha(\mathrm{O}) = 1.048 \times 10^{-5} \ 15; \ \alpha(\mathrm{P}) = 5.56 \times 10^{-7} \ 8 \\ \mathrm{B(E2)(W.u.)} = 26 \ 11 \\ \alpha(\mathrm{K}) = 0.0077 \ 23; \ \alpha(\mathrm{L}) = 0.0011 \ 3; \ \alpha(\mathrm{M}) = 0.00024 \ 6; \ \alpha(\mathrm{N}+) = 6.5 \times 10^{-7} \\ \end{array} $		
7625.4	(21 ⁺)	708.7 <i>5</i>	100.0	6916.5 (20 ⁺)	(M1+E2)		0.0082 24	<i>15</i> $\alpha(N)=5.5\times10^{-5}$ <i>13</i> ; $\alpha(O)=8.5\times10^{-6}$ <i>21</i> ; $\alpha(P)=5.5\times10^{-7}$ <i>18</i> $\alpha(K)=0.0069$ <i>21</i> ; $\alpha(L)=0.00100$ <i>24</i> ; $\alpha(M)=0.00022$ <i>5</i> ;		
7615 6	21+	14252	6.2	7502.0 (20+)	M1+E2		0.706.10	$\alpha(N+)=5.8\times10^{-5} \ 14$ $\alpha(N)=5.0\times10^{-5} \ 12; \ \alpha(O)=7.7\times10^{-6} \ 19; \ \alpha(P)=4.9\times10^{-7} \ 16$ $\alpha(N)=0.51 \ 10, \ \alpha(P)=0.15 \ 7, \ \alpha(P)=0.24 \ 15; \ \alpha(P)=0.000 \ 4$		
/043.0	21	145.5 <i>2</i> 360.4 2	100 12	$7302.0(20^{+})$ 7285.3 20 ⁺	M1+E2 M1(+E2)	-0.1 /	0.706 19	$\alpha(\mathbf{K})=0.51\ 10;\ \alpha(\mathbf{L})=0.15\ 7;\ \alpha(\mathbf{M})=0.034\ 15;\ \alpha(\mathbf{N}+)=0.009\ 4$ $\alpha(\mathbf{N})=0.008\ 4;\ \alpha(\mathbf{O})=0.0011\ 4;\ \alpha(\mathbf{P})=3.4\times10^{-5}\ 12$ $\alpha(\mathbf{K})=0.0497\ 10;\ \alpha(\mathbf{L})=0.00700\ 11;\ \alpha(\mathbf{M})=0.001518\ 23;$		
		200112	100 12	,20010 20		011 1	0.0007 11	$\alpha(N) = 0.000407 \ 6$ $\alpha(N) = 0.000349 \ 6; \ \alpha(O) = 5.43 \times 10^{-5} \ 9; \ \alpha(P) = 3.66 \times 10^{-6} \ 8$		
		787.4 6	8 2	6858.6 19+	E2		0.00462 7	B(M1)(W.u.)=(0.58 +14-17); B(E2)(W.u.)=(30 +60-30) α (K)=0.00387 6; α (L)=0.000591 9; α (M)=0.0001292 19; α (N+)=3.43×10 ⁻⁵ 5		
7770 -	22^{+}	100.0.0	72.0		141.52		0.070.14	$\alpha(N)=2.96\times10^{-5} 5; \alpha(O)=4.49\times10^{-6} 7; \alpha(P)=2.66\times10^{-7} 4$ B(E2)(W.u.)=4.2 +14-15		
7779.5	22*	133.9 2	73.8	7645.6 21+	M1+E2		0.879 14	$\alpha(\mathbf{K}) = 0.63 \ 12; \ \alpha(\mathbf{L}) = 0.19 \ 9; \ \alpha(\mathbf{M}) = 0.045 \ 22; \ \alpha(\mathbf{N}+) = 0.012 \ 6$ $\alpha(\mathbf{N}) = 0.010 \ 5; \ \alpha(\mathbf{O}) = 0.0014 \ 6; \ \alpha(\mathbf{P}) = 4.1 \times 10^{-5} \ 15$		
		604.0 4	100 11	7175.5 (20 ⁺)	E2		0.00862 13	$\alpha(K)=0.00711 \ 10; \ \alpha(L)=0.001182 \ 17; \ \alpha(M)=0.000260 \ 4;$		

					Ad	lopted Levels, (Gammas (continued)				
	γ ⁽¹⁴² Gd) (continued)										
E _i (level)	\mathbf{J}_i^{π}	Eγ	I_{γ}	$\mathbf{E}_f = \mathbf{J}_f^{\pi}$	Mult. [‡]	α^{\dagger}	Comments				
7827.1	(22 ⁺)	910.6 2	100.0	6916.5 (20 ⁺)	E2	0.00336 5	$\alpha(N+)=6.88\times10^{-5} \ 10$ $\alpha(N)=5.95\times10^{-5} \ 9; \ \alpha(O)=8.90\times10^{-6} \ 13; \ \alpha(P)=4.84\times10^{-7} \ 7$ B(E2)(W.u.)=79 \ 16 $\alpha(K)=0.00283 \ 4; \ \alpha(L)=0.000417 \ 6; \ \alpha(M)=9.08\times10^{-5} \ 13; \ \alpha(N+)=2.42\times10^{-5} \ 4$ $\alpha(K)=2.08\times10^{-5} \ 3; \ \alpha(O)=2.18\times10^{-6} \ 5; \ \alpha(P)=1.05\times10^{-7} \ 3; \ \alpha(N+)=2.42\times10^{-5} \ 4$				
7844.2	21^{-}	750.7 6	90 10	7093.3 20-	(M1+E2)	0.0072 20	$\alpha(\mathbf{K}) = 2.08 \times 10^{-5}, \alpha(\mathbf{C}) = 5.18 \times 10^{-5}, \alpha(\mathbf{F}) = 1.95 \times 10^{-5}, \alpha(\mathbf{K}) = 0.0060 \ 18; \ \alpha(\mathbf{L}) = 0.00087 \ 21; \ \alpha(\mathbf{M}) = 0.00019 \ 5; \ \alpha(\mathbf{K}+) = 5.0 \times 10^{-5} \ 12$				
		1277.8 6	100 20	6566.3 19-	E2	0.001690 24	$\begin{aligned} \alpha(N) &= 4.5 \times 10^{-5} \ 10; \ \alpha(O) &= 0.7 \times 10^{-5} \ 17; \ \alpha(P) &= 4.5 \times 10^{-5} \ 14^{-5} \\ \alpha(K) &= 0.001422 \ 20; \ \alpha(L) &= 0.000198 \ 3; \ \alpha(M) &= 4.27 \times 10^{-5} \ 6; \ \alpha(N+) &= 2.76 \times 10^{-5} \ 4 \\ \alpha(N) &= 9.81 \times 10^{-6} \ 14; \ \alpha(O) &= 1.513 \times 10^{-6} \ 22; \ \alpha(P) &= 9.86 \times 10^{-8} \ 14; \\ \alpha(DE) &= 1.618 \times 10^{-5} \ 25. \end{aligned}$				
8018.0	22^{+}	372.3 3	100.0	7645.6 21+	M1+E2	0.043 12	$\alpha(\text{IPP})=1.018 \times 10^{-5} 25$ $\alpha(\text{K})=0.035 \ 11; \ \alpha(\text{L})=0.0058 \ 7; \ \alpha(\text{M})=0.00128 \ 12; \ \alpha(\text{N}+)=0.00034 \ 4$ $\alpha(\text{N})=0.00029 \ 3; \ \alpha(\text{O})=4 \ 4 \times 10^{-5} \ 6; \ \alpha(\text{P})=2 \ 5 \times 10^{-6} \ 9$				
8093.1	(22 ⁺)	955.5 2	100.0	7137.6 20+	(E2)	0.00303 5	$\alpha(\mathbf{N}) = 0.0002554; \ \alpha(\mathbf{L}) = 0.0003736; \ \alpha(\mathbf{M}) = 8.12 \times 10^{-5} 12; \ \alpha(\mathbf{N}+) = 2.16 \times 10^{-5} 3$ $\alpha(\mathbf{N}) = 1.86 \times 10^{-5} 3; \ \alpha(\mathbf{O}) = 2.85 \times 10^{-6} 4; \ \alpha(\mathbf{P}) = 1.767 \times 10^{-7} 25$				
8159.6	(22+)	627.8 <i>3</i>	100.0	7531.8 (20+)	(E2)	0.00784 11	$\alpha(\mathbf{N}) = 1.30 \times 10^{-5} \ S, \ \alpha(\mathbf{O}) = 2.30 \times 10^{-4} \ 4, \ \alpha(\mathbf{I}) = 1.707 \times 10^{-5} \ 2.5$ $\alpha(\mathbf{K}) = 0.00648 \ 10; \ \alpha(\mathbf{L}) = 0.001063 \ 15; \ \alpha(\mathbf{M}) = 0.000234 \ 4; \ \alpha(\mathbf{N}+) = 6.19 \times 10^{-5} \ 9$ $\alpha(\mathbf{N}) = 5.24 \times 10^{-5} \ 8; \ \alpha(\mathbf{O}) = 8.02 \times 10^{-6} \ 12; \ \alpha(\mathbf{M}) = 4.42 \times 10^{-7} \ 7$				
8198.7	22-	354.5 <i>3</i>	40 5	7844.2 21-	M1+E2	0.049 13	$\alpha(N) = 5.54 \times 10^{-5}$, $\alpha(C) = 8.02 \times 10^{-12}$, $\alpha(P) = 4.42 \times 10^{-7}$ $\alpha(K) = 0.040$ 12; $\alpha(L) = 0.0067$ 6; $\alpha(M) = 0.00148$ 11; $\alpha(N+) = 0.00039$ 4 $\alpha(N) = 0.00034$ 3: $\alpha(Q) = 5.1 \times 10^{-5}$ 6: $\alpha(P) = 2.8 \times 10^{-6}$ 10				
		638.9 <i>3</i>	55 15	7559.7 21-	M1+E2	0.011 3	$\alpha(N) = 0.000343, \alpha(D) = 0.1810-0, \alpha(T) = 2.8810-10$ $\alpha(K) = 0.0093; \alpha(L) = 0.00133; \alpha(M) = 0.000287; \alpha(N+) = 7.6 \times 10^{-5} 17$ $\alpha(N) = 65 \times 10^{-5} 15; \alpha(D) = 1.00 \times 10^{-5} 24; \alpha(D) = 6.4 \times 10^{-7} 21$				
		1104.6 6	100 15	7093.3 20-	E2	0.00224 4	$\begin{array}{l} a(N)=0.5\times10^{-1} 13, \ a(O)=1.00\times10^{-1} 24, \ a(P)=0.4\times10^{-1} 21 \\ B(E2)(W.u.)=13 +6-7 \\ \alpha(K)=0.00190 \ 3; \ \alpha(L)=0.000270 \ 4; \ \alpha(M)=5.85\times10^{-5} \ 9; \ \alpha(N+)=1.597\times10^{-5} \ 23 \\ \alpha(N)=1.342\times10^{-5} \ 19; \ \alpha(O)=2.06\times10^{-6} \ 3; \ \alpha(P)=1.315\times10^{-7} \ 19; \\ \alpha(DE)=2.52\times10^{-7} \ 10 \end{array}$				
8249.0	23+	231.0 2	12 2	8018.0 22+	M1+E2	0.17 3	$\alpha(\text{IF}) = 5.35 \times 10^{-10}$ 10 $\alpha(\text{K}) = 0.13 4; \alpha(\text{L}) = 0.026 4; \alpha(\text{M}) = 0.0059 9; \alpha(\text{N}+) = 0.00155 20$ $\alpha(\text{N}) = 0.00124 \text{ J} \text{ (a)}; \alpha(\text{O}) = 0.000106 \text{ J} \text{ (c)}; \alpha(\text{D}) = 0 \text{ E} - 6 2$				
		469.6 2	100 14	7779.5 22+	M1+E2	0.023 7	$\alpha(\mathbf{N}) = 0.00154 \ 19; \ \alpha(\mathbf{O}) = 0.000196 \ 10; \ \alpha(\mathbf{P}) = 9.E - 6.5$ $\alpha(\mathbf{K}) = 0.019 \ 6; \ \alpha(\mathbf{L}) = 0.0030 \ 6; \ \alpha(\mathbf{M}) = 0.00065 \ 11; \ \alpha(\mathbf{N}+) = 0.00017 \ 3$				
8328.3	(23+)	731.2 3	100.0	7597.1 (21+)	(E2)	0.00547 8	$\alpha(N)=0.00015 5; \alpha(O)=2.3\times10^{-5} 5; \alpha(P)=1.4\times10^{-5} 5$ B(E2)(W.u.)=106 22 $\alpha(K)=0.00456 7; \alpha(L)=0.000712 10; \alpha(M)=0.0001560 22; \alpha(N+)=4.14\times10^{-5} 6$ $\alpha(L)=2.57\times10^{-5} 5; \alpha(Q)=5.30\times10^{-6} 8; \alpha(P)=2.13\times10^{-7} 5$				
8568.2	(23+)	741.2 5	60 <i>13</i>	7827.1 (22+)	(M1+E2)	0.0074 21	$\alpha(\mathbf{N}) = 5.7 \times 10^{-5} 5; \ \alpha(\mathbf{O}) = 5.39 \times 10^{-6} 8; \ \alpha(\mathbf{P}) = 5.13 \times 10^{-5} 5$ $\alpha(\mathbf{K}) = 0.0062 \ 19; \ \alpha(\mathbf{L}) = 0.00090 \ 21; \ \alpha(\mathbf{M}) = 0.00019 \ 5; \ \alpha(\mathbf{N}+) = 5.2 \times 10^{-5} \ 12$ $\alpha(\mathbf{N}) = 4.5 \times 10^{-5} \ 11; \ \alpha(\mathbf{O}) = 6.9 \times 10^{-6} \ 17; \ \alpha(\mathbf{P}) = 4.4 \times 10^{-7} \ 14$				
		942.8 <i>3</i>	100 13	7625.4 (21 ⁺)	(E2)	0.00312 5	$\alpha(K)=0.00263 \ 4; \ \alpha(L)=0.000385 \ 6; \ \alpha(M)=8.37\times10^{-5} \ I2; \ \alpha(N+)=2.23\times10^{-5} \ 4$				
8592.7	24+	343.8 2	100 15	8249.0 23+	M1+E2	0.053 14	$\alpha(\mathbf{K}) = 0.044 \ 13; \ \alpha(\mathbf{L}) = 0.0074 \ 6; \ \alpha(\mathbf{M}) = 0.00163 \ 10; \ \alpha(\mathbf{N}+) = 0.00043 \ 4 \\ \alpha(\mathbf{N}) = 0.000372 \ 25; \ \alpha(\mathbf{O}) = 5.6 \times 10^{-5} \ 6; \ \alpha(\mathbf{P}) = 3.1 \times 10^{-6} \ 11$				
		812.9 <i>3</i>	45 6	7779.5 22+	E2	0.00430 6	$\alpha(K)=0.00360\ 5;\ \alpha(L)=0.000547\ 8;\ \alpha(M)=0.0001194\ 17;\ \alpha(N+)=3.17\times10^{-5}\ 5$				

From ENSDF

 $^{142}_{64}\text{Gd}_{78}\text{--}13$

					Ad	lopted Lev	els, Gammas	(continued)	
γ ⁽¹⁴² Gd) (continued)									
E _i (level)	J_i^{π}	Eγ	I_{γ}	E_f J	. Mult. [‡]	δ	α^{\dagger}	Comments	
8637.2	23-	438.6 <i>3</i>	94 12	8198.7 22	M1(+E2)	-0.1 1	0.0352 7	$\begin{aligned} \alpha(N) &= 2.73 \times 10^{-5} \ 4; \ \alpha(O) &= 4.15 \times 10^{-6} \ 6; \ \alpha(P) &= 2.49 \times 10^{-7} \ 4\\ B(E2)(W.u.) &= 25 \ 7\\ \alpha(K) &= 0.0299 \ 6; \ \alpha(L) &= 0.00418 \ 7; \ \alpha(M) &= 0.000905 \ 15;\\ \alpha(N+) &= 0.000243 \ 4 \end{aligned}$	
		792.3 10	88 <i>35</i>	7844.2 21	E2		0.00456 7	$\begin{aligned} &\alpha(\text{N})=0.000208 \ 4; \ \alpha(\text{O})=3.24\times10^{-5} \ 6; \ \alpha(\text{P})=2.19\times10^{-6} \ 5\\ &\text{B}(\text{M1})(\text{W.u.})=(0.16 \ 6); \ \text{B}(\text{E2})(\text{W.u.})=(5 \ +10 - 5)\\ &\alpha(\text{K})=0.00381 \ 6; \ \alpha(\text{L})=0.000582 \ 9; \ \alpha(\text{M})=0.0001273 \ 19;\\ &\alpha(\text{N}+)=3.38\times10^{-5} \ 5 \end{aligned}$	
		1077.8 <i>3</i>	100 12	7559.7 21	E2		0.00236 4	$\begin{aligned} &\alpha(\mathrm{N}) = 2.91 \times 10^{-5} 5; \ \alpha(\mathrm{O}) = 4.42 \times 10^{-6} 7; \ \alpha(\mathrm{P}) = 2.63 \times 10^{-7} 4 \\ &\mathrm{B(E2)(W.u.)} = 24 + 12 - 13 \\ &\alpha(\mathrm{K}) = 0.00199 \ 3; \ \alpha(\mathrm{L}) = 0.000285 \ 4; \ \alpha(\mathrm{M}) = 6.18 \times 10^{-5} \ 9; \\ &\alpha(\mathrm{N}+) = 1.648 \times 10^{-5} \ 23 \end{aligned}$	
8730.4	24+	481.4 <i>3</i>	100.0	8249.0 23	M1+E2		0.022 7	$\begin{aligned} &\alpha(N) = 1.417 \times 10^{-5} \ 20; \ \alpha(O) = 2.18 \times 10^{-6} \ 3; \ \alpha(P) = 1.382 \times 10^{-7} \ 20 \\ &B(E2)(W.u.) = 5.8 \ +19 - 22 \\ &\alpha(K) = 0.018 \ 6; \ \alpha(L) = 0.0028 \ 5; \ \alpha(M) = 0.00061 \ 11; \ \alpha(N+) = 0.00016 \ 3 \\ &\alpha(N) = 0.000140 \ 25; \ \alpha(O) = 2.1 \times 10^{-5} \ 5; \ \alpha(P) = 1.3 \times 10^{-6} \ 5 \end{aligned}$	
8963.6	24+ 24-	980.2 <i>4</i> 326.5 <i>4</i>	100.0 54 <i>15</i>	8637.2 23 ⁻	 • E2 • M1(+E2) 	-0.1 <i>1</i>	0.00287 4	B(E2)(W.u.)=60 9 $\alpha(K)=0.00242 4; \alpha(L)=0.000352 5; \alpha(M)=7.65\times10^{-5} 11; \alpha(N+)=2.04\times10^{-5} 3$ $\alpha(N)=1.754\times10^{-5} 25; \alpha(O)=2.69\times10^{-6} 4; \alpha(P)=1.676\times10^{-7} 24$ $\alpha(K)=0.0645 13; \alpha(L)=0.00911 14; \alpha(M)=0.00198 3;$	
		764.6 <i>3</i>	100 23	8198.7 22	E2		0.00494 7	$\alpha(N+)=0.000530 \ 8$ $\alpha(N)=0.000455 \ 7; \ \alpha(O)=7.06\times10^{-5} \ 11; \ \alpha(P)=4.75\times10^{-6} \ 10$ B(M1)(W.u.)=(0.26 +11-13); B(E2)(W.u.)=(10 +30-10) $\alpha(K)=0.00413 \ 6; \ \alpha(L)=0.000636 \ 9; \ \alpha(M)=0.0001392 \ 20;$ $\alpha(N+.)=3.70\times10^{-5} \ 6$	
9140.9	25+	410.4 6	39 <i>13</i>	8730.4 24	M1+E2		0.033 9	$\alpha(N)=3.18\times10^{-5} 5; \ \alpha(O)=4.83\times10^{-6} 7; \ \alpha(P)=2.84\times10^{-7} 4$ B(E2)(W.u.)=38 +15-17 $\alpha(K)=0.027 9; \ \alpha(L)=0.0044 7; \ \alpha(M)=0.00096 12; \ \alpha(N+)=0.00026 4$ $\alpha(N)=0.00022 3; \ \alpha(O)=3.3\times10^{-5} 6; \ \alpha(P)=1.9\times10^{-6} 7$	
		548.3 <i>4</i>	100 35	8592.7 24	M1(+E2)	0.0 1	0.0200	$\begin{aligned} \alpha(\mathbf{K}) = 0.0170 \ 3; \ \alpha(\mathbf{L}) = 0.00236 \ 4; \ \alpha(\mathbf{M}) = 0.000510 \ 8; \\ \alpha(\mathbf{N}+) = 0.0001369 \ 20 \\ \alpha(\mathbf{N}) = 0.0001173 \ 17; \ \alpha(\mathbf{O}) = 1.83 \times 10^{-5} \ 3; \ \alpha(\mathbf{P}) = 1.243 \times 10^{-6} \ 19 \\ \mathbf{B}(\mathbf{M}1)(\mathbf{W}.\mathbf{u}.) = (0.39 \ 24) \end{aligned}$	
9222.8	(24 ⁺)	1129.7 8	100.0	8093.1 (22	+) (E2)		0.00214 3	$\alpha(K)=0.00181 \ 3; \ \alpha(L)=0.000257 \ 4; \ \alpha(M)=5.57\times10^{-5} \ 8; \\ \alpha(N+)=1.574\times10^{-5} \ 22 \\ \alpha(N)=1.278\times10^{-5} \ 18; \ \alpha(O)=1.96\times10^{-6} \ 3; \ \alpha(P)=1.258\times10^{-7} \ 18; \\ \alpha(PF)=8 \ 8\times10^{-7} \ 3$	
9280.4	(25 ⁺)	952.1 4	100.0	8328.3 (23	+) (E2)		0.00305 5	B(E2)(W.u.)=9.E+1 4 α (K)=0.00257 4; α (L)=0.000376 6; α (M)=8.18×10 ⁻⁵ 12;	

From ENSDF

						$\gamma(^{14})$	² Gd) (continue	<u>d)</u>
E _i (level)	\mathbf{J}_i^{π}	Eγ	Iγ	$\mathbf{E}_f \mathbf{J}_f^{\pi}$	Mult. [‡]	δ	α^{\dagger}	Comments
9475.1	(25 ⁻)	511.3 4	100 25	8963.6 24-	[E2]		0.01316	$ \begin{array}{c} \alpha(\mathrm{N}+)=2.18\times10^{-5} \ 3\\ \alpha(\mathrm{N})=1.88\times10^{-5} \ 3; \ \alpha(\mathrm{O})=2.87\times10^{-6} \ 4; \ \alpha(\mathrm{P})=1.780\times10^{-7} \ 25\\ \alpha(\mathrm{K})=0.01072 \ 16; \ \alpha(\mathrm{L})=0.00190 \ 3; \ \alpha(\mathrm{M})=0.000422 \ 6; \\ \alpha(\mathrm{N}+)=0.0001111 \ 16 \end{array} $
		838.2 <i>3</i>	83 25	8637.2 23-	[E2]		0.00402 6	$ \begin{aligned} \alpha(N) &= 9.62 \times 10^{-5} \ 14; \ \alpha(O) &= 1.424 \times 10^{-5} \ 21; \ \alpha(P) &= 7.20 \times 10^{-7} \ 11 \\ \alpha(K) &= 0.00337 \ 5; \ \alpha(L) &= 0.000508 \ 8; \ \alpha(M) &= 0.0001108 \ 16; \\ \alpha(N+) &= 2.95 \times 10^{-5} \ 5 \end{aligned} $
9628.3	(25 ⁺)	1060.1 <i>3</i>	100.0 2	8568.2 (23 ⁺)	(E2)		0.00244 4	$\alpha(N)=2.54\times10^{-5} 4; \ \alpha(O)=3.86\times10^{-6} 6; \ \alpha(P)=2.33\times10^{-7} 4 \\ \alpha(K)=0.00206 3; \ \alpha(L)=0.000295 5; \ \alpha(M)=6.41\times10^{-5} 9; \\ \alpha(N+)=1.710\times10^{-5} 24$
9700.5	26+	559.6 4	100.0	9140.9 25+	M1(+E2)	0.0 1	0.0190	$ \begin{array}{l} \alpha(\mathrm{N}) = 1.470 \times 10^{-5} \ 21; \ \alpha(\mathrm{O}) = 2.26 \times 10^{-6} \ 4; \ \alpha(\mathrm{P}) = 1.429 \times 10^{-7} \ 20 \\ \alpha(\mathrm{K}) = 0.01617 \ 24; \ \alpha(\mathrm{L}) = 0.00224 \ 4; \ \alpha(\mathrm{M}) = 0.000484 \ 7; \\ \alpha(\mathrm{N}+) = 0.0001299 \ 19 \end{array} $
9747.0	(26+)	939.7 2	100.0	8807.3 24+	E2		0.00314 5	α (N)=0.0001114 <i>17</i> ; α (O)=1.73×10 ⁻⁵ <i>3</i> ; α (P)=1.180×10 ⁻⁶ <i>18</i> B(M1)(W.u.)=(0.6 <i>4</i>) B(E2)(W.u.)=57 <i>13</i> α (K)=0.00264 <i>4</i> ; α (L)=0.000388 <i>6</i> ; α (M)=8.44×10 ⁻⁵ <i>12</i> ; α (N+)=2.25×10 ⁻⁵ <i>4</i>
9858.8	26-	384.4 6	33 6	9475.1 (25 ⁻)	M1(+E2)	-0.1 1	0.0496 10	$\alpha(N)=1.93\times10^{-5} \ 3; \ \alpha(O)=2.96\times10^{-6} \ 5; \ \alpha(P)=1.83\times10^{-7} \ 3 \\ \alpha(K)=0.0420 \ 9; \ \alpha(L)=0.00590 \ 10; \ \alpha(M)=0.001279 \ 20; \\ \alpha(N+)=0.000343 \ 6$
		895.0 <i>3</i>	100 11	8963.6 24-	E2		0.00348 5	α (N)=0.000294 5; α (O)=4.58×10 ⁻⁵ 8; α (P)=3.09×10 ⁻⁶ 7 α (K)=0.00293 5; α (L)=0.000434 6; α (M)=9.46×10 ⁻⁵ 14; α (N+)=2.52×10 ⁻⁵ 4
10096.8	(25 ⁺)	1289.5 <i>4</i>	100.0	8807.3 24+	(M1+E2)		0.0021 5	$\alpha(N)=2.17\times10^{-5} 3; \ \alpha(O)=3.31\times10^{-6} 5; \ \alpha(P)=2.03\times10^{-7} 3 \alpha(K)=0.0018 4; \ \alpha(L)=0.00024 5; \ \alpha(M)=5.2\times10^{-5} 10; \alpha(N+)=3.3\times10^{-5} 4 \alpha(N)=1.20\times10^{-5} 24; \ \alpha(O)=1.9\times10^{-6} 4; \ \alpha(P)=1.3\times10^{-7} 3;$
10102.6	(26+)	879.8 6	100.0	9222.8 (24+)	(E2)		0.00362 5	α (IPF)=1.91×10 ⁻⁵ <i>11</i> α (K)=0.00304 5; α (L)=0.000452 7; α (M)=9.86×10 ⁻⁵ <i>14</i> ; α (N+)=2.62×10 ⁻⁵ 4
10311.9	27+	611.4 2	100.0	9700.5 26+	M1(+E2)	0.0 1	0.01523 23	$\alpha(N)=2.26\times10^{-5} 4; \ \alpha(O)=3.44\times10^{-6} 5; \ \alpha(P)=2.10\times10^{-7} 3 \alpha(K)=0.01295 20; \ \alpha(L)=0.00179 3; \ \alpha(M)=0.000386 6; \alpha(N+)=0.0001037 15$
10395.5	(27+)	1115.1 4	100.0	9280.4 (25 ⁺)	(E2)		0.00220 <i>3</i>	$\begin{split} &\alpha(\mathrm{N}) = 8.89 \times 10^{-5} \ I3; \ \alpha(\mathrm{O}) = 1.385 \times 10^{-5} \ 2I; \ \alpha(\mathrm{P}) = 9.44 \times 10^{-7} \ I4 \\ &\alpha(\mathrm{K}) = 0.00186 \ 3; \ \alpha(\mathrm{L}) = 0.000264 \ 4; \ \alpha(\mathrm{M}) = 5.73 \times 10^{-5} \ 8; \\ &\alpha(\mathrm{N}+) = 1.582 \times 10^{-5} \ 23 \\ &\alpha(\mathrm{N}) = 1.314 \times 10^{-5} \ I9; \ \alpha(\mathrm{O}) = 2.02 \times 10^{-6} \ 3; \ \alpha(\mathrm{P}) = 1.291 \times 10^{-7} \ I8; \\ &\alpha(\mathrm{IPF}) = 5.26 \times 10^{-7} \ I1 \end{split}$

Adopted Levels, Gammas (continued)										
$\gamma(^{142}\text{Gd})$ (continued)										
E _i (level)	\mathbf{J}_i^{π}	Eγ	I_{γ}	E_f	\mathbf{J}_f^{π}	Mult. [‡]	α^{\dagger}	Comments		
10703.1	(28+)	956.1 2	100.0	9747.0 ((26 ⁺)	E2	0.00303 5	α (K)=0.00255 4; α (L)=0.000372 6; α (M)=8.10×10 ⁻⁵ 12; α (N+)=2.16×10 ⁻⁵ 3 α (N)=1.86×10 ⁻⁵ 3; α (O)=2.84×10 ⁻⁶ 4; α (P)=1.765×10 ⁻⁷ 25		
10809.4	(27 ⁺)	1181.1 <i>3</i>	100.0	9628.3 ((25 ⁺)	(E2)	0.00196 3	$\alpha(K)=0.001660\ 24;\ \alpha(L)=0.000233\ 4;\ \alpha(M)=5.06\times10^{-5}\ 7;\ \alpha(N+)=1.721\times10^{-5}\ 25$ $\alpha(N)=1.160\times10^{-5}\ 17;\ \alpha(O)=1.79\times10^{-6}\ 3;\ \alpha(P)=1.151\times10^{-7}\ 17;\ \alpha(IPF)=3.71\times10^{-6}\ 6$		
10989.5	(28+)	677.6 5	100.0	10311.9	27+	(M1+E2)	0.009 3	$\alpha(K)=0.0077\ 23;\ \alpha(L)=0.0011\ 3;\ \alpha(M)=0.00024\ 6;\ \alpha(N+)=6.5\times10^{-5}\ 15$ $\alpha(N)=5.6\times10^{-5}\ 13;\ \alpha(O)=8.6\times10^{-6}\ 21;\ \alpha(P)=5.5\times10^{-7}\ 18$		
11123.4	(27 ⁺)	1026.6 6	100.0	10096.8 ((25 ⁺)	(E2)	0.00261 4	α (K)=0.00220 3; α (L)=0.000317 5; α (M)=6.89×10 ⁻⁵ 10; α (N+)=1.84×10 ⁻⁵ 3 α (N)=1.579×10 ⁻⁵ 23; α (O)=2.42×10 ⁻⁶ 4; α (P)=1.525×10 ⁻⁷ 22		
11352.3	(29 ⁺)	956.8 4	100.0	10395.5 ((27+)	(E2)	0.00302 5	$\alpha(K) = 0.00255 \ 4; \ \alpha(L) = 0.000372 \ 6; \ \alpha(M) = 8.09 \times 10^{-5} \ 12; \ \alpha(N+) = 2.16 \times 10^{-5} \ 3 = 0.000372 \ 6; \ \alpha(M) = 1.85 \times 10^{-5} \ 3; \ \alpha(O) = 2.84 \times 10^{-6} \ 4; \ \alpha(P) = 1.762 \times 10^{-7} \ 25$		
11825.6	(30+)	1122.5 5	100.0	10703.1 ((28+)	(E2)	0.00217 3	$\begin{aligned} \alpha(K) = 0.00184 \ 3; \ \alpha(L) = 0.000260 \ 4; \ \alpha(M) = 5.65 \times 10^{-5} \ 8; \ \alpha(N+) = 1.576 \times 10^{-5} \ 22 \\ \alpha(N) = 1.295 \times 10^{-5} \ 19; \ \alpha(O) = 1.99 \times 10^{-6} \ 3; \ \alpha(P) = 1.274 \times 10^{-7} \ 18; \\ \alpha(IPF) = 6.86 \times 10^{-7} \ 16 \end{aligned}$		
12384.3	(31+)	1032.0 6	100.0	11352.3 ((29+)	(E2)	0.00258 4	$\alpha(K)=0.00218 \ 3; \ \alpha(L)=0.000313 \ 5; \ \alpha(M)=6.81\times10^{-5} \ 10; \ \alpha(N+)=1.82\times10^{-5} \ 3$ $\alpha(N)=1.561\times10^{-5} \ 22; \ \alpha(O)=2.39\times10^{-6} \ 4; \ \alpha(P)=1.509\times10^{-7} \ 22$		
13134.8	(32 ⁺)	1309.1 9	100.0	11825.6 ((30 ⁺)	(E2)	0.001617 23	$\alpha(K) = 0.001356 \ 19; \ \alpha(L) = 0.000188 \ 3; \ \alpha(M) = 4.06 \times 10^{-5} \ 6; \ \alpha(N+) = 3.26 \times 10^{-5} \ 5 \\ \alpha(N) = 9.33 \times 10^{-6} \ 14; \ \alpha(O) = 1.439 \times 10^{-6} \ 21; \ \alpha(P) = 9.41 \times 10^{-8} \ 14; \\ \alpha(IPF) = 2.17 \times 10^{-5} \ 4$		
14580.5	(34+)	1445.7 8	100.0	13134.8 ((32 ⁺)	(E2)	0.001373 20	$\begin{aligned} &\alpha(\text{K}) = 0.001121 \ 16; \ \alpha(\text{L}) = 0.0001533 \ 22; \ \alpha(\text{M}) = 3.31 \times 10^{-5} \ 5; \ \alpha(\text{N}+) = 6.56 \times 10^{-5} \\ &\alpha(\text{N}) = 7.60 \times 10^{-6} \ 11; \ \alpha(\text{O}) = 1.176 \times 10^{-6} \ 17; \ \alpha(\text{P}) = 7.77 \times 10^{-8} \ 11; \\ &\alpha(\text{IPF}) = 5.68 \times 10^{-5} \ 9 \end{aligned}$		

[†] Additional information 1.
[‡] From ADO and DCO ratios from 2008Li08, unless otherwise noted.
[#] Multiply placed with intensity suitably divided.
[@] Placement of transition in the level scheme is uncertain.

Legend Level Scheme $\begin{array}{l} I_{\gamma} < \ 2\% \times I_{\gamma}^{max} \\ I_{\gamma} < 10\% \times I_{\gamma}^{max} \\ I_{\gamma} > 10\% \times I_{\gamma}^{max} \end{array}$ ٠ Intensities: Type not specified 0⁰⁰¹⁽²³⁾ (34+) 14580.5 1.300,1 (53) 100,0 + 10320 (32^+) 13134.8 + 1225 (E2) 400 (31^+) 12384.3 + 95₆₈ (2) 100.0 -1001 -1001 -1001 -1001 (30^{+}) 4 02/0 04/ 25/ 00/ 11825.6 (29+) 11352.3 -0; (27⁺) 11123.4 (28^+) 10989.5 (27^{+}) 10809.4 1/38/1 (28+) 10703.1 + 61.4 MICKE2), -(27+) 10395.5 ((E3) -ۍ. جې $\frac{27^+}{(26^+)}$ 10311.9 11511 (ant the 10102.6 40 (25^+) 10096.8 8 $\frac{26^{-}}{(26^{+})}$ 9858.8 ŧ 2 9747.0 0.31 ps 7 26^{+} 9700.5 0.19 ps 10 (25^+) 9628.3 (25⁻) S 9475.1 (25+) 0.19 ps 8 9280.4 (24^{+}) 9222.8 0.24 ps *10* 0.83 ps +28-21 0.236 ps *35* 25^{+} 9140.9 8963.6 $\frac{24^{-}}{24^{+}}$ 8807.3 . 🔹 8 4 4 5 24+ 8 8730.4 Ð 007 0.53 ps +17-14 23 8637.2 8 $\frac{\frac{23}{24^+}}{(23^+)}$ 8592.7 0.44 ps 10 • .0007 8568.2 0.58 ps 12 ŵ 8328.3 Ð. $\frac{\frac{23^+}{22^-}}{(22^+)}$.8 ŝ 8249.0 0.23 ps 8 ŝ 8198.7 0.30 ps +14-12 ¥ â 8159.6 (22^+) 8093.1 22^{+} 8018.0 0.68 ps +28-17 1 $\frac{21^{-}}{(22^{+})}$ 7844.2 0.26 ps 5 7827.1 $\frac{1}{22^+}$ (21⁺) 7779.5 7625.4 (21^+) 0.76 ps +21-17 7597.1 $\frac{21^{-}}{(20^{+})}$ 7559.7 0.49 ps +12-10 7531.8 20^{+} 7137.6 0.43 ps 9 20-7093.3 <u>0.0</u> 70.2 s 6 0^+ ¹⁴²₆₄Gd₇₈









 $^{142}_{\ 64}Gd_{78}$



 $^{142}_{64}Gd_{78}$



 $^{142}_{\ 64}Gd_{78}$



