

Energy levels and branching ratios [97Pe22].

¹⁴⁶Gd₆₄

E^*	J^π	σ (p,t)	L	σ (p,t)	σ (¹² C, ¹⁰ Be)	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
[keV]		$\mu\text{b/sr}$	(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	Γ_{cm}		E_f^* : 0.0	0+X	826+X	0+Y	1579
								J_f^π : 0 ⁺	$J \approx \langle 33 \rangle$	$J+2$		3 ⁻
0.0	0 ⁺	350	0	71	60(9)	48.27(10) d	89Ma28					
0+X	$J \approx \langle 33 \rangle$											
826.3+X	$J+2$								100			
0+Y	$J_1 \approx \langle 32 \rangle$											
1579.31(10)	3 ⁻	14.0	3	8.0	38(7)	1.06(12) ns	81WiZL	100				
0+Z	J_2											
1971.97(22)	2 ⁺	10.0	2	15	19(6)	<0.7 ps	89Ma28	100				
2165.0(3)	0 ⁺	26.0	0	4.7		375(40) ps	89Ma28	x				
1704.3+X	$J+4$									100		
806.2+Y	J_1+2										100	
958.5+Z	J_2+2											
2611.39(14)	4 ⁺	7.5	2	5.9			89Ma28					98(10)
2657.92(14)	5 ⁻	7.0	$\langle 5 \rangle$	4.1	86(10)		89Ma28					100
2981.93(17)	7 ⁻	5.0			35(7)	7.2(4) ns	80Pa07					
2986.0(10)	$\langle 2^+ \rangle$		$\langle 2 \rangle$	3.2			89Ma28	100				
2996.6(3)	$\langle 4 \rangle^-$											100
3020.0(20)	0 ⁺	200	0	74			89Ma28	100				
3031.20(23)	3 ⁺											33(13)
3098.82(17)	6 ⁻											
3182.42(19)	8 ⁻	8.0					83Fl05					
2634.8+X	$J+6$											
3190(3)	2 ⁺		2	4.3			89Ma28					
1663.2+Y	J_1+4											
3238(3)	2 ⁺	6.0	2	3.5			89Ma28					
3287.09(25)	$\langle 3,5 \rangle^+$											
3290.1(3)	7 ⁻											
3293.48(20)	8 ⁻					<300 ps						
3312.8(4)	5 ⁽⁻⁾											
3320(3)			x				89Ma28					
3359(3)	2 ⁺	6.0	2	7.6			89Ma28					
3383(3)	2 ⁺	110	2	137			89Ma28					
3383.99(19)	6 ⁻											
3389.0(11)	$\langle 3,4 \rangle$											
3411.8(4)	$\langle 4 \rangle$											
3416.3(10)	$\langle 4 \rangle$											100
3422.6(5)	3 ⁻	14.0	3	26			89Ma28					100
3428.06(21)	9 ⁻	10			82(10)	<300 ps	80Pa07					
3436.3(4)	$\langle 3 \rangle$	incl										
3456.3(10)	$\langle 5^- \rangle$	incl										100
3456.8(4)	6 ⁺											
3460.3(10)	$\langle 5^- \rangle$											100
3463.3(10)	$\langle 2^+ \rangle$		$\langle 2 \rangle$	6.1			89Ma28					100
3484.83(25)	6 ⁺			6.6			89Ma28					
3485.0(20)	0 ⁺							100				
1964.6+Z	J_2+4											

(continued)

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E^*	J^π	σ (p,t)	L	σ (p,t)	σ ($^{12}\text{C},^{10}\text{Be}$)	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		$\mu\text{b/sr}$	(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	Γ_{cm}		E_{f}^* :	0.0	0+X	826+X	0+Y	1579
								J_{f}^π :	0 ⁺	$J\approx\langle 33 \rangle$	$J+2$		3 ⁻
3552(3)	2 ⁺		2	5.9			89Ma28						
3639.0(20)	0 ⁺		$\langle 0 \rangle$	0.4			89Ma28	100					
3660.1(5)	6 ⁺				53(8)		80Pa07						
3687(3)	$\langle 5^- \rangle$		$\langle 5 \rangle$	13			89Ma28						
3743(3)	$\langle 2^+, 3^- \rangle$			19			89Ma28						
3765(3)	$\langle 5^- \rangle$		$\langle 5 \rangle$	5.6			89Ma28						
3778.9(4)	8 ⁺												
3783.6(6)	$\langle 5, 6 \rangle^+$												
3854.1(3)	7 ⁻												
3855(3)	$\langle 5^- \rangle$		$\langle 5 \rangle$	40			89Ma28						
3864.46(23)	10 ⁺				82(10)	<300 ps	80Pa07						
3908(3)				2.0									
3971(3)	$\langle 3^- \rangle$		$\langle 3 \rangle$	35									
4005(6)	$\langle 4^+, 5^- \rangle$			10									
4107.3(3)	8 ⁺												
4121(6)	$\langle 4^+, 5^- \rangle$			10									
2571.7+Y	J_1+6												
3618.0+X	$J+8$												
4215(6)				3.0									
4230(6)	$\langle 5^- \rangle$			14									
4248.2(6)	$\langle 9, 10^- \rangle$												
4299(6)	$\langle 2^+ \rangle$		$\langle 2 \rangle$	8.0									
4336(6)	$\langle 4^+ \rangle$		$\langle 4 \rangle$	43									
4368(6)	$\langle 4^+ \rangle$		$\langle 4 \rangle$	12									
4394(6)				4.8									
4409(6)				5.6									
4483(6)	$\langle 4^+ \rangle$		$\langle 4 \rangle$	5.6									
4501.7(4)	10 ⁺												
4534(6)	0 ⁺		0	15									
4540.6(4)	10 ⁺												
4596(6)	$\langle 2^+, 3^- \rangle$			32									
3030+Z	J_2+6												
4638(6)	$\langle 5^-, 6^+ \rangle$			13									
4645.4(4)	11 $\langle^- \rangle$												
4656(6)				9.4									
4686(6)	$\langle 2^+, 3^- \rangle$			19									
4719.0(4)	4 ⁻											x	
4726(6)	$\langle 2^+, 3^- \rangle$			94									
4747(6)	$\langle 2^+, 3^- \rangle$			54	24(6)								
4793(6)	$\langle 2^+, 3^- \rangle$			27									
4825(6)	$\langle 2^+, 3^- \rangle$			43									
4828.5(11)	$\langle 5 \rangle^-$												
4880(6)	$\langle 2^+, 3^- \rangle$			30									
4905(6)				8.0									
4941(6)	$\langle 2^+ \rangle$		$\langle 2 \rangle$	13									

(continued)

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E^*	J^π	σ (p,t)	L	σ (p,t)	σ ($^{12}\text{C}, ^{10}\text{Be}$)	$T_{1/2}$ or Ref.	Branching ratios in percentage				
[keV]		$\mu\text{b/sr}$	(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	Γ_{cm}	E^*_f : J^π_f :	0.0 0 ⁺	0+X $J \approx \langle 33 \rangle$	826+X $J+2$	0+Y 1579 3 ⁻
4976(6)	$\langle 2^+, 3^- \rangle$			41							
5044(6)	$\langle 2^+ \rangle$		$\langle 2 \rangle$	12							
5086(6)	$\langle 2^+, 3 \rangle$			77							
3532.7+Y	J_1+8										
5094.2(4)	11^+										
5115(6)				14							
5151(6)				25							
5177(6)				11							
4656.5+X	$J+10$										
5217(6)				15							
5258(6)	$\langle 2^+ \rangle$		$\langle 2 \rangle$	22							
5277.0(4)	11^+										
5289(6)				9.4							
5342(6)	$\langle 4^+, 5^- \rangle$			69							
5350.2(4)	12^+										
5388(6)				23							
5443(6)				34							
5447.5(6)	12^+										
5482(6)				27							
5528(6)				23							
5528.5(11)	12^+										
5549(6)				25							
5700.2(11)	$\langle 12 \rangle^+$										
5729.7(11)	$\langle 12 \rangle^+$										
4153.0+Z	J_2+8										
5791.3(6)	13^+										
5893.6(7)	14^+										
5995.4(8)	14^+										
4548.9+Y	J_1+10										
6119.4(8)	15^+										
5749.9+X	$J+12$										
6398.3(9)	16^+										
6470(30)					35(7)						
6819.6(12)	$17^{\langle + \rangle}$										
5328.7+Z	J_2+10										
7033.3(11)	16^-										
7164.2(11)	17^-										
5621.1+Y	J_1+12										
7201.3(13)											
6898.7+X	$J+14$										
7512.4(11)	16^+										
7565.5(12)	17^-										
7658.4(11)											
7738.2(12)	17^+										
7999.1(15)	18^+										

(continued)

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E^*	J^π	σ (p,t)	L	σ (p,t)	σ ($^{12}\text{C}, ^{10}\text{Be}$)	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
[keV]		$\mu\text{b/sr}$	(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	Γ_{cm}	E_{f}^* :	0.0	0+X	826+X	0+Y	1579
							J_{f}^π :	0 ⁺	$J \approx \langle 33 \rangle$	$J+2$		3 ⁻
8029.4(10)	18 ⁺					1.5(6) ns						
8076.3(17)												
6554.3+Z	J_2+12											
6749.0+Y	J_1+14											
8367.6(13)	18 ⁺											
8649.0(16)	19 ^{$\langle - \rangle$}											
8100.0+X	$J+16$											
8665.1(15)	19 ⁺											
8803.3(20)												
8914.9(14)	20 ⁻					4.3(3) ns						
9082.9(16)	20 ⁺											
9224.7(17)	21 ⁻											
9253.4(19)	21											
9256.4(19)	21 ⁻											
7832.3+Z	J_2+14											
9481.6(18)	22 ⁻											
7933.7+Y	J_1+16											
9494.3(21)												
9526.2(22)	22 ⁻											
9744.3(21)												
9350.2+X	$J+18$											
9961.9(17)	22 ⁻											
10005.6(24)	23 ⁻											
10086.3(19)	23 ⁻											
10265.8(18)	23 ⁻											
10439.3(22)												
9176.3+Y	J_1+18											
9155+Z	J_2+16											
10769.6(18)	24 ⁻											
11023.0(18)	24 ⁺											
11098.3(24)												
10648.0+X	$J+20$											
11243.4(18)	25 ⁻											
11439.5(18)	25 ⁺											
11449(3)												
11496.8(19)	$\langle 25 \rangle$											
11528.9(19)	25 ⁻											
11637.0(19)	26 ⁺											
11932.0(21)	27 ⁺											
10475.6+Y	J_1+20											
10524+Z	J_2+18											
11993.2+X	$J+22$											
12890.2(23)	29 ⁺											
11832.5+Y	J_1+22											
13695.4(25)	$\langle 30 \rangle$											

(continued)

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E^*	J^π	σ (p,t)	L	σ (p,t)	σ ($^{12}\text{C},^{10}\text{Be}$)	$T_{1/2}$ or Ref.	Branching ratios in percentage					
[keV]		$\mu\text{b/sr}$	(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	Γ_{cm}	$E^*_\text{f}:$ $J^\pi_\text{f}:$	0.0 0 $^+$	0+X $J\approx\langle 33 \rangle$	826+X $J+2$	0+Y 3^-	1579
13386.9+X	$J+24$											
14013.0(25)												
14175.7(25)												
14196(3)												
14443(3)												
14594.3(25)												
13245.9+Y	J_1+24											
15068(3)												
14833.1+X	$J+26$											
15442(3)												
15757(3)												
14718.7+Y	J_1+26											
16312(4)												
16331.6+X	$J+28$											
16248.6+Y	J_1+28											
17885.2+X	$J+30$											
17830.6+Y	J_1+30											

Additional data on this isotope can be found in [01Er09, 94We01, 94Sc04, 93Ab08, 91Zu01, 90He14, 80Pa07, 80Ju04, 79Ke03, 79Kl04, 78Br15].

Data for this isotope are considered in vol. LB I/18C.

Energy levels and branching ratios [97Pe22]. Part 2

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E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	0+Z J_2	1972 2 ⁺	1704+X $J+4$	806.2+Y J_1+2	958.5+Z J_2+2	2611 4 ⁺	2658 5 ⁻	2981.93 7 ⁻	2996.6 $\langle 4 \rangle^-$	3098.82 6 ⁻
2165.0(3)	0 ⁺			100								
958.5+Z	J_2+2		100									
2611.39(14)	4 ⁺			≈ 1.7								
2981.93(17)	7 ⁻								100			
3031.20(23)	3 ⁺			67(20)								
3098.82(17)	6 ⁻								x	x		
3182.42(19)	8 ⁻									100		
2634.8+X	$J+6$				100							
1663.2+Y	J_1+4					100						
3287.09(25)	$\langle 3,5 \rangle^+$							100				
3290.1(3)	7 ⁻									100		
3293.48(20)	8 ⁻									76(7)		
3312.8(4)	5 \langle^-							≈ 8.1	92(27)			
3383.99(19)	6 ⁻								65(8)	19(8)		16(4)
3389.0(11)	$\langle 3,4 \rangle$			100								
3411.8(4)	$\langle 4 \rangle$							≈ 40			60(20)	

(continued)

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E^* [keV]	J^π	Branching ratios in percentage										
		E^*_f : J^π_f :	0+Z J_2	1972 2^+	1704+X $J+4$	806.2+Y J_1+2	958.5+Z J_2+2	2611 4^+	2658 5^-	2981.93 7^-	2996.6 $\langle 4 \rangle^-$	3098.82 6^-
3428.06(21)	9^-									6.5(22)		
3436.3(4)	$\langle 3 \rangle$			100								
3456.8(4)	6^+								100			
3484.83(25)	6^+								100			
1964.6+Z	J_2+4						100					
3660.1(5)	6^+								100			
3778.9(4)	8^+									100		
3783.6(6)	$\langle 5,6 \rangle^+$							100				
3854.1(3)	7^-									44(17)		≈ 28
4107.3(3)	8^+									50(16)		
4719.0(4)	4^-								x			
4828.5(11)	$\langle 5 \rangle^-$										100	

Energy levels and branching ratios [97Pe22]. Part 3

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E^* [keV]	J^π	Branching ratios in percentage										
		E^*_f : J^π_f :	3182.42 8^-	2635+X $J+6$	1663+Y J_1+4	3293.48 8^-	3422.6 3^-	3428.06 9^-	1965+Z J_2+4	3864.46 10^+	2572+Y J_1+6	3618+X $J+8$
3293.48(20)	8^-		24(3)									
3428.06(21)	9^-		6.5(22)			87(5)						
3854.1(3)	7^-		28(6)									
3864.46(23)	10^+							100				
4107.3(3)	8^+		50(16)									
2571.7+Y	J_1+6				100							
3618.0+X	$J+8$			100								
4248.2(6)	$\langle 9,10^- \rangle$		100									
4501.7(4)	10^+							100				
4540.6(4)	10^+							100				
3030+Z	J_2+6								100			
4645.4(4)	$11^{\langle - \rangle}$									100		
4719.0(4)	4^-					x						
3532.7+Y	J_1+8										100	
5094.2(4)	11^+									75		
4656.5+X	$J+10$											100
5277.0(4)	11^+									x		
5350.2(4)	12^+									100		
5447.5(6)	12^+									49		
5700.2(11)	$\langle 12 \rangle^+$									100		
5729.7(11)	$\langle 12 \rangle^+$									100		

Energy levels and branching ratios [97Pe22]. Part 4

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E^*	J^π	Branching ratios in percentage									
[keV]		E^*_f :	4501.7	4540.6	3030+Z	4645.4	3533+Y	5094.2	4657+X	5277.0	5350.2
		J^π_f :	10 ⁺	10 ⁺	J_2+6	11 ⁽⁻⁾	J_1+8	11 ⁺	$J+10$	11 ⁺	12 ⁺
5094.2(4)	11 ⁺		25.1								
5277.0(4)	11 ⁺		x	x							
5447.5(6)	12 ⁺					51					
5528.5(11)	12 ⁺							100			
4153.0+Z	J_2+8				100						
5791.3(6)	13 ⁺							58		24.0	12.3
5893.6(7)	14 ⁺										32
5995.4(8)	14 ⁺										100
4548.9+Y	J_1+10						100				
5749.9+X	$J+12$								100		

Energy levels and branching ratios [97Pe22]. Part 5

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E^*	J^π	Branching ratios in percentage									
[keV]		E_f^* : J_f^π :	5447.5 12 ⁺	4153+Z J_2 +8	5791.3 13 ⁺	5893.6 14 ⁺	5995.4 14 ⁺	4549+Y J_1 +10	6119.4 15 ⁺	5750+X J +12	6398.3 16 ⁺
5791.3(6)	13 ⁺	6.0									
5893.6(7)	14 ⁺	37			31						
6119.4(8)	15 ⁺				x	x	x				
6398.3(9)	16 ⁺					x	x		x		
6819.6(12)	17 ⁽⁺⁾										100
5328.7+Z	J_2 +10			100							
7033.3(11)	16 ⁻								100		
7164.2(11)	17 ⁻										85
5621.1+Y	J_1 +12							100			
7201.3(13)											100
6898.7+X	J +14									100	
7512.4(11)	16 ⁺										100
7565.5(12)	17 ⁻										100
7658.4(11)											x
8029.4(10)	18 ⁺										8.3

Energy levels and branching ratios [97Pe22]. Part 6

¹⁴⁶Gd₆₄

E^*	J^π	Branching ratios in percentage									
		E^*_f :	6819.6	5329+Z	7033.3	7164.2	5621+Y	7201.3	6899+X	7512.4	7565.5
[keV]		J^π_f :	17 ⁽⁺⁾	J_2 +10	16 ⁻	17 ⁻	J_1 +12		J +14	16 ⁺	17 ⁻
7164.2(11)	17 ⁻				15.0						
7658.4(11)			100								

(continued)

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E^* [keV]	J^π	Branching ratios in percentage									
		E^*_f :	6819.6	5329+Z	7033.3	7164.2	5621+Y	7201.3	6899+X	7512.4	7565.5
		J^π_f :	17 ⁽⁺⁾	J_2+10	16 ⁻	17 ⁻	J_1+12		$J+14$	16 ⁺	17 ⁻
7738.2(12)	17 ⁺									x	
8029.4(10)	18 ⁺					57				12.7	2.2
8076.3(17)								100			
6554.3+Z	J_2+12			100							
6749.0+Y	J_1+14						100				
8100.0+X	$J+16$								100		

Energy levels and branching ratios [97Pe22]. Part 7

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E^* [keV]	J^π	Branching ratios in percentage									
		E^*_f :	7658.4	7738.2	7999.1	8029.4	8076.3	6554+Z	6749+Y	8367.6	8649.0
		J^π_f :		17 ⁺	18 ⁺	18 ⁺		J_2+12	J_1+14	18 ⁺	19 ⁽⁻⁾
7999.1(15)	18 ⁺			100							
8029.4(10)	18 ⁺			20.2							
8367.6(13)	18 ⁺		90	9.6							
8649.0(16)	19 ⁽⁻⁾				100						
8665.1(15)	19 ⁺									100	
8803.3(20)							100				
8914.9(14)	20 ⁻					100					
9082.9(16)	20 ⁺										x
7832.3+Z	J_2+14							100			
7933.7+Y	J_1+16								100		

Energy levels and branching ratios [97Pe22]. Part 8

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E^* [keV]	J^π	Branching ratios in percentage									
		E^*_f :	8100+X	8665.1	8803.3	8914.9	9082.9	9224.7	9256.4	7832+Z	9481.6
		J^π_f :	$J+16$	19 ⁺		20 ⁻	20 ⁺	21 ⁻	21 ⁻	J_2+14	22 ⁻
9082.9(16)	20 ⁺			100							
9224.7(17)	21 ⁻					100					
9253.4(19)	21						100				
9256.4(19)	21 ⁻						100				
9481.6(18)	22 ⁻							100			
9494.3(21)					100						
9526.2(22)	22 ⁻								100		
9744.3(21)					100						
9350.2+X	$J+18$		100								
9961.9(17)	22 ⁻					100					
10086.3(19)	23 ⁻							100			

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E^* [keV]	J^π	Branching ratios in percentage									
		E^*_f : J^π_f :	8100+X $J+16$	8665.1 19^+	8803.3	8914.9 20^-	9082.9 20^+	9224.7 21^-	9256.4 21^-	7832+Z J_2+14	9481.6 22^-
10265.8(18)	23^-							100			
9155+Z	J_2+16									100	
10769.6(18)	24^-										61

Energy levels and branching ratios [97Pe22]. Part 9

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E^* [keV]	J^π	Branching ratios in percentage									
		E^*_f : J^π_f :	7934+Y J_1+16	9494.3	9526.2 22^-	9744.3	9350+X $J+18$	9961.9 22^-	10086.3 23^-	10265.8 23^-	10439.3
10005.6(24)	23^-				100						
10439.3(22)				x		x					
9176.3+Y	J_1+18		100								
10769.6(18)	24^-							39			
11023.0(18)	24^+								80	19.7	
11098.3(24)											100
10648.0+X	$J+20$						100				
11243.4(18)	25^-									100	

Energy levels and branching ratios [97Pe22]. Part 10

 $^{146}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage									
		E^*_f : J^π_f :	9176+Y J_1+18	9155+Z J_2+16	10769.6 24^-	11023.0 24^+	11098.3	10648+X $J+20$	11243.4 25^-	11439.5 25^+	11496.8 (25)
11243.4(18)	25^-				x						
11439.5(18)	25^+				77	23.2					
11449(3)							100				
11496.8(19)	(25)				100						
11528.9(19)	25^-					100					
11637.0(19)	26^+								53	18.8	18.8
10475.6+Y	J_1+20		100								
10524+Z	J_2+18			100							
11993.2+X	$J+22$							100			

Energy levels and branching ratios [97Pe22]. Part 11

¹⁴⁶Gd₆₄

E^*	J^π	Branching ratios in percentage									
		E_f^* :	11528.9	11637.0	11932.0	10476+Y	11993+X	12890.2	11833+Y	13695.4	13387+X
[keV]		J_f^π :	25 ⁻	26 ⁺	27 ⁺	J_1+20	$J+22$	29 ⁺	J_1+22	$\langle 30 \rangle$	$J+24$

11637.0(19)	26 ⁺	9.4									
11932.0(21)	27 ⁺		100								
12890.2(23)	29 ⁺			100							
11832.5+Y	J_1+22				100						
13695.4(25)	$\langle 30 \rangle$							100			
13386.9+X	$J+24$					100					
14013.0(25)								100			
14175.7(25)										x	
14196(3)								100			
14594.3(25)								x		x	
13245.9+Y	J_1+24								100		
14833.1+X	$J+26$										100

Energy levels and branching ratios [97Pe22]. Part 12

¹⁴⁶Gd₆₄

E^*	J^π	Branching ratios in percentage											
[keV]		$E^*_{\rm f}$: $J^\pi_{\rm f}$:	14013.0	14196	14594.3	13246+Y J_1+24	15068 $J+26$	14833+X	15442	15757	14719+Y J_1+26	16332+X $J+28$	16249+Y J_1+28
14175.7(25)		x											
14443(3)				100									
15068(3)					100								
15442(3)						100							
15757(3)									100				
14718.7+Y	J_1+26				100								
16312(4)										100			
16331.6+X	$J+28$						100						
16248.6+Y	J_1+28										100		
17885.2+X	$J+30$											100	
17830.6+Y	J_1+30												100

Energy levels and branching ratios [92De38, 79Kl04, 78Br15].

¹⁴⁷Gd₆₄

E^* [keV]	$2J^\pi$	$T_{1/2}$ or Γ_{cm}
0	7 ⁻	38.1(1) h
997.1(1)	13 ⁺	21.4(11) ns
1152.4(1)	3 ⁻	≤0.2 ns
0+X	$2J \approx \langle 55 \rangle$	

(continued)

 $^{147}_{64}\text{Gd}$

E^*	$2J^\pi$	$T_{1/2}$ or Γ_{cm}
[keV]		
1292.3(1)	$\langle 1 \rangle^+$	≤ 0.2 ns
1397.01(10)	9^-	0.35(21) ps
1412.01(18)	3^+	≤ 0.2 ns
0+W	$2J$	
0+U	$2J \approx \langle 61 \rangle$	
0+V	$2J \approx \langle 71 \rangle$	
0+Z	$2J \approx \langle 51 \rangle$	
0+Y	$2J \approx \langle 61 \rangle$	
1628.3(4)	7^+	0.4(2) ps
1643.0(3)	9^+	
1699.36(24)	3^+	
1701.60(23)	11^+	
1759.2(11)	$\langle 1 \rangle^+$	
1797.1(4)	9^-	0.14(7) ps
1846.8(10)	$\langle 1 \rangle^-$	
697.04+X	$2J+4$	
1944.1	11^-	
2028.9(10)	$15^{\langle + \rangle}$	
2078.4		
741.9+U	$2J+4$	
704.8+Z	$2J+4$	
730.21+Y	$2J+4$	
890.8+W	$2J+4$	
2385.9(3)	$\langle 13 \rangle^-$	
2438.91(23)	$\langle 15 \rangle^-$	
899.5+V	$2J+4$	
2488.22(14)	17^+	
2489.8(4)		
2572.27(16)	19^-	0.37(8) ns
2625.9(10)		
1442.35+X	$2J+8$	
2736.0(5)		
2760.47(17)	21^+	4.5(2) ns
2763.81(17)	$\langle 19 \rangle^+$	
2941.6(5)		
2942.7(3)		
2960.3(10)		
2971.5	$9^-, 11^-$	
3005.6	$9^-, 11^-$	
3038.32(20)	23^+	
1527.4+U	$2J+8$	
1457.9+Z	$2J+8$	
3082.5(5)		
1509.15+Y	$2J+8$	
3170.0(5)		

(continued)		$^{147}_{64}\text{Gd}$
E^*	$2J^\pi$	$T_{1/2}$ or
[keV]		Γ_{cm}
3185.8	23^+	
3204.8	$9^-, 11^-$	
3227.9(5)		
1832.6+W	$2J+8$	
3322.7	$9^-, 11^-$	
3360.1(5)		
3399.08(19)	25^+	
1850.6+V	$2J+8$	
2237.88+X	$2J+12$	
3581.97(21)	27^-	26.8(7) ns
3691.94(21)	25^-	
3872.9	$13^-, 11^-$	
2361.8+U	$2J+12$	
2261.7+Z	$2J+12$	
2337.17+Y	$2J+12$	
4006.94(23)	27^-	
4070.32(22)	27^-	
4230.00(22)	29^-	
2829.3+W	$2J+12$	
3084.91+X	$2J+16$	
2844.6+V	$2J+12$	
4450.96(22)	29^-	
4617.92(22)	29^+	
3118.7+Z	$2J+16$	
3245.5+U	$2J+16$	
3214.90+Y	$2J+16$	
4844.08(22)	31^-	
4948.76(23)	31^+	
4971.93(22)	31^-	
3984.86+X	$2J+20$	
5265.10(22)	31^-	
3875.8+W	$2J+16$	
5382.32(22)	33^-	
3880.7+V	$2J+16$	
5557.1(4)	35^+	
5583.05(25)	35^-	
4029.4+Z	$2J+20$	
4181.4+U	$2J+20$	
4143.92+Y	$2J+20$	
5923.2(3)	37^-	
4939.23+X	$2J+24$	
6236.1(3)	$\langle 35^+ \rangle$	
4971.8+W	$2J+20$	
6471.4(3)	39^-	
4960.4+V	$2J+20$	

(continued)

 $^{147}_{64}\text{Gd}$

E^*	$2J^\pi$	$T_{1/2}$ or Γ_{cm}
[keV]		
6541.4(5)	$\langle 37^+ \rangle$	
4995.8+Z	$2J+24$	
6621.4(3)	39^+	
5170.0+U	$2J+24$	
5125.52+Y	$2J+24$	
6826.5		
6906.7(3)	41^+	
7035.4(3)	41^+	
5948.78+X	$2J+28$	
7389.3(4)	45^+	
6115.0+W	$2J+24$	
6018.5+Z	$2J+28$	
6086.0+V	$2J+24$	
7665.4	$\langle 39, 41 \rangle$	
6212.0+U	$2J+28$	
6161.00+Y	$2J+28$	
7825.4(4)		
7873.8(4)	41^-	
7963.9(4)		
7993.9(4)	43^-	
8153.6(4)	$\langle 47^+ \rangle$	
7014.02+X	$2J+32$	
8333.4(4)	45^+	
8587.8(4)	$\langle 49^+ \rangle$	510(20) ns
7098.7+Z	$2J+32$	
7305.6+W	$2J+28$	
7308.9+U	$2J+32$	
7260.5+V	$2J+28$	
7251.42+Y	$2J+32$	
9241	$\langle 51 \rangle$	
8135.05+X	$2J+36$	
9507.0	$\langle 51^+ \rangle$	<1 ps
9691.2	$\langle 53^+ \rangle$	3.1(7) ps
8236.3+Z	$2J+36$	
9879.8	$\langle 53^- \rangle$	≈ 76 ps
8462.4+U	$2J+36$	
8398.1+Y	$2J+36$	
8543.1+W	$2J+32$	
8483.6+V	$2J+32$	
10271.6	$\langle 55^- \rangle$	
10487.6	$\langle 55^+ \rangle$	
9310.50+X	$2J+40$	
10688.7	$\langle 57^- \rangle$	10(3) ps
10747.2	$\langle 57^+ \rangle$	
10993.3	$\langle 59^- \rangle$	0.80(5) ns

(continued)

 $^{147}_{64}\text{Gd}$

E^*	$2J^\pi$	$T_{1/2}$ or Γ_{cm}
[keV]		
9431.6+Z	$2J+40$	17(3) ps
9671.9+U	$2J+40$	
9601.6+Y	$2J+40$	
11232.2	$\langle 61^- \rangle$	
9828.0+W	$2J+36$	
9756.4+V	$2J+36$	
10538.95+X	$2J+44$	≈ 1.4 ps
11850.7	$\langle 65^- \rangle$	
11930.3	$\langle 61 \rangle$	
12208.6	$\langle 65^- \rangle$	
10684.6+Z	$2J+44$	
10939.6+U	$2J+44$	
10863.0+Y	$2J+44$	
12548.7	$\langle 65 \rangle$	
11079.5+V	$2J+40$	
11162.3+W	$2J+40$	
11816.48+X	$2J+48$	
13104.7	$\langle 67, 69 \rangle$	
13265.1	$\langle 67 \rangle$	
13416	67	
13446	$\langle 69, 71 \rangle$	
13446.5	$\langle 69 \rangle$	
11995.3+Z	$2J+48$	
12265.7+U	$2J+48$	
12183.4+Y	$2J+48$	
12453.8+V	$2J+44$	
12547.1+W	$2J+44$	
13139.6+X	$2J+52$	
14433.2	$\langle 71 \rangle$	
14793		
13363.0+Z	$2J+52$	
13650.1+U	$2J+52$	
15174.8	$\langle 73 \rangle$	
13563.5+Y	$2J+52$	
15390	$\langle 73 \rangle$	
13881.8+V	$2J+48$	
13982.7+W	$2J+48$	
15691	$\langle 75 \rangle$	
14506.8+X	$2J+56$	
14786.2+Z	$2J+56$	
15093.7+U	$2J+56$	
15003.3+Y	$2J+56$	
16777		
15365.9+V	$2J+52$	
16937	$\langle 79 \rangle$	

(continued)

 $^{147}_{64}\text{Gd}$

E^*	$2J^\pi$	$T_{1/2}$ or Γ_{cm}
[keV]		
15471.8+W	$2J+52$	
15920.6+X	$2J+60$	
16263.5+Z	$2J+60$	
16596.4+U	$2J+60$	
16503.6+Y	$2J+60$	
17014.1+W	$2J+56$	
17384.4+X	$2J+64$	
17786.2+Z	$2J+64$	
18159.8+U	$2J+64$	
18065.0+Y	$2J+64$	
18610.5+W	$2J+60$	
18900.7+X	$2J+68$	
19298.4+Z	$2J+68$	
19687.8+Y	$2J+68$	
20472.6+X	$2J+72$	
22100.4+X	$2J+76$	

Additional data on this isotope can be found in [97Wa04, 95La18, 91Zu01, 90Zu02, 90Dr06, 89Ka21, 84Kl08, 83Ko42].

Energy levels and branching ratios [92De38, 79Kl04, 78Br15]. Part 2

 $^{147}_{64}\text{Gd}$

E^*	$2J^\pi$	Branching ratios in percentage							
		$E^*_i:$ $2J^\pi_f:$	0 7 ⁻	997 13 ⁺	1152 3 ⁻	0+X	1292 (1) ⁺	1397 9 ⁻	1412 3 ⁺
[keV]									
997.1(1)	13 ⁺		100						
1152.4(1)	3 ⁻		100						
1292.3(1)	(1) ⁺				100				
1397.01(10)	9 ⁻		100						
1412.01(18)	3 ⁺						100		
1628.3(4)	7 ⁺	(100)							
1643.0(3)	9 ⁺	(100)							
1699.36(24)	3 ⁺				67(12)		33(9)		
1701.60(23)	11 ⁺			(100)					
1759.2(11)	(1) ⁺								(100)
1797.1(4)	9 ⁻	(100)							
1846.8(10)	(1) ⁻				(100)		x		x
697.04+X	$2J+4$					(100)			
1944.1	11 ⁻	83		17					
2028.9(10)	15 ⁽⁺⁾			100					
2078.4		100							
2385.9(3)	(13) ⁻			37(4)					
2438.91(23)	(15) ⁻			(100)					

(continued)

 $^{147}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage							
		$E_f^*:$ $2J_f^\pi:$	0 7 ⁻	997 13 ⁺	1152 3 ⁻	0+X	1292 $\langle 1 \rangle^+$	1397 9 ⁻	1412 3 ⁺
2488.22(14)	17 ⁺			100					
2572.27(16)	19 ⁻			54(10)					
2625.9(10)				$\langle 100 \rangle$					
2971.5	9 ⁻ , 11 ⁻		60					10	
3005.6	9 ⁻ , 11 ⁻		50					50	
3204.8	9 ⁻ , 11 ⁻		47					18	
3322.7	9 ⁻ , 11 ⁻		100						
3872.9	13 ⁻ , 11 ⁻			100					

Energy levels and branching ratios [92De38, 79Kl04, 78Br15]. Part 3

 $^{147}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		$E_f^*:$ $2J_f^\pi:$	0+W $2J$	0+U	0+V	0+Z	0+Y	1701.6 11 ⁺	1759.2 $\langle 1 \rangle^+$	1797.1 9 ⁻	697.0+X $2J+4$
741.9+U	$2J+4$			x							
704.8+Z	$2J+4$					x					
730.21+Y	$2J+4$						100				
890.8+W	$2J+4$	x									
2385.9(3)	$\langle 13 \rangle^-$								63(6)		
899.5+V	$2J+4$				x						
2489.8(4)								100			
1442.35+X	$2J+8$										100
3204.8	9 ⁻ , 11 ⁻									12	

Energy levels and branching ratios [92De38, 79Kl04, 78Br15]. Part 4

 $^{147}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		$E_f^*:$ $2J_f^\pi:$	1944.1 11 ⁻	741.9+U $2J+4$	704.8+Z $2J+4$	730.2+Y $2J+4$	890.8+W $2J+4$	2385.9 $\langle 13 \rangle^-$	899.5+V $2J+4$	2488.2 17 ⁺	2572.3 19 ⁻
2572.27(16)	19 ⁻									46(6)	
2736.0(5)								100			
2760.47(17)	21 ⁺									80(6)	20(2)
2763.81(17)	$\langle 19 \rangle^+$									100	
2941.6(5)										100	
2960.3(10)										100	
2971.5	9 ⁻ , 11 ⁻	30									
1527.4+U	$2J+8$		x								
1457.9+Z	$2J+8$			x							
1509.15+Y	$2J+8$					100					

(continued)

 $^{147}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E_f^* : $2J_f^\pi$:	1944.1 11 ⁻	741.9+U $2J+4$	704.8+Z $2J+4$	730.2+Y $2J+4$	890.8+W $2J+4$	2385.9 (13) ⁻	899.5+V $2J+4$	2488.2 17 ⁺	2572.3 19 ⁻
3204.8	9 ⁻ , 11 ⁻		23								
1832.6+W	$2J+8$						x				
1850.6+V	$2J+8$								x		

Energy levels and branching ratios [92De38, 79Kl04, 78Br15]. Part 5

 $^{147}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E_f^* : $2J_f^\pi$:	1442+X $2J+8$	2760.5 21 ⁺	2763.8 (19) ⁺	3038.3 23 ⁺	1527+U $2J+8$	1458+Z $2J+8$	1509+Y $2J+8$	3185.8 23 ⁺	1833+W $2J+8$
2942.7(3)				68(9)	32(9)						
3038.32(20)	23 ⁺			100							
3082.5(5)					100						
3170.0(5)				100							
3185.8	23 ⁺			100							
3227.9(5)					100						
3360.1(5)						100					
3399.08(19)	25 ⁺			9		91					
2237.88+X	$2J+12$	100									
3581.97(21)	27 ⁻			4.5		13					
3691.94(21)	25 ⁻					100				x	
2361.8+U	$2J+12$						x				
2261.7+Z	$2J+12$							x			
2337.17+Y	$2J+12$								100		
2829.3+W	$2J+12$										x

Energy levels and branching ratios [92De38, 79Kl04, 78Br15]. Part 6

 $^{147}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E_f^* : $2J_f^\pi$:	3399.1 25 ⁺	1851+V $2J+8$	2238+X $2J+12$	3582.0 27 ⁻	3691.9 25 ⁻	2362+U $2J+12$	2262+Z $2J+12$	2337+Y $2J+12$	4006.9 27 ⁻
3581.97(21)	27 ⁻		82(16)								
3691.94(21)	25 ⁻					x					
4006.94(23)	27 ⁻					100					
4070.32(22)	27 ⁻	17					83				
4230.00(22)	29 ⁻										22
3084.91+X	$2J+16$				100						
2844.6+V	$2J+12$			x							
4450.96(22)	29 ⁻					60					40
4617.92(22)	29 ⁺					100					

(continued)

 $^{147}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E_f^* : $2J_f^\pi$:	3399.1 25 ⁺	1851+V $2J+8$	2238+X $2J+12$	3582.0 27 ⁻	3691.9 25 ⁻	2362+U $2J+12$	2262+Z $2J+12$	2337+Y $2J+12$	4006.9 27 ⁻
3118.7+Z	$2J+16$								x		
3245.5+U	$2J+16$							x			
3214.90+Y	$2J+16$									100	
4844.08(22)	31^-					27					
4971.93(22)	31^-					100					
5265.10(22)	31^-					55					

Energy levels and branching ratios [92De38, 79Kl04, 78Br15]. Part 7

 $^{147}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E_f^* : $2J_f^\pi$:	4070.3 27 ⁻	4230.0 29 ⁻	2829+W $2J+12$	3085+X $2J+16$	2845+V $2J+12$	4450.9 29 ⁻	4617.9 29 ⁺	3119+Z $2J+16$	3246+U $2J+16$
4230.00(22)	29^-		78								
4844.08(22)	31^-			45				28			
4948.76(23)	31^+							12	88		
3984.86+X	$2J+20$					100					
5265.10(22)	31^-							19			
3875.8+W	$2J+16$				x						
5382.32(22)	33^-			25							
3880.7+V	$2J+16$						x				
4029.4+Z	$2J+20$									x	
4181.4+U	$2J+20$										x

Energy levels and branching ratios [92De38, 79Kl04, 78Br15]. Part 8

 $^{147}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E_f^* : $2J_f^\pi$:	3215+Y $2J+16$	4844.1 31^-	4948.8 31^+	4971.9 31^-	3985+X $2J+20$	5265.1 31^-	3876+W $2J+16$	5382.3 33^-	3881+V $2J+16$
5265.10(22)	31^-			27							
5382.32(22)	33^-			14	≈ 5	7		50			
5557.1(4)	35^+				100						
5583.05(25)	35^-					19				81	
4143.92+Y	$2J+20$		100								
4939.23+X	$2J+24$						100				
6236.1(3)	$\langle 35^+ \rangle$				100						
4971.8+W	$2J+20$								x		
4960.4+V	$2J+20$										x

Energy levels and branching ratios [92De38, 79Kl04, 78Br15]. Part 9

 $^{147}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E_f^* : $2J_f^\pi$:	5557.1 35 ⁺	5583.0 35 ⁻	4029+Z 2J+20	4181+U 2J+20	4144+Y 2J+20	5923.2 37 ⁻	4939+X 2J+24	6236.1 ⟨35 ⁺ ⟩	4972+W 2J+20
5923.2(3)	37 ⁻			100							
6471.4(3)	39 ⁻							100			
6541.4(5)	⟨37 ⁺ ⟩		100								
4995.8+Z	2J+24				x						
6621.4(3)	39 ⁺		40					60			
5170.0+U	2J+24					x					
5125.52+Y	2J+24						100				
6826.5										100	
6906.7(3)	41 ⁺							9			
5948.78+X	2J+28								100		
6115.0+W	2J+24										x
7665.4	⟨39,41⟩							100			
7825.4(4)								100			
7873.8(4)	41 ⁻							42			

Energy levels and branching ratios [92De38, 79Kl04, 78Br15]. Part 10

 $^{147}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E_f^* : $2J_f^\pi$:	6471.4 39 ⁻	4960+V 2J+20	6541.4 ⟨37 ⁺ ⟩	4996+Z 2J+24	6621.4 39 ⁺	5170+U 2J+24	5126+Y 2J+24	6826.5	6906.7 41 ⁺
6621.4(3)	39 ⁺				x						
6906.7(3)	41 ⁺		47				44				
7035.4(3)	41 ⁺						83			≈17	
7389.3(4)	45 ⁺										≈69
6018.5+Z	2J+28					x					
6086.0+V	2J+24			x							
6212.0+U	2J+28							x			
6161.00+Y	2J+28								100		
7873.8(4)	41 ⁻						6				
7963.9(4)											100
7993.9(4)	43 ⁻										8

Energy levels and branching ratios [92De38, 79Kl04, 78Br15]. Part 11

 $^{147}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E_f^* : $2J_f^\pi$:	7035.4 41 ⁺	5949+X 2J+28	7389.3 45 ⁺	6115+W 2J+24	6019+Z 2J+28	6086+V 2J+24	7665.4 ⟨39,41⟩	6212+U 2J+28	6161+Y 2J+28
7389.3(4)	45 ⁺		31								
7873.8(4)	41 ⁻		25						27		

(continued)

 $^{147}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E_f^* : $2J_f^\pi$:	7035.4 41 ⁺	5949+X $2J+28$	7389.3 45 ⁺	6115+W $2J+24$	6019+Z $2J+28$	6086+V $2J+24$	7665.4 ⟨39,41⟩	6212+U $2J+28$	6161+Y $2J+28$
7993.9(4)	43 ⁻		x		9						
8153.6(4)	⟨47⟩ ⁺				100						
7014.02+X	$2J+32$			100							
7098.7+Z	$2J+32$						x				
7305.6+W	$2J+28$				x						
7308.9+U	$2J+32$									x	
7260.5+V	$2J+28$							x			
7251.42+Y	$2J+32$										100

Energy levels and branching ratios [92De38, 79Kl04, 78Br15]. Part 12

 $^{147}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage								
		E_f^* : $2J_f^\pi$:	7825.4	7873.8 41 ⁻	7963.9	7993.9 43 ⁻	8153.6 ⟨47⟩ ⁺	7014+X $2J+32$	8333.4 45 ⁺	8587.8 ⟨49⟩ ⁺
7993.9(4)	43 ⁻		15	68						
8333.4(4)	45 ⁺				11	89				
8587.8(4)	⟨49⟩ ⁺					4	5		91	
9241	⟨51⟩									100
8135.05+X	$2J+36$							100		
9507.0	⟨51⟩ ⁺									100
9691.2	⟨53⟩ ⁺									100
9879.8	⟨53⟩ ⁻									4

Energy levels and branching ratios [92De38, 79Kl04, 78Br15]. Part 13

 $^{147}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage								
		E_f^* : $2J_f^\pi$:	7099+Z $2J+32$	7306+W $2J+28$	7309+U $2J+32$	7261+V $2J+28$	7251+Y $2J+32$	9241 ⟨51⟩	8135+X $2J+36$	9507.0 ⟨51⟩ ⁺
8236.3+Z	$2J+36$		x							
9879.8	⟨53⟩ ⁻							x		36
8462.4+U	$2J+36$				x					
8398.1+Y	$2J+36$						100			
8543.1+W	$2J+32$			x						
8483.6+V	$2J+32$					x				
10487.6	⟨55⟩ ⁺							x		
9310.50+X	$2J+40$								100	

Energy levels and branching ratios [92De38, 79Kl04, 78Br15]. Part 14

 $^{147}_{64}\text{Gd}$

E^*	$2J^\pi$	Branching ratios in percentage								
		E_f^* :	9691.2	8236+Z	9879.8	8462+U	8398+Y	8543+W	8484+V	10271.6
[keV]		$2J_f^\pi$:	$\langle 53^+ \rangle$	$2J+36$	$\langle 53^- \rangle$	$2J+36$	$2J+36$	$2J+32$	$2J+32$	$\langle 55^- \rangle$
<hr/>										
9879.8	$\langle 53^- \rangle$		60							
10271.6	$\langle 55^- \rangle$		x							
10487.6	$\langle 55^+ \rangle$		100							
10688.7	$\langle 57^- \rangle$				100					
10747.2	$\langle 57^+ \rangle$		75							
10993.3	$\langle 59^- \rangle$									x
9431.6+Z	$2J+40$			x						
9671.9+U	$2J+40$					x				
9601.6+Y	$2J+40$						100			
9828.0+W	$2J+36$							x		
9756.4+V	$2J+36$								x	

Energy levels and branching ratios [92De38, 79Kl04, 78Br15]. Part 15

 $^{147}_{64}\text{Gd}$

E^*	$2J^\pi$	Branching ratios in percentage								
[keV]	$E^*_f:$ $2J^\pi_f:$	10487.6 $\langle 55^+ \rangle$	9311+X $2J+40$	10688.7 $\langle 57^- \rangle$	10747.2 $\langle 57^+ \rangle$	10993.3 $\langle 59^- \rangle$	9432+Z $2J+40$	9672+U $2J+40$	9602+Y $2J+40$	
10747.2	$\langle 57^+ \rangle$	25								
10993.3	$\langle 59^- \rangle$			79	21					
11232.2	$\langle 61^- \rangle$			12		88				
10538.95+X	$2J+44$		100							
11930.3	$\langle 61 \rangle$					100				
10684.6+Z	$2J+44$						x			
10939.6+U	$2J+44$							x		
10863.0+Y	$2J+44$								100	

Energy levels and branching ratios [92De38, 79Kl04, 78Br15]. Part 16

 $^{147}_{64}\text{Gd}$

E^*	$2J^\pi$	Branching ratios in percentage								
[keV]		$E_f^*:$ $2J_f^\pi:$	11232 $\langle 61^- \rangle$	9828+W $2J+36$	9756+V $2J+36$	10539+X $2J+44$	11851 $\langle 65^- \rangle$	11930 $\langle 61 \rangle$	12209 $\langle 65^- \rangle$	10685+Z $2J+44$
11850.7	$\langle 65^- \rangle$		100							
12208.6	$\langle 65^- \rangle$		100							
12548.7	$\langle 65 \rangle$							100		
11079.5+V	$2J+40$				x					
11162.3+W	$2J+40$			x						
11816.48+X	$2J+48$					100				
13104.7	$\langle 67,69 \rangle$								100	
13265.1	$\langle 67 \rangle$						74			

(continued)

 $^{147}_{64}\text{Gd}$

E^*	$2J^\pi$	Branching ratios in percentage								
[keV]		E_f^* :	11232	9828+W	9756+V	10539+X	11851	11930	12209	10685+Z
		$2J_f^\pi$:	$\langle 61^- \rangle$	$2J+36$	$2J+36$	$2J+44$	$\langle 65^- \rangle$	$\langle 61 \rangle$	$\langle 65^- \rangle$	$2J+44$
13416	67								100	
11995.3+Z	$2J+48$									x

Energy levels and branching ratios [92De38, 79Kl04, 78Br15]. Part 17

 $^{147}_{64}\text{Gd}$

E^*	$2J^\pi$	Branching ratios in percentage								
[keV]		E_f^* : $2J_f^\pi$:	10940+U $2J+44$	10863+Y $2J+44$	12549 $\langle 65 \rangle$	11080+V $2J+40$	11162+W $2J+40$	11817+X $2J+48$	13105 $\langle 67,69 \rangle$	13265 $\langle 67 \rangle$
13265.1	$\langle 67 \rangle$				26					
13446	$\langle 69,71 \rangle$								x	
13446.5	$\langle 69 \rangle$				50					50
12265.7+U	$2J+48$		x							
12183.4+Y	$2J+48$			100						
12453.8+V	$2J+44$					x				
12547.1+W	$2J+44$						x			
13139.6+X	$2J+52$							100		

Energy levels and branching ratios [92De38, 79Kl04, 78Br15]. Part 18

 $^{147}_{64}\text{Gd}$

E^*	$2J^\pi$	Branching ratios in percentage								
[keV]		E^*_f : $2J^\pi_f$:	13446 $\langle 69 \rangle$	11995+Z $2J+48$	12266+U $2J+48$	12183+Y $2J+48$	12454+V $2J+44$	12547+W $2J+44$	13140+X $2J+52$	14433 $\langle 71 \rangle$
14433.2	$\langle 71 \rangle$		100							
13363.0+Z	$2J+52$			x						
13650.1+U	$2J+52$				x					
15174.8	$\langle 73 \rangle$									100
13563.5+Y	$2J+52$					100				
13881.8+V	$2J+48$						x			
13982.7+W	$2J+48$							x		
14506.8+X	$2J+56$								100	

Energy levels and branching ratios [92De38, 79Kl04, 78Br15]. Part 19

 $^{147}_{64}\text{Gd}$

E^*	$2J^\pi$	Branching ratios in percentage								
	E_f^* :	14793	13363+Z	13650+U	15175	13564+Y	15390	13882+V	13983+W	
[keV]	$2J_f^\pi$:		$2J+52$	$2J+52$	$\langle 73 \rangle$	$2J+52$	$\langle 73 \rangle$	$2J+48$	$2J+48$	
15390	$\langle 73 \rangle$	67			33					
15691	$\langle 75 \rangle$						100			
14786.2+Z	$2J+56$		x							
15093.7+U	$2J+56$			x						
15003.3+Y	$2J+56$					100				
15365.9+V	$2J+52$							x		
15471.8+W	$2J+52$								x	

Energy levels and branching ratios [92De38, 79Kl04, 78Br15]. Part 20

 $^{147}_{64}\text{Gd}$

E^*	$2J^\pi$	Branching ratios in percentage								
[keV]		E_f^* : $2J_f^\pi$:	15691 $\langle 75 \rangle$	14507+X $2J+56$	14786+Z $2J+56$	15094+U $2J+56$	15003+Y $2J+56$	15472+W $2J+52$	15921+X $2J+60$	16264+Z $2J+60$
16777			100							
16937	$\langle 79 \rangle$		100							
15920.6+X	$2J+60$			100						
16263.5+Z	$2J+60$				x					
16596.4+U	$2J+60$					x				
16503.6+Y	$2J+60$						100			
17014.1+W	$2J+56$							x		
17384.4+X	$2J+64$								100	
17786.2+Z	$2J+64$									x

Energy levels and branching ratios [92De38, 79Kl04, 78Br15]. Part 21

 $^{147}_{64}\text{Gd}$

E^*	$2J^\pi$	Branching ratios in percentage								
[keV]		E_f^* : $2J_f^\pi$:	16596+U $2J+60$	16504+Y $2J+60$	17014+W $2J+56$	17384+X $2J+64$	17786+Z $2J+64$	18065+Y $2J+64$	18901+X $2J+68$	20473+X $2J+72$
18159.8+U	$2J+64$	x								
18065.0+Y	$2J+64$			100						
18610.5+W	$2J+60$				x					
18900.7+X	$2J+68$					100				
19298.4+Z	$2J+68$						x			
19687.8+Y	$2J+68$							x		
20472.6+X	$2J+72$								x	
22100.4+X	$2J+76$									x

Energy levels and branching ratios [00Bh03, 03Po02].

 $^{148}_{64}\text{Gd}$

E^*	J^π	L	$d\sigma/d\Omega$	$T_{1/2}$ or	Ref.
[keV]			(p,p')	Γ_{cm}	
0.0	0^+			70.9(10) yr	
0+X	$J \approx \langle 29 \rangle$				
784.432(15)	2^+	2			90De22
1273.489(18)	3^-	3	4.42		90De22
699.9+X	$J+2$				
1416.374(20)	4^+	4	0.61		90De22
0+U	J				
0+T	J				
0+S	J				
0+V	J				
0+R	J				
0+Z	J				
0+W	J				
0+Y	$J \approx \langle 30 \rangle$				
1810.89(12)	6^+	6	0.07		90De22
1834.59(5)	$2^+, 3^+$				
1863.445(24)	2^+	2	0.28		90De22
1912.98(7)	4^-				
2082.00(7)	5^-	5	0.09		00Po13
1447.8+X	$J+4$				
2188.67(4)	2^+	2	0.58		90De22
2233.60(4)	3^-	3	0.55		90De22
2310.97(5)	2^+	2	0.09		90De22
849.7+U	$J+2$				
802.2+W	$J+2$				
868.4+T	$J+2$				
830.3+Z	$J+2$				
853.7+V	$J+2$				
887.0+S	$J+2$				
2424.10(9)	$3^+, 4^+$				
741.8+Y	$J+2$				
911.8+R	$J+2$				
2503.70(6)	$\langle 1-3 \rangle^-$		0.05		90De22
2505.80(3)	3^-				
2522.03(11)	4^+	4	0.15		90De22
2563.83(13)	7^-				
2567.05(22)	6^-				
2614.59(5)	2^+	2	0.10		90De22
2632.80(9)	5^-	5	0.43		90De22
2693.28(13)	8^+		0.06		90De22
2694.62(16)	9^-			16.6(3) ns	00Po13
2700.06(7)	$\langle 1^-, 2^+ \rangle$				
2763(3)	4^+	4	0.12		90De22
2782.54(19)					
2868.67(22)	$\langle 5 \rangle^+$		0.03		90De22

(continued)

 $^{148}_{64}\text{Gd}$

E^*	J^π	L	$d\sigma/d\Omega$	$T_{1/2}$ or	Ref.
[keV]			(p,p')	Γ_{cm}	
2872.89(7)	$\langle 2^-, 3, 4^+ \rangle$				
2886.31(10)	$\langle 2^+, 3, 4^+ \rangle$				
2243.6+X	$J+6$				
2915.51(8)	3^-	3	0.05		90De22
2935.1(6)	$\langle 7 \rangle^+$	$\langle 7 \rangle$	0.04		90De22
2937.0(3)*	7^-				03Po02
3029.72(23)	8^-				
3045.6(4)					
3065					
3076.12(24)					
3089.64(8)	$\langle 1^-, 2^+ \rangle$				
3128.7(4)					
3130.87(16)	$\langle 1, 2^+ \rangle$				
3152.84(20)*	8^-				
3156.9(4)					
3180.1(6)	7^-				
1739.7+U	$J+4$				
1651.6+W	$J+4$				
1530.7+Y	$J+4$				
1706.0+Z	$J+4$				
1783.4+T	$J+4$				
1753.6+V	$J+4$				
3295.03(15)	$\langle 1, 2^+ \rangle$				
3310.7(4)*	8^-				
1822.4+S	$J+4$				
3357.7(3)					
3367.62(21)*	9^-				
1873.7+R	$J+4$				
3477.9(4)	$\langle 8, 9 \rangle$				
3502.1(4)					
3574.94(21)	$\langle 1^-, 2^+ \rangle$				
3645.84(25)	$\langle 8^+ \rangle$				
3667.0(4)	10^-				
3701.85(23)	11^-				00Po13
3090.3+X	$J+8$				
3758.6(2)**	10^+				
3768.28(25)					
3808.27(22)	$\langle 8^+ \rangle$				
3822.8(4)	10^+				
3868.60(21)					
3918.58(23)*	10^-				
3980.80(24)	12^+			58(7) ps	00Po13
3990.45(22)	$\langle 8, 9, 10 \rangle^+$				
4051.0(6)	$\langle 2^+, 3, 4^+ \rangle$				
4068.23(25)	$\langle 1 \rangle$				

(continued)

¹⁴⁸Gd
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E^*	J^π	L	$d\sigma/d\Omega$	$T_{1/2}$ or	Ref.
[keV]			(p,p')	Γ_{cm}	
2369.5+Y	$J+6$				
2549.0+W	$J+6$				
4119.18(17)	$\langle 8,9 \rangle^+$				
4121.80(25)*	11^-				
2678.4+U	$J+6$				
4170.22(22)	$\langle 8,9^- \rangle$				
2631.0+Z	$J+6$				
2698.5+V	$J+6$				
2745.6+T	$J+6$				
4271.3(4)					
4311.95(20)	$\langle 8,9,10 \rangle^+$				
2812.3+S	$J+6$				
4408.86(19)	$\langle 8 \rangle^+$				
4430.1(3)*	12^-				
2892.1+R	$J+6$				
4500.7(2)**	12^+				
4542.27(22)					
4551.4(3)*	13^-				
3988.2+X	$J+10$				
4740.9(4)*	$13^{\langle - \rangle}$				
4906.3(3)*	14^-				
3258.6+Y	$J+8$				
5026.2(2)**	14^+				
3494.9+W	$J+8$				
5117.8(3)*	15^-				
3666.8+U	$J+8$				
3606.7+Z	$J+8$				
5168.2(4)	14^+				00Po13
3689.9+V	$J+8$				
3755.3+T	$J+8$				
5355.9(3)**	16^+				
3858.2+S	$J+8$				
5438.9(4)	16				
3969.0+R	$J+8$				
5579.0					
4938.5+X	$J+12$				
5800.8					
5833.0(3)**	18^+				
5883.3	17				
4198.4+Y	$J+10$				
5934.0(8)	17				
4491.0+W	$J+10$				
4706.4+U	$J+10$				
4634.2+Z	$J+10$				
6211.2(4)	17				

(continued)

¹⁴⁸Gd
64

E^*	J^π	L	$d\sigma/d\Omega$	$T_{1/2}$ or	Ref.
[keV]			(p,p')	Γ_{cm}	
4727.8+V	$J+10$				
6268.9	18				
4811.6+T	$J+10$				
6381.9	18				
4961.4+S	$J+10$				
6546.0(4)	18^-				
6575.3	19^+				
5942.4+X	$J+14$				
6641.1(4)	19^-				
5101.0+R	$J+10$				
6834.9(4)	20^-			1.5(3) ns	
5188.8+Y	$J+12$				
7051.8	19^+				
5537.8+W	$J+12$				
7110.8	20^+				
7156.0(5)	21^-				
5713.8+Z	$J+12$				
5797.5+U	$J+12$				
7274.6	20^+				
7334.1					
5812.4+V	$J+12$				
5916.5+T	$J+12$				
7531.3	21^+				
6120.6+S	$J+12$				
7001.1+X	$J+16$				
7791.3	22^+				
6287.7+R	$J+12$				
6228.5+Y	$J+14$				
8005.3	22^-				
6637.2+W	$J+14$				
8243.2	22^-				
8304.9	23^-				
8309.6	23^+				
8364.5	23^-				
6846.5+Z	$J+14$				
6941.7+U	$J+14$				
8455.9	23^-				
6944.3+V	$J+14$				
7069.9+T	$J+14$				
8609.6	23				
8639.5	24^-				
8115.3+X	$J+18$				
8832.5	24				
7332.7+S	$J+14$				
8987.5	25^-				

(continued)

¹⁴⁸Gd
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E^*	J^π	L	$d\sigma/d\Omega$	$T_{1/2}$ or	Ref.
[keV]			(p,p')	Γ_{cm}	
7316.3+Y	$J+16$				
7527.4+R	$J+14$				
9244.0	25^-				
9259.0					
7789.4+W	$J+16$				
8032.4+Z	$J+16$				
8139.7+U	$J+16$				
9653.1	26^-				
8123.8+V	$J+16$				
9758.1	26				
8271.5+T	$J+16$				
9934.7					
9285.9+X	$J+20$				
9957.8	26^-				
10046.9	25^-				
10063.5	27				
8596.7+S	$J+16$				
8451.5+Y	$J+18$				
10318.4	27^-				
8817.6+R	$J+16$				
10474.7	27				
8996.2+W	$J+18$				
10694.5	27^-				
10760.7	28				
9271.7+Z	$J+18$				
9392.5+U	$J+18$				
10870.1	28				
9350.3+V	$J+18$				
9521.3+T	$J+18$				
11158.8	28				
10513.7+X	$J+22$				
11186.2	29				
9634.2+Y	$J+20$				
9908.0+S	$J+18$				
11457.3	29				
11478.4	29^-				
11546.4	29^-				
11587.4	30				
10152.6+R	$J+18$				
11728.1	30				
10257.2+W	$J+20$				
12013.2					
12064.4	30				
10564.6+Z	$J+20$				
12139.1	31^-				

(continued)

¹⁴⁸Gd
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E^*	J^π	L	$d\sigma/d\Omega$	$T_{1/2}$ or	Ref.
[keV]			(p,p')	Γ_{cm}	
10624.1+V	$J+20$				
10700.6+U	$J+20$				
12285.5	30				
10818.5+T	$J+20$				
12382.3	31				
11799.3+X	$J+24$				
12530.0	32				
10865.4+Y	$J+22$				
12683.4	33				
11263.4+S	$J+20$				
13039.5	33				
11530.7+R	$J+20$				
13126.4	33^-				
11573.7+W	$J+22$				
13148.0	32				
13244.2					
13354.8					
11909.1+Z	$J+22$				
11946.2+V	$J+22$				
12065.0+U	$J+22$				
13555.4	33				
12157.8+T	$J+22$				
13736.3	34				
13143.3+X	$J+26$				
12146.3+Y	$J+24$				
13870.3	35			≈ 2 ns	
13888.7	33				
13911.9					
14011.7	34				
14146.2	35				
12664.8+S	$J+22$				
14207.0	36				
12956.1+R	$J+22$				
12945.8+W	$J+24$				
13304.3+Z	$J+24$				
13315.8+V	$J+24$				
14924.8	36				
13486.3+U	$J+24$				
13509.7+T	$J+24$				
15166.1	38				
13478.5+Y	$J+26$				
14545.8+X	$J+28$				
14115.4+S	$J+24$				
15728.2	37				
14374.4+W	$J+26$				

(continued)

¹⁴⁸Gd
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E^*	J^π	L	$d\sigma/d\Omega$	$T_{1/2}$ or	Ref.
[keV]			(p,p')	Γ_{cm}	
14431.3+R	$J+24$				
16078.0					
16112.5	38				
16204.6	40			<0.17 ps	
16257.8	40				
14732.9+V	$J+26$				
14739.5+Z	$J+26$				
16407.2	40				
14964.8+U	$J+26$				
16474.1	39				
14861.8+Y	$J+28$				
16007.2+X	$J+30$				
15618.4+S	$J+26$				
17241.4	40				
17320.6					
17371.2	42				
15859.5+W	$J+28$				
15960.2+R	$J+26$				
16182.1+Z	$J+28$				
16197.8+V	$J+28$				
16501.7+U	$J+28$				
16299.3+Y	$J+30$				
17527.7+X	$J+32$				
18482.1	44			<0.17 ps	
17401.9+W	$J+30$				
19149	$\langle 46 \rangle$				
17629.8+Z	$J+30$				
17710.9+V	$J+30$				
17790.4+Y	$J+32$				
19108.2+X	$J+34$				
19101.8+Z	$J+32$				
19272.9+V	$J+32$				
19336.6+Y	$J+34$				
20748.2+X	$J+36$				
22448.5+X	$J+38$				
90De22					Ref.

Additional data on this isotope can be found in [00Po13, 96De04, 91Zu01, 90Pi17, 90Dr06].

* Band of negative parity levels considered in [03Po02].

** Band of positive parity levels considered in [03Po02], see other two bands therein.

Data for this isotope are considered in vol. LB I/18C.

Energy levels and branching ratios [00Bh03, 03Po02]. Part 2

 $^{148}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage					
		$E_f^*:$ $J_f^\pi:$	0.0 0^+	0+X $J \approx \langle 29 \rangle$	784 2^+	1273 3^-	700+X $J+2$
784.432(15)	2^+		100				
1273.489(18)	3^-				100		
699.9+X	$J+2$			100			
1416.374(20)	4^+				97(2)	2.8(1)	
1834.59(5)	$2^+, 3^+$				100		
1863.445(24)	2^+		32(1)		65(1)	3.4(2)	
1912.98(7)	4^-					100	
2082.00(7)	5^-					83	
1447.8+X	$J+4$						100
2188.67(4)	2^+		41(2)		52(1)	7.3(8)	
2233.60(4)	3^-				46(2)	54(5)	
2310.97(5)	2^+		65(2)		35(1)		
2424.10(9)	$3^+, 4^+$				39(5)		
2503.70(6)	$\langle 1-3 \rangle^-$				64(4)	36(2)	
2505.80(3)	3^-				13(3)		
2522.03(11)	4^+				17(3)	21(5)	
2614.59(5)	2^+		26(2)		68(4)	6(3)	
2632.80(9)	5^-				x	x	
2700.06(7)	$\langle 1^-, 2^+ \rangle$		49(2)		31(2)	21(1)	
2872.89(7)	$\langle 2^-, 3, 4^+ \rangle$				17(2)	41(1)	
2886.31(10)	$\langle 2^+, 3, 4^+ \rangle$				69(6)		
2915.51(8)	3^-				61(2)	22(3)	
3076.12(24)						100	
3089.64(8)	$\langle 1^-, 2^+ \rangle$		13(4)			36(2)	
3130.87(16)	$\langle 1, 2^+ \rangle$		61(4)		39(6)		
3295.03(15)	$\langle 1, 2^+ \rangle$		25(8)		75(6)		
3574.94(21)	$\langle 1^-, 2^+ \rangle$		47(7)			53(5)	
4051.0(6)	$\langle 2^+, 3, 4^+ \rangle$				63(38)	≈ 13	
4068.23(25)	$\langle 1 \rangle$		22(6)			26(6)	
4542.27(22)						68(5)	

Energy levels and branching ratios [00Bh03, 03Po02]. Part 3

 $^{148}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage									
		$E_f^*:$ $J_f^\pi:$	1416 4^+	0+U J	0+T J	0+S J	0+V J	0+R J	0+Z J	0+W J	0+Y $J \approx \langle 30 \rangle$
1810.89(12)	6^+		100								
2082.00(7)	5^-		6.0								
849.7+U	$J+2$			x							
802.2+W	$J+2$									x	
868.4+T	$J+2$				x						
830.3+Z	$J+2$								100		

(continued)

 $^{148}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage									
		$E_f^*:$ $J_f^\pi:$	1416 4^+	0+U J	0+T J	0+S J	0+V J	0+R J	0+Z J	0+W J	0+Y $J \approx \langle 30 \rangle$
853.7+V	$J+2$						100				
887.0+S	$J+2$					x					
2424.10(9)	$3^+, 4^+$		61(5)								
741.8+Y	$J+2$										x
911.8+R	$J+2$							x			
2505.80(3)	3^-		87.0(19)								
2522.03(11)	4^+		62(3)								
2632.80(9)	5^-		x								
2782.54(19)			60								
2886.31(10)	$\langle 2^+, 3, 4^+ \rangle$		14(6)								
4051.0(6)	$\langle 2^+, 3, 4^+ \rangle$		25(6)								
4542.27(22)			32(4)								

Energy levels and branching ratios [00Bh03, 03Po02]. Part 4

 $^{148}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage									
		$E_f^*:$ $J_f^\pi:$	1810.89 6^+	1834.59 $2^+, 3^+$	1912.98 4^-	2082.00 5^-	1448+X $J+4$	849.7+U $J+2$	802.2+W $J+2$	868.4+T $J+2$	830.3+Z $J+2$
2082.00(7)	5^-	7.3			3.6						
2563.83(13)	7^-	40				60					
2567.05(22)	6^-	x		x		x					
2632.80(9)	5^-	x									
2693.28(13)	8^+	97									
2694.62(16)	9^-	58									
2782.54(19)		40									
2868.67(22)	$\langle 5 \rangle^+$	100									
2872.89(7)	$\langle 2^-, 3, 4^+ \rangle$			41(4)							
2243.6+X	$J+6$						100				
2915.51(8)	3^-			16.8(10)							
2937.0(3)*	7^-	100									
3045.6(4)		100									
3065			100								
3089.64(8)	$\langle 1^-, 2^+ \rangle$				52(5)						
3128.7(4)		100									
3156.9(4)		100									
1739.7+U	$J+4$						100				
1651.6+W	$J+4$							x			
1706.0+Z	$J+4$										100
1783.4+T	$J+4$									x	
3357.7(3)		100									
3477.9(4)	$\langle 8, 9 \rangle$	100									
3645.84(25)	$\langle 8^+ \rangle$	80									

(continued)

 $^{148}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage									
[keV]		E^*_f :	1810.89	1834.59	1912.98	2082.00	1448+X	849.7+U	802.2+W	868.4+T	830.3+Z
		J^π_f :	6 ⁺	2 ⁺ ,3 ⁺	4 ⁻	5 ⁻	$J+4$	$J+2$	$J+2$	$J+2$	$J+2$
3768.28(25)			100								
3808.27(22)	$\langle 8^+ \rangle$		53								
4068.23(25)	$\langle 1 \rangle$				52(8)						
4119.18(17)	$\langle 8,9 \rangle^+$		11.8								

Energy levels and branching ratios [00Bh03, 03Po02]. Part 5

 $^{148}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage									
[keV]		E^*_f : J^π_f	853.7+V $J+2$	887.0+S $J+2$	741.8+Y $J+2$	911.8+R $J+2$	2503.70 7^-	2563.83 7^-	2693.28 8^+	2694.62 9^-	2782.54
2693.28(13)	8^+							3.3			
2694.62(16)	9^-							42(2)			
2886.31(10)	$\langle 2^+, 3, 4^+ \rangle$					17(8)					
2935.1(6)	$\langle 7 \rangle^+$								100		
3029.72(23)	8^-							61		39	
3152.84(20)*	8^-							35		37	
1530.7+Y	$J+4$				100						
1753.6+V	$J+4$		100								
1822.4+S	$J+4$			x							
3367.62(21)*	9^-							16	35		
1873.7+R	$J+4$				x						
3502.1(4)								100			
3645.84(25)	$\langle 8^+ \rangle$								20		
3667.0(4)	10^-									100	
3701.85(23)	11^-									100	
3758.6(2)**	10^+									100	
3808.27(22)	$\langle 8^+ \rangle$								26	21	
3822.8(4)	10^+								22	78	
3868.60(21)									22	78	
3980.80(24)	12^+									2.3	
3990.45(22)	$\langle 8, 9, 10 \rangle^+$								49	8	43
4119.18(17)	$\langle 8, 9 \rangle^+$							9.6	50	10.9	6.5
4170.22(22)	$\langle 8, 9^- \rangle$							15	38	47	
4271.3(4)									100		
4311.95(20)	$\langle 8, 9, 10 \rangle^+$							25	50		
4408.86(19)	$\langle 8 \rangle^+$							18.3	49	13.9	

Energy levels and branching ratios [00Bh03, 03Po02]. Part 6

 $^{148}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage									
		E_f^* : J_f^π :	2868.67 $\langle 5 \rangle^+$	2244+X $J+6$	2937.0 7^-	3029.72 8^-	3152.84 8^-	1740+U $J+4$	1652+W $J+4$	1531+Y $J+4$	1706+Z $J+4$
3152.84(20)*	8^-					28					
3180.1(6)	7^-				100						
3310.7(4)*	8^-				x	x					
3367.62(21)*	9^-				12	20	17				
3090.3+X	$J+8$			100							
3918.58(23)*	10^-					36	50				
2369.5+Y	$J+6$									100	
2549.0+W	$J+6$								100		
4119.18(17)	$\langle 8,9 \rangle^+$	4.4				6.5					
2678.4+U	$J+6$							100			
2631.0+Z	$J+6$										100
4311.95(20)	$\langle 8,9,10 \rangle^+$					11.7					
4408.86(19)	$\langle 8 \rangle^+$	3.5									

Energy levels and branching ratios [00Bh03, 03Po02]. Part 7

 $^{148}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage									
		E_f^* : J_f^π :	1783+T $J+4$	1754+V $J+4$	1822+S $J+4$	3357.7 9^-	3367.62 9^-	1874+R $J+4$	3701.85 11^-	3090+X $J+8$	3758.61 10^+
3918.58(23)*	10^-						14				
3980.80(24)	12^+								98		
4121.80(25)*	11^-						95		5.1		
2698.5+V	$J+6$			100							
2745.6+T	$J+6$	x									
4311.95(20)	$\langle 8,9,10 \rangle^+$					11.1					
2812.3+S	$J+6$				x						
4430.1(3)*	12^-								10		
2892.1+R	$J+6$							x			
4500.7(2)**	12^+								4		38
3988.2+X	$J+10$									100	

Energy levels and branching ratios [00Bh03, 03Po02]. Part 8

 $^{148}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage									
		E_f^* : J_f^π :	3768.28 10^+	3822.8 10^+	3868.60 10^-	3918.58 10^-	3980.80 12^+	2370+Y $J+6$	2549+W $J+6$	4121.80 11^-	2678+U $J+6$
4311.95(20)	$\langle 8,9,10 \rangle^+$				2.2						
4408.86(19)	$\langle 8 \rangle^+$	11.3		4.3							
4430.1(3)*	12^-				42					48	

(continued)

 $^{148}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage									
		E^*_f : J^π_f :	3768.28 $J+6$	3822.8 10^+	3868.60 $J+6$	3918.58 10^-	3980.80 12^+	2370+Y $J+6$	2549+W $J+6$	4121.80 11^-	2678+U $J+6$
4500.7(2)**	12^+			8			50				
4551.4(3)*	13^-						15			36	
3258.6+Y	$J+8$							100			
5026.2(2)**	14^+						6				
3494.9+W	$J+8$								100		
3666.8+U	$J+8$										100
5168.2(4)	14^+						100				

Energy levels and branching ratios [00Bh03, 03Po02]. Part 9

 $^{148}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage									
		E^*_f : J^π_f :	2631+Z $J+6$	2699+V $J+6$	2746+T $J+6$	2812+S $J+6$	4430.1 12^-	2892+R $J+6$	4500.71 12^+	4551.4 13^-	3988+X $J+10$
4551.4(3)*	13^-						49				
4740.9(4)*	$13^{\langle - \rangle}$						100				
4906.3(3)*	14^-									100	
5026.2(2)**	14^+								80	10	
5117.8(3)*	15^-									56	
3606.7+Z	$J+8$		100								
3689.9+V	$J+8$			100							
3755.3+T	$J+8$				x						
3858.2+S	$J+8$					x					
3969.0+R	$J+8$							x			
4938.5+X	$J+12$										100

Energy levels and branching ratios [00Bh03, 03Po02]. Part 10

 $^{148}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage									
		E^*_f : J^π_f :	4740.9 $13^{\langle - \rangle}$	4906.3 14^-	3259+Y $J+8$	5026.20 14^+	3495+W $J+8$	5117.8 15^-	3667+U $J+8$	3607+Z $J+8$	5168.2 14^+
5026.2(2)**	14^+		4								
5117.8(3)*	15^-			44							
5355.9(3)**	16^+					88		12			
5438.9(4)	16			14				86			
5579.0											100
4198.4+Y	$J+10$				100						
5934.0(8)	17							19			
4491.0+W	$J+10$						100				

(continued)

 $^{148}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage									
		E^*_f : J^π_f :	4740.9 $13^{(-)}$	4906.3 14^-	3259+Y $J+8$	5026.20 14^+	3495+W $J+8$	5117.8 15^-	3667+U $J+8$	3607+Z $J+8$	5168.2 14^+
4706.4+U	$J+10$								100		
4634.2+Z	$J+10$									100	

Energy levels and branching ratios [00Bh03, 03Po02]. Part 11

 $^{148}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage									
		E^*_f : J^π_f :	3690+V $J+8$	3755+T $J+8$	5355.9 16^+	3858+S $J+8$	5438.9 16	3969+R $J+8$	5579.0	4939+X $J+12$	5800.8
5800.8									100		
5833.0(3)**	18^+				100						
5883.3	17						100				
5934.0(8)	17				21		53				≈ 8
6211.2(4)	17				80						
4727.8+V	$J+10$		100								
4811.6+T	$J+10$			x							
4961.4+S	$J+10$					x					
5942.4+X	$J+14$									100	
5101.0+R	$J+10$							x			

Energy levels and branching ratios [00Bh03, 03Po02]. Part 12

 $^{148}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage									
		E^*_f : J^π_f :	5833.0 18^+	5883.3 17	4198+Y $J+10$	5934.0 17	4491+W $J+10$	4706+U $J+10$	4634+Z $J+10$	6211.2 17	4728+V $J+10$
6211.2(4)	17		20								
6268.9	18		100								
6381.9	18		20	24		56					
6546.0(4)	18^-					8				92	
6575.3	19^+		53								
6641.1(4)	19^-		100								
6834.9(4)	20^-		46								
5188.8+Y	$J+12$				100						
7051.8	19^+		35								
5537.8+W	$J+12$						100				
7110.8	20^+		100								
5713.8+Z	$J+12$								100		
5797.5+U	$J+12$							100			
5812.4+V	$J+12$										100

Energy levels and branching ratios [00Bh03, 03Po02]. Part 13

 $^{148}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage									
[keV]		E_f^* : J_f^π :	6268.9 18	4812+T J +10	6381.9 18	4961+S J +10	6546.0 18^-	6575.3 19^+	5942+X J +14	6641.1 19^-	5101+R J +10
6575.3	19^+		14		33						
6834.9(4)	20^-						19	6		29	
7051.8	19^+				65						
7156.0(5)	21^-									7	
7274.6	20^+							88			
7334.1								100			
5916.5+T	J +12			x							
6120.6+S	J +12					x					
7001.1+X	J +16								100		
6287.7+R	J +12										x

Energy levels and branching ratios [00Bh03, 03Po02]. Part 14

 $^{148}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage									
[keV]		E_f^* : J_f^π :	6834.9 20 ⁻	5189+Y J +12	7051.8 19 ⁺	5538+W J +12	7110.8 20 ⁺	7156.0 21 ⁻	5714+Z J +12	5798+U J +12	7274.6 20 ⁺
<hr/>											
7156.0(5)	21 ⁻		93								
7274.6	20 ⁺				12						
7531.3	21 ⁺				6		5				69
7791.3	22 ⁺						8				
6228.5+Y	J +14			100							
8005.3	22 ⁻		93					7			
6637.2+W	J +14					100					
8243.2	22 ⁻		100								
8304.9	23 ⁻							100			
8364.5	23 ⁻							95			
6846.5+Z	J +14								100		
6941.7+U	J +14									100	

Energy levels and branching ratios [00Bh03, 03Po02]. Part 15

 $^{148}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage									
[keV]		E_f^* : J_f^π :	7334.1	5812+V $J+12$	5917+T $J+12$	7531.3 21^+	6121+S $J+12$	7001+X $J+16$	7791.3 22^+	6288+R $J+12$	6229+Y $J+14$
7531.3	21^+		19								
7791.3	22^+				92						
8309.6	23^+								100		
8364.5	23^-								5		
8455.9	23^-								44		

(continued)

 $^{148}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage									
		$E_f^*:$ $J_f^\pi:$	7334.1	5812+V $J+12$	5917+T $J+12$	7531.3 21^+	6121+S $J+12$	7001+X $J+16$	7791.3 22^+	6288+R $J+12$	6229+Y $J+14$
6944.3+V	$J+14$			100							
7069.9+T	$J+14$				x						
8609.6	23								100		
8115.3+X	$J+18$							100			
7332.7+S	$J+14$					x					
7316.3+Y	$J+16$										100
7527.4+R	$J+14$									x	

Energy levels and branching ratios [00Bh03, 03Po02]. Part 16

 $^{148}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage									
		$E_f^*:$ $J_f^\pi:$	8005.3	6637+W $J+14$	8243.2 22^-	8304.9 23^-	8309.6 23^+	8364.5 23^-	6847+Z $J+14$	6942+U $J+14$	8455.9 23^-
8455.9	23^-		32		14	9					
8639.5	24^-		37				15				48
8832.5	24						57	7			10
8987.5	25^-							41			
9259.0								46			
7789.4+W	$J+16$			100							
8032.4+Z	$J+16$								100		
8139.7+U	$J+16$									100	
10046.9	25^-					6		76			

Energy levels and branching ratios [00Bh03, 03Po02]. Part 17

 $^{148}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage									
		$E_f^*:$ $J_f^\pi:$	6944+V $J+14$	7070+T $J+14$	8609.6 23	8639.5 24^-	8115+X $J+18$	8832.5 24	7333+S $J+14$	8987.5 25^-	7316+Y $J+16$
8832.5	24				26						
8987.5	25^-					32		27			
9244.0	25^-					100					
9259.0						54					
9653.1	26^-									100	
8123.8+V	$J+16$		100								
9758.1	26									65	
8271.5+T	$J+16$			x							
9934.7								100			
9285.9+X	$J+20$						100.				
8596.7+S	$J+16$								x		

(continued)

 $^{148}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage									
		E^*_f : J^π_f :	6944+V $J+14$	7070+T $J+14$	8609.6 23	8639.5 24^-	8115+X $J+18$	8832.5 24	7333+S $J+14$	8987.5 25^-	7316+Y $J+16$
8451.5+Y 10318.4	$J+18$ 27^-										100
										6	

Energy levels and branching ratios [00Bh03, 03Po02]. Part 18

 $^{148}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage									
		E^*_f : J^π_f :	7527+R $J+14$	9244.0 25^-	9259.0	7789+W $J+16$	8032+Z $J+16$	8140+U $J+16$	9653.1 26^-	8124+V $J+16$	9758.1 26
9758.1	26			35							
9957.8	26^-			100							
10046.9	25^-				18						
10063.5	27										100
10318.4	27^-								8		7
8817.6+R	$J+16$	x									
10474.7	27										100
8996.2+W	$J+18$					100					
10694.5	27^-								100		
9271.7+Z	$J+18$						100				
9392.5+U	$J+18$							100			
9350.3+V	$J+18$									100	

Energy levels and branching ratios [00Bh03, 03Po02]. Part 19

 $^{148}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage									
		E^*_f : J^π_f :	8272+T $J+16$	9286+X $J+20$	9957.8 26^-	10046.9 25^-	10063.5 27	8597+S $J+16$	8452+Y $J+18$	10318.4 27^-	8818+R $J+16$
10318.4	27^-				9	70					
10760.7	28						100				
10870.1	28						100				
9521.3+T	$J+18$	x									
11158.8	28									76	
10513.7+X	$J+22$			100							
11186.2	29						100				
9634.2+Y	$J+20$								100		
9908.0+S	$J+18$							x			
11478.4	29^-									100	
11546.4	29^-									57	
10152.6+R	$J+18$										x

Energy levels and branching ratios [00Bh03, 03Po02]. Part 20

 $^{148}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage									
		E_f^* :	10474.7	8996+W	10694.5	10760.7	9272+Z	9393+U	10870.1	9350+V	9521+T
[keV]		J_f^π :	27	$J+18$	27^-	28	$J+18$	$J+18$	28	$J+18$	$J+18$
11158.8	28		15		9						
11546.4	29^-				43						
11728.1	30					40			29		
10257.2+W	$J+20$			100							
10564.6+Z	$J+20$						100				
10624.1+V	$J+20$									100	
10700.6+U	$J+20$							100			
10818.5+T	$J+20$										x

Energy levels and branching ratios [00Bh03, 03Po02]. Part 21

 $^{148}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage								
[keV]	E_f^* : J_f^π :	11158.8	10514+X	11186.2	9634+Y	9908+S	11457.3	11478.4	11546.4	11587.4
		28	$J+22$	29	$J+20$	$J+18$	29	29^-	29^-	30
11457.3	29	82		18						
11587.4	30						100			
11728.1	30			31						
12013.2							100			
12064.4	30			100						
12139.1	31^-							24	50	7
12285.5	30	70					30			
12382.3	31						100			
11799.3+X	$J+24$		100							
12530.0	32									15
10865.4+Y	$J+22$				100					
12683.4	33									100
11263.4+S	$J+20$					x				

Energy levels and branching ratios [00Bh03, 03Po02]. Part 22

 $^{148}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage								
[keV]	E_f^* : J_f^π :	10153+R $J+18$	11728.1 30	10257+W $J+20$	12064.4 30	10565+Z $J+20$	12139.1 31^-	10624+V $J+20$	10701+U $J+20$	12285.5 30
12139.1	31^-		19		x					
12530.0	32						78			8
11530.7+R	$J+20$	x								
13126.4	33^-						100			
11573.7+W	$J+22$			100						
13148.0	32						30			

(continued)

 $^{148}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage								
[keV]	E^*_f :	10153+R	11728.1	10257+W	12064.4	10565+Z	12139.1	10624+V	10701+U	12285.5
	J^π_f :	$J+18$	30	$J+20$	30	$J+20$	31^-	$J+20$	$J+20$	30
11909.1+Z	$J+22$					100				
11946.2+V	$J+22$							100		
12065.0+U	$J+22$								100	

Energy levels and branching ratios [00Bh03, 03Po02]. Part 23

 $^{148}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage									
[keV]		E_f^* : J_f^π :	10819+T $J+20$	12382.3 31	11799+X $J+24$	12530.0 32	10865+Y $J+22$	12683.4 33	11263+S $J+20$	13039.5 33	11531+R $J+20$
13039.5	33			20		75		5			
13148.0	32			50				20			
13244.2								100			
13354.8						100					
13555.4	33					100					
12157.8+T	$J+22$	x									
13736.3	34									75	
13143.3+X	$J+26$				100						
12146.3+Y	$J+24$						100				
13870.3	35					16					
13888.7	33									100	
14011.7	34									100	
14146.2	35									100	
12664.8+S	$J+22$								x		
12956.1+R	$J+22$										x

Energy levels and branching ratios [00Bh03, 03Po02]. Part 24

 $^{148}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage								
[keV]	E_f^* : J_f^π :	11574+W $J+22$	13148.0 32	13244.2 $J+22$	11909+Z $J+22$	11946+V $J+22$	12065+U $J+22$	13555.4 33	12158+T $J+22$	13736.3 34
13736.3	34		15	4				6		
13870.3	35									84
12945.8+W	$J+24$	100								
13304.3+Z	$J+24$				100					
13315.8+V	$J+24$					100				
13486.3+U	$J+24$						100			
13509.7+T	$J+24$								x	

Energy levels and branching ratios [00Bh03, 03Po02]. Part 25

 $^{148}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage									
[keV]		E^*_f : J^π_f :	13143+X $J+26$	12146+Y $J+24$	13870.3 35	13888.7 33	13911.9	14146.2 35	12665+S $J+22$	14207.0 36	12956+R $J+22$
<hr/>											
13911.9					100						
14207.0	36				88		12				
14924.8	36					21		79			
15166.1	38									100	
13478.5+Y	$J+26$			100							
14545.8+X	$J+28$	100									
14115.4+S	$J+24$								x		
14431.3+R	$J+24$										x

Energy levels and branching ratios [00Bh03, 03Po02]. Part 26

 $^{148}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage									
		E^*_f :	12946+W	13304+Z	13316+V	14924.8	13486+U	15166.1	13479+Y	14546+X	14115+S
[keV]		J^π_f :	$J+24$	$J+24$	$J+24$	36	$J+24$	38	$J+26$	$J+28$	$J+24$
15728.2	37					100					
14374.4+W	$J+26$	100									
16112.5	38					100					
16204.6	40							100			
16257.8	40							100			
14732.9+V	$J+26$				100						
14739.5+Z	$J+26$			100							
14964.8+U	$J+26$						100				
16474.1	39							100			
14861.8+Y	$J+28$								100		
16007.2+X	$J+30$									100	
15618.4+S	$J+26$										x

Energy levels and branching ratios [00Bh03, 03Po02]. Part 27

 $^{148}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage									
[keV]		E^*_f :	15728.2	14374+W	14431+R	16112.5	14733+V	14740+Z	16407.2	14965+U	16474.1
		J^π_f :	37	$J+26$	$J+24$	38	$J+26$	$J+26$	40	$J+26$	39
16078.0			100								
16407.2	40					100					
17241.4	40								100		
17320.6											100
17371.2	42								100		
15859.5+W	$J+28$			100							
15960.2+R	$J+26$				x						

(continued)

 $^{148}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage								
		E^*_f : 15728.2	14374+W	14431+R	16112.5	14733+V	14740+Z	16407.2	14965+U	16474.1
[keV]		J^π_f : 37	$J+26$	$J+24$	38	$J+26$	$J+26$	40	$J+26$	39
16182.1+Z	$J+28$						100			
16197.8+V	$J+28$					100				
16501.7+U	$J+28$								100	

Energy levels and branching ratios [00Bh03, 03Po02]. Part 28

 $^{148}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage									
[keV]		E^*_f : J^π_f :	14862+Y $J+28$	16007+X $J+30$	17371.2 42	15860+W $J+28$	16182+Z $J+28$	16198+V $J+28$	16299+Y $J+30$	17528+X $J+32$	18482.1 44
16299.3+Y	$J+30$	100									
17527.7+X	$J+32$		100								
18482.1	44			100							
17401.9+W	$J+30$				100						
19149	$\langle 46 \rangle$										100
17629.8+Z	$J+30$					100					
17710.9+V	$J+30$						100				
17790.4+Y	$J+32$								100		
19108.2+X	$J+34$									100	

Energy levels and branching ratios [00Bh03, 03Po02]. Part 29

 $^{148}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage					
		E_f^* : J_f^π :	17630+Z $J+30$	17711+V $J+30$	17790+Y $J+32$	19108+X $J+34$	20748+X $J+36$
19101.8+Z	$J+32$		100				
19272.9+V	$J+32$			100			
19336.6+Y	$J+34$				100		
20748.2+X	$J+36$					100	
22448.5+X	$J+38$						100

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16].

 $^{149}_{64}\text{Gd}$

E^*	$2J^\pi$	$T_{1/2}$ or Γ_{cm}
[keV]		
0.0	7^-	9.28(10) d
164.99(2)	5^-	1.7(1) ns
352.23(2)	3^-	0.43(5) ns
775.20(8)	11^-	
795.82(8)	9^-	
817.10(2)	3^-	
873.35(9)	11^+	1.6(6) ns
955.8(1)	$\langle 13 \rangle^+$	
1026.84(2)	3^+	
1085.2(3)	$\langle 5^-, 7, 9^- \rangle$	
1124.89(3)	$1^+, 3^+, 5^+$	
1144.09(5)	$3^+, 5^+$	
1167.11(6)	$\langle 3^+ \rangle$	
1205.67(2)	$\langle 1^- \rangle$	
1348.73(9)	$1^{\langle - \rangle}, 3, 5^-$	
1402.90(7)	$\langle 5^- \rangle$	
1483.8(1)	$\langle 15^- \rangle$	
1487.60(7)	$1^-, 3^-, 5^-$	
1544.13(5)	$\langle 3^-, 5^- \rangle$	
0+T	$2J$	
1557.38(6)	$1^{\langle - \rangle}, 3, 5^-$	
0+C	$2J$	
0+U	$2J \approx \langle 63 \rangle$	
0+B	$2J$	
0+V	$2J \approx \langle 57 \rangle$	
1597.3(1)	$1, 3, 5^-$	
1609.0(1)	$\langle 13^- \rangle$	
1614.05(6)	3^+	
0+A	$2J$	
0+Y	$2J \approx \langle 57 \rangle$	
0+D	$2J$	
0+S	$2J$	
0+Z	$2J \approx \langle 63 \rangle$	
1655.19(6)	$\langle 3 \rangle^+$	
0+W	$2J$	
0+X	$2J \approx \langle 63 \rangle$	
1739.7(2)	$\langle 17 \rangle^+$	
1750.61(9)	$1^{\langle - \rangle}, 3, 5^-$	
1751.1(2)		
1772.83(5)	$1^{\langle + \rangle}, 3^{\langle + \rangle}$	
1844.31(7)	$1^{\langle - \rangle}, 3, 5^-$	
1992.49(4)	3^-	
1999.5(3)	$\langle 15^+ \rangle$	
2058.01(13)	$\langle 17 \rangle^-$	
2088.47(9)	$1^{\langle - \rangle}, 3, 5^-$	

(continued)

 $^{149}_{64}\text{Gd}$

E^*	$2J^\pi$	$T_{1/2}$ or Γ_{cm}
[keV]		
2126.6(6)	1,3,5 ⁻	
2158.36(4)	$\langle 3 \rangle^+$	
2199.90(11)	1 ^{$\langle - \rangle$} ,3,5 ⁻	
2231.6(2)	$\langle 17^- \rangle$	
2261.54(9)	1 ^{$\langle - \rangle$} ,3	
649.8+Y	2J+4	
688.0+V	2J+4	
2300.72(6)	1 ^{$\langle - \rangle$} ,3	
2314.1(7)	1 ^{$\langle - \rangle$} ,3,5 ⁻	
755.6+U	2J+4	
747.4+A	2J+4	
725.6+Z	2J+4	
2383.4(2)	$\langle 19 \rangle^-$	
2401.1(2)	$\langle 21 \rangle^+$	
827.5+B	2J+4	
854.9+C	2J+4	
874.0+T	2J+4	
2482.75(19)	1,3,5 ⁻	
802.9+W	2J+4	
850.2+D	2J+4	
2503.7(2)	1 ^{$\langle - \rangle$} ,3,5 ⁻	
2514.6(3)		
877.5+S	2J+4	
2523.9(2)	$\langle 21 \rangle^-$	
2570.1(3)	1,3,5 ⁻	
858.5+X	2J+4	
2590.06(10)	1,3	
2599.31(9)	1 ^{$\langle - \rangle$} ,3	
2613.2(5)	1 ^{$\langle - \rangle$} ,3	
2683.42(9)	1,3	
2702.9(4)	1 ^{$\langle - \rangle$} ,3,5 ⁻	
2757.21(9)	1,3	
2768.0(4)	1,3,5 ⁻	
2808.6(5)	1,3	
2824.97(8)	1 ⁻ ,3 ⁻	
2830.6(10)	1,3,5 ⁻	
2856.4(4)		
2861.8(5)	1 ^{$\langle - \rangle$} ,3	
2913.08(10)	1,3	
2918.2(7)	1 ^{$\langle - \rangle$} ,3	
2922.7(3)	1,3	
2961.5(6)	1 ^{$\langle - \rangle$} ,3	
1349.6+Y	2J+8	
2977.7(2)	1 ^{$\langle - \rangle$} ,3	
2999.64(7)	1 ^{$\langle - \rangle$} ,3	

(continued)		$^{149}_{64}\text{Gd}$
E^*	$2J^\pi$	$T_{1/2}$ or
[keV]		Γ_{cm}
3003.4(5)	$1^{(-)},3$	
1420.6+V	$2J+8$	
3021.05(18)	$1^{(-)},3$	
3057.0(4)	$1^{(-)},3$	
3070.8(7)	$1^{(-)},3$	
3079.8(3)	$1,3$	
3084.4(3)	$\langle 23^+ \rangle$	
3099.76(10)	$1^{(-)},3$	
3124.07(10)	$1,3$	
3134.4(2)	$\langle 23^- \rangle$	
1560.5+U	$2J+8$	
1497.5+Z	$2J+8$	
3149.4(6)	$1,3$	
1543.9+A	$2J+8$	
3175.59(15)	$1^{(-)},3$	
3201.4(4)	$1^{(-)},3$	
3206.43(23)	$1^{(-)},3$	
3227.5(2)	$\langle 23^+ \rangle$	
3231.2(3)	$1^{(-)},3$	
3258.4(6)	$1,3$	
3272.9(6)	$1,3$	
1697.0+B	$2J+8$	
3294.2(3)	$1,3$	
3294.3(2)	$\langle 25^+ \rangle$	
3313.62(16)	$1^{(-)},3^{(-)}$	
3319.0(4)	$1^{(-)},3$	
1757.2+C	$2J+8$	
3340.6(6)	$1,3$	
1655.0+W	$2J+8$	
1798.6+T	$2J+8$	
3365.2(2)	$1^{(-)},3$	
1741.3+D	$2J+8$	
3384.7(10)	$1,3$	
3387.0(2)	$\langle 27^+ \rangle$	6.0(5) ns
3403.4(5)	$1^{(-)},3$	
3418.8(5)	$1^{(-)},3$	
3431.4(4)	$1^{(-)},3$	
3442.8(6)	$1,3$	
1809.5+S	$2J+8$	
3466.8(6)	$1^{(-)},3$	
3473.2(3)	$1^{(-)},3$	
1746.7+X	$2J+8$	
3486.2(5)	$1,3$	
3499.6(7)	$1^{(-)},3$	
3516.2(4)	$1,3$	

(continued)

 $^{149}_{64}\text{Gd}$

E^*	$2J^\pi$	$T_{1/2}$ or Γ_{cm}
[keV]		
3535.1(4)	$1^{\langle - \rangle}, 3$	0.7 ns
3543.9(4)	$1^{\langle - \rangle}, 3$	
3611.4(2)	$\langle 25 \rangle^-$	
3631.9(3)	$\langle 27^- \rangle$	
2098.2+Y	$2J+12$	
3765.2(4)	$\langle 29 \rangle$	
2200.8+V	$2J+12$	
2315.1+Z	$2J+12$	
2415.5+U	$2J+12$	
2391.2+A	$2J+12$	
4054.3(4)	$\langle 29^- \rangle$	
2621.2+B	$2J+12$	
2556.9+W	$2J+12$	
2713.2+C	$2J+12$	
2677.0+D	$2J+12$	
2771.2+T	$2J+12$	
4323.7(3)	$\langle 29^- \rangle$	
4340.0(4)	$\langle 31^- \rangle$	
4342.7(4)	$\langle 29^+ \rangle$	
2624.8+X	$2J+12$	
2794.9+S	$2J+12$	
2897.4+Y	$2J+16$	
4571.8(5)		
3030.5+V	$2J+16$	
4719.3(4)	$\langle 33^+ \rangle$	
4801.4(4)	$\langle 33^- \rangle$	
3180.0+Z	$2J+16$	
3323.5+U	$2J+16$	
3289.6+A	$2J+16$	
5052.2(4)	$\langle 35^- \rangle$	
3596.6+B	$2J+16$	
3509.0+W	$2J+16$	
3525.8+X	$2J+16$	
3725.8+C	$2J+16$	
5300.3(4)	$\langle 37^- \rangle$	
3663.4+D	$2J+16$	
3797.0+T	$2J+16$	
3751.5+Y	$2J+20$	
5462.5(4)	$\langle 37^+ \rangle$	
3833.0+S	$2J+16$	
3911.5+V	$2J+20$	
5633.5(5)	$\langle 41^- \rangle$	
5738.5(5)	$\langle 39^- \rangle$	
4092.1+Z	$2J+20$	
4239.7+A	$2J+20$	

(continued)

¹⁴⁹Gd
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E^*	$2J^\pi$	$T_{1/2}$ or Γ_{cm}
[keV]		
4283.8+U	$2J+20$	
6098.8(5)	$\langle 41^+ \rangle$	
4468.1+X	$2J+20$	
4512.8+W	$2J+20$	
4627.0+B	$2J+20$	
6264.8(5)	$\langle 45^- \rangle$	
4647.5+Y	$2J+24$	
6299.8		
4701.4+D	$2J+20$	
4795.4+C	$2J+20$	
4813.4+T	$2J+20$	
4845.0+V	$2J+24$	
6470.2(5)	$\langle 45^+ \rangle$	
6504		
4924.0+S	$2J+20$	
6656.4(6)	$\langle 49^+ \rangle$	2.8 ns
5052.8+Z	$2J+24$	
6786.5		
5242.2+A	$2J+24$	
5299.4+U	$2J+24$	
7071.7		
5455.0+X	$2J+24$	
5600.8+Y	$2J+28$	
5562.5+W	$2J+24$	
5715.5+B	$2J+24$	
5851.3+T	$2J+24$	
5832.1+V	$2J+28$	
5792.2+D	$2J+24$	
5921.4+C	$2J+24$	
6058.3+Z	$2J+28$	
6066.5+S	$2J+24$	
7741.4(12)	$\langle 51 \rangle$	
7821.5(6)	$\langle 53^+ \rangle$	
7824.4(7)	$\langle 51^- \rangle$	
6304.9+A	$2J+28$	
6369.3+U	$2J+28$	
7996.6(7)	$\langle 53^- \rangle$	
8217.6(7)	$\langle 53^+ \rangle$	
6488.0+X	$2J+28$	
6605.7+Y	$2J+32$	
6667.6+W	$2J+28$	
8433.3(7)	$\langle 55 \rangle$	
6863.6+B	$2J+28$	
8458.3(11)	$\langle 51^- \rangle$	
8465.2(11)	$\langle 47^- \rangle$	

(continued)

 $^{149}_{64}\text{Gd}$

E^*	$2J^\pi$	$T_{1/2}$ or Γ_{cm}
[keV]		
6874.1+V	$2J+32$	
6941.2+T	$2J+28$	
8557.0(7)	$\langle 57^+ \rangle$	
6935.1+D	$2J+28$	
8657.4(12)	$\langle 51^- \rangle$	
7103.0+C	$2J+28$	
7114.6+Z	$2J+32$	
7259.7+S	$2J+28$	
8940.3(7)	$\langle 57^- \rangle$	
7422.0+A	$2J+32$	
9055.2(11)	$\langle 49^+ \rangle$	
7495.4+U	$2J+32$	
9273.0(7)	$\langle 57^- \rangle$	
7662.4+Y	$2J+36$	
7569.3+X	$2J+32$	
9325.8(7)	$\langle 59 \rangle$	
9437.9(7)	$\langle 59 \rangle$	
9501.6(7)	$\langle 61^- \rangle$	
7824.8+W	$2J+32$	
7971.6+V	$2J+36$	
8086.9+T	$2J+32$	
8072.9+B	$2J+32$	
8130+D	$2J+32$	
8218.3+Z	$2J+36$	
8337.0+C	$2J+32$	
8502.6+S	$2J+32$	
8594.8+A	$2J+36$	
8678.7+U	$2J+36$	
10361.9(7)	$\langle 63 \rangle$	
8772.5+Y	$2J+40$	
8699.7+X	$2J+36$	
10510.0(7)	$\langle 63 \rangle$	
10601.8(7)	$\langle 65^- \rangle$	
10625.4(12)	$\langle 47 \rangle$	
9034.1+W	$2J+36$	
9125.8+V	$2J+40$	
9289.2+T	$2J+36$	
10850.5(7)	$\langle 63 \rangle$	
10930.3(7)	$\langle 65^- \rangle$	
9342.9+B	$2J+36$	
11011.5(7)	$\langle 65 \rangle$	
9369.8+Z	$2J+40$	
9381+D	$2J+36$	
9619.4+C	$2J+36$	
11199.7(7)	$\langle 67 \rangle$	

(continued)

 $^{149}_{64}\text{Gd}$

E^*	$2J^\pi$	$T_{1/2}$ or Γ_{cm}
[keV]		
11243.2(12)	$\langle 51 \rangle$	
9794.5+S	$2J+36$	
9826.0+A	$2J+40$	
9919.6+U	$2J+40$	
9935.7+Y	$2J+44$	
9880.6+X	$2J+40$	
11711.7(7)	$\langle 67 \rangle$	
11907.5(12)	$\langle 55 \rangle$	
10337.8+V	$2J+44$	
10296.4+W	$2J+40$	
10549.2+T	$2J+40$	
10568.8+Z	$2J+44$	
10673.5+B	$2J+40$	
12268.3(8)	$\langle 67 \rangle$	
10688+D	$2J+40$	
12383.7(7)	$\langle 69 \rangle$	
12469.0(8)	$\langle 69^- \rangle$	
10946.4+C	$2J+40$	
12580.6(8)	$\langle 71 \rangle$	
12619.3(12)	$\langle 59 \rangle$	
11114.4+A	$2J+44$	
12751.9(8)	$\langle 71 \rangle$	
11151.2+Y	$2J+48$	
11132.5+S	$2J+40$	
11218.9+U	$2J+44$	
11113.1+X	$2J+44$	
12967.1(7)	$\langle 71 \rangle$	
13189.1(8)	$\langle 75 \rangle$	
11608.3+V	$2J+48$	
13278.6(8)	$\langle 73 \rangle$	
11612.1+W	$2J+44$	
13378.9(12)	$\langle 63 \rangle$	
11867.6+T	$2J+44$	
11815.8+Z	$2J+48$	
13567.2(8)	$\langle 75 \rangle$	
12063.6+B	$2J+44$	
12049+D	$2J+44$	
12320.2+C	$2J+44$	
12420.0+Y	$2J+52$	
12461.2+A	$2J+48$	
14108.6(8)	$\langle 77 \rangle$	
12399.0+X	$2J+48$	
12576.6+U	$2J+48$	
12518.6+S	$2J+44$	
14187.0(13)	$\langle 67 \rangle$	

(continued)

 $^{149}_{64}\text{Gd}$

E^*	$2J^\pi$	$T_{1/2}$ or Γ_{cm}
[keV]		
12937.2+V	$2J+52$	
12981.6+W	$2J+48$	
13110.1+Z	$2J+52$	
13243.1+T	$2J+48$	
15044.2(13)	$\langle 71 \rangle$	
13512.5+B	$2J+48$	
13467+D	$2J+48$	
15163.3(9)	$\langle 81 \rangle$	
13740.5+C	$2J+48$	
13742.8+Y	$2J+56$	
13738.6+X	$2J+52$	
13868.4+A	$2J+52$	
13993.6+U	$2J+52$	
13948.6+S	$2J+48$	
14325.5+V	$2J+56$	
15950.9(13)	$\langle 75 \rangle$	
15997.4(9)	$\langle 85 \rangle$	
14404.4+W	$2J+52$	
14451.6+Z	$2J+56$	
14683.4+T	$2J+52$	
14941+D	$2J+52$	
15020.1+B	$2J+52$	
15119.6+Y	$2J+60$	
15212.1+C	$2J+52$	
15133.4+X	$2J+56$	
16908.0(13)	$\langle 79 \rangle$	
15331.7+A	$2J+56$	
15469.4+U	$2J+56$	
15420.9+S	$2J+52$	
15772.1+V	$2J+60$	
15839.7+Z	$2J+60$	
15881.9+W	$2J+56$	
16178.0+T	$2J+56$	
17916.7(13)	$\langle 83 \rangle$	
16550.5+Y	$2J+64$	
16586.1+B	$2J+56$	
16738+C	$2J+56$	
16584.0+X	$2J+60$	
16863.5+A	$2J+60$	
16934.0+S	$2J+56$	
17004.0+U	$2J+60$	
17278.1+V	$2J+64$	
17274.6+Z	$2J+64$	
18977.4(13)	$\langle 87 \rangle$	
17414.6+W	$2J+60$	

(continued)

¹⁴⁹Gd
64

E^*	$2J^\pi$	$T_{1/2}$ or Γ_{cm}
[keV]		
17731.9+T	$2J+60$	
18036.1+Y	$2J+68$	
18090.7+X	$2J+64$	
18321+C	$2J+60$	
18451.7+A	$2J+64$	
20091.1(13)	$\langle 91 \rangle$	
18483.4+S	$2J+60$	
18599.0+U	$2J+64$	
18757.1+Z	$2J+68$	
18843.3+V	$2J+68$	
19000.4+W	$2J+64$	
19346.4+T	$2J+64$	
19576.3+Y	$2J+72$	
21258.4(13)	$\langle 95 \rangle$	
19654.7+X	$2J+68$	
19960+C	$2J+64$	
20285.7+Z	$2J+72$	
20469.3+V	$2J+72$	
20641.6+W	$2J+68$	
22480.3(13)	$\langle 99 \rangle$	
21170.7+Y	$2J+76$	
21275.0+X	$2J+72$	
21860.7+Z	$2J+76$	
22155.3+V	$2J+76$	
23756.5(13)	$\langle 103 \rangle$	
22818.1+Y	$2J+80$	
25088.5(13)	$\langle 107 \rangle$	
26476.3(13)	$\langle 111 \rangle$	
27920.5(13)	$\langle 115 \rangle$	
29421.0(13)	$\langle 119 \rangle$	
30978.8(13)	$\langle 123 \rangle$	
32594.5(14)	$\langle 127 \rangle$	
34266.6(14)	$\langle 131 \rangle$	
35996.5(16)	$\langle 135 \rangle$	

Additional data on this isotope can be found in [93Fl03, 92Tl02, 91Fl02, 90Ha31].

21 bands of levels with spins up to $2J=135$ are considered in [04Si16].

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 2

¹⁴⁹Gd
64

E^* [keV]	$2J^\pi$	Branching ratios in percentage							
		$E_f^*:$ $2J_f^\pi:$	0.0 7 ⁻	165.0 5 ⁻	352.2 3 ⁻	775.2 11 ⁻	795.8 9 ⁻	817.1 3 ⁻	873.3 11 ⁺
164.99(2)	5 ⁻		100						
352.23(2)	3 ⁻		87(3)	12.7(2)					
775.20(8)	11 ⁻		100						
795.82(8)	9 ⁻		87(4)	≈13					
817.10(2)	3 ⁻		35(1)	48	16.9(2)				
873.35(9)	11 ⁺		2.8(1)			30(1)	67(1)		
955.8(1)	⟨13⟩ ⁺					70(1)			30(1)
1026.84(2)	3 ⁺			92(1)	8.3(2)				
1085.2(3)	⟨5 ⁻ ,7,9 ⁻ ⟩		35(18)	18(6)			47(12)		
1124.89(3)	1 ⁺ ,3 ⁺ ,5 ⁺				79(2)			13.1(9)	
1144.09(5)	3 ⁺ ,5 ⁺		34(3)	57(3)	7(3)				
1167.11(6)	⟨3 ⁺ ⟩		63(3)	37(3)					
1205.67(2)	⟨1⟩ ⁻		≤0.1	4.1(1)	43.8(6)			52.1(4)	
1348.73(9)	1 ^{⟨-⟩} ,3,5 ⁻			33(8)	58(4)				
1402.90(7)	⟨5 ⁻ ⟩		85(5)				3(2)		
1483.8(1)	⟨15⟩ ⁻					69(1)			
1487.60(7)	1 ⁻ ,3 ⁻ ,5 ⁻			6.7(6)	89(3)			4.6(13)	
1544.13(5)	⟨3 ⁻ ,5 ⁻ ⟩		10(2)	45(2)	45(3)				
1557.38(6)	1 ^{⟨-⟩} ,3,5 ⁻			5(1)	33(3)			35(1)	
1597.3(1)	1,3,5 ⁻				9(3)			8(2)	
1609.0(1)	⟨13 ⁻ ⟩					50(2)	50(1)		
1614.05(6)	3 ⁺			81(3)	10(2)			1.5(7)	
1655.19(6)	⟨3⟩ ⁺			13(2)	59(2)			5(1)	
1750.61(9)	1 ^{⟨-⟩} ,3,5 ⁻		7(4)	33(2)	10(3)				
1751.1(2)									100
1772.83(5)	1 ^{⟨+⟩} ,3 ^{⟨+⟩}		1(1)		6			32(2)	
1844.31(7)	1 ^{⟨-⟩} ,3,5 ⁻			31(3)	20(3)			3(2)	
1992.49(4)	3 ⁻		0.2(2)	12.9(1)	37.6(1)			39(2)	
2088.47(9)	1 ^{⟨-⟩} ,3,5 ⁻			4(2)	25(4)				
2126.6(6)	1,3,5 ⁻				43(14)				
2158.36(4)	⟨3⟩ ⁺			1.2(4)	10.4(6)			54(2)	
2199.90(11)	1 ^{⟨-⟩} ,3,5 ⁻			29(5)	14(1)				
2261.54(9)	1 ^{⟨-⟩} ,3		4(4)	5(1)	33(3)			12(3)	
2300.72(6)	1 ^{⟨-⟩} ,3			9(1)	35(1)			21(2)	
2314.1(7)	1 ^{⟨-⟩} ,3,5 ⁻			43(14)				57(14)	
2482.75(19)	1,3,5 ⁻				57(8)				
2503.7(2)	1 ^{⟨-⟩} ,3,5 ⁻			82(18)	18(9)				
2590.06(10)	1,3				43(5)			15(5)	
2599.31(9)	1 ^{⟨-⟩} ,3			9(2)	31(4)			45(4)	
2613.2(5)	1 ^{⟨-⟩} ,3			27(4)	33(4)				
2702.9(4)	1 ^{⟨-⟩} ,3,5 ⁻			51(20)					
2757.21(9)	1,3				20(4)			66(6)	
2768.0(4)	1,3,5 ⁻				60(20)				
2808.6(5)	1,3				42(8)			34(17)	
2824.97(8)	1 ⁻ ,3 ⁻				9(1)			66(2)	

(continued)

 $^{149}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage							
		$E_f^*:$ $2J_f^\pi:$	0.0 7^-	165.0 5^-	352.2 3^-	775.2 11^-	795.8 9^-	817.1 3^-	873.3 11^+
2830.6(10)	1,3,5 ⁻				100				
2861.8(5)	1 ⁽⁻⁾ ,3			35(14)				12(6)	
2913.08(10)	1,3				65(4)				
2918.2(7)	1 ⁽⁻⁾ ,3			38(12)					
2922.7(3)	1,3							77(15)	
2961.5(6)	1 ⁽⁻⁾ ,3		<56	56(19)					
2977.7(2)	1 ⁽⁻⁾ ,3			17(4)				10(4)	
2999.64(7)	1 ⁽⁻⁾ ,3			2(1)	16(1)			34(2)	
3003.4(5)	1 ⁽⁻⁾ ,3			16(10)				16(10)	
3021.05(18)	1 ⁽⁻⁾ ,3			24(5)	40(5)			8(3)	
3057.0(4)	1 ⁽⁻⁾ ,3			100					
3070.8(7)	1 ⁽⁻⁾ ,3			40(14)				60(16)	
3099.76(10)	1 ⁽⁻⁾ ,3			20(4)				75(5)	
3124.07(10)	1,3			≤15	74(10)				
3149.4(6)	1,3				69(14)				
3175.59(15)	1 ⁽⁻⁾ ,3			26(5)	23(5)			2(1)	
3201.4(4)	1 ⁽⁻⁾ ,3			14(5)	9(3)			8(3)	
3206.43(23)	1 ⁽⁻⁾ ,3			7(4)	11(4)			18(4)	
3231.2(3)	1 ⁽⁻⁾ ,3			10(6)	81(23)			9(6)	
3258.4(6)	1,3				26(13)			29(13)	
3272.9(6)	1,3				18(11)			56(18)	
3294.2(3)	1,3				100				
3313.62(16)	1 ⁽⁻⁾ ,3 ⁽⁻⁾			1.2(4)	71(3)			8(1)	
3319.0(4)	1 ⁽⁻⁾ ,3			30(8)	25(8)				
3340.6(6)	1,3							35(13)	
3365.2(2)	1 ⁽⁻⁾ ,3			81(6)				10(3)	
3384.7(10)	1,3				100				
3403.4(5)	1 ⁽⁻⁾ ,3			12(4)	15(6)			24(8)	
3418.8(5)	1 ⁽⁻⁾ ,3			23(11)	25(11)				
3431.4(4)	1 ⁽⁻⁾ ,3			35(8)	65(22)				
3442.8(6)	1,3				22(11)			27(13)	
3466.8(6)	1 ⁽⁻⁾ ,3			41(21)				34(17)	
3473.2(3)	1 ⁽⁻⁾ ,3			75(16)				15(2)	
3486.2(5)	1,3				63(1)				
3499.6(7)	1 ⁽⁻⁾ ,3			53(16)	47(21)				
3516.2(4)	1,3				100				
3535.1(4)	1 ⁽⁻⁾ ,3			13(6)	64(16)			12(6)	
3543.9(4)	1 ⁽⁻⁾ ,3			100					

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 3

 $^{149}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		$E_f^*:$ $2J_f^\pi:$	955.8 $\langle 13 \rangle^+$	1026.8 3^+	1085.2	1124.9	1144.1 $3^+, 5^+$	1167.1 $\langle 3^+ \rangle$	1205.7 $\langle 1 \rangle^-$	1348.7	1402.9 $\langle 5^- \rangle$	1483.8 $\langle 15 \rangle^-$
1124.89(3)	$1^+, 3^+, 5^+$			7.4(9)								
1144.09(5)	$3^+, 5^+$			2(1)								
1348.73(9)	$1^{\langle - \rangle}, 3, 5^-$			8(4)								
1402.90(7)	$\langle 5^- \rangle$				12(3)							
1483.8(1)	$\langle 15 \rangle^-$	31(1)										
1557.38(6)	$1^{\langle - \rangle}, 3, 5^-$					6(1)	11(1)	10(2)				
1597.3(1)	$1, 3, 5^-$					83(12)						
1614.05(6)	3^+			4.6(15)			0.7(5)	2.3(15)				
1655.19(6)	$\langle 3 \rangle^+$			5.8(13)				6(1)	4.5(13)		6(1)	
1739.7(2)	$\langle 17 \rangle^+$	100										
1750.61(9)	$1^{\langle - \rangle}, 3, 5^-$			21(3)		3(2)					26(3)	
1772.83(5)	$1^{\langle + \rangle}, 3^{\langle + \rangle}$			20(1)		41(4)						
1844.31(7)	$1^{\langle - \rangle}, 3, 5^-$			12(3)				34(3)				
1992.49(4)	3^-			6.3(3)				0.7(2)	1.6(1)			
2058.01(13)	$\langle 17 \rangle^-$											84(1)
2088.47(9)	$1^{\langle - \rangle}, 3, 5^-$			27(4)		15(8)	19(8)				8(3)	
2126.6(6)	$1, 3, 5^-$					≤ 21					57(14)	
2158.36(4)	$\langle 3 \rangle^+$			18.5(6)		5.8(10)			3.7(4)			
2199.90(11)	$1^{\langle - \rangle}, 3, 5^-$					12(1)	21(6)	15(5)	6(1)		3(1)	
2231.6(2)	$\langle 17 \rangle^-$											52(2)
2261.54(9)	$1^{\langle - \rangle}, 3$			10(2)		4(3)	16(3)	4(1)			10(3)	
2300.72(6)	$1^{\langle - \rangle}, 3$			1.2(6)		16(2)						
2383.4(2)	$\langle 19 \rangle^-$											32(1)
2482.75(19)	$1, 3, 5^-$					5(3)	21(8)		17(8)			
2570.1(3)	$1, 3, 5^-$			68(17)				8(4)	24(6)			
2590.06(10)	$1, 3$			3(2)		3(2)			5(3)		12(8)	
2599.31(9)	$1^{\langle - \rangle}, 3$			3(1)		4(2)						
2613.2(5)	$1^{\langle - \rangle}, 3$			8(2)		15(4)						
2683.42(9)	$1, 3$			40(4)		21(4)	12(4)		15(4)			
2702.9(4)	$1^{\langle - \rangle}, 3, 5^-$						31(10)		18(7)			
2757.21(9)	$1, 3$			5		6(2)						
2768.0(4)	$1, 3, 5^-$						40(18)					
2808.6(5)	$1, 3$							13(7)				
2824.97(8)	$1^-, 3^-$			12(1)							4(1)	
2861.8(5)	$1^{\langle - \rangle}, 3$			18(6)				21(14)	14(7)			
2913.08(10)	$1, 3$					6(2)			6(2)			
2918.2(7)	$1^{\langle - \rangle}, 3$										62(31)	
2922.7(3)	$1, 3$			5(3)				18(15)				
2961.5(6)	$1^{\langle - \rangle}, 3$								44(17)			
2977.7(2)	$1^{\langle - \rangle}, 3$			7(3)		9(4)		31(4)			26(9)	
2999.64(7)	$1^{\langle - \rangle}, 3$			13(1)		22(1)	2(1)		1.2(5)	0.5(3)		
3003.4(5)	$1^{\langle - \rangle}, 3$			16(10)		42(10)			10(5)			
3021.05(18)	$1^{\langle - \rangle}, 3$			8(3)		7(2)	8(5)					
3079.8(3)	$1, 3$							100				
3099.76(10)	$1^{\langle - \rangle}, 3$			5(2)								

(continued)

 $^{149}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		$E_f^*:$ $2J_f^\pi:$	955.8 $\langle 13 \rangle^+$	1026.8 3^+	1085.2	1124.9	1144.1 $3^+, 5^+$	1167.1 $\langle 3^+ \rangle$	1205.7 $\langle 1 \rangle^-$	1348.7	1402.9 $\langle 5^- \rangle$	1483.8 $\langle 15 \rangle^-$
3124.07(10)	1,3			20(5)					6(3)			
3149.4(6)	1,3					22(12)			8(6)			
3175.59(15)	$1^{\langle - \rangle}, 3$			10(3)		13(5)		8(5)	10(3)	3(1)	5(3)	
3201.4(4)	$1^{\langle - \rangle}, 3$					19(5)		24(14)			14(10)	
3206.43(23)	$1^{\langle - \rangle}, 3$			18(4)			4(3)		7(4)		6(3)	
3258.4(6)	1,3			45(11)								
3272.9(6)	1,3			26(13)								
3313.62(16)	$1^{\langle - \rangle}, 3^{\langle - \rangle}$					2(1)			7(1)			
3319.0(4)	$1^{\langle - \rangle}, 3$										45(22)	
3340.6(6)	1,3						39(13)		26(13)			
3365.2(2)	$1^{\langle - \rangle}, 3$						3.2(19)					
3418.8(5)	$1^{\langle - \rangle}, 3$								34(11)			
3442.8(6)	1,3					51(19)						
3466.8(6)	$1^{\langle - \rangle}, 3$			24(14)								
3473.2(3)	$1^{\langle - \rangle}, 3$			10(6)								
3486.2(5)	1,3							37(1)				
3535.1(4)	$1^{\langle - \rangle}, 3$			12(6)								

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 4

 $^{149}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		$E_f^*:$ $2J_f^\pi:$	1487.6	1544.1 $\langle 3^-, 5^- \rangle$	0+T $2J$	0+C $2J$	0+U	0+B $2J$	0+V	1597.3 $1, 3, 5^-$	1609.1 $\langle 13^- \rangle$	1614.1 3^+
1992.49(4)	3^-			0.5(1)								1.5(2)
1999.5(3)	$\langle 15^+ \rangle$										100	
2058.01(13)	$\langle 17^- \rangle$										16(2)	
2158.36(4)	$\langle 3 \rangle^+$		1.9(4)	3.9(4)								0.6(2)
2231.6(2)	$\langle 17^- \rangle$										48(2)	
2261.54(9)	$1^{\langle - \rangle}, 3$		2(1)									
688.0+V	$2J+4$								x			
2300.72(6)	$1^{\langle - \rangle}, 3$											17(1)
755.6+U	$2J+4$						x					
827.5+B	$2J+4$							x				
854.9+C	$2J+4$					x						
874.0+T	$2J+4$				x							
2590.06(10)	1,3		8(3)	10(5)								
2599.31(9)	$1^{\langle - \rangle}, 3$		3(1)	5(2)								
2683.42(9)	1,3			8(2)								6(2)
2757.21(9)	1,3		3(2)									
2808.6(5)	1,3		11(5)									
2824.97(8)	$1^-, 3^-$		2(1)	7(1)								
2913.08(10)	1,3		14(4)	10(2)								

(continued)

 $^{149}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		$E_f^*:$ $2J_f^\pi:$	1487.6	1544.1	0+T	0+C	0+U	0+B	0+V	1597.3	1609.1	1614.1
				$\langle 3^-, 5^- \rangle$	$2J$	$2J$		$2J$		1,3,5 ⁻	$\langle 13^- \rangle$	3 ⁺
2999.64(7)	$1^{\langle - \rangle}, 3$		7(1)							0.7(3)		
3201.4(4)	$1^{\langle - \rangle}, 3$			12(4)								
3206.43(23)	$1^{\langle - \rangle}, 3$		4(2)	7(4)								18(7)
3313.62(16)	$1^{\langle - \rangle}, 3^{\langle - \rangle}$		7(1)	1(1)								2(1)
3365.2(2)	$1^{\langle - \rangle}, 3$		6(3)									
3403.4(5)	$1^{\langle - \rangle}, 3$		24(8)	24(8)								
3418.8(5)	$1^{\langle - \rangle}, 3$		19(9)									

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 5

 $^{149}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		$E_f^*:$ $2J_f^\pi:$	0+A	0+Y	0+D	0+S	0+Z	1655.2	0+W	0+X	1739.7	1751.1
			$2J$		$2J$	$2J$		$\langle 3 \rangle^+$	$2J$		$\langle 17 \rangle^+$	
649.8+Y	$2J+4$			x								
747.4+A	$2J+4$		x									
725.6+Z	$2J+4$						x					
2383.4(2)	$\langle 19 \rangle^-$										41(1)	
2401.1(2)	$\langle 21 \rangle^+$										100	
802.9+W	$2J+4$								x			
850.2+D	$2J+4$				x							
2514.6(3)												100
877.5+S	$2J+4$					x						
858.5+X	$2J+4$									x		
2999.64(7)	$1^{\langle - \rangle}, 3$							1.4(1)				
3021.05(18)	$1^{\langle - \rangle}, 3$							5(3)				

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 6

 $^{149}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		$E_f^*:$ $2J_f^\pi:$	1772.8	1992.5	2058.0	2231.6	649.8+Y	688.0+V	755.6+U	747.4+A	725.6+Z
				3 ⁻	$\langle 17 \rangle^-$	$\langle 17^- \rangle$	$2J+4$	$2J+4$	$2J+4$	$2J+4$	$2J+4$
1992.49(4)	3 ⁻	0.12(6)									
2383.4(2)	$\langle 19 \rangle^-$				27						
2523.9(2)	$\langle 21 \rangle^-$				84(1)	16(2)					
2613.2(5)	$1^{\langle - \rangle}, 3$			17(4)							
1349.6+Y	$2J+8$						x				
1420.6+V	$2J+8$							x			
1560.5+U	$2J+8$								x		

(continued)

 $^{149}_{64}\text{Gd}$

E^*	$2J^\pi$	Branching ratios in percentage									
[keV]		E_f^* :	1772.8	1992.5	2058.0	2231.6	649.8+Y	688.0+V	755.6+U	747.4+A	725.6+Z
		$2J_f^\pi$:		3^-	$\langle 17 \rangle^-$	$\langle 17^- \rangle$	$2J+4$	$2J+4$	$2J+4$	$2J+4$	$2J+4$
1497.5+Z	$2J+8$										x
1543.9+A	$2J+8$									x	

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 7

 $^{149}_{64}\text{Gd}$

E^*	$2J^\pi$	Branching ratios in percentage									
[keV]		$E_f^*:$ $2J_f^\pi:$	2383.4 $\langle 19 \rangle^-$	2401.1 $\langle 21 \rangle^+$	827.5+B $2J+4$	854.9+C $2J+4$	874.0+T $2J+4$	802.9+W $2J+4$	850.2+D $2J+4$	877.5+S $2J+4$	2523.9 $\langle 21 \rangle^-$
2856.4(4)				100							
3084.4(3)	$\langle 23^+ \rangle$			100							
3134.4(2)	$\langle 23^- \rangle$		66(1)	34(1)							
3227.5(2)	$\langle 23^+ \rangle$			13(2)							87(2)
1697.0+B	$2J+8$				x						
3294.3(2)	$\langle 25^+ \rangle$			100							
1757.2+C	$2J+8$					x					
1655.0+W	$2J+8$							x			
1798.6+T	$2J+8$						x				
1741.3+D	$2J+8$								x		
3387.0(2)	$\langle 27^+ \rangle$										14(1)
1809.5+S	$2J+8$									x	
3611.4(2)	$\langle 25 \rangle^-$										89(1)

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 8

 $^{149}_{64}\text{Gd}$

E^*	$2J^\pi$	Branching ratios in percentage									
[keV]		E_f^* : $2J_f^\pi$:	858.5+X $2J+4$	1350+Y $2J+8$	1421+V $2J+8$	3134.4 $\langle 23^- \rangle$	1561+U $2J+8$	1498+Z $2J+8$	1544+A $2J+8$	3227.5 $\langle 23^+ \rangle$	1697+B $2J+8$
3387.0(2)	$\langle 27^+ \rangle$									86(4)	
1746.7+X	$2J+8$		x								
3611.4(2)	$\langle 25^- \rangle$									11(1)	
3631.9(3)	$\langle 27^- \rangle$					51(1)					
2098.2+Y	$2J+12$			x							
2200.8+V	$2J+12$				x						
2315.1+Z	$2J+12$							x			
2415.5+U	$2J+12$						x				
2391.2+A	$2J+12$								x		
2621.2+B	$2J+12$										x

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 9

¹⁴⁹Gd₆₄

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E_f^* : $2J_f^\pi$:	3294.2 1,3	1757+C $2J+8$	1655+W $2J+8$	1799+T $2J+8$	1741+D $2J+8$	3387.0 $\langle 27^+ \rangle$	1810+S $2J+8$	1747+X $2J+8$	3611.4 $\langle 25^- \rangle$
3631.9(3)	$\langle 27^- \rangle$		28(1)					21(1)			x
3765.2(4)	$\langle 29 \rangle$							100			
2556.9+W	$2J+12$				x						
2713.2+C	$2J+12$			x							
2677.0+D	$2J+12$						x				
2771.2+T	$2J+12$					x					
4323.7(3)	$\langle 29^- \rangle$										100
4342.7(4)	$\langle 29^+ \rangle$							100			
2624.8+X	$2J+12$									100	
2794.9+S	$2J+12$								x		

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 10

¹⁴⁹Gd₆₄

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E_f^* : $2J_f^\pi$:	3631.9 $\langle 27^- \rangle$	2098+Y $2J+12$	2201+V $2J+12$	2315+Z $2J+12$	2416+U $2J+12$	2391+A $2J+12$	4054.3 $\langle 29^- \rangle$	2621+B $2J+12$	2557+W $2J+12$
4054.3(4)	$\langle 29^- \rangle$		100								
4340.0(4)	$\langle 31^- \rangle$		82(2)						18(1)		
2897.4+Y	$2J+16$			x							
3030.5+V	$2J+16$				x						
4801.4(4)	$\langle 33^- \rangle$								91(3)		
3180.0+Z	$2J+16$					x					
3323.5+U	$2J+16$						x				
3289.6+A	$2J+16$							x			
3596.6+B	$2J+16$									x	
3509.0+W	$2J+16$										x

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 11

¹⁴⁹Gd₆₄

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E_f^* : $2J_f^\pi$:	2713+C $2J+12$	2677+D $2J+12$	2771+T $2J+12$	4323.7 $\langle 29^- \rangle$	4340.0 $\langle 31^- \rangle$	4342.7 $\langle 29^+ \rangle$	2625+X $2J+12$	2795+S $2J+12$	2897+Y $2J+16$
4571.8(5)						100					
4719.3(4)	$\langle 33^+ \rangle$						95(1)	5.4(4)			
4801.4(4)	$\langle 33^- \rangle$						9(1)				
5052.2(4)	$\langle 35^- \rangle$						85(1)				
3525.8+X	$2J+16$								100		
3725.8+C	$2J+16$		x								
3663.4+D	$2J+16$			x							

(continued)

 $^{149}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E^*_f : $2J^\pi_f$:	2713+C $2J+12$	2677+D $2J+12$	2771+T $2J+12$	4323.7 $\langle 29^- \rangle$	4340.0 $\langle 31^- \rangle$	4342.7 $\langle 29^+ \rangle$	2625+X $2J+12$	2795+S $2J+12$	2897+Y $2J+16$
3797.0+T	$2J+16$				x						
3751.5+Y	$2J+20$										x
3833.0+S	$2J+16$									x	

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 12

 $^{149}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E^*_f : $2J^\pi_f$:	3031+V $2J+16$	4719.3 $\langle 33^+ \rangle$	4801.4 $\langle 33^- \rangle$	3180+Z $2J+16$	3324+U $2J+16$	3290+A $2J+16$	5052.2 $\langle 35^- \rangle$	3597+B $2J+16$	3509+W $2J+16$
5052.2(4)	$\langle 35^- \rangle$				15(1)						
5300.3(4)	$\langle 37^- \rangle$				59(2)				41(1)		
5462.5(4)	$\langle 37^+ \rangle$			82(1)					18(1)		
3911.5+V	$2J+20$	x									
5738.5(5)	$\langle 39^- \rangle$								32		
4092.1+Z	$2J+20$					x					
4239.7+A	$2J+20$							x			
4283.8+U	$2J+20$						x				
4512.8+W	$2J+20$										x
4627.0+B	$2J+20$									x	

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 13

 $^{149}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E^*_f : $2J^\pi_f$:	3526+X $2J+16$	3726+C $2J+16$	5300.3 $\langle 37^- \rangle$	3663+D $2J+16$	3797+T $2J+16$	3752+Y $2J+20$	5462.5 $\langle 37^+ \rangle$	3833+S $2J+16$	3912+V $2J+20$
5633.5(5)	$\langle 41^- \rangle$				100						
5738.5(5)	$\langle 39^- \rangle$				62						
6098.8(5)	$\langle 41^+ \rangle$								78(2)		
4468.1+X	$2J+20$	x									
4647.5+Y	$2J+24$							100			
4701.4+D	$2J+20$					x					
4795.4+C	$2J+20$			x							
4813.4+T	$2J+20$						x				
4845.0+V	$2J+24$										x
4924.0+S	$2J+20$									x	

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 14

 $^{149}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E^*_f : $2J^\pi_f$:	5633.5 $\langle 41^- \rangle$	5738.5 $\langle 39^- \rangle$	4092+Z $2J+20$	4240+A $2J+20$	4284+U $2J+20$	6098.8 $\langle 41^+ \rangle$	4468+X $2J+20$	4513+W $2J+20$	4627+B $2J+20$
5738.5(5)	$\langle 39^- \rangle$		6								
6098.8(5)	$\langle 41^+ \rangle$			22.4(2)							
6264.8(5)	$\langle 45^- \rangle$		100								
6299.8			100								
6470.2(5)	$\langle 45^+ \rangle$							95(1)			
5052.8+Z	$2J+24$				x						
5242.2+A	$2J+24$					x					
5299.4+U	$2J+24$						x				
5455.0+X	$2J+24$								x		
5562.5+W	$2J+24$									x	
5715.5+B	$2J+24$										x

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 15

 $^{149}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E^*_f : $2J^\pi_f$:	6264.8 $\langle 45^- \rangle$	4648+Y $2J+24$	4701+D $2J+20$	4795+C $2J+20$	4813+T $2J+20$	4845+V $2J+24$	6470.2 $\langle 45^+ \rangle$	4924+S $2J+20$	6656.4 $\langle 49^+ \rangle$
6470.2(5)	$\langle 45^+ \rangle$		4.7(5)								
6504			100								
6656.4(6)	$\langle 49^+ \rangle$								100		
6786.5									100		
7071.7											100
5600.8+Y	$2J+28$			x							
5851.3+T	$2J+24$						x				
5832.1+V	$2J+28$							x			
5792.2+D	$2J+24$				x						
5921.4+C	$2J+24$					x					
6066.5+S	$2J+24$									x	
7741.4(12)	$\langle 51 \rangle$										x
7821.5(6)	$\langle 53^+ \rangle$										100
7824.4(7)	$\langle 51^- \rangle$										100
8217.6(7)	$\langle 53^+ \rangle$										100
8458.3(11)	$\langle 51^- \rangle$										x
8465.2(11)	$\langle 47^- \rangle$								x		
8657.4(12)	$\langle 51^- \rangle$										x
9055.2(11)	$\langle 49^+ \rangle$								x		

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 16

 $^{149}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E^*_f : $2J^\pi_f$:	5053+Z $2J+24$	5242+A $2J+24$	5299+U $2J+24$	5455+X $2J+24$	5601+Y $2J+28$	5563+W $2J+24$	5716+B $2J+24$	5851+T $2J+24$	5832+V $2J+28$
6058.3+Z	$2J+28$		x								
6304.9+A	$2J+28$			x							
6369.3+U	$2J+28$				x						
6488.0+X	$2J+28$					100					
6605.7+Y	$2J+32$						100				
6667.6+W	$2J+28$							x			
6863.6+B	$2J+28$								x		
6874.1+V	$2J+32$										x
6941.2+T	$2J+28$									x	

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 17

 $^{149}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E^*_f : $2J^\pi_f$:	5792+D $2J+24$	5921+C $2J+24$	6058+Z $2J+28$	6067+S $2J+24$	7821.5 $\langle 53^+ \rangle$	7824.4 $\langle 51^- \rangle$	6305+A $2J+28$	6369+U $2J+28$	7996.6 $\langle 53^- \rangle$
7996.6(7)	$\langle 53^- \rangle$							100			
8433.3(7)	$\langle 55 \rangle$						88(1)				
8557.0(7)	$\langle 57^+ \rangle$						76(1)				
6935.1+D	$2J+28$		x								
7103.0+C	$2J+28$			x							
7114.6+Z	$2J+32$				x						
7259.7+S	$2J+28$					x					
8940.3(7)	$\langle 57^- \rangle$										92(1)
7422.0+A	$2J+32$								x		
7495.4+U	$2J+32$									x	
9273.0(7)	$\langle 57^- \rangle$										100

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 18

 $^{149}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E^*_f : $2J^\pi_f$:	8217.6 $\langle 53^+ \rangle$	6488+X $2J+28$	6606+Y $2J+32$	6668+W $2J+28$	8433.3 $\langle 55 \rangle$	6864+B $2J+28$	8458.3 $\langle 51^- \rangle$	8465.2 $\langle 47^- \rangle$	6874+V $2J+32$
8433.3(7)	$\langle 55 \rangle$		12(1)								
8557.0(7)	$\langle 57^+ \rangle$						24(1)				
8940.3(7)	$\langle 57^- \rangle$						7.6(2)				
7662.4+Y	$2J+36$				100						
7569.3+X	$2J+32$			x							
7824.8+W	$2J+32$					x					
7971.6+V	$2J+36$										x

(continued)

 $^{149}_{64}\text{Gd}$

E^*	$2J^\pi$	Branching ratios in percentage									
		E_f^* :	8217.6	6488+X	6606+Y	6668+W	8433.3	6864+B	8458.3	8465.2	6874+V
[keV]		$2J_f^\pi$:	$\langle 53^+ \rangle$	$2J+28$	$2J+32$	$2J+28$	$\langle 55 \rangle$	$2J+28$	$\langle 51^- \rangle$	$\langle 47^- \rangle$	$2J+32$
8072.9+B	$2J+32$							x			
11243.2(12)	$\langle 51 \rangle$								<2.717	<2.717	

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 19

 $^{149}_{64}\text{Gd}$

E^*	$2J^\pi$	Branching ratios in percentage									
		$E^*_\text{f}:$	6941+T	8557.0	6935+D	7103+C	7115+Z	7260+S	8940.3	7422+A	9055.2
[keV]		$2J^\pi_\text{f}:$	$2J+28$	$\langle 57^+ \rangle$	$2J+28$	$2J+28$	$2J+32$	$2J+28$	$\langle 57^- \rangle$	$2J+32$	$\langle 49^+ \rangle$
9325.8(7)	$\langle 59 \rangle$			100							
9437.9(7)	$\langle 59 \rangle$			80(2)							
9501.6(7)	$\langle 61^- \rangle$								89(1)		
8086.9+T	$2J+32$		x								
8130+D	$2J+32$				x						
8218.3+Z	$2J+36$						x				
8337.0+C	$2J+32$					x					
8502.6+S	$2J+32$							x			
8594.8+A	$2J+36$									x	
11243.2(12)	$\langle 51 \rangle$										13.043(3261)

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 20

 $^{149}_{64}\text{Gd}$

E^*	$2J^\pi$	Branching ratios in percentage									
[keV]		E^*_f : $2J^\pi_f$:	7495+U $2J+32$	9273.0 $\langle 57^- \rangle$	7662+Y $2J+36$	7569+X $2J+32$	9325.8 $\langle 59 \rangle$	9437.9 $\langle 59 \rangle$	9501.6 $\langle 61^- \rangle$	7825+W $2J+32$	7972+V $2J+36$
9437.9(7)	$\langle 59 \rangle$			20(1)							
9501.6(7)	$\langle 61^- \rangle$						11.1(2)				
8678.7+U	$2J+36$	x									
10361.9(7)	$\langle 63 \rangle$							69(3)	31(1)		
8772.5+Y	$2J+40$				100						
8699.7+X	$2J+36$					100					
10510.0(7)	$\langle 63 \rangle$								100		
10601.8(7)	$\langle 65^- \rangle$								100		
9034.1+W	$2J+36$									x	
9125.8+V	$2J+40$										x
10850.5(7)	$\langle 63 \rangle$								100		
10930.3(7)	$\langle 65^- \rangle$								45(2)		

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 21

¹⁴⁹Gd₆₄

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E_f^* : $2J_f^\pi$:	8087+T $2J+32$	8073+B $2J+32$	8130+D $2J+32$	8218+Z $2J+36$	8337+C $2J+32$	8503+S $2J+32$	8595+A $2J+36$	8679+U $2J+36$	10361.9 $\langle 63 \rangle$
9289.2+T	$2J+36$		x								
10930.3(7)	$\langle 65^- \rangle$										55(2)
9342.9+B	$2J+36$			x							
9369.8+Z	$2J+40$					x					
9381+D	$2J+36$				x						
9619.4+C	$2J+36$						x				
11199.7(7)	$\langle 67 \rangle$										30(1)
9794.5+S	$2J+36$							x			
9826.0+A	$2J+40$								x		
9919.6+U	$2J+40$									x	

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 22

¹⁴⁹Gd₆₄

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E_f^* : $2J_f^\pi$:	8773+Y $2J+40$	8700+X $2J+36$	10510.0 $\langle 63 \rangle$	10601.8 $\langle 65^- \rangle$	10625.4 $\langle 47 \rangle$	9034+W $2J+36$	9126+V $2J+40$	9289+T $2J+36$	10850.5 $\langle 63 \rangle$
11011.5(7)	$\langle 65 \rangle$				68(3)						32(1)
11199.7(7)	$\langle 67 \rangle$					60(1)					
11243.2(12)	$\langle 51 \rangle$						87(16)				
9935.7+Y	$2J+44$	100									
9880.6+X	$2J+40$			100							
11711.7(7)	$\langle 67 \rangle$					100					
10337.8+V	$2J+44$								x		
10296.4+W	$2J+40$							x			
10549.2+T	$2J+40$									x	
12469.0(8)	$\langle 69^- \rangle$					100					

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 23

¹⁴⁹Gd₆₄

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E_f^* : $2J_f^\pi$:	10930.3 $\langle 65^- \rangle$	9343+B $2J+36$	11011.5 $\langle 65 \rangle$	9370+Z $2J+40$	9381+D $2J+36$	9619+C $2J+36$	11199.7 $\langle 67 \rangle$	11243.2 $\langle 51 \rangle$	9795+S $2J+36$
11199.7(7)	$\langle 67 \rangle$		11(1)								
11907.5(12)	$\langle 55 \rangle$									100	
10568.8+Z	$2J+44$					x					
10673.5+B	$2J+40$			x							
12268.3(8)	$\langle 67 \rangle$								100		
10688+D	$2J+40$						x				
12383.7(7)	$\langle 69 \rangle$				24(3)				33(3)		

(continued)

 $^{149}_{64}\text{Gd}$

E^*	$2J^\pi$	Branching ratios in percentage									
[keV]		E^*_f :	10930.3	9343+B	11011.5	9370+Z	9381+D	9619+C	11199.7	11243.2	9795+S
		$2J^\pi_f$:	$\langle 65^- \rangle$	$2J+36$	$\langle 65 \rangle$	$2J+40$	$2J+36$	$2J+36$	$\langle 67 \rangle$	$\langle 51 \rangle$	$2J+36$
10946.4+C	$2J+40$							x			
12751.9(8)	$\langle 71 \rangle$								100		
11132.5+S	$2J+40$										x
12967.1(7)	$\langle 71 \rangle$								20(1)		

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 24

 $^{149}_{64}\text{Gd}$

E^*	$2J^\pi$	Branching ratios in percentage									
[keV]		E^*_f : $2J^\pi_\text{f}$:	9826+A $2J+40$	9920+U $2J+40$	9936+Y $2J+44$	9881+X $2J+40$	11711.7 $\langle 67 \rangle$	11907.5 $\langle 55 \rangle$	10338+V $2J+44$	10296+W $2J+40$	10549+T $2J+40$
12383.7(7)	$\langle 69 \rangle$						43(2)				
12580.6(8)	$\langle 71 \rangle$						100				
12619.3(12)	$\langle 59 \rangle$							x			
11114.4+A	$2J+44$	x									
11151.2+Y	$2J+48$				100						
11218.9+U	$2J+44$			x							
11113.1+X	$2J+44$					100					
11608.3+V	$2J+48$								x		
11612.1+W	$2J+44$									x	
11867.6+T	$2J+44$										x

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 25

 $^{149}_{64}\text{Gd}$

E^*	$2J^\pi$	Branching ratios in percentage								
[keV]	E^*_f : $2J^\pi_f$:	10569+Z $2J+44$	10674+B $2J+40$	12268.3 $\langle 67 \rangle$	10688+D $2J+40$	12383.7 $\langle 69 \rangle$	10946+C $2J+40$	12580.6 $\langle 71 \rangle$	12619.3 $\langle 59 \rangle$	11114+A $2J+44$
12967.1(7)	$\langle 71 \rangle$			31(1)		35(2)				
13189.1(8)	$\langle 75 \rangle$							100		
13378.9(12)	$\langle 63 \rangle$								100	
11815.8+Z	$2J+48$	100								
12063.6+B	$2J+44$		x							
12049+D	$2J+44$				x					
12320.2+C	$2J+44$						x			
12461.2+A	$2J+48$									x

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 26

 $^{149}_{64}\text{Gd}$

E^*	$2J^\pi$	Branching ratios in percentage									
[keV]		E_f^* : $2J_f^\pi$:	12751.9 ⟨71⟩	11151+Y $2J+48$	11133+S $2J+40$	11219+U $2J+44$	11113+X $2J+44$	12967.1 ⟨71⟩	13189.1 ⟨75⟩	11608+V $2J+48$	13278.6 ⟨73⟩
12967.1(7)	⟨71⟩		14(2)								
13278.6(8)	⟨73⟩							100			
13567.2(8)	⟨75⟩										100
12420.0+Y	$2J+52$			100							
14108.6(8)	⟨77⟩								43(2)		
12399.0+X	$2J+48$						100				
12576.6+U	$2J+48$					x					
12518.6+S	$2J+44$				x						
12937.2+V	$2J+52$									x	

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 27

 $^{149}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage								
		E_f^* : $2J_f^\pi$:	11612+W $2J+44$	13378.9 ⟨63⟩	11868+T $2J+44$	11816+Z $2J+48$	13567.2 ⟨75⟩	12064+B $2J+44$	12049+D $2J+44$	12320+C $2J+44$
14108.6(8)	⟨77⟩						57(2)			
14187.0(13)	⟨67⟩			100						
12981.6+W	$2J+48$		x							
13110.1+Z	$2J+52$					100				
13243.1+T	$2J+48$				x					
13512.5+B	$2J+48$							x		
13467+D	$2J+48$								x	
13740.5+C	$2J+48$									x

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 28

 $^{149}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage								
		E_f^* : $2J_f^\pi$:	12420+Y $2J+52$	12461+A $2J+48$	14108.6 ⟨77⟩	12399+X $2J+48$	12577+U $2J+48$	12519+S $2J+44$	14187.0 ⟨67⟩	12937+V $2J+52$
15044.2(13)	⟨71⟩								100	
15163.3(9)	⟨81⟩				100					
13742.8+Y	$2J+56$		100							
13738.6+X	$2J+52$					100				
13868.4+A	$2J+52$			x						
13993.6+U	$2J+52$						x			
13948.6+S	$2J+48$							x		
14325.5+V	$2J+56$									x

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 29

¹⁴⁹Gd₆₄

E^*	$2J^\pi$	Branching ratios in percentage								
[keV]	E_f^* : $2J_f^\pi$:	12982+W $2J+48$	13110+Z $2J+52$	13243+T $2J+48$	15044.2 $\langle 71 \rangle$	13513+B $2J+48$	13467+D $2J+48$	15163.3 $\langle 81 \rangle$	13741+C $2J+48$	
15950.9(13)	$\langle 75 \rangle$				100					
15997.4(9)	$\langle 85 \rangle$							100		
14404.4+W	$2J+52$	x								
14451.6+Z	$2J+56$		100							
14683.4+T	$2J+52$			x						
14941+D	$2J+52$						x			
15020.1+B	$2J+52$					x				
15212.1+C	$2J+52$								x	

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 30

¹⁴⁹Gd₆₄

E^*	$2J^\pi$	Branching ratios in percentage								
[keV]	$E_f^*:$ $2J_f^\pi:$	13743+Y $2J+56$	13739+X $2J+52$	13868+A $2J+52$	13994+U $2J+52$	13949+S $2J+48$	14326+V $2J+56$	15950.9 $\langle 75 \rangle$	14404+W $2J+52$	
15119.6+Y	$2J+60$	100								
15133.4+X	$2J+56$		100							
16908.0(13)	$\langle 79 \rangle$							100		
15331.7+A	$2J+56$			x						
15469.4+U	$2J+56$				x					
15420.9+S	$2J+52$					x				
15772.1+V	$2J+60$						x			
15881.9+W	$2J+56$								x	

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 31

¹⁴⁹Gd₆₄

E^*	$2J^\pi$	Branching ratios in percentage								
[keV]		E_f^* : $2J_f^\pi$:	14452+Z $2J+56$	14683+T $2J+52$	15020+B $2J+52$	15120+Y $2J+60$	15212+C $2J+52$	15133+X $2J+56$	16908.0 $\langle 79 \rangle$	15332+A $2J+56$
15839.7+Z	$2J+60$		100							
16178.0+T	$2J+56$			x						
17916.7(13)	$\langle 83 \rangle$								100	
16550.5+Y	$2J+64$					100				
16586.1+B	$2J+56$				x					
16738+C	$2J+56$						x			
16584.0+X	$2J+60$							100		
16863.5+A	$2J+60$									x

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 32

 $^{149}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage							
		E_f^* : $2J_f^\pi$:	15469+U $2J+56$	15421+S $2J+52$	15772+V $2J+60$	15840+Z $2J+60$	15882+W $2J+56$	16178+T $2J+56$	17916.7 (83) $2J+64$
16934.0+S	$2J+56$			x					
17004.0+U	$2J+60$		x						
17278.1+V	$2J+64$				x				
17274.6+Z	$2J+64$					100			
18977.4(13)	(87)								100
17414.6+W	$2J+60$						x		
17731.9+T	$2J+60$							x	
18036.1+Y	$2J+68$								100

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 33

 $^{149}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage							
		E_f^* : $2J_f^\pi$:	16738+C $2J+56$	16584+X $2J+60$	16864+A $2J+60$	16934+S $2J+56$	17004+U $2J+60$	17278+V $2J+64$	17275+Z $2J+64$
18090.7+X	$2J+64$			100					
18321+C	$2J+60$		x						
18451.7+A	$2J+64$				x				
20091.1(13)	(91)								100
18483.4+S	$2J+60$					x			
18599.0+U	$2J+64$						x		
18757.1+Z	$2J+68$								100
18843.3+V	$2J+68$							x	

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 34

 $^{149}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage							
		E_f^* : $2J_f^\pi$:	17415+W $2J+60$	17732+T $2J+60$	18036+Y $2J+68$	18091+X $2J+64$	18321+C $2J+60$	20091.1 (91)	18757+Z $2J+68$
19000.4+W	$2J+64$		x						
19346.4+T	$2J+64$			x					
19576.3+Y	$2J+72$				x				
21258.4(13)	(95)							x	
19654.7+X	$2J+68$					x			
19960+C	$2J+64$						x		
20285.7+Z	$2J+72$								100
20469.3+V	$2J+72$								x

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 35

 $^{149}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage								
		E_f^* : $2J_f^\pi$:	19000+W $2J+64$	19576+Y $2J+72$	21258.4 $\langle 95 \rangle$	19655+X $2J+68$	20286+Z $2J+72$	20469+V $2J+72$	22480.3 $\langle 99 \rangle$	21171+Y $2J+76$
20641.6+W	$2J+68$		x							
22480.3(13)	$\langle 99 \rangle$				100					
21170.7+Y	$2J+76$			x						
21275.0+X	$2J+72$					x				
21860.7+Z	$2J+76$						x			
22155.3+V	$2J+76$							x		
23756.5(13)	$\langle 103 \rangle$								100	
22818.1+Y	$2J+80$									x

Energy levels and branching ratios [85Sz01, 94Si18, 04Si16]. Part 36

 $^{149}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage								
		E_f^* : $2J_f^\pi$:	23756.5 $\langle 103 \rangle$	25088.5 $\langle 107 \rangle$	26476.3 $\langle 111 \rangle$	27920.5 $\langle 115 \rangle$	29421.0 $\langle 119 \rangle$	30978.8 $\langle 123 \rangle$	32594.5 $\langle 127 \rangle$	34266.6 $\langle 131 \rangle$
25088.5(13)	$\langle 107 \rangle$		100							
26476.3(13)	$\langle 111 \rangle$			100						
27920.5(13)	$\langle 115 \rangle$				100					
29421.0(13)	$\langle 119 \rangle$					100				
30978.8(13)	$\langle 123 \rangle$						100			
32594.5(14)	$\langle 127 \rangle$							100		
34266.6(14)	$\langle 131 \rangle$								100	
35996.5(16)	$\langle 135 \rangle$									100

Energy levels and branching ratios [95De28, 91Fa07, 90By01]

 $^{150}_{64}\text{Gd}$

E^* [keV]	J^π	L (p,t)	σ (p,t) $\mu\text{b/sr}$	σ (p,t) $\mu\text{b/sr}$	$T_{1/2}$ or Γ_{cm}	Ref.
0.0	0^+	0	540	3200	$179(8) \cdot 10^4$ yr	
0+X	$J \approx \langle 30^+ \rangle$					
638.04(1)	2^+	$\langle 2 \rangle$	26	290		
1134.30(2)	3^-		8	90		
1207.14(2)	0^+	0	50	415		
1288.42(3)	4^+		2			73Fl04
815.00+X	$J+2$					
1430.47(2)	$\langle 2 \rangle^+$		<1			73Fl04
0+C	$J \approx \langle 29^+ \rangle$					
1021.1+X	$J+2$					
1518.36(2)	2^+					

(continued)

¹⁵⁰Gd
64

E^*	J^π	L	σ (p,t)	σ (p,t)	$T_{1/2}$ or	Ref.
[keV]		(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	Γ_{cm}	
0+B	$J \approx \langle 34^+ \rangle$					
0+D	$J \approx \langle 28^+ \rangle$					
0+A	$J \approx \langle 32^+ \rangle$					
0+U	$J \approx \langle 27^+ \rangle$					
0+Z	$J \approx \langle 28^- \rangle$					
0+V	$J \approx \langle 29^+ \rangle$					
1592.43(2)	1					
0+S	$J \approx \langle 31^+ \rangle$					
0+W	$J \approx \langle 28^+ \rangle$					
0+Y	$J \approx \langle 27^- \rangle$					
0+T	$J \approx \langle 33^+ \rangle$					
1699.91(3)	5^-		≤ 2			73F104
1814.13(6)	3^-					
1936.31(16)	6^+					
1947.36(3)	$2^- - 4^-$		≤ 2			73F104
1955.37(2)	2^+					
1970.0(1)						
1987.93(3)	$2^+ - 4^+$		$\langle 8 \rangle$			73F104
2080.61(9)	$\langle 2 - 4 \rangle^+$					
2083.96(3)	$2^-, 3^-$					
2091.62(3)	2^+					
2115.75(9)	6^+					
1664.10+X	$J+4$					
2157.5(7)						
2179.91(2)	2^+					
2209.54(3)	$2^-, 3^-$					
2211.11(14)	7^-					
2262.21(4)						
712.5+Z	$J+2$					
2306.2(4)	$\langle 5^-, 6^+ \rangle$					
815.1+C	$J+2$					
733.20+V	$J+2$					
2326.28(2)						
688.1+Y	$J+2$					
771.5+U	$J+2$					
711.1+W	$J+2$					
2364.91(5)	$1, 2^+$					
808.9+D	$J+2$					
830.0+B	$J+2$					
804.0+A	$J+2$					
2392.06(17)	$\langle 7 \rangle^+$					
2408.53(5)	2^+					
2416.7(5)						
800.4+S	$J+2$					
1931.3+X	$J+4$					

(continued)

¹⁵⁰₆₄Gd

E^*	J^π	L	σ (p,t)	σ (p,t)	$T_{1/2}$ or	Ref.
[keV]		(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	Γ_{cm}	
2426.20(3)	$1^-, 2^+$					
2434.34(9)						
827.6+T	$J+2$					
2521.56(7)	$\langle 2^+, 4^+ \rangle$					
2554.14(12)	8^+					
2558.51(20)	$1, 2^+$					
2564.96(13)	$\langle 1^-, 3^- \rangle$					
2593.9(7)						
2627.99(8)						
2156.6+X	$J+4$					
2654.39(7)						
2678.45(13)	$1, 2^+$					
2686.84(4)	$1^-, 2, 3^-$					
2754.58(6)	$2^+, 3, 4^+$					
2767.3(6)	$\langle 8^+ \rangle$					
2786.49(5)	$1^-, 2^+$					
2816.1(4)	9^-					
2827.81(7)						
2845.41(5)	$1, 2^+$					
2868.27(10)						
2906.0(5)	8^+					
1287.6+Y	$J+2$					
2956.20(5)						
2984.95(11)	$1, 2^+$					
3024.7(3)						
3035.64(5)	$1^-, 2^+$					
3042.61(24)						
2552.00+X	$J+6$					
1473.7+Z	$J+4$					
1423.8+Y	$J+4$					
3083.76(17)						
1511.4+V	$J+4$					
1469.4+W	$J+4$					
3118.75(8)						
3134.13(6)						
1588.6+U	$J+4$					
1664.1+C	$J+4$					
3176.8(5)						
3177.732(17)						
3220.3(4)	10^-					
1655.6+A	$J+4$					
1667.4+D	$J+4$					
1706.5+B	$J+4$					
3251.5(5)						
1650.3+S	$J+4$					

(continued)

¹⁵⁰Gd
64

E^*	J^π	L	σ (p,t)	σ (p,t)	$T_{1/2}$ or	Ref.
[keV]		(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	Γ_{cm}	
3269.32(11)						
3288.2(4)	10 ⁺					
3298.34(22)						
3329.33(16)						
3344.68(6)	$\langle 2^+ \rangle$					
1702.9+T	$J+4$					
3366.4(4)	11 ⁻					
3375.72(14)						
3378.11(11)						
3389.2(5)						
2897.4+X	$J+6$					
3461.7(5)	2 ⁺					
3012.6+X	$J+6$					
3510.72(17)	$\langle 1^-, 2^+ \rangle$					
3522.4(6)						
3631.4(3)						
3657.35(19)	2 ⁺					
2015.5+Y	$J+4$					
3712.40(22)						
3726.63(15)						
3772.03(19)						
3828.4(4)	$\langle 1, 2^+ \rangle$					
3840.04(17)						
2208.9+Y	$J+6$					
2284.2+Z	$J+6$					
2275.8+W	$J+6$					
2341.2+V	$J+6$					
3963.64(23)						
3480.90+X	$J+8$					
2451.5+U	$J+6$					
4021.2(4)	$\langle 1, 2^+ \rangle$					
2553.1+C	$J+6$					
4105.4(10)	12 ⁺					
4111.07(25)	1 ⁻ , 2 ⁺					
2555.8+A	$J+6$					
4131.1(5)	13 ⁻					
2577.0+D	$J+6$					
4143.8(3)	$\langle 1^-, 2^+ \rangle$					
4151.0(4)						
4164.0(4)	2 ⁺					
2629.1+B	$J+6$					
2552.7+S	$J+6$					
4178.6(5)						
4186.9(5)	$\langle 12^- \rangle$					
4206.9(3)	$\langle 1, 2^+ \rangle$					

(continued)

¹⁵⁰Gd
64

E^*	J^π	L	σ (p,t)	σ (p,t)	$T_{1/2}$ or	Ref.
[keV]		(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	Γ_{cm}	
4235.2(6)	$\langle 1^-, 2^+ \rangle$					
4246.2(3)	$\langle 1, 2^+ \rangle$					
4258.0(3)	$\langle 1^-, 2^+ \rangle$					
4264.6(3)	2^+					
2627.2+T	$J+6$					
4283.1(10)	$\langle 1, 2^+ \rangle$					
4289.4(3)	$\langle 1, 2^+ \rangle$					
4296.7(10)						
4303.2(3)						
4314.0(3)	$1, 2^+$					
4322.0(3)	2^+					
4343.9(4)	$\langle 1, 2^+ \rangle$					
4378.6(6)	$\langle 1^+, 2^+ \rangle$					
3893.0+X	$J+8$					
4405.3(3)	$\langle 1, 2^+ \rangle$					
2787.0+Y	$J+6$					
4435.2(6)						
4445.9(3)	$1, 2^+$					
3960.6+X	$J+8$					
4462.3(8)						
4492.8(7)						
4499.8(8)						
4522.8(6)						
4529.4(4)	$\langle 1, 2^+ \rangle$					
4545.6(6)						
4557.2(10)						
4563.3(10)						
3043.3+Y	$J+8$					
3144.2+Z	$J+8$					
4739.6(11)	14^+					
4744.9(3)						
3131.3+W	$J+8$					
3221.1+V	$J+8$					
4834.9(10)	15^-					
3430.8+C	$J+8$					
3359.9+U	$J+8$					
4451.79+X	$J+10$					
3433.3+D	$J+8$					
3507.0+A	$J+8$					
3507.9+S	$J+8$					
3599.1+B	$J+8$					
3601.3+Y	$J+8$					
3601.5+T	$J+8$					
4861.7+X	$J+10$					
5428.8(11)	16^+					

(continued)

¹⁵⁰Gd
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E^*	J^π	L	σ (p,t)	σ (p,t)	$T_{1/2}$ or	Ref.
[keV]		(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	Γ_{cm}	
5450.9(13)	17^-					
3928.6+Y	$J+10$					
5632.8(14)	17^+					
4054.7+Z	$J+10$					
4036.7+W	$J+10$					
4151.2+V	$J+10$					
5764.8(13)	18^+					
4353.5+C	$J+10$					
4313.1+U	$J+10$					
4334.0+D	$J+10$					
5465.28+X	$J+12$					
4508.5+A	$J+10$					
4458.6+Y	$J+10$					
4518.1+S	$J+10$					
4615.7+B	$J+10$					
4626.6+T	$J+10$					
6311.8(16)	$\langle 19^- \rangle$					
5860.7+X	$J+12$					
6450.8(16)	$\langle 20^+ \rangle$					
6495.8(19)	$\langle 21^- \rangle$					
4865.1+Y	$J+12$					
5017.2+Z	$J+12$					
4993.1+W	$J+12$					
5132.6+V	$J+12$					
5322.9+C	$J+12$					
5279.6+D	$J+12$					
5311.3+U	$J+12$					
5359.3+Y	$J+12$					
6521.8+X	$J+14$					
5562.2+A	$J+12$					
5584.2+S	$J+12$					
5680.0+B	$J+12$					
7275.8(22)	$\langle 23^- \rangle$					
5703.4+T	$J+12$					
6907.6+X	$J+14$					
5853.7+Y	$J+14$					
6032.1+Z	$J+14$					
6001.3+W	$J+14$					
6166.5+V	$J+14$					
6271.1+D	$J+14$					
6338.5+C	$J+14$					
6353.7+U	$J+14$					
7929.8(24)	$\langle 25^- \rangle$					
6304.6+Y	$J+14$					
7621.8+X	$J+16$					

(continued)

¹⁵⁰Gd
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E^*	J^π	L	σ (p,t)	σ (p,t)	$T_{1/2}$ or	Ref.
[keV]		(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	Γ_{cm}	
6660.4+A	$J+14$					
6706.4+S	$J+14$					
8325(3)	$\langle 27^- \rangle$					
6792.0+B	$J+14$					
6832.3+T	$J+14$					
8005.2+X	$J+16$					
6894.6+Y	$J+16$					
7100.3+Z	$J+16$					
7062.1+W	$J+16$					
7253.5+V	$J+16$					
7311.5+D	$J+16$					
7403.9+C	$J+16$					
7295.2+Y	$J+16$					
7441.4+U	$J+16$					
8766.4+X	$J+18$					
7822.2+A	$J+16$					
9410(3)	$\langle 28^+ \rangle$					
7952.0+B	$J+16$					
9497(3)	$\langle 29^- \rangle$					
7886.2+S	$J+16$					
9582(3)	$\langle 29^+ \rangle$					
7989.9+Y	$J+18$					
9154.0+X	$J+18$					
8014.8+T	$J+16$					
8222.7+Z	$J+18$					
8176.0+W	$J+18$					
9851(3)	$\langle 30^+ \rangle$					
8404.3+D	$J+18$					
8331.9+Y	$J+18$					
8394.9+V	$J+18$					
8516.3+C	$J+18$					
8574.4+U	$J+18$					
9956.9+X	$J+20$					
10532(3)	$\langle 31^+ \rangle$					
9034.6+A	$J+18$					
9159.7+B	$J+18$					
9124.2+S	$J+18$					
9139.2+Y	$J+20$					
10354.0+X	$J+20$					
9250.8+T	$J+18$					
9399.8+Z	$J+20$					
9344.4+W	$J+20$					
9415.2+Y	$J+20$					
9544.6+D	$J+20$					
9682.2+C	$J+20$					

(continued)

¹⁵⁰₆₄Gd

E^*	J^π	L	σ (p,t)	σ (p,t)	$T_{1/2}$ or	Ref.
[keV]		(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	Γ_{cm}	
9590.4+V	$J+20$					
11231(4)	$\langle 33^+ \rangle$					
9753.9+U	$J+20$					
11194.8+X	$J+22$					
10300.5+A	$J+20$					
10414.1+B	$J+20$					
10343.1+Y	$J+22$					
10420.8+S	$J+20$					
11604.9+X	$J+22$					
12185(4)	$\langle 34^- \rangle$					
10546.6+Y	$J+22$					
10540.9+T	$J+20$					
10567.0+W	$J+22$					
10632.1+Z	$J+22$					
10736.6+D	$J+22$					
10901.0+C	$J+22$					
10841.4+V	$J+22$					
10980.9+U	$J+22$					
12678(4)	$\langle 36^-, 34^+ \rangle$					
12481.4+X	$J+24$					
11621.0+A	$J+22$					
11602.4+Y	$J+24$					
11716.8+B	$J+22$					
11725.9+Y	$J+24$					
11776.5+S	$J+22$					
12906.1+X	$J+24$					
11845.0+W	$J+24$					
11919.8+Z	$J+24$					
11981.5+D	$J+24$					
11885.9+T	$J+22$					
12172.4+C	$J+24$					
12147.9+V	$J+24$					
12256.0+U	$J+24$					
13818.0+X	$J+26$					
12916.1+Y	$J+26$					
12996.6+A	$J+24$					
12955.8+Y	$J+26$					
13068.5+B	$J+24$					
14257.7+X	$J+26$					
13191.5+S	$J+24$					
13178.7+W	$J+26$					
13280.5+D	$J+26$					
13263.6+Z	$J+26$					
13286.0+T	$J+24$					
13499.3+C	$J+26$					

(continued)

¹⁵⁰₆₄Gd

E^*	J^π	L	σ (p,t)	σ (p,t)	$T_{1/2}$ or	Ref.
[keV]		(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	Γ_{cm}	
13510.5+V	$J+26$					
13581.2+U	$J+26$					
15205.8+X	$J+28$					
14229.1+Y	$J+28$					
14293.5+Y	$J+28$					
14427.3+A	$J+26$					
14468.6+B	$J+26$					
15658.7+X	$J+28$					
14635.3+D	$J+28$					
14568.9+W	$J+28$					
14664.1+Z	$J+28$					
14665.5+S	$J+26$					
14881.7+C	$J+28$					
14741.9+T	$J+26$					
14929.5+V	$J+28$					
14956.3+U	$J+28$					
16645.9+X	$J+30$					
15557.7+Y	$J+30$					
15721.8+Y	$J+30$					
15917.5+B	$J+28$					
15912.7+A	$J+28$					
17109.1+X	$J+30$					
16047+D	$J+30$					
16015.7+W	$J+30$					
16121.2+Z	$J+30$					
16320.1+C	$J+30$					
16199.5+S	$J+28$					
16253.7+T	$J+28$					
16382.4+U	$J+30$					
16404.8+V	$J+30$					
16936.3+Y	$J+32$					
18139.1+X	$J+32$					
17208.2+Y	$J+32$					
17412.5+B	$J+30$					
17451.6+A	$J+30$					
17515+D	$J+32$					
18608.2+X	$J+32$					
17519.6+W	$J+32$					
17635.1+Z	$J+32$					
17816.2+C	$J+32$					
17793.6+S	$J+30$					
17862.5+U	$J+32$					
17821.0+T	$J+30$					
17937.1+V	$J+32$					
18366.7+Y	$J+34$					

(continued)

¹⁵⁰₆₄Gd

<i>E</i> [*]	<i>J</i> ^π	<i>L</i>	σ (p,t)	σ (p,t)	<i>T</i> _{1/2} or	Ref.
[keV]		(p,t)	μb/sr	μb/sr	Γ _{cm}	
19686.1+X	<i>J</i> +34					
18751.4+Y	<i>J</i> +34					
19046+D	<i>J</i> +34					
20155.8+X	<i>J</i> +34					
19080.3+W	<i>J</i> +34					
19204.2+Z	<i>J</i> +34					
19373+C	<i>J</i> +34					
19379.2+U	<i>J</i> +34					
19446.1+S	<i>J</i> +32					
19527.0+V	<i>J</i> +34					
19848.9+Y	<i>J</i> +36					
21287.8+X	<i>J</i> +36					
20351.6+Y	<i>J</i> +36					
20638+D	<i>J</i> +36					
21751.8+X	<i>J</i> +36					
20698.2+W	<i>J</i> +36					
20915.2+U	<i>J</i> +36					
21171.8+V	<i>J</i> +36					
21384.3+Y	<i>J</i> +38					
22010.0+Y	<i>J</i> +38					
23397.3+X	<i>J</i> +38					
22505.2+U	<i>J</i> +38					
22972.1+Y	<i>J</i> +40					
			73F104	73F104		Ref.

Additional data on this isotope can be found in [91Fa07, 76Ba18].
The second value σ (p,t) is the linear sum of the differential cross section from 5 to 70°.
Identical superdeformed bands were observed in ¹⁵⁰Gd and ¹⁵¹Tb [90By01].

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 2

¹⁵⁰₆₄Gd

<i>E</i> [*]	<i>J</i> ^π	Branching ratios in percentage				
[keV]		<i>E</i> _f [*] :	0.0	0+X	638	1134
		<i>J</i> _f ^π :	0 ⁺		2 ⁺	3 [−]
638.04(1)	2 ⁺		100			
1134.30(2)	3 [−]				100	
1207.14(2)	0 ⁺		x		100	
1288.42(3)	4 ⁺				98	1.8(4)
815.00+X	<i>J</i> +2			100		
1430.47(2)	⟨2⟩ ⁺		36(3)		64	
1518.36(2)	2 ⁺		45.0		49(2)	6.4
1592.43(2)	1		61(1)		37(2)	
1699.91(3)	5 [−]				8(2)	52

(continued)

¹⁵⁰Gd
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E^* [keV]	J^π	$E_f^*:$ $J_f^\pi:$	Branching ratios in percentage				
			0.0 0 ⁺	0+X	638 2 ⁺	1134 3 ⁻	1207 0 ⁺
1814.13(6)	3 ⁻				74(4)		
1947.36(3)	2 ⁻ -4 ⁻					100	
1955.37(2)	2 ⁺		2.6(6)		11(1)	36(2)	12.3
1970.0(1)					42(17)		
1987.93(3)	2 ⁺ -4 ⁺				63		
2080.61(9)	⟨2-4⟩ ⁺				<51	15(4)	
2083.96(3)	2 ⁻ ,3 ⁻				31(3)	60(3)	
2091.62(3)	2 ⁺		26(1)		54(3)	10.6(6)	3.1(2)
2157.5(7)					96	4	
2179.91(2)	2 ⁺		17.6(9)		21.1(1)	53(3)	
2209.54(3)	2 ⁻ ,3 ⁻				12(2)	60(3)	
2262.21(4)					50(3)	32(2)	
2326.28(2)					41(4)		
2364.91(5)	1,2 ⁺		62(3)		15(2)	1.1	9.9(8)
2408.53(5)	2 ⁺				53(3)	24(2)	
2416.7(5)					100		
2426.20(3)	1 ⁻ ,2 ⁺		24(1)		38(2)	33(2)	
2434.34(9)					78(8)		
2521.56(7)	⟨2 ⁺ -4 ⁺ ⟩				38(3)	8(5)	
2558.51(20)	1,2 ⁺		86(9)				14.29
2564.96(13)	⟨1 ⁻ -3 ⁻ ⟩		14(4)		28(4)	25(3)	
2593.9(7)						67	33(5)
2627.99(8)					27(12)	56(7)	
2654.39(7)					80(4)		
2678.45(13)	1,2 ⁺		21(3)		51(4)	16(8)	
2686.84(4)	1 ⁻ ,2,3 ⁻					8(4)	
2754.58(6)	2 ⁺ ,3,4 ⁺		14(4)		56(3)	18(3)	
2786.49(5)	1 ⁻ ,2 ⁺				67(3)	9.0(13)	
2845.41(5)	1,2 ⁺		11(2)		59(3)		8.4(13)
2868.27(10)						47(9)	
2956.20(5)					29(1)	5(2)	
2984.95(11)	1,2 ⁺		40(2)		15(2)		11.12
3024.7(3)			50(8)				
3035.64(5)	1 ⁻ ,2 ⁺		15(1)		29(1)	28(1)	
3042.61(24)			67(6)			33(13)	
3083.76(17)					24(8)	48(5)	10(5)
3118.75(8)						35(6)	
3134.13(6)			21(3)		36(7)		
3177.732(17)					63(3)	9(6)	
3251.5(5)			17(6)		37(2)		
3298.34(22)					54(7)		
3329.33(16)					24(4)	54(4)	
3344.68(6)	⟨2 ⁺ ⟩		3.3(4)		21(1)	8.20	
3375.72(14)			8(3)		55(10)	29(4)	
3378.11(11)					60(10)		

(continued)

¹⁵⁰Gd
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E^* [keV]	J^π	$E_f^*:$ $J_f^\pi:$	Branching ratios in percentage				
			0.0 0 ⁺	0+X	638 2 ⁺	1134 3 ⁻	1207 0 ⁺
3389.2(5)			62(8)		38(3)		
3510.72(17)	$\langle 1^-, 2^+ \rangle$				49(6)	42(4)	
3522.4(6)			100				
3631.4(3)					36(8)	14.32	
3657.35(19)	2 ⁺		50(3)				22(12)
3712.40(22)						47(2)	
3726.63(15)						52(4)	
3772.03(19)					67	33(2)	
3828.4(4)	$\langle 1, 2^+ \rangle$		25(5)				75(30)
3840.04(17)					15(3)		
3963.64(23)					29(3)	14(7)	
4021.2(4)	$\langle 1, 2^+ \rangle$		0.70(7)		99(50)		
4111.07(25)	1 ⁻ , 2 ⁺		60(8)			24(8)	
4143.8(3)	$\langle 1^-, 2^+ \rangle$		40(5)			60(10)	
4151.0(4)			29(6)		71(29)		
4164.0(4)	2 ⁺		10.0(17)		17(7)		
4178.6(5)			44(9)				56(39)
4206.9(3)	$\langle 1, 2^+ \rangle$		66(4)		34(5)		
4235.2(6)	$\langle 1^-, 2^+ \rangle$		100				
4246.2(3)	$\langle 1, 2^+ \rangle$		70(4)		30(8)		
4258.0(3)	$\langle 1^-, 2^+ \rangle$		12(4)			88(12)	
4264.6(3)	2 ⁺		100				
4283.1(10)	$\langle 1, 2^+ \rangle$		100				
4289.4(3)	$\langle 1, 2^+ \rangle$		100				
4296.7(10)			100				
4303.2(3)			7(3)				93(10)
4314.0(3)	1, 2 ⁺		41(4)		59(14)		
4322.0(3)	2 ⁺		61(4)		39(7)		
4343.9(4)	$\langle 1, 2^+ \rangle$		9(3)				
4378.6(6)	$\langle 1^+, 2^+ \rangle$		100				
4405.3(3)	$\langle 1, 2^+ \rangle$		59(4)		41(2)		
4435.2(6)			16(8)		84(34)		
4445.9(3)	1, 2 ⁺		62(3)				38(4)
4462.3(8)			100				
4492.8(7)			11(8)		89(45)		
4499.8(8)			100				
4522.8(6)					100		
4529.4(4)	$\langle 1, 2^+ \rangle$		8.3(18)				
4545.6(6)					100		
4557.2(10)			100				
4563.3(10)			100				

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 3

¹⁵⁰Gd
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E^*	J^π	Branching ratios in percentage										
[keV]		$E_f^*:$ $J_f^\pi:$	1288 4 ⁺	815+X $J+2$	1430 $\langle 2 \rangle^+$	0+C	1021+X $J+2$	1518 2 ⁺	0+B	0+D	0+A	0+U
1699.91(3)	5 [−]		40(2)									
1814.13(6)	3 [−]		26.04									
1936.31(16)	6 ⁺		97(25)									
1955.37(2)	2 ⁺				14			24(1)				
1970.0(1)					21(11)			2				
1987.93(3)	2 ⁺ −4 ⁺		14.00		23.0(10)							
2080.61(9)	$\langle 2-4 \rangle^+$		38		38			8.9				
2083.96(3)	2 [−] , 3 [−]							7.86				
2091.62(3)	2 ⁺		0.50		0.80			5.1				
2115.75(9)	6 ⁺		79(11)									
1664.10+X	$J+4$			100								
2179.91(2)	2 ⁺				2.1			2.4				
2209.54(3)	2 [−] , 3 [−]				28(3)							
2262.21(4)					7.28			10.39				
2306.2(4)	$\langle 5^-, 6^+ \rangle$		12(2)									
815.1+C	$J+2$					x						
2326.28(2)			6(2)		20(2)			8(2)				
771.5+U	$J+2$											x
2364.91(5)	1, 2 ⁺							1.9(12)				
808.9+D	$J+2$									100		
830.0+B	$J+2$								100			
804.0+A	$J+2$										x	
2408.53(5)	2 ⁺		9(4)		10.9(13)							
1931.3+X	$J+4$						100					
2426.20(3)	1 [−] , 2 ⁺				4.0(7)			0.7(5)				
2434.34(9)					7.303			15(5)				
2521.56(7)	$\langle 2^+ - 4^+ \rangle$		20(3)		17.98			9.99				
2564.96(13)	$\langle 1^- - 3^- \rangle$				25.40							
2654.39(7)					4.3(17)							
2678.45(13)	1, 2 ⁺				8(2)							
2686.84(4)	1 [−] , 2, 3 [−]				5(2)			39(3)				
2754.58(6)	2 ⁺ , 3, 4 ⁺		3(4)									
2786.49(5)	1 [−] , 2 ⁺				10.2(13)			2.869				
2845.41(5)	1, 2 ⁺				16.2(10)			4.2(10)				
2868.27(10)			53(11)									
2956.20(5)					29(1)							
2984.95(11)	1, 2 ⁺				15(4)			4(3)				
3024.7(3)					50							
3035.64(5)	1 [−] , 2 ⁺		8.66		6(1)			2.89				
3083.76(17)					10(5)							
3118.75(8)			14(6)		24(8)			27(5)				
3134.13(6)					11(4)			21(4)				
3177.732(17)					7.92			9(3)				
3298.34(22)			23(9)									
3329.33(16)								13(4)				

(continued)

¹⁵⁰Gd
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E^* [keV]	J^π	Branching ratios in percentage										
		$E_f^*:$ $J_f^\pi:$	1288 4 ⁺	815+X $J+2$	1430 $\langle 2 \rangle^+$	0+C	1021+X $J+2$	1518 2 ⁺	0+B	0+D	0+A	0+U
3344.68(6)	$\langle 2^+ \rangle$		5(1)		24(3)			6(2)				
3378.11(11)					10.00							
3461.7(5)	2 ⁺		96(29)					4				
3631.4(3)					50(20)							
3726.63(15)					3(3)							
3840.04(17)					73(4)							
3963.64(23)					44(13)							
4111.07(25)	1 ⁻ , 2 ⁺		16(8)									
4164.0(4)	2 ⁺		73(17)									
4343.9(4)	$\langle 1, 2^+ \rangle$				91(18)							
4744.9(3)					22(6)							

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 4

¹⁵⁰Gd
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E^* [keV]	J^π	Branching ratios in percentage										
		$E_f^*:$ $J_f^\pi:$	0+Z	0+V	1592 1	0+S	0+W	0+Y	0+T	1700 5 ⁻	1814 3 ⁻	1936 6 ⁺
1936.31(16)	6 ⁺									≈3		
1970.0(1)					35(11)							
2083.96(3)	2 ⁻ , 3 ⁻				1.4(14)							
2115.75(9)	6 ⁺									20(9)		≈1.0
2179.91(2)	2 ⁺				1.5							
2211.11(14)	7 ⁻									91(15)		7(3)
712.5+Z	$J+2$		100									
2306.2(4)	$\langle 5^-, 6^+ \rangle$									88(9)		
733.20+V	$J+2$			x								
2326.28(2)										10(2)		
688.1+Y	$J+2$							100				
711.1+W	$J+2$						x					
2364.91(5)	1, 2 ⁺				10.6(12)							
2392.06(17)	$\langle 7 \rangle^+$											x
800.4+S	$J+2$					100						
827.6+T	$J+2$								100			
2564.96(13)	$\langle 1^-, 3^- \rangle$				8(4)							
2627.99(8)					17(7)							
2678.45(13)	1, 2 ⁺										3.7	
2686.84(4)	1 ⁻ , 2, 3 ⁻				20.5					3(2)		
2767.3(6)	$\langle 8^+ \rangle$											100
2786.49(5)	1 ⁻ , 2 ⁺				5(1)							
2956.20(5)					5(1)							
2984.95(11)	1, 2 ⁺				7(2)							
3035.64(5)	1 ⁻ , 2 ⁺				>11.6							

(continued)

¹⁵⁰Gd₆₄

E^*	J^π	Branching ratios in percentage										
[keV]		$E_{\rm f}^*:$ $J_{\rm f}^\pi:$	0+Z	0+V	1592 1	0+S	0+W	0+Y	0+T	1700 5 ⁻	1814 3 ⁻	1936 6 ⁺
3134.13(6)					10(6)							
3177.732(17)					6(3)							
3251.5(5)					46(9)							
3329.33(16)					9(5)							
3344.68(6)	$\langle 2^+ \rangle$				8(1)					5(1)	3(1)	
3378.11(11)											30(4)	
3510.72(17)	$\langle 1^-, 2^+ \rangle$				8.84							
3963.64(23)					12.20							
4529.4(4)	$\langle 1, 2^+ \rangle$				92(18)							
4744.9(3)					78(12)							

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 5

¹⁵⁰Gd₆₄

E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	1947	1955 2 ⁺	1988	2081	2084 2 ⁻ ,3 ⁻	2092 2 ⁺	2116 6 ⁺	1664+X $J+4$	2180 2 ⁺	2209 2 ⁻ ,3 ⁻
2179.91(2)	2 ⁺			2.1(6)								
2211.11(14)	7 ⁻								1.8(4)			
2326.28(2)					15(2)							
2392.06(17)	$\langle 7 \rangle^+$								x			
2408.53(5)	2 ⁺					3(2)						
2521.56(7)	$\langle 2^+ - 4^+ \rangle$	5.99										
2554.14(12)	8 ⁺								58(26)			
2654.39(7)				10.21	5.4(17)							
2686.84(4)	1 ⁻ ,2,3 ⁻	3(2)					15(2)					
2786.49(5)	1 ⁻ ,2 ⁺	2.9(9)		2.8								
2827.81(7)				x			100					
2845.41(5)	1,2 ⁺							0.9(6)				
2906.0(5)	8 ⁺								100			
2956.20(5)		6(2)	8(2)	9(2)		3(1)	3.70					3.70
2984.95(11)	1,2 ⁺			8(2)								
3035.64(5)	1 ⁻ ,2 ⁺						8.66					2.0(3)
2552.00+X	$J+6$									100		
3083.76(17)				10(7)								
3177.732(17)							6.34					
3269.32(11)											100	
3298.34(22)		22.69										
3344.68(6)	$\langle 2^+ \rangle$			7(2)			2(1)	5(1)				
3657.35(19)	2 ⁺				28(8)							
3712.40(22)						53(21)						
3726.63(15)												44.53
3840.04(17)					12.02							

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 6

¹⁵⁰Gd₆₄

E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	2211 7 ⁻	2262	713+Z $J+2$	815+C $J+2$	733+V $J+2$	2326	688+Y $J+2$	771+U $J+2$	711+W $J+2$	2365 1,2 ⁺
2306.2(4)	$\langle 5^-, 6^+ \rangle$	x										
2392.06(17)	$\langle 7 \rangle^+$	x										
2554.14(12)	8 ⁺	34(11)										
2686.84(4)	1 ⁻ , 2, 3 ⁻											6(2)
2754.58(6)	2 ⁺ , 3, 4 ⁺			8.74								
2816.1(4)	9 ⁻	100										
1473.7+Z	$J+4$				100							
1423.8+Y	$J+4$								100			
1511.4+V	$J+4$						x					
1469.4+W	$J+4$										x	
1588.6+U	$J+4$									100		
1664.1+C	$J+4$					x						
3375.72(14)									9(5)			

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 7

¹⁵⁰Gd₆₄

E^*	J^π	Branching ratios in percentage										
		E_f^* :	808.9+D	830.0+B	804.0+A	2392.1	2408.5	800.4+S	1931+X	827.6+T	2554.1	2157+X
[keV]		J_f^π :	$J+2$	$J+2$	$J+2$	$\langle 7 \rangle^+$	2^+	$J+2$	$J+4$	$J+2$	8^+	$J+4$
2554.14(12)	8^+					8(2)						
3176.8(5)											100	
1655.6+A	$J+4$				100							
1667.4+D	$J+4$	x										
1706.5+B	$J+4$			100								
1650.3+S	$J+4$							100				
3288.2(4)	10^+										100	
3344.68(6)	$\langle 2^+ \rangle$						2(1)					
1702.9+T	$J+4$									100		
2897.4+X	$J+6$								100			
3012.6+X	$J+6$											x

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 8

¹⁵⁰Gd₆₄

E^*	J^π	Branching ratios in percentage										
		E_f^* :	2816.1	1288+Y	2552+X	1474+Z	1424+Y	1511+V	1469+W	1589+U	1664+C	3220.3
[keV]		J_f^π :	9 ⁻	$J+2$	$J+6$	$J+4$	$J+4$	$J+4$	$J+4$	$J+4$	$J+4$	10 ⁻
3220.3(4)	10 ⁻		100									
3366.4(4)	11 ⁻		x									x
2015.5+Y	$J+4$			100								

(continued)

 $^{150}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage										
[keV]		E^*_f : J^π_f :	2816.1 9 [−]	1288+Y $J+2$	2552+X $J+6$	1474+Z $J+4$	1424+Y $J+4$	1511+V $J+4$	1469+W $J+4$	1589+U $J+4$	1664+C $J+4$	3220.3 10 [−]
2208.9+Y	$J+6$						100					
2284.2+Z	$J+6$				100							
2275.8+W	$J+6$								100			
2341.2+V	$J+6$							100				
3480.90+X	$J+8$			100								
2451.5+U	$J+6$									100		
2553.1+C	$J+6$										x	
4186.9(5)	$\langle 12^- \rangle$											100

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 9

 $^{150}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage									
		E^*_f : J^π_f :	1656+A $J+4$	1667+D $J+4$	1707+B $J+4$	1650+S $J+4$	3288.2 10 ⁺	1703+T $J+4$	3366.4 11 ⁻	2897+X $J+6$	3013+X $J+6$
3366.4(4)	11 ⁻						x				
4105.4(10)	12 ⁺						100				
2555.8+A	$J+6$	100									
4131.1(5)	13 ⁻								100		
2577.0+D	$J+6$			x							
2629.1+B	$J+6$				100						
2552.7+S	$J+6$					100					
2627.2+T	$J+6$							100			
3893.0+X	$J+8$									100	
3960.6+X	$J+8$										x

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 10

 $^{150}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage									
		E^*_f : J^π_f :	2016+Y $J+4$	2209+Y $J+6$	2284+Z $J+6$	2276+W $J+6$	2341+V $J+6$	3481+X $J+8$	2452+U $J+6$	2553+C $J+6$	4105.4 12 ⁺
2787.0+Y	$J+6$	100									
3043.3+Y	$J+8$			100							
3144.2+Z	$J+8$				100						
4739.6(11)	14 ⁺										100
3131.3+W	$J+8$					100					
3221.1+V	$J+8$						100				
3430.8+C	$J+8$									100	
3359.9+U	$J+8$								100		

(continued)

 $^{150}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage									
		$E^*_\text{f}:$	2016+Y	2209+Y	2284+Z	2276+W	2341+V	3481+X	2452+U	2553+C	4105.4
[keV]		$J^\pi_\text{f}:$	$J+4$	$J+6$	$J+6$	$J+6$	$J+6$	$J+8$	$J+6$	$J+6$	12^+
4451.79+X	$J+10$							100			
4861.7+X	$J+10$							≈ 8			

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 11

 $^{150}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage									
[keV]		E^*_f : J^π_f :	2556+A $J+6$	4131.1 13^-	2577+D $J+6$	2629+B $J+6$	2553+S $J+6$	2627+T $J+6$	3893+X $J+8$	2787+Y $J+6$	3961+X $J+8$
4834.9(10)	15^-			100							
3433.3+D	$J+8$				100						
3507.0+A	$J+8$		100								
3507.9+S	$J+8$						100				
3599.1+B	$J+8$				100						
3601.3+Y	$J+8$									100	
3601.5+T	$J+8$							100			
4861.7+X	$J+10$								92(5)		x

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 12

 $^{150}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage									
[keV]		E^*_f : J^π_f :	3043+Y	3144+Z	4739.6	3131+W	3221+V	4834.9	3431+C	3360+U	4452+X
			$J+8$	$J+8$	14^+	$J+8$	$J+8$	15^-	$J+8$	$J+8$	$J+10$
5428.8(11)	16^+				x			x			
5450.9(13)	17^-							100			
3928.6+Y	$J+10$		100								
4054.7+Z	$J+10$			100							
4036.7+W	$J+10$					100					
4151.2+V	$J+10$						100				
4353.5+C	$J+10$								100		
4313.1+U	$J+10$									100	
5465.28+X	$J+12$										100
5860.7+X	$J+12$										≈ 5.5

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 13

¹⁵⁰Gd₆₄

E^*	J^π	Branching ratios in percentage									
[keV]		E_f^* : J_f^π :	3433+D $J+8$	3507+A $J+8$	3508+S $J+8$	3599+B $J+8$	3601+Y $J+8$	3602+T $J+8$	4862+X $J+10$	5428.8 16 ⁺	5450.9 17 ⁻
5632.8(14)	17 ⁺									100	
5764.8(13)	18 ⁺									x	x
4334.0+D	$J+10$		100								
4508.5+A	$J+10$			100							
4458.6+Y	$J+10$						100				
4518.1+S	$J+10$				100						
4615.7+B	$J+10$					100					
4626.6+T	$J+10$							100			
5860.7+X	$J+12$								95(3)		

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 14

¹⁵⁰Gd₆₄

E^*	J^π	Branching ratios in percentage									
[keV]		E^*_f : J^π_f :	3929+Y $J+10$	5632.8 17^+	4055+Z $J+10$	4037+W $J+10$	4151+V $J+10$	5764.8 18^+	4354+C $J+10$	4313+U $J+10$	4334+D $J+10$
5764.8(13)	18^+			x							
6311.8(16)	$\langle 19^- \rangle$							100			
6450.8(16)	$\langle 20^+ \rangle$							100			
4865.1+Y	$J+12$		100								
5017.2+Z	$J+12$				100						
4993.1+W	$J+12$					100					
5132.6+V	$J+12$						100				
5322.9+C	$J+12$								100		
5279.6+D	$J+12$										100
5311.3+U	$J+12$									100	

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 15

¹⁵⁰Gd₆₄

E^*	J^π	Branching ratios in percentage									
[keV]		E_f^* : J_f^π :	5465+X $J+12$	4509+A $J+10$	4459+Y $J+10$	4518+S $J+10$	4616+B $J+10$	4627+T $J+10$	6311.8 $\langle 19^- \rangle$	5861+X $J+12$	6495.8 $\langle 21^- \rangle$
6495.8(19)	$\langle 21^- \rangle$								100		
5359.3+Y	$J+12$				100						
6521.8+X	$J+14$		100								
5562.2+A	$J+12$			100							
5584.2+S	$J+12$					100					
5680.0+B	$J+12$						100				
7275.8(22)	$\langle 23^- \rangle$										100

(continued)

 $^{150}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage									
[keV]		E^*_f :	5465+X	4509+A	4459+Y	4518+S	4616+B	4627+T	6311.8	5861+X	6495.8
		J^π_f :	$J+12$	$J+10$	$J+10$	$J+10$	$J+10$	$J+10$	$\langle 19^- \rangle$	$J+12$	$\langle 21^- \rangle$
5703.4+T	$J+12$							100			
6907.6+X	$J+14$		≈ 5							95(3)	

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 16

 $^{150}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage									
		E^*_f : J^π_f :	4865+Y $J+12$	5017+Z $J+12$	4993+W $J+12$	5133+V $J+12$	5323+C $J+12$	5280+D $J+12$	5311+U $J+12$	5359+Y $J+12$	6522+X $J+14$
5853.7+Y	$J+14$		100								
6032.1+Z	$J+14$			100							
6001.3+W	$J+14$				100						
6166.5+V	$J+14$					100					
6271.1+D	$J+14$							100			
6338.5+C	$J+14$						100				
6353.7+U	$J+14$								100		
6304.6+Y	$J+14$									100	
7621.8+X	$J+16$										100
8005.2+X	$J+16$										≈ 4.9

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 17

 $^{150}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage									
		E^*_f : J^π_f :	5562+A $J+12$	5584+S $J+12$	5680+B $J+12$	7275.8 $\langle 23^- \rangle$	5703+T $J+12$	6908+X $J+14$	5854+Y $J+14$	6032+Z $J+14$	6001+W $J+14$
7929.8(24)	$\langle 25^- \rangle$					100					
6660.4+A	$J+14$		100								
6706.4+S	$J+14$			100							
6792.0+B	$J+14$				100						
6832.3+T	$J+14$						100				
8005.2+X	$J+16$							95(2)			
6894.6+Y	$J+16$								100		
7100.3+Z	$J+16$									100	
7062.1+W	$J+16$										100

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 18

¹⁵⁰Gd₆₄

E^*	J^π	Branching ratios in percentage									
[keV]		E_f^* : J_f^π :	6167+V $J+14$	6271+D $J+14$	6339+C $J+14$	6354+U $J+14$	7929.8 $\langle 25^- \rangle$	6305+Y $J+14$	7622+X $J+16$	6660+A $J+14$	6706+S $J+14$
8325(3)	$\langle 27^- \rangle$						100				
7253.5+V	$J+16$		100								
7311.5+D	$J+16$			100							
7403.9+C	$J+16$				100						
7295.2+Y	$J+16$							100			
7441.4+U	$J+16$					100					
8766.4+X	$J+18$								100		
7822.2+A	$J+16$									100	
7886.2+S	$J+16$										100
9154.0+X	$J+18$								≈ 4.85		

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 19

¹⁵⁰Gd₆₄

E^*	J^π	Branching ratios in percentage									
[keV]		$\frac{E^*_{\text{f}}}{J^\pi_{\text{f}}}$:	8325	6792+B	6832+T	8005+X	6895+Y	7100+Z	7062+W	7254+V	7312+D
		$\frac{E^*_{\text{f}}}{J^\pi_{\text{f}}}$:	$\langle 27^- \rangle$	$J+14$	$J+14$	$J+16$	$J+16$	$J+16$	$J+16$	$J+16$	$J+16$
9410(3)	$\langle 28^+ \rangle$		100								
7952.0+B	$J+16$			100							
9497(3)	$\langle 29^- \rangle$		100								
7989.9+Y	$J+18$						100				
9154.0+X	$J+18$					95(2)					
8014.8+T	$J+16$				100						
8222.7+Z	$J+18$							100			
8176.0+W	$J+18$								100		
8404.3+D	$J+18$										100
8394.9+V	$J+18$									100	

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 20

¹⁵⁰Gd₆₄

E^*	J^π	Branching ratios in percentage								
[keV]	E^*_f : J^π_f :	7404+C $J+16$	7295+Y $J+16$	7441+U $J+16$	8766+X $J+18$	7822+A $J+16$	9410 $\langle 28^+ \rangle$	7952+B $J+16$	9497 $\langle 29^- \rangle$	7886+S $J+16$
9582(3)	$\langle 29^+ \rangle$						100			
9851(3)	$\langle 30^+ \rangle$								x	
8331.9+Y	$J+18$		100							
8516.3+C	$J+18$	100								
8574.4+U	$J+18$			100						
9956.9+X	$J+20$				100					
9034.6+A	$J+18$					100				

(continued)

 $^{150}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage									
		E_f^* :	7404+C	7295+Y	7441+U	8766+X	7822+A	9410	7952+B	9497	7886+S
[keV]		J_f^π :	$J+16$	$J+16$	$J+16$	$J+18$	$J+16$	$\langle 28^+ \rangle$	$J+16$	$\langle 29^- \rangle$	$J+16$
9159.7+B	$J+18$								100		
9124.2+S	$J+18$										100
10354.0+X	$J+20$					≈ 4.76					

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 21

 $^{150}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage									
[keV]		E_f^* : J_f^π :	9582 $\langle 29^+ \rangle$	7990+Y $J+18$	9154+X $J+18$	8015+T $J+16$	8223+Z $J+18$	8176+W $J+18$	8404+D $J+18$	8332+Y $J+18$	8395+V $J+18$
9851(3)	$\langle 30^+ \rangle$	x									
10532(3)	$\langle 31^+ \rangle$	100									
9139.2+Y	$J+20$			100							
10354.0+X	$J+20$				95(1)						
9250.8+T	$J+18$					100(2)					
9399.8+Z	$J+20$						100				
9344.4+W	$J+20$							100			
9415.2+Y	$J+20$									100	
9544.6+D	$J+20$								100		
9590.4+V	$J+20$										100

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 22

 $^{150}_{64}\text{Gd}$

E^* [keV]	J^π	Branching ratios in percentage								
		E_f^* : J_f^π :	8516+C $J+18$	8574+U $J+18$	9957+X $J+20$	10532 $\langle 31^+ \rangle$	9035+A $J+18$	9160+B $J+18$	9124+S $J+18$	9139+Y $J+20$
9682.2+C	$J+20$		100							
11231(4)	$\langle 33^+ \rangle$					100				
9753.9+U	$J+20$			100						
11194.8+X	$J+22$				100					
10300.5+A	$J+20$						100			
10414.1+B	$J+20$							100		
10343.1+Y	$J+22$									100
10420.8+S	$J+20$								100	
11604.9+X	$J+22$				≈ 4.67					

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 23

¹⁵⁰Gd₆₄

E^*	J^π	Branching ratios in percentage								
[keV]		E_f^* : J_f^π :	10354+X $J+20$	9251+T $J+18$	9400+Z $J+20$	9344+W $J+20$	9415+Y $J+20$	9545+D $J+20$	9682+C $J+20$	9590+V $J+20$
11604.9+X	$J+22$		95(3)							
10546.6+Y	$J+22$						100			
10540.9+T	$J+20$			100(2)						
10567.0+W	$J+22$					100				
10632.1+Z	$J+22$				100					
10736.6+D	$J+22$							100		
10901.0+C	$J+22$								100	
10841.4+V	$J+22$									100

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 24

¹⁵⁰Gd₆₄

E^*	J^π	Branching ratios in percentage								
[keV]		E^*_f : J^π_f :	11231 $\langle 33^+ \rangle$	9754+U $J+20$	11195+X $J+22$	10301+A $J+20$	10414+B $J+20$	10343+Y $J+22$	10421+S $J+20$	11605+X $J+22$
12185(4)	$\langle 34^- \rangle$		100							
10980.9+U	$J+22$			100						
12481.4+X	$J+24$				100					
11621.0+A	$J+22$					100				
11602.4+Y	$J+24$							100		
11716.8+B	$J+22$						100			
11776.5+S	$J+22$								100	
12906.1+X	$J+24$									100

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 25

¹⁵⁰Gd₆₄

E^*	J^π	Branching ratios in percentage								
[keV]		E_f^* : J_f^π :	12185 $\langle 34^- \rangle$	10547+Y $J+22$	10541+T $J+20$	10567+W $J+22$	10632+Z $J+22$	10737+D $J+22$	10901+C $J+22$	10841+V $J+22$
12678(4)	$\langle 36^-, 34^+ \rangle$		100							
11725.9+Y	$J+24$			100						
11845.0+W	$J+24$					100				
11919.8+Z	$J+24$						100			
11981.5+D	$J+24$							100		
11885.9+T	$J+22$				100					
12172.4+C	$J+24$								100	
12147.9+V	$J+24$									100

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 26

¹⁵⁰Gd₆₄

E^*	J^π	Branching ratios in percentage								
[keV]		E_f^* : J_f^π :	10981+U $J+22$	12481+X $J+24$	11621+A $J+22$	11602+Y $J+24$	11717+B $J+22$	11726+Y $J+24$	11777+S $J+22$	12906+X $J+24$
12256.0+U	$J+24$		100							
13818.0+X	$J+26$			100						
12916.1+Y	$J+26$					100				
12996.6+A	$J+24$				100					
12955.8+Y	$J+26$					≈ 3.1		97(2)		
13068.5+B	$J+24$						100(1)			
14257.7+X	$J+26$									100
13191.5+S	$J+24$								100	

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 27

¹⁵⁰Gd₆₄

E^*	J^π	Branching ratios in percentage								
		E_f^* :	11845+W	11920+Z	11982+D	11886+T	12172+C	12148+V	12256+U	13818+X
[keV]		J_f^π :	$J+24$	$J+24$	$J+24$	$J+22$	$J+24$	$J+24$	$J+24$	$J+26$
13178.7+W	$J+26$		100							
13280.5+D	$J+26$				100					
13263.6+Z	$J+26$			100						
13286.0+T	$J+24$					100				
13499.3+C	$J+26$						100			
13510.5+V	$J+26$							100		
13581.2+U	$J+26$								100	
15205.8+X	$J+28$									100

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 28

¹⁵⁰Gd₆₄

E^*	J^π	Branching ratios in percentage								
[keV]		E_f^* : J_f^π :	12916+Y $J+26$	12997+A $J+24$	12956+Y $J+26$	13069+B $J+24$	14258+X $J+26$	13192+S $J+24$	13179+W $J+26$	13281+D $J+26$
14229.1+Y	$J+28$	x			100					
14293.5+Y	$J+28$	100			x					
14427.3+A	$J+26$			100						
14468.6+B	$J+26$					100				
15658.7+X	$J+28$						100			
14635.3+D	$J+28$									100
14568.9+W	$J+28$								100	
14665.5+S	$J+26$							100		

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 29

¹⁵⁰Gd₆₄

E^*	J^π	Branching ratios in percentage								
[keV]		E_f^* : J_f^π :	13264+Z $J+26$	13286+T $J+24$	13499+C $J+26$	13511+V $J+26$	13581+U $J+26$	15206+X $J+28$	14229+Y $J+28$	14294+Y $J+28$
14664.1+Z	$J+28$		100							
14881.7+C	$J+28$				100					
14741.9+T	$J+26$			100						
14929.5+V	$J+28$					100				
14956.3+U	$J+28$						100			
16645.9+X	$J+30$							100		
15557.7+Y	$J+30$								100	
15721.8+Y	$J+30$								x	100

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 30

¹⁵⁰Gd₆₄

E^*	J^π	Branching ratios in percentage								
[keV]		E_f^* : J_f^π :	14427+A $J+26$	14469+B $J+26$	15659+X $J+28$	14635+D $J+28$	14569+W $J+28$	14664+Z $J+28$	14666+S $J+26$	14882+C $J+28$
15917.5+B	$J+28$			100						
15912.7+A	$J+28$	100								
17109.1+X	$J+30$				100					
16047+D	$J+30$					100				
16015.7+W	$J+30$						100			
16121.2+Z	$J+30$							100		
16320.1+C	$J+30$									100
16199.5+S	$J+28$								100	

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 31

¹⁵⁰Gd₆₄

E^*	J^π	Branching ratios in percentage								
		E_f^* :	14742+T	14930+V	14956+U	16646+X	15558+Y	15722+Y	15918+B	15913+A
[keV]		J_f^π :	$J+26$	$J+28$	$J+28$	$J+30$	$J+30$	$J+30$	$J+28$	$J+28$
16253.7+T	$J+28$		100							
16382.4+U	$J+30$				100					
16404.8+V	$J+30$			100						
16936.3+Y	$J+32$						100			
18139.1+X	$J+32$					100				
17208.2+Y	$J+32$							100		
17412.5+B	$J+30$								100	
17451.6+A	$J+30$									100

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 32

¹⁵⁰Gd₆₄

E^*	J^π	Branching ratios in percentage								
[keV]		E_f^* : J_f^π :	17109+X $J+30$	16047+D $J+30$	16016+W $J+30$	16121+Z $J+30$	16320+C $J+30$	16200+S $J+28$	16254+T $J+28$	16382+U $J+30$
17515+D	$J+32$			100						
18608.2+X	$J+32$	100								
17519.6+W	$J+32$				100					
17635.1+Z	$J+32$					100				
17816.2+C	$J+32$						100			
17793.6+S	$J+30$							100		
17862.5+U	$J+32$									100
17821.0+T	$J+30$								100	

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 33

¹⁵⁰Gd₆₄

E^*	J^π	Branching ratios in percentage								
		E_f^* :	16405+V	16936+Y	18139+X	17208+Y	17515+D	18608+X	17520+W	17635+Z
[keV]		J_f^π :	$J+30$	$J+32$	$J+32$	$J+32$	$J+32$	$J+32$	$J+32$	$J+32$
17937.1+V	$J+32$		100							
18366.7+Y	$J+34$			100						
19686.1+X	$J+34$				100					
18751.4+Y	$J+34$					100				
19046+D	$J+34$						100			
20155.8+X	$J+34$							100		
19080.3+W	$J+34$								100	
19204.2+Z	$J+34$									100

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 34

¹⁵⁰Gd₆₄

E^*	J^π	Branching ratios in percentage								
		E_f^* :	17816+C	17794+S	17863+U	17937+V	18367+Y	19686+X	18751+Y	19046+D
[keV]		J_f^π :	$J+32$	$J+30$	$J+32$	$J+32$	$J+34$	$J+34$	$J+34$	$J+34$
19373+C	$J+34$		100							
19379.2+U	$J+34$				x					
19446.1+S	$J+32$			100						
19527.0+V	$J+34$					100				
19848.9+Y	$J+36$						100			
21287.8+X	$J+36$							100		
20351.6+Y	$J+36$								100	
20638+D	$J+36$									100

Energy levels and branching ratios [95De28, 91Fa07, 90By01] Part 35

¹⁵⁰Gd
64

E^* [keV]	J^π	Branching ratios in percentage								
		E_f^* : 20156+X J_f^π : $J+34$	19080+W $J+34$	19379+U $J+34$	19527+V $J+34$	19849+Y $J+36$	20352+Y $J+36$	21752+X $J+36$	20915+U $J+36$	21384+Y $J+38$
21751.8+X	$J+36$	100								
20698.2+W	$J+36$		100							
20915.2+U	$J+36$			x						
21171.8+V	$J+36$				x					
21384.3+Y	$J+38$					100				
22010.0+Y	$J+38$						100			
23397.3+X	$J+38$							x		
22505.2+U	$J+38$								x	
22972.1+Y	$J+40$									100

Energy levels and branching ratios [97Si03].

¹⁵¹Gd
64

E^* [keV]	$2J^\pi$	L	S_N	σ (d,t) $\mu\text{b/sr}$	L	S_N	σ (τ, α) $\mu\text{b/sr}$	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage				
										E_f^* : 0.0 $2J_f^\pi$: 7^-	0.0 5^-	108 9^-	379 3^-	427 5^-
0.0	7^-	3	1.89	442		1.89	34	124(1) d	75Lo04					
108.09(1)	5^-	3	0.04	11		0.05	≈ 3	2.80(11) ns	75Lo04	100				
379.30(3)	9^-	5	0.75	30	5	1.29	50		75Lo04	99.3(4)	0.7(1)			
395.44(1)	3^-	[3]	0.24	216			<3	0.29(3) ns	75Lo04	28(1)	72(2)			
426.69(1)	5^-	[3]	0.16	35	[3]	0.17	3		75Lo04	92(3)	8.1(3)			
575.62(1)	1^-	1	0.21					0.23(3) ns	75Lo04		6.9(3)		90(4)	2.8(1)
584.78(11)	5,9									89(7)	11(4)			
587.45(1)	3^-			142			<3	0.30(2) ns	75Lo04	45(1)	44(1)		10	1.4
589.10(7)	3^-7^-									63(14)	25(11)		13(2)	
618.1(1)	5^-9^-	≤ 3	0.22	39			<3		75Lo04	100				
620.60(1)	$3^-, 5^-$		incl						75Lo04	41(2)	39(8)		6	13(5)
670.86(6)	$\langle 5, 7 \rangle^-$	3	0.48	83	3	0.42	8		75Lo04	32(5)	63(4)		5(1)	
697														
705.98(3)	11^-			12					75Lo04	98(1)		1.9(4)		
719.46(4)	9^-									100				
784.81(4)	11^+											73(1)		
811.83(1)	3^-	1,3		23			<3		75Lo04	2.7(1)	52(2)		27(1)	14(1)
839.32(1)	1^-	[1]	0.13	63			<3	0.28(3) ns	75Lo04		17(1)		24(1)	0.04(1)
851.90(4)	13^+	6	1.27	10	6	1.92	91		75Lo04					
882														
901.97(4)	13^-											99(1)		
905.58(9)	3^-5^-									100				
913(2)	$9^-, 11^-$	[5]	0.22	6	[5]	0.23	11		75Lo04					
913.56(2)	$\langle 3^- \rangle$									14(3)	76(3)		6.0(3)	
938.77(7)	3^-7^-									72(15)	28(2)			
982.27(4)	$\langle 3 \rangle^+$	2	1.49	286		1.51	12		75Lo04		6(1)		58(12)	10(1)
1050(2)	1^+	0		417		1.57	5		75Lo04					

(continued)

¹⁵¹Gd
64

E^*	$2J^\pi$	L	S_N	σ (d,t)	L	S_N	σ (τ,α)	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]				(d,t) $\mu\text{b/sr}$			(τ,α) $\mu\text{b/sr}$	Γ_{cm}		E_f^* : $2J_f^\pi$:	0.0 7 ⁻	108 5 ⁻	379 9 ⁻	395 3 ⁻	427 5 ⁻
1052.2(1)	1 ⁻ ,3 ⁻			incl			incl		75Lo04					21(1)	
1076.9(1)	X ⁻			32					75Lo04				100		
1087.6(1)	3 ⁻									0.6(2)	13			45(3)	14
1115.8(1)	13 ⁺														
1157.9(1)	$\langle 3 \rangle^+$			47			9		75Lo04			6		17(1)	33(7)
1159(2)	$\langle 5^--9^+ \rangle$	1.2		incl	3,4	0.83			75Lo04						
1164.3(2)	$\langle 13^-,15^+ \rangle$														
1192.19(1)	1 ⁺	0	0.21	76			<3		75Lo04					0.29(6)	
1199.15(5)	$\langle 1^--5^- \rangle$											48(2)		12(3)	28(2)
1210.06(8)	11 ⁻	5	2.16	36	5	2.24	94		75Lo04	20(3)			49(2)		
1261(5)							8		75Lo04						
1279.06(3)	3 ⁻ ,5 ⁻									2.4(3)	51(2)			9(2)	4.9(3)
1345.44(6)	17 ⁺														
1351(5)															
1363.84(5)	15 ⁺														
1364(2)				48			≈ 3		75Lo04						
1373.95(2)	1 ⁻ ,3 ⁻ ,5 ⁻														8(2)
1405.14(3)	3 ⁻ ,5 ⁻									4.0(4)	10(1)			59(2)	
1425(1)	$\langle 11-15 \rangle$														
1435.08(6)	$\langle 15 \rangle^-$														
1456.58(5)	1 ⁻ ,3 ⁻ ,5 ⁻											28(1)		33(2)	14
1463.27(9)	$\langle 13 \rangle^-$														
1477.66(9)	$\langle 1^--5^- \rangle$			28			11		75Lo04			100			
1493.38(5)	$\langle 1-5^- \rangle$											9.5(3)		13.2(3)	
1505.41(2)	1 ^{$\langle - \rangle$} ,3 ^{$\langle - \rangle$}											4.8(2)		71(2)	5.9(2)
1505.73(14)	$\langle 11-15 \rangle$														
1510.92(6)	17 ⁻														
1552.70(14)	$\langle 3^-,5^- \rangle$									[100]					
1577.56(4)	$\langle 1-5^- \rangle$													50(2)	7(1)
1676.61(7)	$\langle 17 \rangle^+$														
1701.40(7)	1,3,5 ^{$\langle - \rangle$}													20(2)	
1707.68(3)	1 ^{$\langle - \rangle$} ,3 ^{$\langle - \rangle$}											18		46(1)	9
1725.74(10)	$\langle 15 \rangle^-$														
1745.76(11)	1,3,5 ^{$\langle - \rangle$}													16(3)	6(3)
1778.56(2)	1 ⁻ ,3 ⁻											33(1)		16	13(3)
1788.96(5)	$\langle 1-5^- \rangle$													13(1)	49(1)
1836.90(3)	$\langle 3 \rangle^-$									0.6(1)	5			4	4
1851.58(6)	19 ⁺														
1852.72(12)	$\langle 1^-,3^-,5^- \rangle$											13(1)		10(2)	
1852.97(7)	$\langle 21 \rangle^+$														
1890.80(13)	$\langle 1^-,3,5^- \rangle$													46(12)	19(2)
1941.11(14)	$\langle 1^-,3,5^- \rangle$						23		75Lo04					24(3)	29(2)
1970.91(13)	1,3,5 ^{$\langle - \rangle$}													27(1)	
1978.05(8)	$\langle 3^- \rangle$									5.1(13)	79(5)				
2003.73(10)	$\langle 17 \rangle^-$														

(continued)

¹⁵¹Gd₆₄

E^*	$2J^\pi$	L	S_N	σ (d,t)	L	S_N	σ (τ,α)	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]			(d,t)	$\mu\text{b/sr}$		(τ,α)	$\mu\text{b/sr}$	Γ_{cm}		E_{f}^* :	0.0	108	379	395	427
										$2J_{\text{f}}^\pi$:	7 ⁻	5 ⁻	9 ⁻	3 ⁻	5 ⁻
2012.15(24)	$\langle 1^-, 3, 5^- \rangle$														44(4)
2034.36(2)	$1^-, 3^-$													4.2(2)	0.4(2)
2043.89(23)	$\langle 1, 3, 5^- \rangle$														
2070.97(4)	$1^-, 3^-$											2.1(4)		3.6(2)	1.9(1)
2076.02(8)	$1^{\langle - \rangle}, 3$											5(1)		9(3)	11(1)
2077.86(12)	$\langle 19^- \rangle$														
2099.01(16)	$\langle 1, 3, 5^- \rangle$														
2107.0(3)	$\langle 1, 3, 5^- \rangle$														
2116.09(5)	$1^{\langle - \rangle}, 3^{\langle - \rangle}$											3(1)		32(5)	44(1)
2128.72(11)	$1^{\langle - \rangle}, 3$											50(2)		5(2)	15(2)
2132.53(13)	$1^{\langle - \rangle}, 3$													11(5)	39(2)
2154.9(2)	$\langle 1, 3, 5^- \rangle$													50(8)	
2173.19(8)	$1^{\langle - \rangle}, 3$											3		18(5)	6(1)
2196.6(7)	$\langle 17-21 \rangle$														
2205.94(11)	$1^{\langle - \rangle}, 3$											16(1)		7(1)	53(12)
2220.9(3)	$1, 3$													20(2)	
2243.8(3)	$1^{\langle - \rangle}, 3$											18(2)		21(10)	31(10)
2246.95(9)	$1^{\langle - \rangle}, 3$														31(2)
2256.7(2)	$1, 3$													22(4)	
2295.02(12)	$\langle 19 \rangle^-$														
2297.3(6)	$\langle 21 \rangle^-$														
2317.7(3)	$1^{\langle - \rangle}, 3$											20(10)			40(4)
2324.32(14)	$1^{\langle - \rangle}, 3$														60(3)
2325.11(9)	23^+														
2391.50(5)	$1, 3$													8(1)	
2400.5(2)	$1^{\langle - \rangle}, 3$											40(6)		20(4)	40(6)
2405.4(5)	$\langle 25^+ \rangle$														
2421.74(12)	$1, 3$													47(2)	
2443.0(3)	$\langle 1, 3 \rangle$													100	
2444.86(8)	$1, 3$														
2600.05(14)	$\langle 21 \rangle^-$														
2866.2(5)	$\langle 27^+ \rangle$														
2915.24(17)	$\langle 23 \rangle^-$														
3007.7(8)	$\langle 29^+ \rangle$														
3238.17(18)	$\langle 25 \rangle^-$														
3728.2(7)	$\langle 27-31 \rangle$														
			75Lo04			75Lo04				Ref.					
				75Lo04			75Lo04			Ref.					

Additional data on this isotope can be found in [84Pe03, 74Kl01, 67Tj01].

 $S_N = S_{\ell_j} = d\sigma/d\Omega / N\sigma_{DWBA}$ with normalization parameters $N=3.0$ and 22.5 for (d,t) and (τ, α) reactions, respectively [75Lo04].

Data for this isotope are considered in vol. LB I/18C.

Energy levels and branching ratios [97Si03]. Part 2

¹⁵¹Gd
64

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		E_f^* : $2J_f^\pi$:	575.6 1 ⁻	587.4 3 ⁻	620.6 3 ⁻ ,5 ⁽⁻⁾	705.98 11 ⁻	719.46 9 ⁻	784.81 11 ⁺	811.835 3 ⁻	839.320 1 ⁻	851.90 13 ⁺	901.97 13 ⁻
784.81(4)	11 ⁺					18.6(2)	8.6(7)					
811.83(1)	3 ⁻		1.7(1)		2.9(6)							
839.32(1)	1 ⁻		0.44(2)	59(2)	0.06(1)							
851.90(4)	13 ⁺					74(1)		26(1)				
901.97(4)	13 ⁻					1.3(3)						
913.56(2)	$\langle 3^- \rangle$			4(1)								
982.27(4)	$\langle 3^+ \rangle$				22(3)					4(1)		
1052.2(1)	1 ⁻ ,3 ⁻		67(3)						12(1)			
1087.6(1)	3 ⁻		5(1)	9(2)	3.0(6)				1.3(2)	9		
1115.8(1)	13 ⁺					12(4)		38(2)			45(1)	5(2)
1157.9(1)	$\langle 3^+ \rangle$		4		22(1)					1		
1164.3(2)	$\langle 13^-, 15^+ \rangle$							100				
1192.19(1)	1 ⁺		56(2)	18(1)					26(1)			
1199.15(5)	$\langle 1^--5^- \rangle$				12(3)							
1210.06(8)	11 ⁻					17(7)					15(2)	
1279.06(3)	3 ⁻ ,5 ⁻		1.7(5)	14(3)	11(1)					3.2(3)		
1345.44(6)	17 ⁺										98(1)	
1363.84(5)	15 ⁺							27(2)			18(7)	47(1)
1373.95(2)	1 ⁻ ,3 ⁻ ,5 ⁻		14(1)	3					10	10		
1405.14(3)	3 ⁻ ,5 ⁻			4.0(5)	14(1)				9(2)			
1425(1)	$\langle 11-15 \rangle$					100						
1435.08(6)	$\langle 15^- \rangle$					66(3)					34(4)	
1456.58(5)	1 ⁻ ,3 ⁻ ,5 ⁻		12(1)	4(1)					6			
1493.38(5)	$\langle 1-5^- \rangle$		4.1(10)	64(14)								
1505.41(2)	1 ⁽⁻⁾ ,3 ⁽⁻⁾		2.5(2)	2.8(5)	11(2)					0.9(5)		
1505.73(14)	$\langle 11-15 \rangle$							47(19)				53(9)
1510.92(6)	17 ⁻											87(2)
1577.56(4)	$\langle 1-5^- \rangle$		6(1)	6(1)	7(1)				5(1)			
1676.61(7)	$\langle 17^+ \rangle$										27(6)	
1701.40(7)	1,3,5 ⁽⁻⁾			24(2)	22(2)				17(1)			
1707.68(3)	1 ⁽⁻⁾ ,3 ⁽⁻⁾		5	4.0(8)	0.6(2)				1.6(2)	1.6(2)		
1745.76(11)	1,3,5 ⁽⁻⁾			5(2)	22(2)							
1778.56(2)	1 ⁻ ,3 ⁻		3.8(2)	8	1.8(4)				1.8(2)	2		
1788.96(5)	$\langle 1-5^- \rangle$		18(1)						15(3)	5		
1836.90(3)	$\langle 3^- \rangle$		4(1)	11	3				41(1)	2.3(2)		
1852.72(12)	$\langle 1^-, 3^-, 5^- \rangle$				40(8)							
1890.80(13)	$\langle 1^-, 3^-, 5^- \rangle$		17(2)		7(2)					10(2)		
1941.11(14)	$\langle 1^-, 3^-, 5^- \rangle$		6(3)		12(6)				29(6)			
1970.91(13)	1,3,5 ⁽⁻⁾		23(4)		9(4)							
1978.05(8)	$\langle 3^- \rangle$		8(1)									
2012.15(24)	$\langle 1^-, 3^-, 5^- \rangle$				56(11)							
2034.36(2)	1 ⁻ ,3 ⁻		1.0(2)	6.2(2)	0.8(2)				40(1)	11		
2043.89(23)	$\langle 1, 3, 5^- \rangle$		15(2)	50(10)					35(10)			
2070.97(4)	1 ⁻ ,3 ⁻		13(3)	40(1)	4.8(2)				4(1)			
2076.02(8)	1 ⁽⁻⁾ ,3		5(1)		5(1)				11(1)			

(continued)

¹⁵¹Gd
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E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		E_f^* : $2J_f^\pi$:	575.6 1 ⁻	587.4 3 ⁻	620.6 3 ⁻ ,5 ⁽⁻⁾	705.98 11 ⁻	719.46 9 ⁻	784.81 11 ⁺	811.835 3 ⁻	839.320 1 ⁻	851.90 13 ⁺	901.97 13 ⁻
2099.01(16)	$\langle 1,3,5^- \rangle$			100								
2107.0(3)	$\langle 1,3,5^- \rangle$			100								
2116.09(5)	1 ⁽⁻⁾ ,3 ⁽⁻⁾				6(1)				6(1)			
2128.72(11)	1 ⁽⁻⁾ ,3			10(2)	20(5)							
2132.53(13)	1 ⁽⁻⁾ ,3		28(5)						22(5)			
2154.9(2)	$\langle 1,3,5^- \rangle$		50(25)									
2173.19(8)	1 ⁽⁻⁾ ,3			3(1)					9(1)			
2205.94(11)	1 ⁽⁻⁾ ,3		16(1)	9(1)								
2220.9(3)	1,3			50(10)								
2246.95(9)	1 ⁽⁻⁾ ,3		31(8)		15(8)				23(3)			
2256.7(2)	1,3		44(11)	33(11)								
2317.7(3)	1 ⁽⁻⁾ ,3									40(6)		
2324.32(14)	1 ⁽⁻⁾ ,3		40(6)									
2391.50(5)	1,3		51(10)	4.3(3)					20(1)			
2421.74(12)	1,3		12(6)	6(3)								
2444.86(8)	1,3		24(5)						52(3)	19(6)		

Energy levels and branching ratios [97Si03]. Part 3

¹⁵¹Gd
64

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		E_f^* : $2J_f^\pi$:	905.58 $\langle 3^-,5^- \rangle$	913	913.56 $\langle 3^- \rangle$	938.77	982.27 $\langle 3 \rangle^+$	1052.20 1 ⁻ ,3 ⁻	1087.59 3 ⁻	1115.77 13 ⁺	1157.90 $\langle 3 \rangle^+$	1164.3
1157.9(1)	$\langle 3 \rangle^+$		18(5)									
1192.19(1)	1 ⁺				0.51(3)			0.26(2)				
1279.06(3)	3 ⁻ ,5 ⁻		1.2(3)		1.9(5)							
1345.44(6)	17 ⁺									1.6(4)		
1363.84(5)	15 ⁺									8(1)		
1373.95(2)	1 ⁻ ,3 ⁻ ,5 ⁻		2(1)		8		22(3)	6			16(1)	
1456.58(5)	1 ⁻ ,3 ⁻ ,5 ⁻			3								
1493.38(5)	$\langle 1-5^- \rangle$				5.1(10)				3.7(3)			
1505.41(2)	1 ⁽⁻⁾ ,3 ⁽⁻⁾				1.6(5)							
1510.92(6)	17 ⁻											5.1(11)
1577.56(4)	$\langle 1-5^- \rangle$		8(1)		5(1)						8(2)	
1676.61(7)	$\langle 17 \rangle^+$									64(6)		
1701.40(7)	1,3,5 ⁽⁻⁾		17(5)									
1707.68(3)	1 ⁽⁻⁾ ,3 ⁽⁻⁾				6		2.2(2)		2.2(4)			
1745.76(11)	1,3,5 ⁽⁻⁾					16(3)						
1778.56(2)	1 ⁻ ,3 ⁻				8	1.8(3)			4(1)			
1836.90(3)	$\langle 3 \rangle^-$				4	6			3.5(2)		6(1)	
1852.72(12)	$\langle 1^-,3^-,5^- \rangle$				30(6)	8(2)						
1970.91(13)	1,3,5 ⁽⁻⁾				41(9)							
1978.05(8)	$\langle 3^- \rangle$					8(2)						

(continued)

¹⁵¹Gd₆₄

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		E_f^* : $2J_f^\pi$:	905.58 $\langle 3^-, 5^- \rangle$	913	913.56 $\langle 3^- \rangle$	938.77	982.27 $\langle 3 \rangle^+$	1052.20 $1^-, 3^-$	1087.59 3^-	1115.77 13^+	1157.90 $\langle 3 \rangle^+$	1164.3
2034.36(2)	$1^-, 3^-$		0.8(2)		1.7(4)	0.8(2)	4(1)	4(1)	3.1(6)		1.0(2)	
2070.97(4)	$1^-, 3^-$		1.3(4)		12(2)	1.1(2)		1.7(2)	6(1)		1.7(4)	
2076.02(8)	$1^{\langle - \rangle}, 3$		18(3)	18(1)		8(1)						
2116.09(5)	$1^{\langle - \rangle}, 3^{\langle - \rangle}$		3(1)			3(1)						
2173.19(8)	$1^{\langle - \rangle}, 3$		5(1)		3(1)	6(1)			9(1)			
2220.9(3)	$1, 3$				30(10)							
2391.50(5)	$1, 3$							7(1)				
2421.74(12)	$1, 3$				12(6)		24(6)					
2444.86(8)	$1, 3$				5(3)							

Energy levels and branching ratios [97Si03]. Part 4

¹⁵¹Gd₆₄

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		E_f^* : $2J_f^\pi$:	1192.19 1^+	1199.15	1210.06 11^-	1279.06 $3^-, 5^-$	1345.44 17^+	1363.84 15^+	1373.95	1405.14 $3^-, 5^-$	1435.08 $\langle 15 \rangle^-$	1456.58
1463.27(9)	$\langle 13 \rangle^-$				100							
1510.92(6)	17^-							8(2)				
1676.61(7)	$\langle 17 \rangle^+$						9(4)					
1707.68(3)	$1^{\langle - \rangle}, 3^{\langle - \rangle}$					3.2(6)						
1725.74(10)	$\langle 15 \rangle^-$				24(11)							
1778.56(2)	$1^-, 3^-$					7(1)						
1836.90(3)	$\langle 3 \rangle^-$			4								
1851.58(6)	19^+						21(7)	36(2)				
1852.97(7)	$\langle 21 \rangle^+$						100					
2034.36(2)	$1^-, 3^-$	5.4(2)	1.2(4)			0.4(1)			2.1(6)	6.8(2)		1.7(2)
2070.97(4)	$1^-, 3^-$	3.6(4)	1.3(4)			1.5(2)						
2076.02(8)	$1^{\langle - \rangle}, 3$	9(3)										
2077.86(12)	$\langle 19^- \rangle$										100	
2116.09(5)	$1^{\langle - \rangle}, 3^{\langle - \rangle}$					4(1)						
2173.19(8)	$1^{\langle - \rangle}, 3$			36(1)		1(1)						
2243.8(3)	$1^{\langle - \rangle}, 3$			31(5)								
2391.50(5)	$1, 3$	3(1)				0.9(5)				5(2)		

Energy levels and branching ratios [97Si03]. Part 5

¹⁵¹Gd₆₄

E^*	$2J^\pi$	Branching ratios in percentage										
[keV]		E_f^* : $2J_f^\pi$:	1463.27 $\langle 13 \rangle^-$	1477.66	1493.38 $\langle 1-5^- \rangle$	1505.41	1510.92 17^-	1577.56 $\langle 1-5^- \rangle$	1676.61 $\langle 17 \rangle^+$	1725.74 $\langle 15 \rangle^-$	1851.58 19^+	1852.97 $\langle 21 \rangle^+$
1725.74(10)	$\langle 15 \rangle^-$		76(2)									
1745.76(11)	$1,3,5^{\langle - \rangle}$				35(8)							
1851.58(6)	19^+						43(1)					
2003.73(10)	$\langle 17 \rangle^-$		49(8)							51(3)		
2034.36(2)	$1^-, 3^-$			1.3(2)				1.5(2)				
2196.6(7)	$\langle 17-21 \rangle$								33(17)		67(17)	
2295.02(12)	$\langle 19 \rangle^-$									55(17)		
2297.3(6)	$\langle 21^- \rangle$						100					
2325.11(9)	23^+										100	
2391.50(5)	$1,3$			0.9(5)		0.9(5)						
2405.4(5)	$\langle 25^+ \rangle$											100

Energy levels and branching ratios [97Si03]. Part 6

¹⁵¹Gd₆₄

E^* [keV]	$2J^\pi$	Branching ratios in percentage							
		E_f^* : $2J_f^\pi$:	2003.73 $\langle 17 \rangle^-$	2295.02 $\langle 19 \rangle^-$	2325.11 23^+	2405.4 $\langle 25^+ \rangle$	2600.05 $\langle 21^- \rangle$	2866.2 $\langle 27^+ \rangle$	2915.24 $\langle 23 \rangle^-$
2295.02(12)	$\langle 19 \rangle^-$		45(3)						
2600.05(14)	$\langle 21^- \rangle$		64(9)	36(4)					
2866.2(5)	$\langle 27^+ \rangle$				100				
2915.24(17)	$\langle 23 \rangle^-$			82(18)			18(5)		
3007.7(8)	$\langle 29^+ \rangle$					100			
3238.17(18)	$\langle 25^- \rangle$						100		x
3728.2(7)	$\langle 27-31 \rangle$							100	

Energy levels and branching ratios [96Ar09].

¹⁵²Gd₆₄

E^*	J^π	L	σ (p,t)	σ (p,t)	σ (d,d')	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	$\mu\text{b/sr}$	Γ_{cm}		E^*_f : J^π_f :	0.0 0 ⁺	344 2 ⁺	615 0 ⁺	755 4 ⁺	930 2 ⁺
0.0	0 ⁺	0	308	2450	48800	1.1(1)·10 ¹⁴ yr	73Fl04						
344.2789(12)	2 ⁺	⟨2⟩	169	954	2170	32.4(17) ps	73Fl04	100					
615.399(7)	0 ⁺	0	274	1903	9	37(8) ps	73Fl04	x	100				
755.3958(17)	4 ⁺	⟨4⟩	11	140	58	7.3(4) ps	73Fl04		100				
930.545(3)	2 ⁺	⟨2⟩	64	400	930	7.3(6) ps	73Fl04	14(1)	78(1)	8.2(4)	0.37(4)		
1047.85(4)	0 ⁺	0	100	700	4		73Fl04	x	97(3)	x			3.0(8)
1109.173(6)	2 ⁺	⟨2⟩	67	410	36		73Fl04	45(2)	53(3)	2.5(2)			
1123.185(2)	3 ⁻		≤1		494		67Bl05		94(1)		6.29(3)	0.050(2)	
1227.38(8)	6 ⁺		3			2.5(5) ps					100		

(continued)

¹⁵²Gd₆₄

E^*	J^π	L	σ (p,t)	σ (p,t)	σ (d,d')	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	$\mu\text{b/sr}$	Γ_{cm}		E_f^* : J_f^π :	0.0 0 ⁺	344 2 ⁺	615 0 ⁺	755 4 ⁺	930 2 ⁺
1282.263(18)	4 ⁺		<1		4		67Bl05					50(2)	48(6)
1314.652(7)	1 ⁻		2		17		67Bl05	59(1)	37(1)	4.4(1)			
1318.34(2)	2 ⁺						03Ad25	7(1)	54(3)	13(3)	1.2(2)	9(2)	
1434.020(5)	3 ⁺						03Ad25		72(1)		19.2(4)	6.3(1)	
1460.53(12)	1,2 ⁺							12(4)	8(4)	74(10)			
1470.48(17)	2 ⁺				8		03Ad25				100		
1533.9(1)							03Ad25						
1550.21(3)	4 ⁺				11		67Bl05		31(3)		57(4)		
1605.602(16)	2 ⁺	25					03Ad25	8.5(5)	35(1)	30(3)			18(1)
1643.409(4)	2 ⁻						03Ad25		89(1)				5.3(1)
1668.07(9)	6 ⁺	<1											
1680.76(5)							03Ad25						
1692.41(6)	3 ⁺						03Ad25		83(3)		17(2)		
1734.44(16)							03Ad25						
1746.78(12)	8 ⁺												
1755.98(3)	1 ⁻						03Ad25	5.2(3)	89.6(14)				1.4(9)
1771.57(14)	2 ⁺						03Ad25		30(4)		22(4)	15(4)	
1785.24(11)	2 ⁺						03Ad25						
1807.66(24)							03Ad25				100		
1808.95(8)							03Ad25						
1839.62(17)	$\langle 2^+ \rangle$						03Ad25		23(4)		34(6)	27(3)	
1861.58(9)	$\langle 5^+ \rangle$						03Ad25				56(3)		
1862.05(8)	2 ⁺						03Ad25	23(2)	33(2)		20(2)		
1880.3(3)	7 ⁻												
1915.19(4)	4 ⁺ ,5,6 ⁺				93		03Ad25		38(5)		61(10)		
1915.69(4)	2 ⁺ ,3,4 ⁺						03Ad25						
1941.16(7)	2 ⁺				2		67Bl05	16(1)	5(2)	20(1)	5(1)	9(1)	
1962					19		67Bl05						
1975.67(17)	1,2 ⁺						03Ad25	18(3)	65(6)	17(8)			
1997.89(17)	$\langle 6^+ \rangle$										29(5)		
2011.63(14)	$\langle 3^+ \rangle$						03Ad25		81(6)				
2120.96(10)	2 ⁺ ,3,4 ⁺				11		03Ad25						
2133.39(10)	1 ⁺ ,2 ⁺						03Ad25						
2138.8(3)	8 ⁺												
2169.58(6)	1,2 ⁺						03Ad25						
2173.41(19)	$\langle 6^- \rangle$												
2190	$\langle 2^+ \rangle$				8		67Bl05						
2201.73(5)*	2 ⁺						03Ad25		68(10)		32		
2234					16		67Bl05						
2246.77(2)*	2 ⁺						03Ad25		51(4)			5(1)	
2258.14(6)	2 ⁺ ,3,4 ⁺						03Ad25						
2264.83(7)	1 ⁻ ,2,3 ⁻						03Ad25		100				
2265.28(9)	1 ⁺ ,2 ⁺ ,3						03Ad25						
2267.71(8)							03Ad25						
2299.66(13)*	3 ⁻				≈ 2		03Ad25		32(3)		7(3)	12(2)	

(continued)

¹⁵²Gd
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E^*	J^π	L	σ (p,t)	σ (p,t)	σ (d,d')	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	$\mu\text{b/sr}$	Γ_{cm}		E_{f}^* : J_{f}^π :	0.0 0 ⁺	344 2 ⁺	615 0 ⁺	755 4 ⁺	930 2 ⁺
2300.4(8)	10 ⁺				incl		67Bl05						
2301.83(14)	$\langle 7^+ \rangle$				incl		67Bl05						
2325.82(9)							03Ad25						
2330.70(8)	2 ⁺ ,3,4 ⁺				6		03Ad25						
2331.4(7)	9 ⁻												
2386.95(11)	1 ⁻ ,2,3 ⁻												
2394.19(10)	7 ⁺												
2395													
2401.49(6)	1 ⁺ ,2,3 ⁺						03Ad25						
2414													
2437.44(6)	1 ⁺ ,2 ⁺						03Ad25						
2447.82(12)							03Ad25						
2462.77(25)	$\langle 2^+ \rangle$									23(6)			40(14)
2495.17(5)	1 ⁺						03Ad25	29(4)		71(8)			
2513.9(3)	1 ⁺ ,2 ⁺						03Ad25						
2523.80(4)	2 ⁺						03Ad25	14(3)		10(2)	5(3)		
2529.39(3)	$\langle 3^+ \rangle$						03Ad25			30(4)			33(6)
2536.9(9)	$\langle 9^+ \rangle$												
2540.45(6)	2 ⁺ ,3 ⁺						03Ad25						
2544.00(7)							03Ad25						
2551.12(6)							03Ad25						
2557.84(4)	2 ⁺						03Ad25						
2598.78(5)	1 ⁺ ,2 ⁺						03Ad25	11(6)		33(6)			
2604.33(5)	1 ⁻ ,2,3 ⁻						03Ad25						
2641.56(7)							03Ad25						
2667.54(6)	1 ⁻						03Ad25						
2686.85(10)	1 ⁺ ,2 ⁺ ,3						03Ad25	20(5)		61(9)			
2691.2(11)	10 ⁺												
2709.32(11)	2 ⁺						03Ad25	12.9(10)	23(2)	3.4			4.4(10)
2719.67(4)	2 ⁺						03Ad25	19(2)	44(3)				28(2)
2729.16(3)	2 ⁺						03Ad25		10(1)	5(1)			10(2)
2734.04(7)	1 ⁺						03Ad25						
2744.05(11)	1 ⁻						03Ad25						
2749.20(3)	2 ⁺ ,3 ⁺						03Ad25			84(5)		5.1(11)	2.9(8)
2772.36(6)	2 ⁺						03Ad25						
2814.6(9)	11 ⁻												
2862.64(5)	3 ⁺						03Ad25			59(12)			
2869.76(10)	1,2 ⁺						03Ad25						
2880.65(2)*	1 ⁺ ,2 ⁺						03Ad25			18(2)	4.7(7)		
2883.8(11)	12 ⁺												
2890.4(10)	$\langle 11 \rangle^+$												
2914.15(7)	2 ⁺						03Ad25	4(2)	37(3)			14(2)	12(2)
2920.08(14)							03Ad25						
2927.85(5)	2 ⁺ ,3 ⁺						03Ad25			41(11)			
2928.68(24)							03Ad25						

(continued)

¹⁵²Gd
64

E^*	J^π	L	σ (p,t)	σ (p,t)	σ (d,d')	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	$\mu\text{b/sr}$	Γ_{cm}		E^*_f : J^π_f :	0.0 0 ⁺	344 2 ⁺	615 0 ⁺	755 4 ⁺	930 2 ⁺
2932.66(6)	2 ⁺						03Ad25			74(7)			
2964.33(4)*	2 ⁻ ,3 ⁻						03Ad25			39(4)	7(2)		18(2)
2981.38(9)	2 ⁺ ,3,4 ⁺						03Ad25						
2989.02(9)							03Ad25						
2999.52(4)	1 ⁺ ,2 ⁺						03Ad25						
3006.71(4)*	2 ⁺						03Ad25			70(6)		30(4)	
3009.16(6)	2 ⁻ ,3 ⁻						03Ad25						
3012.06(13)	2 ⁺ ,3 ⁺						03Ad25						
3024.3(4)	1 ⁺ ,2 ⁺								16(11)	53(16)			
3042.30(5)	2 ⁺						03Ad25		16(2)	49(5)			
3067.40(11)							03Ad25						
3074.86(16)							03Ad25						
3079.64(18)	3 ⁺ ,4 ⁺						03Ad25						
3085.2(3)	2 ⁺								5(3)	11(5)			
3090.40(22)							03Ad25						
3098.99(8)	X ⁽⁺⁾						03Ad25			57(6)			43(9)
3105.49(7)	2 ⁺						03Ad25		19(4)	8(4)			
3110.90(10)	1 ⁺						03Ad25						
3112.50(8)	1 ⁺ ,2 ⁺						03Ad25						
3140.17(7)*	1 ⁺ ,2 ⁺						03Ad25		9(2)	39(5)			
3143.96(8)							03Ad25						
3152.98(9)	2 ⁺ ,3,4 ⁺						03Ad25						
3159.6(9)	1,2 ⁺								68(15)	15(7)			
3165.1(7)	1,2 ⁺								75(13)	25(12)			
3189.5(10)	1,2 ⁺								50(16)	50(33)			
3191.3(3)	1 ⁻ ,2 ⁺										27(9)		27(6)
3205.4(4)	1 ⁻								14(4)	25(4)			
3214.23(9)							03Ad25						
3232.05(9)							03Ad25						
3236.92(9)	2 ⁺ ,3,4 ⁺						03Ad25						
3248.7**	12 ⁺						05Wa23						
3250.9(4)	$\langle 1 \rangle^-$								5(3)	57(12)			
3285.12(7)	2 ⁺						03Ad25		5(2)	66(9)			
3309.7(6)	1,2 ⁺								16(3)	14(7)	70(21)		
3324.2(9)	1,2 ⁺								50(8)	50(16)			
3328.8(4)	$\langle 1,2^+ \rangle$								9(3)	15(10)			76(19)
3337.8(10)	$\langle 1,2^+ \rangle$								9(5)	45(23)			
3338.2(12)	13 ⁻												
3340.60(5)	3 ⁻						03Ad25						
3346.4(14)	$\langle 13^+ \rangle$												
3358.26(10)	2 ⁺						03Ad25					27(9)	30(6)
3393.27(25)	2 ⁺										16(9)	12(6)	
3411.5(3)	$\langle 2 \rangle^+$								3.2(11)	5(3)		24(8)	8(5)
3433.2(9)										14(7)			
3478.9(11)	1,2 ⁺								62(16)	38(19)			

(continued)

¹⁵²Gd
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E^*	J^π	L	σ (p,t)	σ (p,t)	σ (d,d')	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	$\mu\text{b/sr}$	Γ_{cm}		E_f^* :	0.0	344	615	755	930
								J_f^π :	0^+	2^+	0^+	4^+	2^+
3499.2(15)	14^+												
3573.2(11)	$\langle 1,2^+ \rangle$								12(5)	88(29)			
3699.0**	14^+						05Wa23						
3938.7(15)	$\langle 15 \rangle^-$												
3975.3**	$\langle 15^+ \rangle$						05Wa23						
4142.7(18)	$\langle 16 \rangle^+$												
4195.7**	16^+						05Wa23						
4609.3(18)	$\langle 17 \rangle^-$												
4662.8**	$\langle 17^+ \rangle$						05Wa23						
4747.5**	$\langle 18^+ \rangle$						05Wa23						
4836.2**	18^+						05Wa23						
5334.3**	19^-						05Wa23						
5387.2**	$\langle 20^+ \rangle$						05Wa23						
5550.5**	20^+						05Wa23						
6081.8**	21^-						05Wa23						
	03Ad25		73Fl04	73Fl04	67Bl05		Ref.						

Additional data on this isotope can be found in [03Ad25, 02AdZZ, 90Ta19].

Abundance: 0.20(1) %.* Different J^π in [03Ad25] and in the earlier evaluation [96Ar09].

** new high-spin levels introduced in [05Wa23]; see assignment of 5 bands therein.

The second value σ (p,t) is the linear sum of the differential cross section from 5 to 70°.

Data for this isotope are considered in vol. LB I/18C.

Energy levels and branching ratios [96Ar09]. Part 2

¹⁵²Gd
64

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	1048 0 ⁺	1109 2 ⁺	1123 3 ⁻	1227.38 6 ⁺	1282.26 4 ⁺	1314.65 1 ⁻	1318.42 2 ⁺	1434.02 3 ⁺	1470.48 5 ⁽⁻⁾	1550.21 4 ⁺
1282.263(18)	4 ⁺			1.6(8)								
1314.652(7)	1 ⁻		0.07(4)		0.05(3)							
1318.34(2)	2 ⁺		8(2)	0.4(1)	8(4)							
1434.020(5)	3 ⁺			3.03(6)								
1460.53(12)	1,2 ⁺		6(4)									
1550.21(3)	4 ⁺			11(5)					1.2(2)			
1605.602(16)	2 ⁺		3.4(4)	4.4(4)	1.5(6)							
1643.409(4)	2 ⁻			2.3(1)	2.94(11)				0.30(3)			
1668.07(9)	6 ⁺					10(3)	83(4)				7.4(6)	
1746.78(12)	8 ⁺					100						
1755.98(3)	1 ⁻			1.4(9)	2.3(14)							
1771.57(14)	2 ⁺				24(4)			9(4)				
1839.62(17)	$\langle 2^+ \rangle$			6(3)	10(4)							
1861.58(9)	$\langle 5^+ \rangle$					19(2)	4.4(3)			18.7(11)		1.6(6)

(continued)

 $^{152}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	1048 0 ⁺	1109 2 ⁺	1123 3 ⁻	1227.38 6 ⁺	1282.26 4 ⁺	1314.65 1 ⁻	1318.42 2 ⁺	1434.02 3 ⁺	1470.48 5 ⁽⁻⁾	1550.21 4 ⁺
1862.05(8)	2 ⁺				10(1)			3.4(6)	9(1)			
1880.3(3)	7 ⁻					100						
1941.16(7)	2 ⁺		15(1)	2.5(4)	2.3(3)		0.6(3)		21(1)			
1997.89(17)	$\langle 6^+ \rangle$					44(7)						27(7)
2011.63(14)	$\langle 3 \rangle^+$			16(1)					3.5(14)			
2173.41(19)	$\langle 6^- \rangle$					100						
2246.77(2)*	2 ⁺			22(2)	2.2(5)				12(2)	6.3(5)		
2299.66(13)*	3 ⁻			41(4)				4(1)				
2301.83(14)	$\langle 7^+ \rangle$					61(4)						
2394.19(10)	7 ⁺					22(2)						
2462.77(25)	$\langle 2^+ \rangle$			<43								
2523.80(4)	2 ⁺				25(3)			45(5)				
2529.39(3)	$\langle 3^+ \rangle$			7(2)	14(5)		16(2)					
2598.78(5)	1 ⁺ , 2 ⁺			28(8)				28(6)				
2686.85(10)	1 ⁺ , 2 ⁺ , 3							20(11)				
2709.32(11)	2 ⁺				50(4)					5.4(7)		
2719.67(4)	2 ⁺				9(2)							
2729.16(3)	2 ⁺		2.8(7)		11(2)				39(4)			
2749.20(3)	2 ⁺ , 3 ⁺			3(2)					5.1(8)			
2862.64(5)	3 ⁺				41(9)							
2880.65(2)*	1 ⁺ , 2 ⁺			16(2)	40(3)			6(1)	4(1)	10		
2914.15(7)	2 ⁺							32(14)				
2932.66(6)	2 ⁺				17(4)							
2964.33(4)*	2 ⁻ , 3 ⁻				12(4)				12(4)			
3024.3(4)	1 ⁺ , 2 ⁺			32(16)								
3042.30(5)	2 ⁺			7(3)				10(2)				
3085.2(3)	2 ⁺						43(8)					
3140.17(7)*	1 ⁺ , 2 ⁺							51(7)				
3159.6(9)	1, 2 ⁺			18(9)								
3191.3(3)	1 ⁻ , 2 ⁺				45(6)							
3205.4(4)	1 ⁻							14(8)	6(4)			
3250.9(4)	$\langle 1 \rangle^-$				38(12)							
3285.12(7)	2 ⁺							28(9)				
3337.8(10)	$\langle 1, 2^+ \rangle$								45(23)			
3358.26(10)	2 ⁺							43(6)				
3393.27(25)	2 ⁺							34(12)	37(12)			
3411.5(3)	$\langle 2 \rangle^+$								59			
3433.2(9)				86(52)								

Energy levels and branching ratios [96Ar09]. Part 3

¹⁵²Gd
64

E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	1605.60 2 ⁺	1643.41 2 ⁻	1668.07 6 ⁺	1692.41 3 ⁺	1746.78 8 ⁺	1771.57 ⟨2 ⁺ ,3 ⁻ ⟩	1839.62 ⟨2 ⁺ ⟩	1861.58 ⟨5 ⁺ ⟩	1862.05 2 ⁺	1880.3 7 ⁻
1915.19(4)	4 ⁺ ,5,6 ⁺							1.1(5)				
1941.16(7)	2 ⁺	<1				3(1)						
1975.67(17)	1,2 ⁺										≈0.01	
2138.8(3)	8 ⁺				100							
2246.77(2)*	2 ⁺	1.0(4)										
2299.66(13)*	3 ⁻			4(1)								
2300.4(8)	10 ⁺						100					
2301.83(14)	⟨7 ⁺ ⟩									33(17)		
2331.4(7)	9 ⁻						78					22
2394.19(10)	7 ⁺				19(1)		26(2)			26(2)		
2462.77(25)	⟨2 ⁺ ⟩	37(6)										
2536.9(9)	⟨9 ⁺ ⟩						100					
2729.16(3)	2 ⁺			13(2)		6.6(7)						
2927.85(5)	2 ⁺ ,3 ⁺					41(11)						
2932.66(6)	2 ⁺										10(4)	
3042.30(5)	2 ⁺	11(5)							8(2)			
3085.2(3)	2 ⁺			41(6)								
3205.4(4)	1 ⁻								31(6)			

Energy levels and branching ratios [96Ar09]. Part 4

¹⁵²Gd
64

E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	1915.42 $\langle 3^-, 4^+ \rangle$	1941.16 2^+	1975.67 $1, 2^+$	1997.89 $\langle 6^+ \rangle$	2011.63 $\langle 3 \rangle^+$	2138.8 8^+	2173.41 $\langle 6^- \rangle$	2246.83 3^+	2300.4 10^+	2301.83 $\langle 7^+ \rangle$
2301.83(14)	$\langle 7^+ \rangle$				6(3)							
2394.19(10)	7^+				0.8(2)			2.2(2)	2.6(2)			1.8(2)
2691.2(11)	10^+							100				
2729.16(3)	2^+			2.8(7)								
2814.6(9)	11^-										65	
2880.65(2)*	$1^+, 2^+$									1.1(4)		
2883.8(11)	12^+										100	
2890.4(10)	$\langle 11 \rangle^+$										62	
2964.33(4)*	$2^-, 3^-$	5(2)				7(2)						
3105.49(7)	2^+				73(12)							
3205.4(4)	1^-	10(4)										

Energy levels and branching ratios [96Ar09]. Part 5

 $^{152}_{64}\text{Gd}$

E^*	J^π	Branching ratios in percentage											
[keV]		E_f^* : J_f^π :	2331.4 9 ⁻	2462.77 ⟨2 ⁺ ⟩	2529.39 ⟨3 ⁺ ⟩	2536.9 ⟨9 ⁺ ⟩	2814.6 11 ⁻	2883.8 12 ⁺	2890.4 ⟨11⟩ ⁺	2928.8	3338.2 13 ⁻	3499.2 14 ⁺	3938.7 ⟨15⟩ ⁻
2709.32(11)	2 ⁺				0.9(2)								
2814.6(9)	11 ⁻	35											
2890.4(10)	⟨11⟩ ⁺				38								
2927.85(5)	2 ⁺ , 3 ⁺		18(7)										
3085.2(3)	2 ⁺									x			
3338.2(12)	13 ⁻					81	19						
3346.4(14)	⟨13 ⁺ ⟩								100				
3499.2(15)	14 ⁺						100						
3938.7(15)	⟨15⟩ ⁻										100		
4142.7(18)	⟨16⟩ ⁺											100	
4609.3(18)	⟨17⟩ ⁻												100

Energy levels and branching ratios [98He06, 06He06].

 $^{153}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	$2J^\pi$	σ (d,p)	L	σ (d,t)	L	σ (τ, α)	L	σ (p,t)	$T_{1/2}$ or Γ_{cm}	Ref.
		(d,p)	$\mu\text{b/sr}$	(d,t)	$\mu\text{b/sr}$	(τ, α)	$\mu\text{b/sr}$	(p,t)	$\mu\text{b/sr}$		
0.0	3 ⁻		94	1	207	1	≈ 0.0	0	268	240.4(10) d	67Tj01
41.5566(4)	5 ⁻		≈ 6	3	7	3	≈ 1		27	4.08(6) ns	73Lo14
93.3426(6)	7 ⁻		630	3	335	3	45		8	0.45(8) ns	73Lo14
95.1736(8)	(9) ⁺			4	incl	[4]	incl			3.5(4) μs	73Lo14
109.7560(7)	(5) ⁻		60	3	72				10	0.243(14) ns	67Tj01
129.1635(6)	3 ⁻			1	9			0	88	2.52(9) ns	73Lo14
139.79(15)	(13 ⁺)			6	45	6	135				73Lo14
168.4(6)	9 ⁻										
171.188(4)	(11 ⁻)		52	5	63	5	96			76.0(14) μs	73Lo14
183.4695(7)	5 ⁺		23	2	29					0.76(12) ns	67Tj01
212.0078(7)	3 ⁺		110	2	646	2,3	≈ 5		19		67Tj01
215.9927(10)	7 ⁻		incl								67Tj01
219.4426(11)	9 ⁻		incl								67Tj01
249.5538(11)	5 ⁻			2,3	46						73Lo14
290.3595(10)	7 ⁺										
303.5428(8)	5 ⁺			2	27	2	≈ 5				73Lo14
315.1991(14)	1 ⁻		31	1	≈ 40						67Tj01
316.0269(8)	(3,5) ⁺		incl								67Tj01
322.3(3)									4		73Lo08
327.8525(12)	1 ⁺		25	0	1063	0	18		2		67Tj01
333.168(2)	(9) ⁻										
336.3	(1,3) ⁺										
361.651(1)	3 ⁻		445	1	361	1	≈ 8		8		67Tj01
363.448(14)	(13 ⁻)						incl				06He06
365.39(15)	(17 ⁺)										06He06

(continued)

¹⁵³Gd₆₄

E^*	$2J^\pi$	$2J^\pi$	σ (d,p)	L	σ (d,t)	L	σ (τ,α)	L	σ (p,t)	$T_{1/2}$ or	Ref.
[keV]		(d,p)	$\mu\text{b/sr}$	(d,t)	$\mu\text{b/sr}$	(τ,α)	$\mu\text{b/sr}$	(p,t)	$\mu\text{b/sr}$	Γ_{cm}	
368.6675(14)	$\langle 5^- \rangle$						incl				06He06
378.0	$\langle 11^+ \rangle$										06He06
395.1458(12)	7^+				29						73Lo14
412.8948(11)	3^+			2	71	2	≈ 5		≈ 2		73Lo14
429.3(5)									4		73Lo08
430.1(4)	11^-										
436.2710(15)	1^-		369	$\langle 1 \rangle$	≈ 65	$\langle 1 \rangle$	≈ 4				67Tj01
442.1909(10)	5^+			$\langle 2 \rangle$	≈ 40						73Lo14
448.5193(13)	5^-								10		73Lo08
482.9359(14)	1^+			0	23						73Lo14
490.61(14)	$\langle 5^+, 7^+ \rangle$										
504.1709(9)	5^+			2	112						73Lo14
508.664(3)	3^-		189					0	82		67Tj01
512*	$[3^+]$					2	7				73Lo14
514.79(24)	11^-										
530.460(2)	3^-		136	1	21			0	96		67Tj01
548.765(2)	5^-		65		5				8		67Tj01
551.09(2)	$\langle 3^-, 5, 7^- \rangle$										
564.01(10)	$\langle 13^- \rangle$										
575.19(9)	$\langle 15^- \rangle$										
579.125(3)	$\langle 7^- \rangle$		10	3,4	26	3,4	18		8		67Tj01
607.202(3)	5^-		24		3				13		67Tj01
615.24(19)	$\langle 15^+ \rangle$										
615.60(22)	$\langle 15^+ \rangle$										
632.75(15)	$\langle 13^+ \rangle$										
636.307(12)	7^-		14	5,6	3	5,6	19				67Tj01
636.448(3)	$\langle 7^+ \rangle$		incl								67Tj01
649.021(10)	$\langle 7, 9^+, 11^+ \rangle$		29		10				13		67Tj01
664.325(2)	$\langle 1, 3^- \rangle$										
674.4(3)	$\langle 9^- \rangle$								6		
675.98	11^+		37						incl		67Tj01
676.724(13)	$\langle 1, 3, 5^+ \rangle$		incl						incl		67Tj01
677.1(3)	X^+										
683.957(2)	3^-				12				2		73Lo14
708.963(2)	3^+										
715.809(11)	$\langle 13^- \rangle$										
720.345(3)	$5^-, 7^-$		71								67Tj01
727.799(4)	$\langle 3-7^- \rangle$										
728.6(2)	$\langle 21^+ \rangle$										
729.203(4)	$\langle 1^-, 3^- \rangle$										
731.627(11)	7^+		11								67Tj01
754.4	$\langle 1, 3^+ \rangle$										
769.054(6)	$\langle 5, 7^- \rangle$		147	$\langle 3 \rangle$	35	$\langle 3 \rangle$	9				67Tj01
775.123(8)	$\langle 1^--5^+ \rangle$		incl		incl		incl				67Tj01
782.674(2)	3^+										

(continued)

¹⁵³Gd₆₄

E^*	$2J^\pi$	$2J^\pi$	σ (d,p)	L	σ (d,t)	L	σ (τ,α)	L	σ (p,t)	$T_{1/2}$ or	Ref.
[keV]		(d,p)	$\mu\text{b/sr}$	(d,t)	$\mu\text{b/sr}$	(τ,α)	$\mu\text{b/sr}$	(p,t)	$\mu\text{b/sr}$	Γ_{cm}	
791.014(4)	$\langle 1,3 \rangle^+$										
804.95(14)	$\langle 17^- \rangle$										
812.642(7)	$\langle 5^- \rangle$										
821.297(8)	5^+										
847.825(10)	$5^-, 7^-$										
852.0(4)	15^-										06He06
857.612(7)	3^-		427		10		3				67Tj01
865.610(5)	3^+										
873.88(15)	17^+										06He06
876(3)			27								67Tj01
885.911(15)	3^-			1	35	1	4				73Lo14
887.8	$\langle 9^- \rangle$		28				incl				67Tj01
894.614(6)	$\langle 1-5 \rangle^+$		incl								67Tj01
899.0(4)	$\langle 15^- \rangle$										
903.503(5)	$\langle 3^--7^- \rangle$		52		8						67Tj01
932.190(12)	$\langle 5^- \rangle$				10		≈ 1				73Lo14
937.374(5)	$\langle 5^+ \rangle$										
945.249(6)	3^+		55								67Tj01
955.451(13)	5^+										
962.034(8)	$\langle 1-5 \rangle^-$		175								67Tj01
977.63(13)	$\langle 19^+ \rangle$										
990.154(13)	$\langle 3^+ \rangle$		89		24		5				67Tj01
1010.0(2)	$\langle 17^- \rangle$										
1014.74(4)	5^+										
1015.24(3)	$\langle 1,3 \rangle^+$										
1025.498(9)	$\langle 5^- \rangle$										
1035.18(2)	5^+		19		6		2				67Tj01
1035.8(4)	15^+										
1037.1(11)			incl								67Tj01
1040.47(3)	$\langle 1-5 \rangle^-$										
1044.59(12)	$\langle 3-7 \rangle^+$										
1051.1(2)	$\langle 19^- \rangle$		64								67Tj01
1054.722(8)	3^-		incl								67Tj01
1066.571(13)	3^+										
1082(2)			9		15		5				67Tj01
1101.642(7)	3^+		22		8						67Tj01
1102.765(11)	$\langle 3-7 \rangle^-$		incl								67Tj01
1118.34(4)	$\langle 3^-, 5 \rangle$		8	2	53				8		67Tj01
1118.48(4)	3^+		incl			2	10		incl		67Tj01
1124.22(2)	$\langle 3, 5 \rangle^-$										
1131.632(14)	5^+										
1139.0	$\langle 1,3 \rangle^+$		24								67Tj01
1141.0(4)	17^-										
1152(2)	$\langle 7^- \rangle$		82	3	113						67Tj01
1157.42(3)	$\langle 5^- \rangle$		incl			2,3	14				67Tj01

(continued)

¹⁵³Gd₆₄

E^*	$2J^\pi$	$2J^\pi$	σ (d,p)	L	σ (d,t)	L	σ (τ, α)	L	σ (p,t)	$T_{1/2}$ or	Ref.
[keV]		(d,p)	$\mu\text{b/sr}$	(d,t)	$\mu\text{b/sr}$	(τ, α)	$\mu\text{b/sr}$	(p,t)	$\mu\text{b/sr}$	Γ_{cm}	
1163.74(12)	$\langle 3 \rangle^+$										
1172.602(7)	$\langle 1-5 \rangle^-$		193								67Tj01
1180.75(3)	5^+										
1191.1(9)	$\langle 25^+ \rangle$										
1194(5)			12								67Tj01
1195.30(16)	$\langle 25^+ \rangle$										
1199.04(6)	$\langle 7,9 \rangle^+$										
1208.72(13)	21^+										
1220.8(3)	$\langle 3,5,7 \rangle$										
1235(5)			27								67Tj01
1247.484(14)	$\langle 3-7 \rangle^+$		27		7						67Tj01
1252.145(13)	$\langle 1,3 \rangle^-$		incl		incl						67Tj01
1268.199(13)	3^-										
1272.71(4)	5^+										
1280(2)					4						73Lo14
1293.8(3)	$\langle 1,3 \rangle$		60		13		5				67Tj01
1312.3(2)	$\langle 21^- \rangle$										
1314.5(4)	$\langle 1,3 \rangle$										
1318.4	$\langle 19^- \rangle$										
1328.319(13)	5^+										
1330.6	$\langle 1,3 \rangle^+$										
1337.98(9)	$1^-, 3^-$		19								67Tj01
1339.4(4)	$\langle 17^- \rangle$										
1353.50(5)	$\langle 3 \rangle^-$										06He06
1357.3(5)	19^-										06He06
1363.60(6)	$\langle 1,3 \rangle^-$		139		8		9				67Tj01
1384.51(11)	$\langle 1,3 \rangle^-$		76		6						67Tj01
1387.46(3)	$\langle 3-7 \rangle$				7						73Lo14
1401.28(5)	$\langle 3 \rangle^+$		67		5						67Tj01
1422.94(2)	$\langle 3,5 \rangle^-$		65								67Tj01
1426.53(16)	$\langle 1,3 \rangle^+$										
1437.77(14)	23^+										
1450.30(13)	$\langle 1,3 \rangle^-$		58								67Tj01
1452.43(12)	$\langle 3,5 \rangle^+$				12						73Lo14
1462.02	$\langle 1,3 \rangle^+$										
1463.0(5)	19^+										
1471.8	$9^-, 11^-$			5	16	5	48				73Lo14
1484.8(5)	$\langle 1,3 \rangle$		49								67Tj01
1496(5)			37								67Tj01
1503.0(4)	$\langle 1,3 \rangle^-$										
1504.3(2)	$\langle 21^- \rangle$										
1509(2)	$\langle 7^+ \rangle$		43	3,4	48	$\langle 4 \rangle$	≈ 20				67Tj01
1520.2(3)	21^-										
1531(5)			42				18				67Tj01
1548(5)			71								67Tj01

(continued)

¹⁵³Gd₆₄

E^*	$2J^\pi$	$2J^\pi$	σ (d,p)	L	σ (d,t)	L	σ (τ,α)	L	σ (p,t)	$T_{1/2}$ or	Ref.
[keV]		(d,p)	$\mu\text{b/sr}$	(d,t)	$\mu\text{b/sr}$	(τ,α)	$\mu\text{b/sr}$	(p,t)	$\mu\text{b/sr}$	Γ_{cm}	
1563(5)			39				22				67Tj01
1584(5)			51								67Tj01
1574.0(3)	$\langle 19^- \rangle$										
1584(5)											
1586.8(2)	$\langle 23^- \rangle$										
1597(5)			28								67Tj01
1615(5)			47								67Tj01
1628.98(16)	25^+										06He06
1631(5)			13								67Tj01
1655(5)			51								67Tj01
1669(5)			22								67Tj01
1686(5)			34								67Tj01
1701(5)			18								67Tj01
1703.0(11)	$\langle 21^- \rangle$										06He06
1721.6(2)	$\langle 1,3 \rangle^+$		65								67Tj01
1738(5)			47								67Tj01
1746.7(2)	$\langle 29^+ \rangle$										06He06
1755(5)			69								67Tj01
1772(5)			34								67Tj01
1818.9(4)	$\langle 21^- \rangle$										06He06
1873.2(3)	$\langle 25^- \rangle$										06He06
1891.6(7)	23^-										06He06
1903.3(2)	25^-										06He06
1944.1(7)	23^+										06He06
1980.8(2)	27^+										06He06
2039.7(3)	25^-										06He06
2073.1(7)	$\langle 23^- \rangle$										06He06
2103.8(3)	$\langle 27^- \rangle$										06He06
2132.5(3)	29^+										06He06
2170.0(3)	27^-										06He06
2330.8(8)	$\langle 25^- \rangle$										06He06
2361.9(3)	29^-										06He06
2363.2(3)	33^+										06He06
2458.9(9)	27^-										06He06
2463.3(9)	27^+										06He06
2476.0(4)	29^-										06He06
2581.2(4)	29^-										06He06
2596.5(3)	31^+										06He06
2717.7(4)	33^+										06He06
2789.7(5)	31^-										06He06
2885.4(5)	33^-										06He06
3018.3(13)	$\langle 31^+ \rangle$										06He06
3031.6(6)	37^+										06He06
3049.9(13)	$\langle 31^- \rangle$										06He06
3109.4(6)	33^-										06He06

(continued)

¹⁵³Gd₆₄

E^*	$2J^\pi$	$2J^\pi$	σ (d,p)	L	σ (d,t)	L	σ (τ,α)	L	σ (p,t)	$T_{1/2}$ or	Ref.
[keV]		(d,p)	$\mu\text{b/sr}$	(d,t)	$\mu\text{b/sr}$	(τ,α)	$\mu\text{b/sr}$	(p,t)	$\mu\text{b/sr}$	Γ_{cm}	
3126.4(6)	$\langle 33^- \rangle$										06He06
3160.2(11)	$\langle 33^- \rangle$										06He06
3277.0(11)	$\langle 35^+ \rangle$										06He06
3368.6(6)	$\langle 37^+ \rangle$										06He06
3427.0(9)	35^-										06He06
3471.7(7)	$\langle 37^- \rangle$										06He06
3744.2(12)	41^+										06He06
4044.9(12)	$\langle 41^+ \rangle$										06He06
4124.7(12)	$\langle 41^- \rangle$										06He06
4499.2(16)	$\langle 45^+ \rangle$										06He06
4732.9(16)	$\langle 45^+ \rangle$										06He06
4841.7(16)	$\langle 45^- \rangle$										06He06
5298.2(19)	$\langle 49^+ \rangle$										06He06
5456.9(19)	$\langle 49^+ \rangle$										06He06
6145.2(21)	$\langle 53^+ \rangle$										06He06
6230.9(21)	$\langle 53^+ \rangle$										06He06
7035.2(23)	$\langle 57^+ \rangle$										06He06
			67Tj01		73Lo14		73Lo14		73Lo08		Ref.

Additional data on this isotope can be found in [02Br52, 84Pe03].

* Not included in adopted parameters [98He06].

20 bands (A-X) were considered in [06He06], see parameters therein.

Data for this isotope are considered in vol. LB I/18C.

Energy levels and branching ratios [98He06, 06He06]. Part 2

¹⁵³Gd₆₄

E^*	$2J^\pi$	Branching ratios in percentage										
		E_f^* :	0.0	41.5	93.3	95.2	109.7	129.2	134.9	171.2	183.470	212.008
[keV]	(d,p)	$2J_f^\pi$:	3–	5–	7–	$\langle 9 \rangle +$	$\langle 5 \rangle -$	3–	$\langle 13 + \rangle$	$\langle 11 - \rangle$	5+	3+
41.5566(4)			100									
93.3426(6)			21(2)	79(6)								
95.1736(8)					x							
109.7560(7)			95(4)	5.2(2)	0.09							
129.1635(6)			28(2)	72(4)	0.03		0.06(1)					
139.79(15)						x						
168.4(6)				15(8)	85(64)							
171.188(4)					≈ 10.2	90						
183.4695(7)			30(2)	37(1)	11.9(4)	17.0(5)		3.8(2)				
212.0078(7)			59(3)	13.0(7)			13.1(6)	15(2)				
215.9927(10)			7.1(3)	88(3)	1.06(8)		3.18(17)	0.57(17)				
219.4426(11)				13.4(15)	87(3)							
249.5538(11)			75(4)	18.9(6)	0.31(3)		5.0(7)	0.37(3)			0.95(14)	
290.3595(10)			1.3(2)	24.7(12)	6.6(13)	63(3)					4.3(6)	

(continued)

¹⁵³Gd₆₄

E^* [keV]	$2J^\pi$ (d,p)	$E_f^*:$ $2J_f^\pi:$	Branching ratios in percentage									
			0.0 3–	41.5 5–	93.3 7–	95.2 (9)+	109.7 (5)–	129.2 3–	134.9 (13+)	171.2 (11–)	183.470 5+	212.008 3+
303.5428(8)			19(1)	17(2)	21(2)		10(1)	23(1)			0.55(5)	5.9(5)
315.1991(14)			87(6)	3.8(3)			1.8(3)	7.0(10)				
316.0269(8)			44(1)	6.6(4)			20.4(9)	14.3(9)			15.0(4)	
327.8525(12)			70.6(14)					25(4)			3.99(13)	
333.168(2)				43(2)	52(4)							
361.651(1)			33(2)	44(1)	1.71		0.38	1.0(2)			18.5(6)	
363.448(14)										100		
368.6675(14)			15.2(6)	32(1)	37.2(7)	5.3(7)	≈2.5	3(1)			0.6(1)	
395.1458(12)				31(6)	10.5(6)	4(1)	27(1)					10.7(6)
412.8948(11)			3(2)	37(1)			15(1)	4.1(2)			7.5(7)	1.2(1)
436.2710(15)			96(4)	0.60(10)			1.7(3)					0.69(14)
442.1909(10)			26(1)	21(2)	8.3(3)		10.5(5)	0.3(1)			6.1(4)	1.39(5)
448.5193(13)			32(1)	15(2)	36(1)		2.0(1)	5.4(3)			2.1(1)	
482.9359(14)			11.9(6)					21(2)			18.4(4)	0.48(5)
490.61(14)						26						49
504.1709(9)			12(2)		10(1)		7.7(2)				12.5(5)	17.6(3)
508.664(3)			21.7(13)	61(2)				1.53(9)			11.0(3)	
530.460(2)			[50]	[24]		[1.2]	[7.5]					
548.765(2)			3.5(3)	17.5(9)	53(1)		2.8(5)	<2.2			1.6(3)	
551.09(2)								21(10)				
575.19(9)										21		
579.125(3)				5.8(7)	3.7(11)	71(4)	3.9(4)				14.3(4)	
607.202(3)			15(1)	32.1(10)	41(1)							
615.24(19)												
636.307(12)			23(2)				10(4)					
636.448(3)						26(2)	14(6)					
649.021(10)			38(6)		25(3)	14(4)						
664.325(2)			63.6(13)	3.0(3)								
683.957(2)			5.2(4)				3.61(19)				83.3(17)	
708.963(2)				7(1)			8.2(3)	23(1)			21(2)	
720.345(3)			5(2)	33(2)			11.8(6)	11(1)			3.7(4)	
727.799(4)			31(2)		15(2)							
729.203(4)			19(1)					17.5(5)				3.9(4)
731.627(11)			2(2)	35(1)	7(1)		2.7(5)				24(2)	
775.123(8)			19.5(9)	11(1)							8(2)	
782.674(2)			1(1)				2	10			10.4(4)	
791.014(4)				38(2)								
821.297(8)			7(1)	14(1)	11(4)		21(1)				21(1)	6(1)
847.825(10)					12		2.4(5)	7(1)				
857.612(7)			19(1)	21(2)			1.3(3)	4(1)				
865.610(5)			31(2)	4(2)			22(2)	19(2)			5.8(6)	
885.911(15)			84(4)	16(3)								
903.503(5)			52(10)	24(5)	11(4)							
932.190(12)			33(2)									6(3)
937.374(5)			39(2)	8(2)		9.4(8)	7(1)				10(4)	

(continued)

¹⁵³Gd
64

E^* [keV]	$2J^\pi$ (d,p)	$E_f^*:$ $2J_f^\pi:$	Branching ratios in percentage									
			0.0 3-	41.5 5-	93.3 7-	95.2 (9)+	109.7 (5)-	129.2 3-	134.9 (13+)	171.2 (11-)	183.470 5+	212.008 3+
945.249(6)			15(1)	11.9(5)			21(1)	1.1			25(1)	
955.451(13)			2.5(5)				39(2)	7(2)			1.9(3)	
962.034(8)								30(8)				
990.154(13)			10(2)				16(1)	26(3)			3.3(8)	5.5(5)
1014.74(4)			23(1)					10(1)				
1015.24(3)			67(19)									22(3)
1025.498(9)				52(18)								
1037.1(11)			1.3(8)				9.8(4)	37(1)				
1040.47(3)			70(8)					18(2)				
1044.59(12)			5(2)									
1054.722(8)			20(5)								38(3)	
1066.571(13)			10(1)	2.9(5)			9(1)	32(1)			11(1)	
1101.642(7)			10.7(2)	3.9(4)			35(1)	11.0(3)			2.7(3)	
1118.34(4)				25(4)								
1118.48(4)			23(4)	8(3)	6(1)		3(1)				11(7)	
1124.22(2)			54(5)		16(3)							
1131.632(14)			1.0(3)	5(2)		11(3)	24(3)					
1157.42(3)			38(6)					30(4)				
1163.74(12)							64(17)				17(6)	
1172.602(7)				36(11)								
1180.75(3)			5(1)	25(2)			7(1)	15(2)			11(1)	
1199.04(6)			7	3.5(7)	32(2)							
1220.8(3)							70(6)				30(10)	
1247.484(14)				58(7)								
1252.145(13)				95(9)								
1268.199(13)				58(15)								
1272.71(4)			18	31(2)	8			9(1)				
1328.319(13)			0.5(2)			2(1)	8(1)	13(1)			3.3(4)	
1337.98(9)			83(7)									
1353.50(5)											44(6)	
1363.60(6)												100
1384.51(11)			21(8)	79(10)								
1387.46(3)				0.50(17)	1.53(13)							
1401.28(5)			2.2(4)	17(1)				10				
1422.94(2)			6	1.1(3)		10(1)						
1426.53(16)			10(4)									
1450.30(13)			46(16)				54(11)					
1452.43(12)							6.2(8)	17(2)				
1721.6(2)			77(9)									

Energy levels and branching ratios [98He06, 06He06]. Part 3

¹⁵³Gd
64

E^* [keV]	$2J^\pi$ (d,p)	$E_f^*:$ $2J_f^\pi:$	Branching ratios in percentage									
			215.993 7-	219.443 <9->	221.3 <11+>	249.554 5-	290.360 <7+>	303.543 5+	315.200 1-	316.027 <3,5>+	321	327.854 1+
303.5428(8)			3.5(5)									
333.168(2)				4.6(5)								
361.651(1)						1.33						
368.6675(14)			2.1(1)	0.8(1)		1.4(1)						
395.1458(12)				7.5(2)		5.7(4)		4.5(6)				
412.8948(11)			29(2)						0.65(8)	0.80(8)		1.9(1)
436.2710(15)						<34			0.35(10)	0.49(5)		
442.1909(10)			2.2(1)			0.81(5)	15.2(4)	0.43(5)		6.7(2)		0.4(1)
448.5193(13)			4(1)			1.9(4)	1.09(7)		0.51(7)			
482.9359(14)									3.7(2)	40(1)		0.24(5)
490.61(14)						25						
504.1709(9)							22(2)	2.6(1)		6.2(2)		
508.664(3)			4.5(5)									
514.79(24)			x	x								
530.460(2)			[10]			[4.8]			[0.4]	[0.9]		[0.4]
548.765(2)			11.1(10)			4.1(11)	4.8(3)		0.68(9)	0.77(9)		
551.09(2)			x					79(13)				
564.01(10)				100								
607.202(3)				2.4(6)		7.8(5)			x			
636.307(12)			9(5)			x	x	58(5)		x		
636.448(3)				17(2)				20(4)				
649.021(10)			15(5)									
664.325(2)										5.1(3)		
675.98							100					
676.724(13)										2.8(5)		
708.963(2)			2.1			2.5(1)	3	3.3(1)	2.5(4)	7(1)	6(2)	
720.345(3)			16(3)			2.9(5)						
727.799(4)									44(10)			
729.203(4)						13.5(6)				27(1)		
731.627(11)			5(1)			10(2)						
769.054(6)				42(5)								
775.123(8)						39(2)						
782.674(2)						7.1(2)			12(1)	12(1)		2(1)
812.642(7)				37(4)						51(19)		
821.297(8)			6(2)			8(1)						
847.825(10)						10.4(4)	39(13)					
857.612(7)						3.1(3)		1(1)	2(1)	10(1)		12(1)
865.610(5)						3(2)				4.2(8)		
932.190(12)						7(1)						
937.374(5)			6(2)	13.7(9)			6(2)					
945.249(6)						0.4(3)		0.3(1)	4.0(2)	2.9(2)		2.8(2)
955.451(13)			29(5)	4(1)		3.8(4)	4					
962.034(8)						6(1)			17(2)	17(1)		
990.154(13)						32(3)						
1014.74(4)			23(1)			5(3)				6(4)		

(continued)

¹⁵³Gd₆₄

E^* [keV]	$2J^\pi$ (d,p)	Branching ratios in percentage										
		E_f^* : $2J_f^\pi$:	215.993 7−	219.443 ⟨9−⟩	221.3 ⟨11+⟩	249.554 5−	290.360 ⟨7+⟩	303.543 5+	315.200 1−	316.027 ⟨3,5⟩+	321	327.854 1+
1037.1(11)			1.0(4)			17(1)	1.6(10)			3.7(3)		
1040.47(3)										12.3(17)		
1044.59(12)						22(1)		50(5)		23(5)		
1054.722(8)										17.1(8)		2.3(5)
1066.571(13)						5(1)						
1101.642(7)						9.0(4)				2.0		
1102.765(11)						15(5)		29(3)				
1118.34(4)			36(3)			22(4)				18(3)		
1118.48(4)						14(3)						
1124.22(2)								14(2)				
1131.632(14)			6(3)	6(2)		12(1)						
1180.75(3)			12(1)			5(3)	12(3)					
1199.04(6)			21(8)	16(2)								
1268.199(13)								27(3)				
1272.71(4)							7(2)					
1314.5(4)										100		
1328.319(13)			3.4(4)			14(1)				7(1)		
1401.28(5)								6(2)		11(1)		
1422.94(2)						5(2)		22(4)	6(3)			
1426.53(16)			15(2)									
1452.43(12)						8(1)						

Energy levels and branching ratios [98He06, 06He06]. Part 4

¹⁵³Gd₆₄

E^* [keV]	$2J^\pi$ (d,p)	Branching ratios in percentage										
		E_f^* : $2J_f^\pi$:	333.169 ⟨9⟩−	361.0 ⟨17+⟩	361.651 3−	363.448 ⟨13−⟩	368.668 7−	395.146 ⟨7+⟩	412.896 3+	436.271 1−	442.192 5+	448.520 5−
442.1909(10)					0.8(2)							
482.9359(14)					4.6(2)							
504.1709(9)							1.0(1)		8.5(4)			
508.664(3)					0.79(9)							
530.460(2)					[0.38]							
575.19(9)						79						
579.125(3)											1.1(2)	
607.202(3)											0.9(1)	
615.24(19)				100								
636.448(3)							4(1)		19(1)			
664.325(2)					22.8(6)					0.74(10)		
674.4(3)								100				
676.724(13)					97(15)							
683.957(2)											2.2(3)	1.85(19)
708.963(2)										1.9(3)	9(1)	0.6(1)

(continued)

¹⁵³Gd₆₄

E^* [keV]	$2J^\pi$ (d,p)	Branching ratios in percentage										
		$E_f^*:$ $2J_f^\pi:$	333.169 ⟨9⟩−	361.0 ⟨17+⟩	361.651 3−	363.448 ⟨13−⟩	368.668 7−	395.146 ⟨7+⟩	412.896 3+	436.271 1−	442.192 5+	448.520 5−
715.809(11)			52(8)									28(8)
720.345(3)							5.0(6)				1.5(4)	6.7(2)
728.6(2)				100								
729.203(4)					6(1)					1.5(1)		5.4(4)
731.627(11)							5.8(9)		8.8(8)			
775.123(8)							2(1)					
782.674(2)										4.4(2)	18(1)	3.0(2)
804.95(14)						42(24)						
847.825(10)							3.8(5)				17(3)	9(2)
857.612(7)				≤28			≤10			1.0(2)		2.0(2)
865.610(5)											2.5(5)	7(2)
894.614(6)									11(4)			
932.190(12)			22(1)		15.0(7)					11(1)		
937.374(5)												≤30
945.249(6)											5.4(5)	≤6
955.451(13)											7(3)	
977.63(13)				10(4)								
990.154(13)							2.6(5)					4.9(5)
1014.74(4)							5(2)					10(3)
1037.1(11)					6(1)		9(3)					1.9(4)
1054.722(8)									2.3(8)	3.3(3)		
1066.571(13)						3(1)						
1101.642(7)										10(1)		5.1(1)
1102.765(11)											49(2)	
1118.48(4)							7(2)			20(2)		
1124.22(2)					14.3(12)							
1131.632(14)									12(1)			
1157.42(3)					22(6)							
1163.74(12)							20(8)					
1180.75(3)							6(2)					
1199.04(6)									14			7(2)
1272.71(4)							27					
1328.319(13)							3(1)		3(1)		8(1)	
1337.98(9)				17(3)								
1353.50(5)					46(10)							
1387.46(3)											92(3)	
1401.28(5)							5(2)			20(2)		
1422.94(2)							14(2)				15(1)	
1426.53(16)										75(17)		
1721.6(2)									23(8)			

Energy levels and branching ratios [98He06, 06He06]. Part 5

¹⁵³Gd₆₄

E^* [keV]	$2J^\pi$ (d,p)	$E_f^*:$ $2J_f^\pi:$	Branching ratios in percentage									
			482.936 1+	504.172 5+	508.659 3-	514.3 11-	530.461 3-	548.765 5-	551.09	564.6 ⟨13-⟩	575.0 ⟨15-⟩	579.127 ⟨7-⟩
664.325(2)			3.6(2)		0.46(10)		0.65(10)					
683.957(2)			2.2(4)	1.17(10)				0.48(10)				
708.963(2)			3.4(1)	1.0(1)								
720.345(3)								1.0(2)				1.5(4)
727.799(4)							10.4(7)					
729.203(4)			3.6(2)	1.6(1)								
769.054(6)							58(5)					
775.123(8)			21(1)									
782.674(2)			5.7(2)	6.0(1)				5.2(4)				
804.95(14)											58(10)	
812.642(7)							13(2)					
821.297(8)			5(1)									
857.612(7)							23(5)					
865.610(5)			1.4(2)									
887.8									100			
899.0(4)						x				x		
932.190(12)								6(1)				
945.249(6)				0.7(3)	9(1)							
955.451(13)				2(1)								
962.034(8)					13(1)		17(1)					
1010.0(2)										100		
1014.74(4)							18(4)					
1015.24(3)							11(2)					
1025.498(9)							40(11)					
1037.1(11)					3.4(5)		9(4)					
1051.1(2)											72(5)	
1054.722(8)				2.2(5)	4.2(3)		2.2(9)	9(1)				
1066.571(13)					15.6(6)							
1101.642(7)								3.9(4)				
1118.48(4)								8(7)				
1157.42(3)					5(1)							
1180.75(3)							2(1)					
1328.319(13)								18(7)				
1401.28(5)							14(3)					
1452.43(12)				25(7)								

Energy levels and branching ratios [98He06, 06He06]. Part 6

¹⁵³Gd₆₄

E^*	$2J^\pi$	Branching ratios in percentage											
[keV]	(d,p)	E_f^* : $2J_f^\pi$:	607.202 5−	610.5 ⟨15+⟩	636.311 7−	649.021	664.325 ⟨1,3⟩−	674.4 ⟨9−⟩	683.957 ⟨3⟩−	708.964 3+	715.810 ⟨13−⟩	720.348 5−,7−	723.6 ⟨21+⟩
715.809(11)						20(8)							
782.674(2)							1.5(3)						
791.014(4)												62(8)	
865.610(5)										0.5(1)			
977.63(13)				38(4)									52(5)
1035.18(2)								100					
1066.571(13)												12(1)	
1101.642(7)		2.1(2)											
1102.765(11)											7(2)		
1131.632(14)										10(2)			
1157.42(3)					5.0(9)								
1172.602(7)									20(4)				
1191.1(9)													100
1268.199(13)												9.5(11)	
1328.319(13)										6(1)			
1353.50(5)		9(2)											
1387.46(3)										5.6(3)			
1401.28(5)		10(2)											

Energy levels and branching ratios [98He06, 06He06]. Part 7

¹⁵³Gd₆₄

E^*	$2J^\pi$	Branching ratios in percentage											
[keV]	(d,p)	$E_f^*:$ $2J_f^\pi:$	727.805 ⟨5−⟩	729.207 ⟨1−,3−⟩	782.674 3+	804.7 ⟨17−⟩	812.645 ⟨5−⟩	821.312 ⟨5+⟩	847.823 5−,7−	857.587 3−	865.611 3+	898.7 ⟨15−⟩	945.280 3+
894.614(6)					89(10)								
903.503(5)			13.2(4)										
937.374(5)					1.0(3)								
945.249(6)			0.4(1)										
1025.498(9)					3(2)		5.6(8)						
1051.1(2)						28(8)							
1101.642(7)								4.4(6)					
1124.22(2)				1.4(4)									
1131.632(14)					5.2(6)			8(3)					
1172.602(7)													2.0(6)
1252.145(13)									5.5(6)				
1312.3(2)						x							
1318.4												100	
1328.319(13)										4(1)	6(1)		
1401.28(5)				4(1)									
1422.94(2)										17(1)			
1452.43(12)				45(13)									
1471.8								100					

Energy levels and branching ratios [98He06, 06He06]. Part 8

¹⁵³Gd₆₄

E^*	$2J^\pi$	Branching ratios in percentage											
		E_f^* :	962.034	1050.7	1066.64	1101.67	1102.77	1131.70	1190.5	1311.8	1586.3	1740.7	1872.3
[keV]	(d,p)	$2J_f^\pi$:	$\langle 1,3 \rangle -$	$\langle 19 - \rangle$	3+	3+	$\langle 7 \rangle -$	5+	$\langle 25 + \rangle$	$\langle 21 - \rangle$	$\langle 23 - \rangle$	$\langle 29 + \rangle$	$\langle 25 - \rangle$
1131.632(14)					1.1(4)								
1172.602(7)						43(3)							
1247.484(14)								42(2)					
1268.199(13)		4.6(6)											
1312.3(2)				x									
1422.94(2)							4(1)						
1586.8(2)				61						39			
1746.7(2)									100				
1873.2(3)										x	x		
2170.0(3)													100
2363.2(3)												100	

Energy levels and branching ratios [98Re22].

¹⁵⁴Gd₆₄

E^* [keV]	J^π	σ (t,p) $\mu\text{b/sr}$	ε <i>rel.</i>	σ (τ ,d) $\mu\text{b/sr}$	σ (α ,t) $\mu\text{b/sr}$	σ (p,t) $\mu\text{b/sr}$	σ (p,t) $\mu\text{b/sr}$	L (p,t)	$T_{1/2}$ or Γ_{cm}	Ref.
0.0 ^a	0 ⁺	267	100	≤0.5	0.8(1)	570	3500	0	Stable	73Fl04
123.070(1) ^a	2 ⁺	17		4.9(8)	31(1)	290	1270	2	1.184(5) ns	73Fl04
370.995(3) ^a	4 ⁺	3		2.7(7)	18(1)	15	155	4	45.2(15) ps	73Fl04
680.656(3) ^b	0 ⁺	162	62			90	460	0	4.0(6) ps	73Fl04
717.655(4) ^a	6 ⁺					5		⟨6⟩	7.8(4) ps	73Fl04
815.480(3) ^b	2 ⁺	9		≈1		40	235	2	6.4(5) ps	73Fl04
996.251(3) ^c	2 ⁺			4.5(7)	6.2(3)	70	385	2	0.95(7) ps	73Fl04
1047.582(4) ^b	4 ⁺	2			0.6(1)	3	≈30	4		73Fl04
1127.784(3) ^c	3 ⁺				6.2(3)					01Bu17
1135.96(19)	⟨1,2 ⁺ ⟩									
1144.43(6)	8 ⁺								2.56(14) ps	
1182.076(4) ^e	0 ⁺	138	56			2		0		89Sh08
1233.1										
1241.271(4)	1 [−]					<1			1.54 fs	73Fl04
1251.625(4)	3 [−]	21				incl		⟨3⟩		73Fl04
1263.776(5) ^c	4 ⁺				2.9(3)	2		⟨4⟩		73Fl04
1276.986(8)										
1294.174(4)	⟨2 ⁺ ⟩					<1				73Fl04
1295.467(6)	0 ⁺					incl				
1365(12)										
1365.869(8)	6 ⁺									
1397.524(5)	2 [−]									
1404.069(6)	⟨5 [−] ⟩									
1414.418(4)	1 [−]									
1418.140(3) ^e	2 ⁺	18				≤1		2		73Fl04

(continued)

¹⁵⁴Gd₆₄

E^*	J^π	σ (t,p)	ε	σ (τ ,d)	σ (α ,t)	σ (p,t)	σ (p,t)	L	$T_{1/2}$ or	Ref.
[keV]		$\mu\text{b/sr}$	<i>rel.</i>	$\mu\text{b/sr}$	$\mu\text{b/sr}$	$\mu\text{b/sr}$	$\mu\text{b/sr}$	(p,t)	Γ_{cm}	
1432.585(6)	5 ⁺									
1510.1(3)	$\langle 1,2^+ \rangle$					<1				73Fl04
1531.289(4)	2 ⁺				1.2(3)	20	145	2		73Fl04
1559.994(5)	$\langle 4^- \rangle$				1.4(3)					01Bu17
1573.958(7)	0 ⁺	23	10					0		
1606.55(8)	6 ⁺									
1617.118(7)	3 ⁻					<1				73Fl04
1637.04(10)	10 ⁺								1.1(1) ps	
1645.809(5) ^d	4 ⁺			30(2)	28(2)					01Bu17
1650.33(3)	0 ⁺									
1660.896(8)	3 ⁺									
1674.1	$\langle 7^- \rangle$									
1698.501(7)	$\langle 4^+ \rangle$									
1701.98(3) ^e	$\langle 4 \rangle^+$									
1716.031(6)	$\langle 2 \rangle^+$									
1719.551(4)	2 ⁻									
1731.7(6)	$\langle 7^- \rangle$									
1756.45(9)	8 ⁺									
1770.182(5) ^d	5 ⁺			40(3)	28(2)					01Bu17
1775.390(7)	2 ⁺									
1790.199(14)	$\langle 4^+ \rangle$									
1790.2	2 ⁺ , 3, 4 ⁺									
1796.932(6)	3 ⁻									
1810.21(6)	7 ⁺									
1836.36(5)	$\langle 0,1,2 \rangle$									01Bu17
1838.597(7)	2 ⁺									
1861.546(15)	4 ⁻									
1878.3										
1894.7(5)	$\langle 2^+ \rangle$									
1900.15(22)	$\langle 2^+ \rangle$									
1911.538(24) ^d	6 ⁺			≈ 1	1.1(2)					01Bu17
1912.07(15)	$\langle 0,1,2 \rangle$									
1943.93(3)	$\langle 1,2 \rangle$									
1948.542(9)	$\langle 5^- \rangle$									
1963.80(5)	$\langle 2 \rangle^+$									
1973.06(17)	$\langle 2^+ \rangle$									
2023.82(11)	1, 2 ⁺				0.8(3)					01Bu17
2040.5(3)	$\langle 9^- \rangle$									
2041.07(11)	$\langle 1,2 \rangle^+$									
2073.29(4)	$\langle 7^+ \rangle$									
2080.219(20)	$\langle 4^+ \rangle$			6(2)	2.9(3)					01Bu17
2080.777(9)	$\langle 3^- \rangle$			incl	incl					01Bu17
2101.6(3)	$\langle 1,2 \rangle$									
2112.78(3)	$\langle 2^+ \rangle$									
2116.9				18(2)	14(1)					01Bu17

(continued)

¹⁵⁴Gd₆₄

E^*	J^π	σ (t,p)	ε	σ (τ ,d)	σ (α ,t)	σ (p,t)	σ (p,t)	L	$T_{1/2}$ or	Ref.
[keV]		$\mu\text{b/sr}$	<i>rel.</i>	$\mu\text{b/sr}$	$\mu\text{b/sr}$	$\mu\text{b/sr}$	$\mu\text{b/sr}$	(p,t)	Γ_{cm}	
2119.51(5)	$1^+, \langle 2^+ \rangle$			incl	2(1)					01Bu17
2137.47(4)	7^-								68 ns	
2148.79(6)	$\langle 1,2 \rangle^+$			14(2)	8.7(5)					01Bu17
2175.08(3)	$\langle 1^+ \rangle$			7(1)	5(1)					01Bu17
2183.17(19)	$8^{\langle - \rangle}$			9(1)	5(1)					01Bu17
2184.67(13)	12^+			incl	7(1)					01Bu17
2185.850(12)	4^-									
2186.04(3)	1^+									
2194.12(12)	10^+									
2215.3	$\langle 6^+ - 8^+ \rangle$									
2221.53(3)	$\langle 2^+ \rangle$			34(2)	16(1)					01Bu17
2228.81(3)	$\langle 2^+ \rangle$			incl	incl					
2230.06(18)	$2^+ - 4^+$			incl	incl					
2245.29(6)										
2248.05(3)	$\langle 3 \rangle$			16(2)	9(1)					01Bu17
2251.2(3)										
2254.11(5)	$\langle 8^+ \rangle$									
2266.22(4)	$\langle 2^+ - 4^+ \rangle$									
2272.3	$\langle 8^+, 9^+ \rangle$									
2277.12(9)	3									
2294.54(3)	$\langle 3 \rangle^+$			25(2)	18(1)					01Bu17
2299.39(17)	$\langle 1,2 \rangle$			incl	incl					
2302.27(24)	$\langle 1,2 \rangle$			incl	incl					01Bu17
2304.83(3)	3^+			incl	incl					01Bu17
2309.46(6)	$\langle 8^- \rangle$			incl	incl					01Bu17
2309.53(15)	$\langle 2 \rangle^+$									
2324.3										
2336.00(5)	3^-									
2342.53(21)	$1,2^+$				1.4(3)					01Bu17
2356				3(1)	1.4(3)					01Bu17
2368.86(17)	$\langle 2^+ - 4^+ \rangle$				1.8(3)					01Bu17
2380.51(4)	1^-			3(1)	2.1(3)					01Bu17
2385.04(3)	$\langle 4^+ \rangle$									
2401.33(17)	$1,2^+$			6(1)	6.0(5)					01Bu17
2403.1(3)	$\langle 4^+ \rangle$			incl	incl					01Bu17
2403.8	$\langle 7^+ \rangle$			incl	incl					
2406.18(25)	$\langle 2^+ \rangle$			incl	incl					01Bu17
2409.90(3)	$\langle 4^+ \rangle$			incl	incl					01Bu17
2416.21(8)	4^+			≤ 6	10(1)					01Bu17
2430.67(6)	$1,2^+$			11(2)	7(1)					01Bu17
2432.82(4)	$\langle 0,1,2 \rangle$									
2440.7										
2440.76(16)	$\langle 1,2 \rangle$									
2449.2(3)	$\langle 1,2 \rangle$			6(1)	5(1)					01Bu17
2453.29(7)	$\langle 9^+ \rangle$									

(continued)

¹⁵⁴Gd₆₄

E^*	J^π	σ (t,p)	ε	σ (τ ,d)	σ (α ,t)	σ (p,t)	σ (p,t)	L	$T_{1/2}$ or	Ref.
[keV]		$\mu\text{b/sr}$	<i>rel.</i>	$\mu\text{b/sr}$	$\mu\text{b/sr}$	$\mu\text{b/sr}$	$\mu\text{b/sr}$	(p,t)	Γ_{cm}	
2459.4(4)	$6^+, 7, 8^+$									
2459.74(22)	$\langle 2^+ \rangle$									
2467.50(4)	$1, 2^+$			7(1)	2.8(5)					01Bu17
2475.26(11)	$\langle 9^- \rangle$			incl	incl					
2482.02(21)	$\langle 2^+ \rangle$									
2482.28(24)	$\langle 11^- \rangle$									
2486.41(11)	$1, 2^+$									
2494.80(4)	$1, 2^+$									
2499.3(3)	2^+									
2502.58(17)	$1, 2^+$									
2512.00(7)	2			19(2)	6(1)					01Bu17
2514.8(3)	$1, 2^+$			incl	incl					
2532.87(16)	$\langle 0^+, 1, 2 \rangle$			5(1)	8(1)					01Bu17
2561.3(4)	$2, 3^-$									
2568.10(16)	2			7(1)	21(2)					01Bu17
2579.61(19)	$10^{\langle - \rangle}$									
2585.5(4)	$\langle 0^+, 1, 2 \rangle$									
2590.30(5)	$\langle 1, 2 \rangle^+$			9(1)	9(1)					01Bu17
2616.06(19)										
2619.52(15)	$10^{\langle - \rangle}$			≤ 2	1.0(3)					01Bu17
2621.78(19)	12^+			incl	incl					
2633.13(24)	2^-									
2637.47(21)	$\langle 2 \rangle^-$			6(2)	2.6(5)					01Bu17
2655.38(11)	2^+			5(1)	≤ 1					01Bu17
2668.4										
2686.7(3)	2									
2695.5										
2699.4(4)	$\langle 0^+, 1, 2 \rangle$									
2710.5(4)	$1, 2^+$									
2721.5										
2722.53(8)	$1, 2^+$			4(1)	3(1)					01Bu17
2734.28(20)	$1^+, 2^+$									
2735.9										
2741.5(3)	$2^+, 3^-$			7(2)	9(2)					01Bu17
2744.1(4)	$\langle 0^+, 1, 2 \rangle$			incl	incl					
2775.36(18)	$11^{\langle - \rangle}$				3(1)					01Bu17
2777.30(15)	14^+									
2779.9										
2787.2					7(2)					01Bu17
2788.46(6)	$1, 2^+$									
2850.3(3)	2^+									
2860	1^+									
2872.37(24)	2^+									
2934.2(6)	1^+									
2948.33(4)	2^+									

(continued)

¹⁵⁴Gd
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E^*	J^π	σ (t,p)	ε	σ (τ ,d)	σ (α ,t)	σ (p,t)	σ (p,t)	L	$T_{1/2}$ or Ref.
[keV]		$\mu\text{b/sr}$	<i>rel.</i>	$\mu\text{b/sr}$	$\mu\text{b/sr}$	$\mu\text{b/sr}$	$\mu\text{b/sr}$	(p,t)	Γ_{cm}
2950.64(20)	12 ⁽⁻⁾								
2955.68(18)	12 ⁽⁻⁾								
2981.27(19)	13 ⁽⁻⁾								
2989.88(15)	1,2 ⁺								
3009.7(4)	1,2 ⁺								
3022.72(15)	2 ⁺								
3027.2(2)	14 ⁺								
3031.5(3)	1,2 ⁺								
3080	1 ⁺								
3090.6(9)	1,2 ⁺								
3122.54(24)	1 ⁺								
3153.1									
3154.8(4)									
3158.72(19)	13 ⁽⁻⁾								
3162.7(12)	1,2 ⁺								
3184.06(18)	1,2 ⁺								
3264.40(21)	1,2 ⁺								
3294.2(7)	1,2 ⁺								
3327.30(20)	1,2 ⁺								
3345.9(10)	1,2 ⁺								
3350.7(9)	1,2 ⁺								
3363.6(4)	2 ⁺								
3384.0(3)	14 ⁽⁻⁾								
3404.44(18)	16 ⁺								
3414.75(20)	1,2 ⁺								
3428.0(3)	14 ⁽⁻⁾								
3490.81(19)	16 ⁺								
3517.17(16)	3 ⁺								
3519.07(20)	15 ⁽⁻⁾								
3550.2(3)	2 ⁺ ,3,4 ⁺								
3599.2(6)									
3629.42(21)	15 ⁽⁻⁾								
3894.3(2)	16 ⁽⁻⁾								
3987.3(4)	16 ⁽⁻⁾								
4016.1(2)	18 ⁺								
4087.1(2)	18 ⁺								
4099.3(6)									
4102.0(3)	17 ⁽⁻⁾								
4176.3(3)	17 ⁽⁻⁾								
4474.9(3)	18 ⁽⁻⁾								
4595.1(4)	18 ⁽⁻⁾								
4646.3(2)	20 ⁺								
4656.0(8)									
4735.5(4)	19 ⁽⁻⁾								
4782.3(3)	20 ⁺								

(continued)

¹⁵⁴₆₄Gd

<i>E</i> [*]	<i>J</i> ^π	<i>σ</i> (t,p)	<i>ε</i>	<i>σ</i> (τ,d)	<i>σ</i> (α,t)	<i>σ</i> (p,t)	<i>σ</i> (p,t)	<i>L</i>	<i>T</i> _{1/2} or	Ref.
[keV]		μb/sr	rel.	μb/sr	μb/sr	μb/sr	μb/sr	(p,t)	<i>Γ</i> _{cm}	
4788.5(3)	19 ^{⟨-⟩}									
5116.4(4)	20 ^{⟨-⟩}									
5209.2(8)	20 ^{⟨-⟩}									
5254.3(10)										
5349.9(3)	22 ⁺									
5415.8(5)	21 ^{⟨-⟩}									
5457.5(4)	21 ^{⟨-⟩}									
5519.5(4)	22 ⁺									
5810.9(4)	⟨22 ⁻ ⟩									
5848.5(8)	⟨22 ⁻ ⟩									
5889.4(11)										
6121.6(4)	24 ⁺									
6136.2(6)	⟨23 ⁻ ⟩									
6178.0(5)	⟨23 ⁻ ⟩									
6294.1(5)	24 ⁺									
6535.6(9)	⟨24 ⁻ ⟩									
6555.4(5)	⟨24 ⁻ ⟩									
6883.3(7)	⟨25 ⁻ ⟩									
6946.1(7)	⟨25 ⁻ ⟩									
6955.0(6)	⟨26 ⁺ ⟩									
7055.5(6)	26 ⁺									
7274.0(10)	⟨26 ⁻ ⟩									
7353.1(7)	⟨26 ⁻ ⟩									
		80Sh08	80Sh08	01Bu17	01Bu17	73Fl04	73Fl04			Ref.
								98Re22		Ref.

Additional data on this isotope can be found in [04De15, 03Ku19, 02El07, 01Bu17, 00Jo11, 94Wu01, 94Bu16, 93Wu03, 93Su16, 92El11, 89Ha20, 68Me18, 68Me12, 67Bl05].

Abundance: 2.18(3) %.

a,b,c,d mark the ground state band and β-, γ and Γ-bands according to [01Bu17]; e marks weakly deformed intruder band (based on 0⁺ state) introduced in [03Ku19].

The second value σ (p,t) is the linear sum of the differential cross section from 5 to 70°.

Relative parameter analogous to ε is given in [80Sh08] to show the strength of two-neutron transfer (t,p) reaction.

Data for this isotope are considered in vol. LB I/18C.

Energy levels and branching ratios [98Re22]. Part 2

¹⁵⁴₆₄Gd

<i>E</i> [*]	<i>J</i> ^π	Branching ratios in percentage									
[keV]		<i>E</i> _f [*] :	0.0	123	371	681	718	815	996	1048	1127.8
		<i>J</i> _f ^π :	0 ⁺	2 ⁺	4 ⁺	0 ⁺	6 ⁺	2 ⁺	2 ⁺	4 ⁺	3 ⁺
123.070(1) ^a	2 ⁺		100								
370.995(3) ^a	4 ⁺			100							

(continued)

¹⁵⁴Gd
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E^*	J^π	Branching ratios in percentage									
[keV]		E_f^* : J_f^π :	0.0 0 ⁺	123 2 ⁺	371 4 ⁺	681 0 ⁺	718 6 ⁺	815 2 ⁺	996 2 ⁺	1048 4 ⁺	1127.8 3 ⁺
680.656(3) ^b	0 ⁺	x		100							
717.655(4) ^a	6 ⁺				100						
815.480(3) ^b	2 ⁺	17.9(1)	62.3(2)	19.6(2)	0.25(1)						
996.251(3) ^c	2 ⁺	46(2)	52.2(2)	1.36(2)	0.031(6)			0.017(2)			
1047.582(4) ^b	4 ⁺		24.0(9)	63(1)		3.8(1)	9.4(4)				
1127.784(3) ^c	3 ⁺		79.6(2)	20.2(2)			0.083(6)	0.049(2)	0.014(4)		
1135.96(19)	⟨1,2 ⁺ ⟩	72(9)	28(12)								
1144.43(6)	8 ⁺					100					
1182.076(4) ^e	0 ⁺	x	85(4)		x		15.3(5)				
1233.1			100								
1241.271(4)	1 ⁻	55(2)	44(1)		0.7(2)		0.32(3)				
1251.625(4)	3 ⁻	3.8(6)	76.7(8)	19.5(8)							
1263.776(5) ^c	4 ⁺		30.8(3)	67.3(5)		1.9(2)		≤1.9			
1276.986(8)				83						17(4)	
1294.174(4)	⟨2 ⁺ ⟩	28(8)	26(6)	19(2)							18(3)
1295.467(6)	0 ⁺	x	74(7)				4.4(18)	21(6)			
1365.869(8)	6 ⁺			18(1)		58(3)				23.5(12)	
1397.524(5)	2 ⁻		96.9(5)				2.46(2)	0.536(6)			0.0199(22)
1404.069(6)	⟨5 ⁻ ⟩			100							
1414.418(4)	1 ⁻	21(2)	76(3)				2.67(16)				
1418.140(3) ^e	2 ⁺	12(1)	8.8(6)	48(3)	1.0(2)		21.6(4)	1.0(1)	3.8(2)	0.85(4)	
1432.585(6)	5 ⁺			74(3)		26(1)					x
1510.1(3)	⟨1,2 ⁺ ⟩	20(3)	80(57)								
1531.289(4)	2 ⁺	1.11(6)	4.3(3)	8.1(3)	45(1)		34(1)	<2	0.92(5)	4.5(4)	
1559.994(5)	⟨4 ⁻ ⟩			88(3)				2.6(7)			
1573.958(7)	0 ⁺	x	10(3)				37(2)	31.7(6)			
1606.55(8)	6 ⁺			30(4)		70(10)					
1617.118(7)	3 ⁻		42.7(4)	52.7(2)			0.7(2)	0.55(3)	0.61(5)	0.4(2)	
1645.809(5) ^d	4 ⁺		1.4(6)	1.4(5)		1.5(5)	3.0(2)	49(2)	5.1(10)	28(1)	
1650.33(3)	0 ⁺	x	85(3)		x		15(4)				
1660.896(8)	3 ⁺		6.3(2)	2.9(3)			69.9(4)	3.41(13)	11.1(3)	0.8(3)	
1674.1	⟨7 ⁻ ⟩					100					
1698.501(7)	⟨4 ⁺ ⟩		24(3)	40(2)			17(3)		8(2)		
1701.98(3) ^e	⟨4 ⁺ ⟩					41(14)					
1716.031(6)	⟨2 ⁺ ⟩	15(5)	18(8)	25(6)				11(1)		18(1)	
1719.551(4)	2 ⁻		6.27(4)				3.13(2)	70.5(3)		17.41(8)	
1756.45(9)	8 ⁺					36(2)					
1770.182(5) ^d	5 ⁺			2(1)				37	5(2)	20(1)	
1775.390(7)	2 ⁺	20(1)	43(5)	17(2)	9(2)		4(1)		6.5(3)	1.3(5)	
1790.2	2 ⁺ ,3,4 ⁺		49(6)	51(3)							
1796.932(6)	3 ⁻	21(1)	1.9(2)	1.3(5)			9(1)	35(1)		15(2)	
1810.21(6)	7 ⁺					67(3)					
1836.36(5)	⟨0,1,2⟩	18(6)	45(2)		x						
1838.597(7)	2 ⁺	4.0(8)	2.8(11)				31(8)		50(10)		
1861.546(15)	4 ⁻			26(3)							

(continued)

¹⁵⁴Gd
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E^*	J^π	Branching ratios in percentage									
[keV]		E_f^* : J_f^π :	0.0 0 ⁺	123 2 ⁺	371 4 ⁺	681 0 ⁺	718 6 ⁺	815 2 ⁺	996 2 ⁺	1048 4 ⁺	1127.8 3 ⁺
1894.7(5)	⟨2 ⁺ ⟩		18(5)	9(4)	17(8)				56(14)		
1900.15(22)	⟨2 ⁺ ⟩				96(9)						
1911.538(24) ^d	6 ⁺				1.6		12(2)				
1912.07(15)	⟨0,1,2⟩			88(2)				12(3)			
1943.93(3)	⟨1,2⟩			25(5)							
1948.542(9)	⟨5 ⁻ ⟩				69(6)						
1963.80(5)	⟨2 ⁺ ⟩		17(3)	27.2(9)	51(8)						
1973.06(17)	⟨2 ⁺ ⟩		13(2)	20(7)	68(4)						
2023.82(11)	1,2 ⁺	x	x								
2041.07(11)	⟨1,2⟩ ⁺		44(3)	32(2)							
2080.219(20)	⟨4 ⁺ ⟩				15(2)		23(2)		24(3)		
2080.777(9)	⟨3 ⁻ ⟩				14(2)	15(1)			24(4)		32(2)
2101.6(3)	⟨1,2⟩		100						23(3)	35(1)	
2112.78(3)	⟨2 ⁺ ⟩		6(1)	37.6(8)	9.3(8)	14(4)					5(2)
2119.51(5)	1 ⁺ ,⟨2 ⁺ ⟩		13(1)	22(1)					17(1)		
2137.47(4)	7 ⁻						22(1)				
2148.79(6)	⟨1,2⟩ ⁺		44(3)	33(11)				19(3)			
2175.08(3)	⟨1 ⁺ ⟩		72(10)			13(4)		14(2)			
2185.850(12)	4 ⁻				0.5(1)						1.0(1)
2186.04(3)	1 ⁺		46(3)	33(2)		11(1)		3.6(10)	4(1)		
2221.53(3)	⟨2 ⁺ ⟩		19(3)	37(1)	20(5)	22(1)					
2228.81(3)	⟨2 ⁺ ⟩		33(13)			20(5)					
2230.06(18)	2 ⁺ -4 ⁺			20(3)	28(3)				31(6)		15(2)
2248.05(3)	⟨3⟩			28(6)	14(1)			14(4)	15(8)		36(5)
2266.22(4)	⟨2 ⁺ -4 ⁺ ⟩			29(3)	22(2)			8(2)		6(1)	12(4)
2277.12(9)	3			33(2)	5(1)					39(3)	
2294.54(3)	⟨3 ⁺ ⟩				49(7)				6(3)	20(3)	33(5)
2299.39(17)	⟨1,2⟩		36(3)	64(9)					31(14)		
2302.27(24)	⟨1,2⟩			72(2)				28(4)			
2304.83(3)	3 ⁺			3.8(9)	16(1)			23(2)	2.6(4)	36(2)	6.4(9)
2309.53(15)	⟨2 ⁺ ⟩								53(12)	47(5)	
2336.00(5)	3 ⁻			29(1)	≤74			25(6)	9(3)	≤59	26(9)
2342.53(21)	1,2 ⁺		68(5)	32(4)							
2368.86(17)	⟨2 ⁺ -4 ⁺ ⟩			40(4)	33(9)			21(4)			
2380.51(4)	1 ⁻			100							
2385.04(3)	⟨4 ⁺ ⟩			22(2)	37(1)			8(1)	13(2)		
2401.33(17)	1,2 ⁺		31(2)	41(2)					28(3)		
2403.1(3)	⟨4 ⁺ ⟩				62(6)					38(9)	
2406.18(25)	⟨2 ⁺ ⟩		21(5)	61(4)	17(2)						
2409.90(3)	⟨4 ⁺ ⟩			38(3)			22(5)			36(3)	
2416.21(8)	4 ⁺								15(3)		29(2)
2430.67(6)	1,2 ⁺		49(3)	33(2)							
2432.82(4)	⟨0,1,2⟩			92(9)							
2440.76(16)	⟨1,2⟩		42(2)	58(5)							
2449.2(3)	⟨1,2⟩		77(21)			23(4)					

(continued)

¹⁵⁴Gd
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E^*	J^π	Branching ratios in percentage									
[keV]		$E_f^*:$ $J_f^\pi:$	0.0 0 ⁺	123 2 ⁺	371 4 ⁺	681 0 ⁺	718 6 ⁺	815 2 ⁺	996 2 ⁺	1048 4 ⁺	1127.8 3 ⁺
2459.4(4)	6 ⁺ , 7, 8 ⁺						45(4)				
2459.74(22)	⟨2 ⁺ ⟩		20(2)	53(12)	27(3)						
2467.50(4)	1, 2 ⁺		31(7)	59(4)							
2482.02(21)	⟨2 ⁺ ⟩		30(3)	38(5)	32(3)						
2486.41(11)	1, 2 ⁺		77(5)	23(2)							
2494.80(4)	1, 2 ⁺		17(7)	23(2)							
2499.3(3)	2 ⁺		45(2)	35(2)	20(3)						
2502.58(17)	1, 2 ⁺		34(3)	66(3)							
2512.00(7)	2			61(2)	35(4)						
2514.8(3)	1, 2 ⁺		54(6)	46(5)							
2532.87(16)	⟨0 ⁺ , 1, 2⟩			96(24)							
2561.3(4)	2, 3 [−]			28(12)	72(8)						
2568.10(16)	2			34(10)	65(14)						
2585.5(4)	⟨0 ⁺ , 1, 2⟩			100							
2590.30(5)	⟨1, 2⟩ ⁺	3.0(9)	16(5)			42(3)		9(1)	20(2)		
2633.13(24)	2 [−]	57(16)	42(4)								
2637.47(21)	⟨2⟩ [−]		36(4)					17(5)			47(2)
2655.38(11)	2 ⁺	14(2)	8(1)			8(4)				8(3)	12(3)
2686.7(3)	2				51(17)			49(4)			
2699.4(4)	⟨0 ⁺ , 1, 2⟩								100		
2710.5(4)	1, 2 ⁺	24(4)	76(6)								
2722.53(8)	1, 2 ⁺	1.8(1)	4(1)			28(1)		19(1)		13(1)	
2734.28(20)	1 ⁺ , 2 ⁺	2.7(14)	9(4)						62(2)		13(5)
2741.5(3)	2 ⁺ , 3 [−]		44(3)	56(7)							
2744.1(4)	⟨0 ⁺ , 1, 2⟩			100							
2788.46(6)	1, 2 ⁺	24(2)	15(1)			11(1)		4(1)	6(1)		
2850.3(3)	2 ⁺	39(7)	37(2)							24(2)	
2872.37(24)	2 ⁺	11(1)	14(5)	63(13)						5(2)	
2934.2(6)	1 ⁺	80(8)	20(6)								
2948.33(4)	2 ⁺	39(2)	18(2)	15(3)							
2989.88(15)	1, 2 ⁺	9.7(6)	5.9(4)					0.3(2)			
3009.7(4)	1, 2 ⁺	79(5)	21(5)								
3022.72(15)	⟨2 ⁺ ⟩	22(1)	12(2)	8(3)							
3031.5(3)	1, 2 ⁺	68(7)	32(8)								
3090.6(9)	1, 2 ⁺	75(10)	25(10)								
3122.54(24)	⟨1 ⁺ ⟩	22(7)	41(4)			37(2)					
3162.7(12)	1, 2 ⁺	50(30)	50(20)								
3184.06(18)	1, 2 ⁺	5(1)	13(2)	28(2)	30(2)						
3264.40(21)	1, 2 ⁺	15(2)	23(5)					24(7)			
3294.2(7)	1, 2 ⁺	52(10)	48(8)								
3327.30(20)	1, 2 ⁺	6(4)	1.8(8)			93(8)					
3345.9(10)	1, 2 ⁺	65(12)	35(14)								
3350.7(9)	1, 2 ⁺	33(9)	67(12)								
3363.6(4)	2 ⁺		4(1)			16(1)		7(3)			
3414.75(20)	1, 2 ⁺	16(2)	16(2)			7(3)		48(16)			

(continued)

¹⁵⁴Gd₆₄

E^* [keV]	J^π	Branching ratios in percentage									
		$E_f^*:$ $J_f^\pi:$	0.0 0 ⁺	123 2 ⁺	371 4 ⁺	681 0 ⁺	718 6 ⁺	815 2 ⁺	996 2 ⁺	1048 4 ⁺	1127.8 3 ⁺
3517.17(16)	$\langle 3^+ \rangle$								3(2)		31(3)
3550.2(3)	2 ⁺ , 3, 4 ⁺								58(3)		42(3)

Energy levels and branching ratios [98Re22]. Part 3

¹⁵⁴Gd₆₄

E^* [keV]	J^π	Branching ratios in percentage										
		$E_f^*:$ $J_f^\pi:$	1136.0 $\langle 1, 2^+ \rangle$	1144.4 8 ⁺	1182.1 0 ⁺	1241.3 1 ⁻	1251.6 3 ⁻	1263.8 4 ⁺	1277.0	1294.2 $\langle 2 \rangle^+$	1295.5 0 ⁺	1365
1294.174(4)	$\langle 2 \rangle^+$				9.2(4)							
1397.524(5)	2 ⁻	0.0060(16)				0.0271(11)	0.072(3)					
1414.418(4)	1 ⁻						0.11(3)			0.21(3)		
1418.140(3) ^e	2 ⁺				1.2(1)	0.59(9)	0.64(4)			0.51(9)	0.55(4)	
1432.585(6)	5 ⁺							≤3.7				
1531.289(4)	2 ⁺					0.62(3)	0.55(3)	≤1.7		1.2(4)		
1559.994(5)	$\langle 4^- \rangle$							2.26(13)	5.7(12)			
1573.958(7)	0 ⁺			x	21.1(8)							
1606.55(8)	6 ⁺							x				
1617.118(7)	3 ⁻	0.30(2)				0.12(4)						
1637.04(10)	10 ⁺			100								
1645.809(5) ^d	4 ⁺						2.3(5)	5.3(8)	1.9(1)	≤41		
1660.896(8)	3 ⁺					0.42(13)		3.41(13)				
1698.501(7)	$\langle 4^+ \rangle$									7(1)		
1701.98(3) ^e	$\langle 4 \rangle^+$									30(3)		
1716.031(6)	$\langle 2 \rangle^+$					7.8(6)	5.5(4)					
1719.551(4)	2 ⁻					0.789(6)	0.212(6)					
1756.45(9)	8 ⁺			15.9(10)								
1770.182(5) ^d	5 ⁺							19(2)				
1790.199(14)	$\langle 4^+ \rangle$							42(16)				
1796.932(6)	3 ⁻					4.0(4)		6.7				
1810.21(6)	7 ⁺			15.2(8)								
1836.36(5)	$\langle 0, 1, 2 \rangle$					33.5(7)				3.4(6)		
1861.546(15)	4 ⁻							51(3)				
1911.538(24) ^d	6 ⁺							20(2)				
1943.93(3)	$\langle 1, 2 \rangle$				75(4)							
1948.542(9)	$\langle 5^- \rangle$						19(2)					
1963.80(5)	$\langle 2 \rangle^+$									4.3(10)		
2040.5(3)	$\langle 9^- \rangle$			100								
2112.78(3)	$\langle 2^+ \rangle$					27(3)						
2119.51(5)	1 ⁺ , $\langle 2^+ \rangle$					8.4(5)						
2137.47(4)	7 ⁻			34(2)								
2183.17(19)	8 $\langle^- \rangle$			x								
2185.850(12)	4 ⁻							1.5(4)				

(continued)

¹⁵⁴Gd₆₄

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	1136.0 $\langle 1, 2^+ \rangle$	1144.4 8^+	1182.1 0^+	1241.3 1^-	1251.6 3^-	1263.8 4^+	1277.0	1294.2 $\langle 2 \rangle^+$	1295.5 0^+	1365
2186.04(3)	1^+					1.7(4)						
2194.12(12)	10^+			5.1(5)								
2248.05(3)	$\langle 3 \rangle$					18(4)		7(2)				
2251.2(3)				x								
2254.11(5)	$\langle 8^+ \rangle$			x								
2277.12(9)	3							3(1)				
2304.83(3)	3^+						5(1)	4.7(4)				
2336.00(5)	3^-						<16	10(3)				
2368.86(17)	$\langle 2^+ - 4^+ \rangle$							5(4)				
2385.04(3)	$\langle 4^+ \rangle$						14(3)					7(2)
2416.21(8)	4^+							46(6)				
2459.4(4)	$6^+, 7, 8^+$			≈ 28								
2655.38(11)	2^+							29(3)				
2734.28(20)	$1^+, 2^+$										12(6)	
2872.37(24)	2^+					7(1)						
2989.88(15)	$1, 2^+$				50(3)							
3022.72(15)	$\langle 2^+ \rangle$					11(1)	7(1)					
3264.40(21)	$1, 2^+$				38(2)							
3414.75(20)	$1, 2^+$				14(2)							
3517.17(16)	$\langle 3^+ \rangle$							12(6)				

Energy levels and branching ratios [98Re22]. Part 4

¹⁵⁴Gd₆₄

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	1365.9 6^+	1397.5 2^-	1404.1 $\langle 5^- \rangle$	1414.4 1^-	1418.1 2^+	1432.6 5^+	1510.1 $\langle 1, 2^+ \rangle$	1531.3 2^+	1560.0 $\langle 4^- \rangle$	1606.5 6^+
1531.289(4)	2^+					0.4(1)						
1559.994(5)	$\langle 4^- \rangle$			1.1(4)								
1617.118(7)	3^-			0.14(3)		1.7(4)						
1645.809(5) ^d	4^+				≤ 2		1.1(3)					
1660.896(8)	3^+									1.6(3)		
1698.501(7)	$\langle 4^+ \rangle$					5(1)						
1719.551(4)	2^-			0.232(6)		0.061(2)	0.0358(12)		0.0087(16)	0.839(15)	0.47(8)	
1756.45(9)	8^+	48(2)										
1770.182(5) ^d	5^+	6(1)						7(2)				
1790.199(14)	$\langle 4^+ \rangle$									58(5)		
1796.932(6)	3^-				7(2)					x		
1810.21(6)	7^+							17.4(9)				
1861.546(15)	4^-				23(3)							
1878.3						100						
1911.538(24) ^d	6^+	2(1)						15(1)				5.6(1)
2080.777(9)	$\langle 3^- \rangle$			8(1)							3	

(continued)

¹⁵⁴Gd₆₄

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	1365.9 6 ⁺	1397.5 2 ⁻	1404.1 ⟨5 ⁻ ⟩	1414.4 1 ⁻	1418.1 2 ⁺	1432.6 5 ⁺	1510.1 ⟨1,2 ⁺ ⟩	1531.3 2 ⁺	1560.0 ⟨4 ⁻ ⟩	1606.5 6 ⁺
2119.51(5)	1 ⁺ ,⟨2 ⁺ ⟩			23(1)		14(1)	1.5(2)			1.3(1)		
2148.79(6)	⟨1,2⟩ ⁺						4(1)					
2185.850(12)	4 ⁻							0.9(4)				
2215.3	⟨6 ⁺ -8 ⁺ ⟩											x
2254.11(5)	⟨8 ⁺ ⟩	x										
2309.46(6)	⟨8 ⁻ ⟩	x										
2336.00(5)	3 ⁻					<16						
2342.53(21)	1,2 ⁺			≤5								
2416.21(8)	4 ⁺							10(1)				
2430.67(6)	1,2 ⁺			10(1)		9(1)						
2459.4(4)	6 ⁺ ,7,8 ⁺	≈28										
2467.50(4)	1,2 ⁺					5(2)						
2475.26(11)	⟨9 ⁻ ⟩	x										
2494.80(4)	1,2 ⁺									58(7)		
2655.38(11)	2 ⁺									21(2)		
2695.5												x
2722.53(8)	1,2 ⁺			17(1)						13(4)		
2787.2		[100]										
2788.46(6)	1,2 ⁺			14(1)		18(1)						
2989.88(15)	1,2 ⁺									32(2)		
3184.06(18)	1,2 ⁺			24(2)								
3517.17(16)	⟨3 ⁺ ⟩							20(2)				

Energy levels and branching ratios [98Re22]. Part 5

¹⁵⁴Gd₆₄

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	1617.1 3 ⁻	1637.0 10 ⁺	1645.8 4 ⁺	1660.9 3 ⁺	1702.0 ⟨4⟩ ⁺	1716.0 ⟨2⟩ ⁺	1719.5 2 ⁻	1731.7 ⟨7 ⁻ ⟩	1756.4 8 ⁺	1770.2 5 ⁺
1701.98(3) ^e	⟨4⟩ ⁺				29(7)							
1719.551(4)	2 ⁻				0.0135(12)							
1770.182(5) ^d	5 ⁺				4							
1838.597(7)	2 ⁺				6.2(7)							
1911.538(24) ^d	6 ⁺				15(1)							28(1)
1948.542(9)	⟨5 ⁻ ⟩	8(1)										
2073.29(4)	⟨7 ⁺ ⟩											38(7)
2080.219(20)	⟨4 ⁺ ⟩			2.2(7)	3(2)		1.0(3)					
2080.777(9)	⟨3 ⁻ ⟩	2										
2183.17(19)	8⟨ ⁻ ⟩									x		
2184.67(13)	12 ⁺			100								
2185.850(12)	4 ⁻				73(4)							7.9(5)
2194.12(12)	10 ⁺			8(3)							87(4)	
2215.3	⟨6 ⁺ -8 ⁺ ⟩										x	

(continued)

¹⁵⁴Gd₆₄

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	1617.1 3 ⁻	1637.0 10 ⁺	1645.8 4 ⁺	1660.9 3 ⁺	1702.0 ⟨4⟩ ⁺	1716.0 ⟨2⟩ ⁺	1719.5 2 ⁻	1731.7 ⟨7 ⁻ ⟩	1756.4 8 ⁺	1770.2 5 ⁺
2272.3	⟨8 ⁺ ,9 ⁺ ⟩			x								
2482.28(24)	⟨11 ⁻ ⟩			79(5)								
2512.00(7)	2						3.7(10)					
2579.61(19)	10 ^{⟨-⟩}			70								
2616.06(19)				58								
2619.52(15)	10 ^{⟨-⟩}			51								
2621.78(19)	12 ⁺			14								
2788.46(6)	1,2 ⁺								8(3)			

Energy levels and branching ratios [98Re22]. Part 6

¹⁵⁴Gd₆₄

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	1775.4 2 ⁺	1790.2 ⟨4 ⁺ ⟩	1796.9 3 ⁻	1810.2 7 ⁺	1836.4 ⟨0,1,2⟩	1911.5 6 ⁺	1912.1 ⟨0,1,2⟩	1948.5 ⟨5 ⁻ ⟩	2040.5 ⟨9 ⁻ ⟩	2041.1 ⟨1,2⟩ ⁺
1838.597(7)	2 ⁺		6(1)									
1900.15(22)	⟨2 ⁺ ⟩						4.1(13)					
1948.542(9)	⟨5 ⁻ ⟩			3(1)								
1963.80(5)	⟨2⟩ ⁺						0.51(9)					
2073.29(4)	⟨7 ⁺ ⟩							62(9)				
2080.777(9)	⟨3 ⁻ ⟩									1		
2116.9								100				
2137.47(4)	7 ⁻							44(2)				
2254.11(5)	⟨8 ⁺ ⟩							65(23)				
2266.22(4)	⟨2 ⁺ -4 ⁺ ⟩			2.0(5)								
2324.3								100				
2482.28(24)	⟨11 ⁻ ⟩											20.6(18)
2668.4									x			
2695.5						x						
2735.9											x	

Energy levels and branching ratios [98Re22]. Part 7

¹⁵⁴Gd₆₄

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	2073.3 ⟨7 ⁺ ⟩	2080.8 ⟨3 ⁻ ⟩	2112.8 ⟨2 ⁺ ⟩	2119.5 1 ⁺ ,⟨2 ⁺ ⟩	2137.5 7 ⁻	2175.1 ⟨1 ⁺ ⟩	2183.2 8 ⁻	2184.7 12 ⁺	2186.0 1 ⁺	2194.1 10 ⁺
2175.08(3)	⟨1 ⁺ ⟩				2							
2185.850(12)	4 ⁻			15(3)								
2221.53(3)	⟨2 ⁺ ⟩							2.3(2)				
2228.81(3)	⟨2 ⁺ ⟩										0.7(2)	

(continued)

¹⁵⁴Gd₆₄

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	2073.3 $\langle 7^+ \rangle$	2080.8 $\langle 3^- \rangle$	2112.8 $\langle 2^+ \rangle$	2119.5 $1^+, \langle 2^+ \rangle$	2137.5 7^-	2175.1 $\langle 1^+ \rangle$	2183.2 8^-	2184.7 12^+	2186.0 1^+	2194.1 10^+
2245.29(6)			100									
2248.05(3)	$\langle 3 \rangle$				0.2(1)							
2254.11(5)	$\langle 8^+ \rangle$		35(12)									
2272.3	$\langle 8^+, 9^+ \rangle$		x									
2309.46(6)	$\langle 8^- \rangle$					x						
2403.8	$\langle 7^+ \rangle$					x						
2432.82(4)	$\langle 0, 1, 2 \rangle$							2.6(7)				
2440.7						x						
2453.29(7)	$\langle 9^+ \rangle$		61(9)									
2590.30(5)	$\langle 1, 2 \rangle^+$					9.7(4)						
2616.06(19)									42			
2619.52(15)	$10^{\langle - \rangle}$								40			
2621.78(19)	12^+									x		86
2722.53(8)	$1, 2^+$					4(1)						
2777.30(15)	14^+									100		
2779.9			x									
2948.33(4)	2^+				27(2)							
2950.64(20)	$12^{\langle - \rangle}$									21		
2981.27(19)	$13^{\langle - \rangle}$									x		
3027.2(2)	14^+									x		
3517.17(16)	$\langle 3^+ \rangle$										9(3)	

Energy levels and branching ratios [98Re22]. Part 8

¹⁵⁴Gd₆₄

E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	2221.5 $\langle 2^+ \rangle$	2228.8 $\langle 2^+ \rangle$	2230.1 $2^+, 3, 4^+$	2245.3 $\langle 3 \rangle$	2248.0 $\langle 3 \rangle$	2251.2	2254.1 $\langle 8^+ \rangle$	2304.8 3^+	2309.5 $\langle 8^- \rangle$	2309.5 $\langle 2 \rangle^+$
2294.54(3)	$\langle 3 \rangle^+$		10.4(10)		3.1(10)			6(2)				
2304.83(3)	3^+			4(1)								
2385.04(3)	$\langle 4^+ \rangle$						0.3(1)					
2403.8	$\langle 7^+ \rangle$					x			x			
2409.90(3)	$\langle 4^+ \rangle$									3.8(7)		
2440.7											x	
2453.29(7)	$\langle 9^+ \rangle$								39(6)			
2467.50(4)	$1, 2^+$		4.0(4)									
2475.26(11)	$\langle 9^- \rangle$								x		x	
2579.61(19)	$10^{\langle - \rangle}$							30				
2668.4									x			
2779.9									x			x
3153.1												x
3154.8(4)												100

Energy levels and branching ratios [98Re22]. Part 9

¹⁵⁴₆₄Gd

<i>E</i> [*] [keV]	<i>J</i> ^π	Branching ratios in percentage										
		<i>E</i> _f [*] : <i>J</i> _f ^π :	2336.0 3 [−]	2342.5 1,2 ⁺	2368.9	2380.5	2432.8 ⟨0,1,2⟩	2440.7	2440.8 ⟨1,2⟩	2475.3 ⟨9 [−] ⟩	2482.3 ⟨11 [−] ⟩	2486.4 1,2 ⁺
2432.82(4)	⟨0,1,2⟩					5.4(18)						
2494.80(4)	1,2 ⁺						2.4(2)					
2532.87(16)	⟨0 ⁺ ,1,2⟩								4.0(16)			
2568.10(16)	2								1.4(2)			
2619.52(15)	10 ^{⟨−⟩}									9		
2695.5										x		
2721.5										100		
2735.9										x		
2775.36(18)	11 ^{⟨−⟩}									14		
2787.2										x		
2981.27(19)	13 ^{⟨−⟩}										x	
2989.88(15)	1,2 ⁺		2(1)									
3022.72(15)	⟨2 ⁺ ⟩				3							37(5)
3153.1								x				
3363.6(4)	2 ⁺			73(10)								

Energy levels and branching ratios [98Re22]. Part 10

¹⁵⁴₆₄Gd

<i>E</i> [*] [keV]	<i>J</i> ^π	Branching ratios in percentage										
		<i>E</i> _f [*] : <i>J</i> _f ^π :	2532.9	2579.6 10 [−]	2616.1	2619.5 10 [−]	2621.8 12 ⁺	2775.4 11 [−]	2777.3 14 ⁺	2950.6 12 [−]	2955.7 12 [−]	2981.3 13 [−]
2633.13(24)	2 [−]		1.3									
2775.36(18)	11 ^{⟨−⟩}				22	65						
2950.64(20)	12 ^{⟨−⟩}			79								
2955.68(18)	12 ^{⟨−⟩}				17	24		60				
3027.2(2)	14 ⁺						100					
3158.72(19)	13 ^{⟨−⟩}							x			x	
3384.0(3)	14 ^{⟨−⟩}										x	
3404.44(18)	16 ⁺								100			
3428.0(3)	14 ^{⟨−⟩}									100		
3490.81(19)	16 ⁺								≈29			
3519.07(20)	15 ^{⟨−⟩}								61			39

Energy levels and branching ratios [98Re22]. Part 11

¹⁵⁴Gd₆₄

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	3027.2 14 ⁺	3031.5 1,2 ⁺	3154.8	3158.7 13 ⁻	3384.0 14 ⁻	3404.4 16 ⁺	3428.0 14 ⁻	3490.8 16 ⁺	3519.1 15 ⁻	3599.2
3384.0(3)	14 ⁽⁻⁾					x						
3490.81(19)	16 ⁺		71									
3517.17(16)	3 ⁺			25(3)								
3599.2(6)					100							
3629.42(21)	15 ⁽⁻⁾					x	x					
3894.3(2)	16 ⁽⁻⁾						66					
3987.3(4)	16 ⁽⁻⁾								100			
4016.1(2)	18 ⁺							58		42		
4087.1(2)	18 ⁺							76		24		
4099.3(6)												x
4102.0(3)	17 ⁽⁻⁾										100	

Energy levels and branching ratios [98Re22]. Part 12

¹⁵⁴Gd₆₄

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	3629.4 15 ⁻	3894.3 16 ⁻	3987.3 16 ⁻	4016.1 18 ⁺	4087.1 18 ⁺	4099.3	4102.0 17 ⁻	4176.3 17 ⁻	4474.9 18 ⁻	4595.1 18 ⁻
3894.3(2)	16 ⁽⁻⁾		34									
4176.3(3)	17 ⁽⁻⁾		68	32								
4474.9(3)	18 ⁽⁻⁾			70						30		
4595.1(4)	18 ⁽⁻⁾				100							
4646.3(2)	20 ⁺					100						
4656.0(8)								x				
4735.5(4)	19 ⁽⁻⁾								100			
4782.3(3)	20 ⁺						100					
4788.5(3)	19 ⁽⁻⁾									72	28	
5116.4(4)	20 ⁽⁻⁾										x	
5209.2(8)	20 ⁽⁻⁾											100

Energy levels and branching ratios [98Re22]. Part 13

¹⁵⁴Gd₆₄

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	4646.3 20 ⁺	4656.0	4735.5 19 ⁻	4782.3 20 ⁺	4788.5 19 ⁻	5116.4 20 ⁻	5209.2 20 ⁻	5254.3	5349.9 22 ⁺	5415.8 21 ⁻
5116.4(4)	20 ⁽⁻⁾						x					
5254.3(10)				x								
5349.9(3)	22 ⁺		100									
5415.8(5)	21 ⁽⁻⁾				100							
5457.5(4)	21 ⁽⁻⁾						x	x				

(continued)

¹⁵⁴Gd₆₄

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	4646.3 20 ⁺	4656.0	4735.5 19 ⁻	4782.3 20 ⁺	4788.5 19 ⁻	5116.4 20 ⁻	5209.2 20 ⁻	5254.3	5349.9 22 ⁺	5415.8 21 ⁻
5519.5(4)	22 ⁺				100							
5810.9(4)	⟨22 ⁻ ⟩							100				
5848.5(8)	⟨22 ⁻ ⟩								100			
5889.4(11)										x		
6121.6(4)	24 ⁺										100	
6136.2(6)	⟨23 ⁻ ⟩											100

Energy levels and branching ratios [98Re22]. Part 14

¹⁵⁴Gd₆₄

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	5457.5 21 ⁻	5519.5 22 ⁺	5810.9 ⟨22 ⁻ ⟩	5848.5 ⟨22 ⁻ ⟩	6121.6 24 ⁺	6136.2 ⟨23 ⁻ ⟩	6178.0 ⟨23 ⁻ ⟩	6294.1 24 ⁺	6535.6 ⟨24 ⁻ ⟩	6555.4 ⟨24 ⁻ ⟩
6178.0(5)	⟨23 ⁻ ⟩	x										
6294.1(5)	24 ⁺			100								
6535.6(9)	⟨24 ⁻ ⟩					100						
6555.4(5)	⟨24 ⁻ ⟩				x							
6883.3(7)	⟨25 ⁻ ⟩							x				
6946.1(7)	⟨25 ⁻ ⟩								x			
6955.0(6)	⟨26 ⁺ ⟩						100					
7055.5(6)	26 ⁺									100		
7274.0(10)	⟨26 ⁻ ⟩										x	
7353.1(7)	⟨26 ⁻ ⟩											x

Energy levels and branching ratios [94Re10, 05Re01].

¹⁵⁵Gd₆₄

E^*	$2J^\pi$	L	σ (d,p)	σ (d,t)	L	$d\sigma/d\Omega$	L	$d\sigma/d\Omega$	$d\sigma/d\Omega$	I_γ	Γ_o	Γ_o^{red}	$T_{1/2}$ or	Ref.
[keV]		(d,p)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	(d,d')	$\mu\text{b/sr}$	(τ, α)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	[eVb]	[meV]	[meV']	Γ_{cm}	
0.0	3 ⁻	1	131(6)	372(15)*		12100		<1	493				Stable	86Sc25
60.0106(6)	5 ⁻		6(1)	29(7)		1410			48				0.20 ns	71St03
86.5468(6)	5 ⁺	2	21(2)	54(8)									6.50 ns	86Sc25
105.311(1)	3 ⁺		111(16)	1030(130)			2,4	≈10					1.16 ns	71Lo01
107.581(1) ^a	9 ⁺		141(18)	620(120)										86Sc25
117.999(1) ^b	7 ⁺							38						71Lo01
121.05(19)	11 ⁻	5	48(3)	490(40)									32.0 ms	86Sc25
146.070(1)	7 ⁻	3	512(10)	516(20)		834			21				0.10 ns	71St03
214.351(1) ^a	13 ⁺	6	233(8)	351(18)			6	66						71Lo01
230.129(1) ^b	11 ⁺		12(2)	54(7)										86Sc25
251.706(1)	9 ⁻	5	96(4)	106(11)		74							58 ps	71St03

(continued)

¹⁵⁵Gd₆₄

E^*	$2J^\pi$	L	σ (d,p)	σ (d,t)	L	$d\sigma/d\Omega$	L	$d\sigma/d\Omega$	$d\sigma/d\Omega$	I_γ	Γ_o	Γ_o^{red}	$T_{1/2}$ or	Ref.
[keV]		(d,p)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	(d,d')	$\mu\text{b/sr}$	(τ, α)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	[eVb]	[meV]	[meV]	Γ_{cm}	
266.647(1)	5 ⁺													
268.623(1)	3 ⁺	2	152(5)	2110(40)				17						71Lo01
282.6(2)	13 ⁻													
287.004(1)	3 ⁻	2,3	13(2)	163(11)					≈ 4					86Sc25
321.381(1)	5 ⁻	3,2	109(6)	497(17)		5								71St03
326.088(1)	5 ⁺		23(4)	147(12)										86Sc25
350.436(1)	7 ⁺		9(3)	101(11)										86Sc25
367.634(1)	1 ⁺	0	140(10)	4670(90)				≤ 3						71Lo01
392.317(4)	11 ⁻					45							23 ps	71St03
393.532(1)	7 ⁻	3	283(10)	266(19)		incl								71St03
423.412(1)	7 ⁺		20(3)	63(14)		2								71St03
423.8(2) ^a	17 ⁺													
427.238(7)	3 ⁺		25(3)	347(23)										86Sc25
450.563(1)	3 ⁻	1	266(11)	1820(80)		18			8					71St03
451.371(1)	1 ⁻													
453.7(1) ^b	15 ⁺													
454.475(1)	5 ⁻		41(16)	80(40)										86Sc25
463.8(3)	15 ⁻													
480(15)								12						71Lo01
485.975(4)	$\langle 9^- \rangle$		43(7)	200(30)		4								71St03
488.721(1)	5 ⁺	$\langle 2 \rangle$	44(8)	460(30)										86Sc25
534.1(1)	13 ⁻		5(1)	9(4)		5							22 ps	71St03
553.371(4)	$\langle 7^- \rangle$	$\langle 3 \rangle$	335(15)	185(17)										86Sc25
559.369(4)	1 ⁻	0,1	397(16)	123(11)		9			8					71St03
581.455(1)	5 ⁻		11(4)	47(5)		8								71St03
592.142(2)	3 ⁻	1	36(4)	136(9)		16			82					71St03
610.842(2)	7 ⁺			26(7)		14								71St03
614.855(2)	3 ⁻		183(12)	150(50)		incl			4				14 ps	71St03
647.790(2)	5 ⁻		15(4)	11(6)		8			10				14 ps	71St03
658.985(4)	5 ⁻		152(10)	56(8)		4								71St03
663.6(3)	17 ⁻													
692.4(3)	$\langle 9^- \rangle$		36(5)	27(6)		3								71St03
714.0(6)														
720.617(2)	1 ⁺ -5 ⁺	3		198(23)										86Sc25
721.0	$\langle 7^- \rangle$					9								71St03
729.39(25)	15 ⁻								4				7.1 ps	73Lo08
736.7(2) ^a	21 ⁺													
752.549(4)	5 ⁺	1,3	44(7)	220(30)										86Sc25
754.8														
786.6(2) ^b	19 ⁺													
786.896(6)	7 ⁻		362(18)	88(13)		6								71St03
804.38(2)	$\langle 9^- \rangle$		21(4)	32(7)										86Sc25
815.731(3)	$\langle 3^+ \rangle$	5	5(2)	58(10)		3								71St03
827.9(5)			11(3)											86Sc25
860.17(21)	$\langle 13^+ \rangle$	6	48(4)	7(3)		3								71St03

(continued)

¹⁵⁵Gd₆₄

E^*	$2J^\pi$	L	σ (d,p)	σ (d,t)	L	$d\sigma/d\Omega$	$d\sigma/d\Omega$	$d\sigma/d\Omega$	I_γ	Γ_o	Γ_o^{red}	$T_{1/2}$ or	Ref.
[keV]		(d,p)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	(d,d')	$\mu\text{b/sr}$	$\mu\text{b/sr}$	$\mu\text{b/sr}$	[eVb]	[meV]	[meV']	Γ_{cm}	
872.809(3)	$\langle 5 \rangle^+$		21(24)	38(5)		5							71St03
880.7(3)	19^-												
889.3													
896.75(27)	17^-					10						5.2 ps	71St03
931.5													
950(2)						2							71St03
987.1(4)			15(3)			8							71St03
1002.953(3)	1^-		72(7)										86Sc25
1012.892(3)	3^-		31(4)	23(4)		4							71St03
1023.89(20)			130(13)			35							86Sc25
1028.028(15)	1^-5^-		32(10)	2.6(15)				23					86Sc25
1028.1	$\langle 7^- \rangle$												
1035.218(4)	$1^+, 3^+$		12(3)	27(5)									86Sc25
1057.1(6)			14(2)										86Sc25
1060.597(3)	$\langle 5^- \rangle$		11(2)										86Sc25
1078.43(2)	$1^-, 3^-$		38(4)	9(3)									86Sc25
1086.846(7)	3^+												
1092.2(4)			5(2)	22(6)									86Sc25
1104.792(6)	$\langle 7^- \rangle$		31(5)	11(3)									86Sc25
1107.3													
1112.02(21)			45(5)	21(6)									86Sc25
1113.1(3)	21^-												
1129.849(3)	3^-	0=2,4	135(13)	34(7)		6							71St03
1140.9(4)			15(3)	4.8(22)									86Sc25
1142.3(3)	19^-											2.4 ps	
1144.3(3) ^a	$\langle 25 \rangle^+$												
1146.8(5)				10(3)		5							71St03
1158.9(3)	13^+	5,6	85(7)										86Sc25
1173.3(3)			31(3)	13(3)		16							71St03
1192.850(9)	$1^+, 3^+$		17(2)	53(8)									86Sc25
1197.610(17)	3^-7		6(2)			10							71St03
1220.3(2) ^b	23^+					9							71St03
1225.007(9)			19(2)	26(5)									86Sc25
1230.3(2)	3^-			13(6)									86Sc25
1233.6(4)			16(2)										86Sc25
1246.7(4)	$1^-, 3^-$		22(2)	86(12)		10							71St03
1255.8													
1269.6(5)				18(8)									86Sc25
1278(2)						5							71St03
1286.7(6)				36(8)									86Sc25
1292.58(5)	3^+		6(2)			4							71St03
1297.177(7)	7^+	4	89(8)	1600(400)				7					71Lo01
1303.2													
1306.97(22)			65(6)			7							71St03
1312.8(9)			17(4)			3							71St03

(continued)

¹⁵⁵Gd₆₄

E^*	$2J^\pi$	L	σ (d,p)	σ (d,t)	L	$d\sigma/d\Omega$	L	$d\sigma/d\Omega$	$d\sigma/d\Omega$	I_γ	Γ_o	Γ_o^{red}	$T_{1/2}$ or	Ref.
[keV]		(d,p)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	(d,d')	$\mu\text{b/sr}$	(τ, α)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	[eVb]	[meV]	[meV']	Γ_{cm}	
1326.5(3)	21^-					3							2.9 ps	71St03
1327(2)														
1332.05(7)	$1^+, 3^+$													
1335.16(22)			47(6)	53(10)		5								71St03
1343.312(12)	$3^- - 7^-$		36(5)											86Sc25
1359.88(4)	$3^- - 7^+$													
1359.9(4)	23^-													
1363.631(9)	$5, 7^+$		107(11)	33(9)		5								71St03
1368.2(9)				7(3)										86Sc25
1380.5(5)			9(4)											86Sc25
1387.7(8)	$1^+, 3^+$					9								
1399.2(4)				28(9)										86Sc25
1405.0(3)			41(8)			7								71St03
1415.9(7)			27(5)	12(5)										86Sc25
1425.0(5)			13(3)											86Sc25
1427.5(5)				32(9)		3								86Sc25
1434.42(5)	$1^+, 3^+$													
1437.680(11)			244(24)	31(9)										86Sc25
1452.3(8)			37(8)											86Sc25
1458.1(5)				42(12)		3								71St03
1460.6(4)	$\langle 19^- \rangle$													05Re01
1466.1(4)														
1470.02(3)	5^+		130(13)											86Sc25
1474.53(5)	$1^+ - 5^+$													
1481.8(4)				100(30)										86Sc25
1484.5(7)			21(4)											86Sc25
1492.7(5)				53(15)										86Sc25
1505.9(4)			37(5)											86Sc25
1517.11(4)			40(5)											86Sc25
1522.5														
1526.1(6)				49(16)										86Sc25
1536.8(4)			28(5)			10								71St03
1542.5(6)				38(13)										86Sc25
1546.1(3)			20(3)											86Sc25
1551.3(8)	$1^+, 3^+$			240(60)										86Sc25
1554.8(9)			17(9)											86Sc25
1561.5(5)			49(9)											86Sc25
1576(2)						6								71St03
1581(15)	11^-						5	39						71Lo01
1587(5)			32											67Tj01
1604(5)			83											67Tj01
1615.3(3)	23^-													05Re01
1619.2	25^-													05Re01
1619.2(4)	25^-													05Re01
1626(5)			233											67Tj01

(continued)

¹⁵⁵Gd₆₄

E^*	$2J^\pi$	L	σ (d,p)	σ (d,t)	L	$d\sigma/d\Omega$	L	$d\sigma/d\Omega$	$d\sigma/d\Omega$	I_γ	Γ_o	Γ_o^{red}	$T_{1/2}$ or	Ref.
[keV]		(d,p)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	(d,d')	$\mu\text{b/sr}$	(τ, α)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	[eVb]	[meV]	[meV']	Γ_{cm}	
1635.8(3) ^a	$\langle 29^+ \rangle$													05Re01
1653(5)			41											67Tj01
1675(1)	1-5									7.3(9)	5.3(6)	1.13(13)		96No10
1686.8														05Re01
1704(5)			28											67Tj01
1740.7														05Re01
1743(5) ^b	$[27^+]$		63											99Ha48
1745(5)														05Re01
1794(5)			66											67Tj01
1809.0(5)	25-													05Re01
1822(5)			42											67Tj01
1843(5)			175											67Tj01
1869(5)			55											67Tj01
1889.8(4)	27-													05Re01
1899(5)			53											67Tj01
1913.1(14)	$\langle 23^- \rangle$													05Re01
1932(5)			79											67Tj01
1982(1)	1-5									2.4(6)	2.5(7)	0.32(8)		96No10
2017(1)	1-5									6.3(6)	6.7(7)	0.82(8)		96No10
2136.0	27-													05Re01
2161.0(4)	$\langle 25^- \rangle$													05Re01
2170.4(4)	29-													05Re01
2199 ^a	33+													05Re01
2283(1)	1-5									1.4(3)	1.9(4)	0.16(3)		96No10
2329(1)	1-5									1.5(4)	2.2(6)	0.17(4)		96No10
2331.9	29-													05Re01
2345 ^b	$[31^+]$													05Re01
2421.6(4)	$\langle 27^- \rangle$													05Re01
2456(1)	1-5									1.3(3)	4.1(7)	0.27(5)		96No10
2460.0(4)	31-													05Re01
2558(1)	1-5									2.1(4)	3.5(6)	0.21(4)		96No10
2596(1)	1-5									3.1(4)	5.5(7)	0.32(4)		96No10
2645(1)	1-5									1.3(4)	2.4(8)	0.13(4)		96No10
2655(1)	5									1.9(4)	11(1)	0.60(6)		96No10
2689(1)	1-5									1.3(4)	2.5(8)	0.13(4)		96No10
2694.5(5)	$\langle 29^- \rangle$													05Re01
2702.2	31-													05Re01
2728(1)	1-5									3.9(5)	7.5(10)	0.37(5)		96No10
2743(1)	1-5									2.6(4)	5.1(8)	0.25(4)		96No10
2756(1)	1-5									1.4(3)	7.4(11)	0.36(5)		96No10
2758.3(4)	33-													05Re01
2768(1)	1-5									2.9(3)	5.7(7)	0.27(3)		96No10
2814(1)	1-5									1.3(4)	2.8(7)	0.12(3)		96No10
2819(1)	1-5									1.3(3)	2.8(6)	0.12(3)		96No10
2825(5) ^a	37+													05Re01

(continued)

¹⁵⁵₆₄Gd

E^*	$2J^\pi$	L	σ (d,p)	σ (d,t)	L	$d\sigma/d\Omega$	L	$d\sigma/d\Omega$	I_γ	Γ_o	Γ_o^{red}	$T_{1/2}$ or	Ref.
[keV]		(d,p)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	(d,d')	$\mu\text{b/sr}$	(τ, α)	$\mu\text{b/sr}$	[eVb]	[meV]	[meV']	Γ_{cm}	
2826(1)	1-5								1.3(4)	2.6(7)	0.12(3)		96No10
2854(1)	5								3.6(4)	17(1)	0.73(4)		96No10
2865(1)	1 ⁻ -5								1.4(3)	6.0(9)	0.26(4)		96No10
2872(1)	1-5								2.6(3)	5.6(7)	0.24(3)		96No10
2883.7	33 ⁻												05Re01
2978.4(5)	$\langle 31^- \rangle$												05Re01
3011(1)	1-5								1.3(3)	3.2(7)	0.12(3)		96No10
3014.3(4)	35 ⁺												05Re01
3064.4(4)	35 ⁻												05Re01
3123(1)	1-5								1.5(3)	5.9(11)	0.19(4)		96No10
3199(1)	1-5								1.1(3)	3.0(8)	0.09(2)		96No10
3276.0(5)	$\langle 33^- \rangle$												05Re01
3305(1)	1-5								1.8(4)	5.0(10)	0.14(3)		96No10
3379.8(5)	37 ⁻												05Re01
3505 ^a	$\langle 41^+ \rangle$												05Re01
3579.1(5)	$\langle 35^- \rangle$												05Re01
3702.8(5)	39 ⁻												05Re01
3730.4(5)	39 ⁻												05Re01
4038.9(5)	41 ⁻												05Re01
4234 ^a	45 ⁺												05Re01
4379.6(10)	43 ⁻												05Re01
4503.9(5)	43 ⁺												05Re01
4735.4(10)	45 ⁻												05Re01
5009 ^a	49 ⁺												05Re01
5343.3(5)	47 ⁺												05Re01
5829 ^a	$\langle 53^+ \rangle$												05Re01
6240.67(6)	$\langle 51^+ \rangle$												05Re01
			86Sc25	86Sc25		71St03		71Lo01	96No10	96No10	96No10		Ref.
			67Tj01										Ref.

Additional data on this isotope can be found in [00Hu04, 99Ha48, 93Ri05, 84Pe03, 75Ja18, 69Ja04, 69Bo17, 67Tj01].

Abundance: 14.80(12) %.

* Measured at 45°; similar σ (d,t) measurements at 90° are reported in [69Ja04].

a,b mark levels of two bands ($\alpha=+1/2^+$, $\alpha=-1/2^+$) built on the $9/2^+$ state; identical bands are found [00Ha59] in N=91 isotones ¹⁵³Sm, ¹⁵⁵Gd [99Ha48] and ¹⁵⁷Dy [93Ri05].

20 bands are assigned to excited states of this nucleus in [05Re01].

σ (d,p) from I_p measured at 45° for E=20 MeV in [86Sc25] ($E^*<1.56$ MeV) and 12 MeV in [67Tj01].

σ (τ,α) was measured at 60°, data for 90° can be found in [71Lo01].

Data for this isotope are considered in vol. LB I/18C.

Energy levels and branching ratios [94Re10, 05Re01]. Part 2

¹⁵⁵Gd
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E^*	$2J^\pi$	Branching ratios in percentage										
[keV]		E_f^* : $2J_f^\pi$:	0.0 3 ⁻	60.0 5 ⁻	86.5 5 ⁺	105.3 3 ⁺	107.6 9 ⁺	118.0 7 ⁺	121.0 11 ⁻	146.1 7 ⁻	214.351 13 ⁺	230.129 11 ⁺
60.0106(6)	5 ⁻		100									
86.5468(6)	5 ⁺		99(2)	1.02(4)								
105.311(1)	3 ⁺		94(2)	5.9(1)	0.22(6)							
107.581(1) ^a	9 ⁺				100							
117.999(1) ^b	7 ⁺			85(4)	9.0(20)		6.2(6)					
121.05(19)	11 ⁻						100					
146.070(1)	7 ⁻		26(1)	74(7)								
214.351(1) ^a	13 ⁺						100					
230.129(1) ^b	11 ⁺						54(4)	46(4)				
251.706(1)	9 ⁻			52(7)						48(6)		
266.647(1)	5 ⁺			1.3(1)	57(1)	21.1(2)		20.2(2)		0.46(5)		
268.623(1)	3 ⁺		13.4(9)	1.1(2)	2.1(1)	83(1)		0.049(6)				
282.6(2)	13 ⁻								100			
287.004(1)	3 ⁻		28(1)	13.3(2)	21(1)	38(1)						
321.381(1)	5 ⁻		5.3(5)	13(2)	11(1)	46(3)		9.7(10)		15(1)		
326.088(1)	5 ⁺			2.6(3)	22(2)	55(6)	0.7(1)	20(2)				
350.436(1)	7 ⁺				6.1(7)	6.9(7)	39(3)	48(4)				
367.634(1)	1 ⁺		10.6(8)		5.1(5)	83(8)						
392.317(4)	11 ⁻									59(7)		
393.532(1)	7 ⁻		1.6(5)	13(1)	46(5)			2.9(3)		21(2)		
423.412(1)	7 ⁺			13(3)	35(3)		8.3(8)	36(3)		2.2(3)		
423.8(2) ^a	17 ⁺										100	
427.238(7)	3 ⁺		0.7	33(3)	28(3)	4		0.11(2)				
450.563(1)	3 ⁻		34(2)	30(2)	32(2)					0.6(1)		
451.371(1)	1 ⁻		44(4)	6.9(7)		32(3)						
453.7(1) ^b	15 ⁺										30	70
454.475(1)	5 ⁻		19(2)	2.2(3)	50(5)			28(2)				
463.8(3)	15 ⁻								17			
488.721(1)	5 ⁺		2.6(4)	0.1(1)	13(1)	3.9(4)	0.8(1)	34(3)		1.2(3)		
553.371(4)	⟨7 ⁻ ⟩			6(1)	12(1)			77(7)				
559.369(4)	1 ⁻		97(9)	2.0(3)								
581.455(1)	5 ⁻		13(1)	3.7(6)		5.5(6)		64(6)				
592.142(2)	3 ⁻		12(1)	26(2)	28(2)	14(1)				4.4(4)		
614.855(2)	3 ⁻		48(5)	51(5)	0.36(8)							
647.790(2)	5 ⁻		31(4)	9(1)		5(1)		21(2)		19(2)		
658.985(4)	5 ⁻			60(6)				2.0(5)		36(3)		
720.617(2)	1 ⁺ -5 ⁺				9.4(14)	76(7)						
721.0	⟨7 ⁻ ⟩		100									
752.549(4)	5 ⁺		3(1)	9(1)	35(3)	8(4)		41(4)				
786.896(6)	7 ⁻						11.2(12)			55(9)		
804.38(2)	⟨9 ⁻ ⟩											81(11)
815.731(3)	⟨3 ⁺ ⟩				50(5)	37(7)						
872.809(3)	⟨5 ⁺ ⟩		19(2)			60(7)						
1002.953(3)	1 ⁻		38(4)									
1012.892(3)	3 ⁻		12(2)	8(1)	25(5)	30(4)						

(continued)

¹⁵⁵Gd₆₄

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		E_f^* : $2J_f^\pi$:	0.0 3 ⁻	60.0 5 ⁻	86.5 5 ⁺	105.3 3 ⁺	107.6 9 ⁺	118.0 7 ⁺	121.0 11 ⁻	146.1 7 ⁻	214.351 13 ⁺	230.129 11 ⁺
1028.1	$\langle 7^- \rangle$		x	x						x		
1035.218(4)	1 ⁺ ,3 ⁺		45(9)									
1060.597(3)	$\langle 5^- \rangle$		54(5)	39(7)								
1086.846(7)	3 ⁺					40(6)						
1104.792(6)	$\langle 7^- \rangle$		20(3)				10(1)	30(4)				
1129.849(3)	3 ⁻			45(4)	28(8)							
1197.610(17)	3 ⁻ -7			43(4)	45(8)							
1230.3(2)	3 ⁻									69(16)		
1297.177(7)	7 ⁺									62(10)		
1332.05(7)	1 ⁺ ,3 ⁺		52(8)		34(4)							
1343.312(12)	3 ⁻ -7 ⁻			34(4)								
1359.9(4)	23 ⁻				57(9)	28(3)						
1363.631(9)	5,7 ⁺					35(5)		36(4)				
1434.42(5)	1 ⁺ ,3 ⁺				21(13)							
1437.680(11)					19(10)							
1470.02(3)	5 ⁺			17(3)			17(3)	12(2)				
1474.53(5)	1 ⁺ -5 ⁺				29(6)							
1517.11(4)					23(4)							

Energy levels and branching ratios [94Re10, 05Re01]. Part 3

¹⁵⁵Gd₆₄

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		E_f^* : $2J_f^\pi$:	251.706 9 ⁻	266.648 5 ⁺	268.624 3 ⁺	282.8 13 ⁻	287.004 3 ⁻	321.381 5 ⁻	326.088 5 ⁺	350.436 7 ⁺	367.634 1 ⁺	392.318 11 ⁻
367.634(1)	1 ⁺				1.1(5)		0.2(2)					
392.317(4)	11 ⁻		41(7)									
393.532(1)	7 ⁻		15(1)									
423.412(1)	7 ⁺			4.6(6)				0.8(3)				
427.238(7)	3 ⁺			25(3)	2.2(2)			0.5(1)	7(2)		0.8(3)	
450.563(1)	3 ⁻							0.7(1)	1.9(2)		0.4(1)	
451.371(1)	1 ⁻				6.2(6)		10.8(7)				0.8(1)	
454.475(1)	5 ⁻							0.77(12)				
463.8(3)	15 ⁻					83						
485.975(4)	$\langle 9^- \rangle$		100									
488.721(1)	5 ⁺			2.8(3)	26(3)		2(1)		≈3	6.3(6)		
534.1(1)	13 ⁻		87(4)									13(4)
553.371(4)	$\langle 7^- \rangle$		4.9(14)									
559.369(4)	1 ⁻						1.19(9)					
581.455(1)	5 ⁻				0.8(1)		0.95(16)	3.4(3)		0.64(16)		
592.142(2)	3 ⁻			1.8(2)	8.4(7)		1.7(1)	2.8(2)				
610.842(2)	7 ⁺		26(2)	15(1)					23(2)			
614.855(2)	3 ⁻						0.44(8)	0.44(6)				

(continued)

¹⁵⁵Gd
64

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		E_f^* : $2J_f^\pi$:	251.706 9 ⁻	266.648 5 ⁺	268.624 3 ⁺	282.8 13 ⁻	287.004 3 ⁻	321.381 5 ⁻	326.088 5 ⁺	350.436 7 ⁺	367.634 1 ⁺	392.318 11 ⁻
647.790(2)	5 ⁻		2.6(2)		6.0(6)				2.8(4)			
658.985(4)	5 ⁻						0.9(7)	1.0(5)				
663.6(3)	17 ⁻					51						
720.617(2)	1 ⁺ -5 ⁺				9.4(9)		1.17(14)					
729.39(25)	15 ⁻											78(33)
786.896(6)	7 ⁻		27(3)									
815.731(3)	⟨3⟩ ⁺			1.6(8)	6.8(6)				3.0(3)			
872.809(3)	⟨5⟩ ⁺							8(1)				
1002.953(3)	1 ⁻				45(3)							
1012.892(3)	3 ⁻				9(1)		8(1)					
1035.218(4)	1 ⁺ ,3 ⁺			20(5)							15(2)	
1060.597(3)	⟨5 ⁻ ⟩							6(2)				
1078.43(2)	1 ⁻ ,3 ⁻						54(6)					
1086.846(7)	3 ⁺			25(3)							9(2)	
1104.792(6)	⟨7 ⁻ ⟩			3(1)			18(2)					
1129.849(3)	3 ⁻				3.5(7)							
1343.312(12)	3 ⁻ -7 ⁻						12(3)	20(3)	23(3)			
1437.680(11)							48(8)		24(11)			
1470.02(3)	5 ⁺						25(4)					

Energy levels and branching ratios [94Re10, 05Re01]. Part 4

¹⁵⁵Gd
64

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		E_f^* : $2J_f^\pi$:	393.533 7 ⁻	423.413 7 ⁺	423.7 ⟨17⟩ ⁺	427.236 3 ⁺	450.564 3 ⁻	451.372 1 ⁻	453.6 ⟨15⟩ ⁺	454.475 5 ⁻	464.1 ⟨15⟩ ⁻	485.976 ⟨9 ⁻ ⟩
488.721(1)	5 ⁺					5(1)						
581.455(1)	5 ⁻		6.4(7)	1.7(3)								
592.142(2)	3 ⁻						0.7(3)					
610.842(2)	7 ⁺			15(1)		20(2)						
647.790(2)	5 ⁻		2.7(2)							1.6(2)		
663.6(3)	17 ⁻										49	
720.617(2)	1 ⁺ -5 ⁺						2.6(3)	1.79(14)				
736.7(2) ^a	21 ⁺				100							
752.549(4)	5 ⁺			3.1(3)			1.6(2)					
786.6(2) ^b	19 ⁺				39				61			
786.896(6)	7 ⁻											7(1)
804.38(2)	⟨9 ⁻ ⟩											19(15)
815.731(3)	⟨3⟩ ⁺							1.60(11)		0.50(11)		
872.809(3)	⟨5⟩ ⁺									12.9(13)		
880.7(3)	19 ⁻										42	
1002.953(3)	1 ⁻									4		
1012.892(3)	3 ⁻						1.0(2)					

(continued)

¹⁵⁵Gd₆₄

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		E_f^* : $2J_f^\pi$:	393.533 7 ⁻	423.413 7 ⁺	423.7 $\langle 17 \rangle^+$	427.236 3 ⁺	450.564 3 ⁻	451.372 1 ⁻	453.6 $\langle 15 \rangle^+$	454.475 5 ⁻	464.1 $\langle 15 \rangle^-$	485.976 $\langle 9^- \rangle$
1028.028(15)	1 ⁻ –5 ⁻						40(5)					
1086.846(7)	3 ⁺							12(4)				
1104.792(6)	$\langle 7^- \rangle$			5(1)								
1129.849(3)	3 ⁻						3.2(3)					
1192.850(9)	1 ⁺ ,3 ⁺					58(8)						
1225.007(9)		88(3)										
1292.58(5)	3 ⁺			37(7)						14(3)		
1434.42(5)	1 ⁺ ,3 ⁺							79(9)				
1470.02(3)	5 ⁺									18(2)		
1517.11(4)										63(11)		

Energy levels and branching ratios [94Re10, 05Re01]. Part 5

¹⁵⁵Gd₆₄

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		E_f^* : $2J_f^\pi$:	488.721 5 ⁺	534.13 13 ⁻	553.372 $\langle 7 \rangle^-$	559.368 1 ⁻	592.143 3 ⁻	614.856 3 ⁻	647.793 5 ⁻	658.987 5 ⁻	663.5 $\langle 17^- \rangle$	720.618
729.39(25)	15 ⁻			22(7)								
880.7(3)	19 ⁻										58	
896.75(27)	17 ⁻			93(6)								
1002.953(3)	1 ⁻							7(1)				1.34(11)
1012.892(3)	3 ⁻	2.9(4)				1.0(2)			1.1(2)			1.1(1)
1028.028(15)	1 ⁻ –5 ⁻					16(2)				44(12)		
1035.218(4)	1 ⁺ ,3 ⁺							2.5(6)				10(1)
1078.43(2)	1 ⁻ ,3 ⁻					34(4)				12(3)		
1086.846(7)	3 ⁺											5
1104.792(6)	$\langle 7^- \rangle$			4						7(1)		
1113.1(3)	21 ⁻										46	
1129.849(3)	3 ⁻					3.0(7)	9(3)			1.7(4)		
1192.850(9)	1 ⁺ ,3 ⁺	42(19)										
1230.3(2)	3 ⁻	31(8)										
1297.177(7)	7 ⁺	33(6)										
1332.05(7)	1 ⁺ ,3 ⁺					14(5)						
1343.312(12)	3 ⁻ –7 ⁻								8(3)			
1359.9(4)	23 ⁻								15(2)			
1363.631(9)	5,7 ⁺								24(3)			
1470.02(3)	5 ⁺	11(1)										
1517.11(4)									8(1)			

Energy levels and branching ratios [94Re10, 05Re01]. Part 6

¹⁵⁵Gd₆₄

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		E_f^* : $2J_f^\pi$:	729.39 15 ⁻	736.7 $\langle 21 \rangle^+$	752.551 5 ⁺	786.6 $\langle 19^+ \rangle$	786.899 7 ⁻	815.733 $\langle 3 \rangle^+$	872.810 $\langle 5 \rangle^+$	880.5 $\langle 19 \rangle^-$	896.75 17 ⁻	1002.96 $\langle 1 \rangle^-$
896.75(27)	17 ⁻		7.1(18)									
1002.953(3)	1 ⁻							4.7(4)				
1012.892(3)	3 ⁻							1.1(1)				
1035.218(4)	1 ⁺ , 3 ⁺							8(1)				
1060.597(3)	$\langle 5^- \rangle$											1.8(11)
1086.846(7)	3 ⁺				9(1)							
1104.792(6)	$\langle 7^- \rangle$						4(1)					
1113.1(3)	21 ⁻									54		
1129.849(3)	3 ⁻											7(1)
1142.3(3)	19 ⁻		85(36)								15(10)	
1144.3(3) ^a	$\langle 25 \rangle^+$			100								
1197.610(17)	3 ⁻ -7				3.7(4)		8.3(11)					
1220.3(2) ^b	23 ⁺			25		75						
1225.007(9)								5.7(13)	6.3(13)			
1292.58(5)	3 ⁺							49(10)				
1326.5(3)	21 ⁻										100	
1359.88(4)	3 ⁻ -7 ⁺									47		
1517.11(4)								5(2)				

Energy levels and branching ratios [94Re10, 05Re01]. Part 7

¹⁵⁵Gd₆₄

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		E_f^* : $2J_f^\pi$:	1012.89 3 ⁻	1028.0 $\langle 7^- \rangle$	1086.85 3 ⁺	1104.80 $\langle 7^- \rangle$	1112.02	1113.0 $\langle 21 \rangle^-$	1142.1 19 ⁻	1144.4 $\langle 25 \rangle^+$	1192.85 1 ⁺ , 3 ⁺	1292.49 3 ⁺
1297.177(7)	7 ⁺					2.0(4)					3.7(8)	
1343.312(12)	3 ⁻ -7 ⁻					2.6(2)						
1359.88(4)	3 ⁻ -7 ⁺							53				
1363.631(9)	5, 7 ⁺			2.7(4)	1.5(5)	1.2(5)						
1437.680(11)			2.9(6)			5.6(8)						
1474.53(5)	1 ⁺ -5 ⁺		8(1)									9(2)
1615.3(3)	23 ⁻								100			
1619.2	25 ⁻						75					
1635.8(3) ^a	$\langle 29^+ \rangle$									100		

Energy levels and branching ratios [94Re10, 05Re01]. Part 8

¹⁵⁵Gd₆₄

E^*	$2J^\pi$	Branching ratios in percentage											
[keV]		E_f^* : $2J_f^\pi$:	1326.3 21 ⁻	1359.3 ⟨23 ⁻ ⟩	1359.85	1434.31 1 ⁺ ,3 ⁺	1617.5 ⟨25 ⁻ ⟩	1635.8 ⟨29 ⁺ ⟩	2199 ⟨33 ⁺ ⟩	2825 ⟨37 ⁺ ⟩	3505 ⟨41 ⁺ ⟩	4234 ⟨45 ⁺ ⟩	5009 ⟨49 ⁺ ⟩
1474.53(5)	1 ⁺ -5 ⁺					54(17)							
1517.11(4)					1.3(3)								
1619.2	25 ⁻			25									
1809.0(5)	25 ⁻		100										
1889.8(4)	27 ⁻					100							
2199 ^a	33 ⁺							x					
2825(5) ^a	37 ⁺								x				
3505 ^a	⟨41 ⁺ ⟩									x			
4234 ^a	45 ⁺										x		
5009 ^a	49 ⁺											x	
5829 ^a	⟨53 ⁺ ⟩												x

Energy levels and branching ratios [03Re20].

¹⁵⁶Gd₆₄

E^* [keV]	J^π	L (t,p)	$d\sigma/d\Omega$ $\mu\text{b/sr}$	ε <i>rel.</i>	I_p (d,p)	I_t (d,t)	L (p,t)	σ (p,t) $\mu\text{b/sr}$	σ (p,t) $\mu\text{b/sr}$	Γ [meV]	$T_{1/2}$ or Γ_{cm}	Ref.
0.0 ^a	0 ⁺	0	290	100	4.8(7)**	6.9(5)**	0	624	3900		Stable	93Kl03
88.970(1) ^a	2 ⁺		11		23.4(17)	27.0(9)	2	295	1145		2.21(2) ns	93Kl03
288.187(1) ^a	4 ⁺		6		25.2(20)	35.2(11)	4	14	170		111.9(17) ps	93Kl03
584.715(3) ^a	6 ⁺		3			3.2(3)	6	4			15.8(4) ps	89Lo07
965.134(6) ^a	8 ⁺					0.14(9)					4.32(23) ps	93Kl03
1049.487(2)	0 ⁺	0	3	1			0	64	315		1.8(+19-6) ps	89Lo07
1129.437(2)	2 ⁺					0.79(19)	2	30	185		1.59(11) ps	93Kl03
1154.152(2)	2 ⁺		3		29(4)	0.67(18)	2	65	475		0.568(19) ps	93Kl03
1168.186(7)	0 ⁺	0	50	23	8.8(24)	2.3(3)	0	12	95		5(+5-3) ps	93Kl03
1242.480(4)	1 ⁻					1.95(22)				6.7(27)	31(+22-9) fs	93Kl03
1248.006(2)	3 ⁺				2.4(12)						0.58(11) ps	93Kl03
1258.075(3)	2 ⁺		5		17.1(23)	7.0(4)					1.54(15) ps	93Kl03
1276.138(2)	3 ⁻		12		4.5(11)	1.47(19)		3			0.098(20) ps	93Kl03
1297.822(2)	4 ⁺		5		2.6(8)	3.1(3)	4	≤1			1.6(+8-5) ps	93Kl03
1319.658(2)	2 ⁻					1.66(20)					>3.9 ps	93Kl03
1355.422(2)	4 ⁺		6		3.3(10)	1.63(20)	4	≤2			0.5(1) ps	93Kl03
1366.462(4)	1 ⁻				1.6(8)	0.98(16)				14(5)	17(6) fs	93Kl03
1408.133(5)	5 ⁻		2		11.0(16)	1.48(15)		3				93Kl03
1416.078(21) ^a	10 ⁺										1.90(8) ps	
1462.297(3)	4 ⁺		7		32(3)	4.2(3)						93Kl03
1468.506(2)	4 ⁻										>3.5 ps	
1506.863(2) ^d	5 ⁺				9.9(11)	0.11(5)					0.4(+8-3) ps	93Kl03
1510.594(2)	4 ⁺										190(5) ps	
1538.851(4)	3 ⁻				3.7(10)	1.07(13)					20(6) fs	93Kl03
1540.190(10)	6 ⁺											

(continued)

¹⁵⁶Gd₆₄

E^*	J^π	L	$d\sigma/d\Omega$	ε	I_p	I_t	L	σ (p,t)	σ (p,t)	Γ	$T_{1/2}$ or	Ref.
[keV]		(t,p)	$\mu\text{b/sr}$	<i>rel.</i>	(d,p)	(d,t)	(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	[meV]	Γ_{cm}	
1576.87(24)						1.38(15)						93Kl03
1595(7)			1									89Lo07
1622.535(2)	5 ⁺				4.9(8)							93Kl03
1638.00(5)	7 ⁻				14.1(12)	1.53(16)						93Kl03
1643.653(6)	6 ⁺											
1705.799(5) ^c	6 ⁻				10.0(10)							93Kl03
1715.192(5)	0 ⁺	$\langle 0 \rangle$	2	1		2.78(23)	0	12(3)			2.6(+23-12) ps	
1753.653(3)	6 ⁺		2			1.04(14)						89Lo07
1765.61(10)	6 ⁺				6.2(9)	3.7(3)						93Kl03
1771.092(4)	2 ⁺										0.42(+14-9) ps	
1780.486(3)	2 ⁻					1.00(14)					0.7(+16-3) ps	93Kl03
1798.717(10)	$\langle 5^- \rangle$											
1804.0(7)						0.37(9)						93Kl03
1827.841(4)	2 ⁺				7.3(13)	1.04(14)						93Kl03
1848.33(10)	8 ⁺											
1849.84(6) ^c	7 ⁺											
1851.239(7)	0 ⁺		6			0.90(17)						89Lo07
1851.803(4)	3 ⁻		incl									89Lo07
1861.067(3)	4 ⁺				20.1(16)	10.1(4)						93Kl03
1893.390(6)	4 ⁺											
1909.26(4)	7 ⁺											
1914.835(5)	2 ⁺				6.7(18)							93Kl03
1916.449(4)	3 ⁺		3			0.80(16)						89Lo07
1924.49(4) ^a	12 ⁺										1.1(1) ps	
1934.155(5)	2 ⁻				23.7(18)	22.3(8)						93Kl03
1934.355(5)	3 ⁻										0.5(+6-3) ps	
1946.375(6)	1 ⁻					2.6(5)			5.8(24)		30(+11-6) fs	93Kl03
1952.364(3)	4 ⁻					5.8(4)						93Kl03
1952.385(7)	0 ⁻											
1958.50(10) ^b	9 ⁻											
1962.037(12)	1 ⁻		2		17.5(29)	8.0(5)						93Kl03
1962.064(3)	5 ⁺				incl	incl						93Kl03
1965.113(5)	4 ⁻											
1965.950(4)	1 ⁺											
1970.2(8)					9.7(13)							93Kl03
1988.5(2)	0 ⁺											
1995.455(4)	4 ⁻				8.0(10)	1.37(21)						93Kl03
2003.749(5)	2 ⁺					2.0(3)						93Kl03
2010.350(4)	4 ⁺					2.0(6)						93Kl03
2011.38(7)	8 ⁺											
2011.9	3 ⁻											
2016.952(8)	5 ⁻				14.5(16)	6.5(4)						93Kl03
2020.594(5)	4 ⁺											
2024.945(5)	3 ⁻	$\langle 0 \rangle$	5	3		5.8(4)						89Lo07
2026.664(6)	1 ⁺									5.0(18)	53(+16-10) fs	89Pi05

(continued)

¹⁵⁶Gd₆₄

E^*	J^π	L	$d\sigma/d\Omega$	ε	I_p	I_t	L	σ (p,t)	σ (p,t)	Γ	$T_{1/2}$ or	Ref.
[keV]		(t,p)	$\mu\text{b/sr}$	<i>rel.</i>	(d,p)	(d,t)	(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	[meV]	Γ_{cm}	
2027.61(4) ^c	8 ⁻											
2029.784(4)	4 ⁻				11.7(15)	3.3(3)						93Kl03
2040(5)	4 ⁺											
2044.944(5)	4 ⁻											
2047.805(6)	2 ⁺		4		25.3(19)	6.0(11)						93Kl03
2054.134(6)	2 ⁺		incl			12.3(13)					0.19(+4-3) ps	89Lo07
2058.0	$\langle 6^+ \rangle$											
2064.06(12)						13.1(5)						
2070.290(4)	3 ⁺				18.5(19)							93Kl03
2079.42(6)	8 ⁺											
2082.0	0 ⁺		5			1.13(20)						89Lo07
2103.28(4)	3 ⁻					56.4(15)						93Kl03
2106.645(5)	3 ⁺				11.1(14)							93Kl03
2116.454(5)	5 ⁻											
2121.43(3)	2 ⁻											
2134.34(10)	$\langle 8^+ \rangle$											
2137.60(5)	7 ⁻										1.3(1) μs	
2139.8	3 ⁺				25.2(21)	21.3(9)						93Kl03
2147.4	2 ⁺											
2155.554(7)	4 ⁻											
2160.7	$\langle 3^+ \rangle$											
2170.8	1 ⁻	$\langle 0 \rangle$	18	8								89Lo07
2174.338(5)	2 ⁺											
2175.07(4)	4				83(4)	12.6(12)						93Kl03
2181.384(25)	2 ⁺					18.2(14)						93Kl03
2186.784(13)	1 ⁺											
2190.653(5)	2 ⁺											
2190.9	4 ⁺											
2199.778(12)	2 ⁻				39.5(27)	82.5(17)						93Kl03
2203.5(6)	1 ⁻ , 2 ⁻											
2205.569(6)	1 ⁻											
2216.614(5)	2 ⁺											
2220.0(3)	10 ⁺											
2227.625(9)	3 ⁻											
2231.5	3 ⁺											
2232.59(7)	4 ⁻											
2240.375(4)	2 ⁺ , 3 ⁺				39(3)	37.2(13)						93Kl03
2249.65(8) ^c	9 ⁺											
2254.314(4)	4 ⁺					15.8(11)						93Kl03
2256.746(4)	3 ⁺				23.2(23)							93Kl03
2259.88(6)	1 ⁻		6			49.2(16)						89Lo07
2269.937(23)	1 ⁺											00GrZY
2274.4(6)					34(3)	9.8(8)						93Kl03
2287.5(3)												
2293.45(12)	1 ⁻					3.6(7)						93Kl03

(continued)

¹⁵⁶Gd₆₄

E^*	J^π	L	$d\sigma/d\Omega$	ε	I_p	I_t	L	σ (p,t)	σ (p,t)	Γ	$T_{1/2}$ or	Ref.
[keV]		(t,p)	$\mu\text{b/sr}$	<i>rel.</i>	(d,p)	(d,t)	(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	[meV]	Γ_{cm}	
2300.70(7)	1 ⁺											
2302.825(7)	2 ⁺		5		19.6(20)	18.9(9)						93Kl03
2309(5)	4 ⁺											
2316.501(7)	1 ⁻ , 2 ⁻					13.7(7)						00GrZY
2321.9	3 ⁺				23.1(22)							93Kl03
2322.6(10)												
2323.217(11)	2 ⁺					6.5(16)						93Kl03
2340.2	$\langle 2^- \rangle$					6.5(6)						93Kl03
2344.4(4)	1 ⁻											
2349.637(8)	3 ⁺				24.2(24)	5.2(5)						93Kl03
2359.98(10) ^b	11 ⁻											
2360.87(14)	1 ⁺											00GrZY
2367.44(4)	2 ⁺				31(3)	11.7(7)						93Kl03
2375(5)	4 ⁺		7									89Lo07
2382.471(11)	2 ⁺				17.8(25)	5.9(18)						93Kl03
2391.7	$\langle 2^- \rangle$					17.3(13)						93Kl03
2402.7	1 ⁺					95.9(29)				17.5(36)	17(+5-3) fs	93Kl03
2406.1	1 ⁻ , 3 ⁻					incl						93Kl03
2415.490(24)	3 ⁺					13.0(12)						93Kl03
2423.0	0 ⁺ , 3 ⁺											
2427.43(8) ^c	10 ⁻											
2428.37(11)	2 ⁺											
2430.56(10)												
2434.7	1 ⁺ , 2 ⁺											
2436.95(10)	$\langle 2^+ \rangle$		3			9.1(10)						89Lo07
2442.41(10) ^e	10 ⁺											
2446.16(3)	2 ⁺					20.2(14)						93Kl03
2449.7	1 ⁻											
2451.5	$\langle 2^+ \rangle$											
2460.5(4)			5			6.5(8)						89Lo07
2467.6	3 ⁺											
2475.82(7) ^a	14 ⁺											
2478.6	3 ⁺											
2484	6 ⁺											
2490.57(20) ^f	J											
2494.1	$\langle 1^- \rangle$											
2502.40(7)	3 ⁺					11.8(11)						93Kl03
2506.2	2 ⁺											
2511.0(10)						3.6(6)						93Kl03
2517.8	0 ⁺ , 3 ⁺											
2520.2(5)	$\langle 4^+, 5^- \rangle$					7.5(9)						93Kl03
2523.02(19)	10 ⁺											
2528.9	$\langle 3^+ \rangle$											
2534.7	$\langle 3^+ \rangle$											
2539	1 ⁻									15(4)	13(+5-3) fs	89Pi05

(continued)

¹⁵⁶Gd₆₄

E^*	J^π	L	$d\sigma/d\Omega$	ε	I_p	I_t	L	σ (p,t)	σ (p,t)	Γ	$T_{1/2}$ or	Ref.
[keV]		(t,p)	$\mu\text{b/sr}$	<i>rel.</i>	(d,p)	(d,t)	(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	[meV]	Γ_{cm}	
2544.7(5)						8.5(9)						93Kl03
2554.4	$\langle 1^- \rangle$					1.6(3)						93Kl03
2571.9	$1^+, 2^+$					11.0(11)						93Kl03
2581	$1^-, 2^-$											
2584.0(9)						4.3(6)						93Kl03
2588.9	$1^+, 2^+$					2.3(5)						93Kl03
2594.9(15)						incl						93Kl03
2602.2(14)*	$1^+, 2^+$					1.6(4)						93Va16
2607.9	$\langle 1^- \rangle$	6										89Lo07
2617.2	$1^+, 2^+$					2.0(4)						93Kl03
2622.1	$1^-, 3^-$					incl						93Kl03
2629.7(10)						2.0(4)						93Kl03
2640.5	$\langle 3^+ \rangle$											
2647.59(13)*	$1^+, 2^+$											93Va16
2650.7	3^+											
2652.56(8)		4				5.1(5)						89Lo07
2665.3	$0^+, 3^+$											
2668.5(7)						2.8(4)						93Kl03
2676.6												
2684	$1^+, 2^+$											
2686.7 ^c	11^+											
2689.5	3^+											
2701.77(11)	$\langle 2^+ \rangle$					4.5(5)						93Kl03
2707.78(21)	$\langle 12^+ \rangle$											
2718.4	$1^+, 2^+$					1.3(3)						93Kl03
2722(5)	4^+											
2722.9	3^+											
2727.4(8)						2.9(4)						93Kl03
2738.0	$\langle 3^+ \rangle$											
2740.9(6)						3.4(4)						93Kl03
2745	1^-									39(8)	4.3(+10-7) fs	89Pi05
2749.53(7)	$1^+, 2^+$											
2761(5)	4^+											
2762.46(8)	$1^+, 2^+$	5										89Lo07
2770.5	$0^+, 3^+$											
2776.8	$1^+, 2^+$											
2785	1^+									19.5(41)	15(+4-3) fs	89Pi05
2787.8	3^+											
2794.7	$1^+, 2^+$											
2804.0(8)	$\langle 2^+ \rangle$	7				2.4(3)						89Lo07
2816.3	3^-											
2823.7 ^f	$J+2$											
2826.7	3^+											
2829.59(10) ^b	13^-											
2831.5(10)	2^+					2.1(3)						93Kl03

(continued)

¹⁵⁶Gd₆₄

E^*	J^π	L	$d\sigma/d\Omega$	ε	I_p	I_t	L	σ (p,t)	σ (p,t)	Γ	$T_{1/2}$ or	Ref.
[keV]		(t,p)	$\mu\text{b/sr}$	<i>rel.</i>	(d,p)	(d,t)	(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	[meV]	Γ_{cm}	
2839.6(12)*	2 ⁺											93Va16
2846.8	2 ⁺ ,3 ⁺											
2853.9(12)*	1 ⁺ ,2 ⁺											93Va16
2873.8*	$\langle 2^+ \rangle$											93Va16
2878.9	1 ⁺ ,2 ⁺											
2894.0	0 ⁺ ,3 ⁺											
2897.03(22) ^c	12 ⁻											
2900	0 ⁺ -3 ⁺											
2907.4	1 ⁺ ,2 ⁺											
2918.5	1 ⁺ ,2 ⁺											
2922.6 ^e	12 ⁺											
2928.78(10)												
2931.8	1 ⁺ ,2 ⁺											
2943.2	1 ⁻ -3 ⁻											
2946.7	3 ⁺											
2974	1 ⁺									35.4(67)	8.7(+13-11) fs	89Pi05
3010	1 ⁺									9.2(25)	32(+12-7) fs	89Pi05
3024.66(10)												
3030.2(13)*												93Va16
3050.8(13)*	1 ⁺									11.6(29)	28(+11-6) fs	89Pi05
3055												
3059.5(8) ^a	16 ⁺											
3068												
3071.3(7)	1 ⁺					3.5(5)				134(25)	2.13(+19-16) fs	93Kl03
3083.2(15)						1.3(3)						93Kl03
3096.1(7)	2 ⁺					2.9(4)						93Kl03
3117.7(8)*	1 ⁺									10.2(30)	26(+7-5) fs	89Pi05
3138												
3151.3(17)	$\langle 2^+ \rangle$					3.3(16)						93Kl03
3158	1 ⁺									41(9)	7.4(+13-10) fs	89Pi05
3165.6(9)						3.4(16)						93Kl03
3175.2 ^c	13 ⁺											
3186.8(14)*												93Va16
3218	1 ⁺									39(8)	7.5(+12-10) fs	89Pi05
3227.0(10)*												93Va16
3234.9 ^f	$J+4$											
3314	1 ⁻									18(7)	9(+8-3) fs	89Pi05
3334.9(18)						3.4(17)						93Kl03
3350.4 ^b	$\langle 15^- \rangle$											
3400	2 ⁺										≤ 0.31 ps	
3427.1 ^c	14 ⁻											
3437.9 ^e	14 ⁺											
3470.9(16)						6.2(22)						93Kl03
3487.1(10)						10.3(27)						93Kl03
3520.9(13)						7.4(23)						93Kl03

(continued)

¹⁵⁶Gd
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E^*	J^π	L	$d\sigma/d\Omega$	ε	I_p	I_t	L	σ (p,t)	σ (p,t)	Γ	$T_{1/2}$ or	Ref.
[keV]		(t,p)	$\mu\text{b/sr}$	<i>rel.</i>	(d,p)	(d,t)	(p,t)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	[meV]	Γ_{cm}	
3552.5(5)						7.1(23)						93Kl03
3580.7(13)						6.8(23)						93Kl03
3599.5(8)*												93Va16
3673.5 ^a	18 ⁺											
3715.2 ^c	15 ⁺											
3715.4 ^f	$J+6$											
3782.4(8)*												93Va16
3914.3 ^b	$\langle 17^- \rangle$											
3995.1 ^e	16 ⁺											
4003.1 ^c	16 ⁻											
4257.9 ^f	$J+8$											
4325.9 ^a	20 ⁺											
4523.7 ^b	$\langle 19^- \rangle$											
4566.8(9)*												93Va16
4602.5 ^c	$\langle 18^- \rangle$											
4697.7(11)*												93Va16
4857.1(10)*												93Va16
4857.4 ^f	$\langle J+10 \rangle$											
5026.0 ^a	22 ⁺											
5100.1(10)*												93Va16
5182.6 ^b	$\langle 21^- \rangle$											
5778.7 ^a	24 ⁺											
6582.6 ^a	$\langle 26^+ \rangle$											
			89Lo07	89Lo07				73Fl04	73Fl04	89Pi05		Ref.
					93Kl03	93Kl03						Ref.

Additional data on this isotope can be found in [02GrZV, 01Su06, 01Kh0A, 00GrZY, 99GrZN, 96Vo0A, 95Bo20, 93Kl03, 93Su16, 93Va16, 90Zi05, 67Bl05].

Abundance: 20.47(9) %.

* E_M^* – intermediate state introduced from $(n_{\text{th}}, \gamma\gamma)$ measurements [93Va16].

** Relative intensities measured at 40° and 30° ($E_d=22$ MeV) [93Kl03].

a,b,c,d,e,f mark bands derived in [01Su06]: ground-state band, two octupole and two gamma bands, new band with uncertain spin J .

Data for cross sections of the (p,t) reaction are from [73Fl04], see comments in [03Re20].

The second value σ (p,t) is the linear sum of the differential cross section from 5 to 70°.

For the level at $E^*=1243$ and 1367 keV $\Gamma_{\text{o}}^{\text{red}}=3.5(14)$ and 5.6(21) meV and $B(E1)=10(4)$ and 16(6) in units $10^{-3}e^2fm^2$ were given in [91Zi01].

Absolute value of the (p,t) cross section for $E_p=52$ MeV at $\theta=6^\circ-43.5^\circ$ $2\pi\Sigma d\sigma/d\Omega \sin\theta d\theta$ for 0⁺ state was found to be 63 μb [74Ta04]; see therein the relative values for 2⁺, 4⁺ and 6⁺ states.

Data for this isotope are considered in vol. LB I/18C.

Energy levels and branching ratios [03Re20]. Part 2

¹⁵⁶Gd
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E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	0.0 0 ⁺	89 2 ⁺	288 4 ⁺	585 6 ⁺	965.1 8 ⁺	1049 0 ⁺	1129 2 ⁺	1154 2 ⁺	1168.19 0 ⁺	1242.48 1 ⁻
88.970(1) ^a	2 ⁺		100									
288.187(1) ^a	4 ⁺			100								
584.715(3) ^a	6 ⁺				100							
965.134(6) ^a	8 ⁺					100						
1049.487(2)	0 ⁺	x	100									
1129.437(2)	2 ⁺	16.3(9)	59(2)	24.3(9)				0.002(1)				
1154.152(2)	2 ⁺	48.1(3)	50.0(3)	1.89(6)				0.0004(2)				
1168.186(7)	0 ⁺	x	100					x				
1242.480(4)	1 ⁻	49.2(3)	50.7(5)					0.04(1)				
1248.006(2)	3 ⁺		78.7(4)	21.3(2)					<0.003			
1258.075(3)	2 ⁺	13(1)	36(1)	51(1)				<0.002		0.003(1)		
1276.138(2)	3 ⁻		69(1)	31(1)								
1297.822(2)	4 ⁺		49(1)	44(2)	5.6(5)				0.55(4)	0.04(1)		
1319.658(2)	2 ⁻		100						0.21(2)			
1355.422(2)	4 ⁺		28(1)	71(1)	0.6(2)				0.012(3)	0.19(1)		
1366.462(4)	1 ⁻	35.3(2)	65(1)						0.05(2)			
1408.133(5)	5 ⁻			77(6)	23.1(12)							
1416.078(21) ^a	10 ⁺					100						
1462.297(3)	4 ⁺		10(1)	63(6)	26(1)				0.23(3)			
1468.506(2)	4 ⁻			99(8)								
1506.863(2) ^d	5 ⁺			73(4)	26.0(7)							
1510.594(2)	4 ⁺		24(2)	56(1)	6.5(3)				1.0(1)	≤20		
1538.851(4)	3 ⁻		48(3)	51(3)						0.2(1)		
1540.190(10)	6 ⁺			71(21)	29(5)							
1622.535(2)	5 ⁺			51(1)	21.2(3)							
1638.00(5)	7 ⁻				75(2)	≈25						
1643.653(6)	6 ⁺			47(4)	51(4)							
1705.799(5) ^c	6 ⁻				91(27)							
1715.192(5)	0 ⁺	x	22(3)					x	2.7(7)		x	68(3)
1765.61(10)	6 ⁺			x	100							
1771.092(4)	2 ⁺		89(4)									0.74(6)
1780.486(3)	2 ⁻								3.9(2)	70(3)		
1827.841(4)	2 ⁺		28(2)					23(2)	20(1)	14(1)		
1848.33(10)	8 ⁺						[100]					
1849.84(6) ^c	7 ⁺						[56]					
1851.239(7)	0 ⁺	x	60(3)						5.4(5)	8.9(7)		12.5(12)
1851.803(4)	3 ⁻								9(1)	33(2)		
1861.067(3)	4 ⁺									1.6(6)		
1893.390(6)	4 ⁺			84(3)								
1909.26(4)	7 ⁺				66(5)	6						
1914.835(5)	2 ⁺		74(7)									4.0(2)
1916.449(4)	3 ⁺		38(2)	30(3)					≤24	20(1)		
1934.155(5)	2 ⁻		9(3)						1.4(3)	22(2)		2.7(4)
1934.355(5)	3 ⁻		1.7	1.6					0.1	96		0.09
1946.375(6)	1 ⁻	39(2)	58(2)									

(continued)

¹⁵⁶Gd
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E^*	J^π	Branching ratios in percentage									
[keV]		E_f^* : 0.0 J_f^π : 0 ⁺	89 2 ⁺	288 4 ⁺	585 6 ⁺	965.1 8 ⁺	1049 0 ⁺	1129 2 ⁺	1154 2 ⁺	1168.19 0 ⁺	1242.48 1 ⁻
1952.385(7)	0 ⁻										90.7(7)
1958.50(10) ^b	9 ⁻					93(3)					
1962.037(12)	1 ⁻	30(4)	53(2)				12(2)			4.1(4)	
1965.950(4)	1 ⁺	13.31(7)	5.20(4)				0.11(2)	0.28(2)	33.3(1)	0.37(2)	18.63(8)
1995.455(4)	4 ⁻			33(5)							
2003.749(5)	2 ⁺			3(2)				2.9(3)	12.6(6)		28(1)
2010.350(4)	4 ⁺			31(3)				6(1)	12(2)		
2011.38(7)	8 ⁺				x	36(2)					
2016.952(8)	5 ⁻			48(4)	35(3)						
2020.594(5)	4 ⁺		17(3)	71(4)							
2024.945(5)	3 ⁻										20(3)
2026.664(6)	1 ⁺	57.6(3)	34.2(2)						0.70(9)	3.61(9)	0.87(7)
2027.61(4) ^c	8 ⁻					47(16)					
2047.805(6)	2 ⁺	21(5)	73(5)						3.5(4)		
2054.134(6)	2 ⁺	6.6(7)	68(4)	12.2(8)							
2070.290(4)	3 ⁺		33(2)	18(3)							
2079.42(6)	8 ⁺					≈41					
2103.28(4)	3 ⁻	0.11(4)	26.4(3)	9.9(2)				2.8(3)	37.9(4)		5.0(3)
2106.645(5)	3 ⁺		54(2)	40(2)							
2121.43(3)	2 ⁻	3.5(16)	97(4)								
2134.34(10)	(8 ⁺)					100					
2174.338(5)	2 ⁺						3(1)			18(3)	21(1)
2175.07(4)	4			8.8(4)							
2181.384(25)	2 ⁺		41(2)	36(2)							
2186.784(13)	1 ⁺	34.0(2)	37.1(2)							0.82(5)	12.98(9)
2190.653(5)	2 ⁺	21(1)	8(1)	17(1)					32(2)		3(1)
2199.778(12)	2 ⁻		58(3)						27(4)		
2203.5(6)	1 ⁻ , 2 ⁻										100
2205.569(6)	1 ⁻	39(3)	5.1(1)				5.8(9)	15.1(3)		2.4(2)	
2216.614(5)	2 ⁺		52(7)								22.9(12)
2227.625(9)	3 ⁻								68(12)		
2232.59(7)	4 ⁻			13.5(13)							
2240.375(4)	2 ⁺ , 3 ⁺		51(5)								
2249.65(8) ^c	9 ⁺					[85]					
2254.314(4)	4 ⁺								35(4)		
2256.746(4)	3 ⁺		30(2)								
2259.88(6)	1 ⁻	22(2)	62(4)								
2269.937(23)	1 ⁺	24.7(2)	51.3(3)				0.47(12)	6.78(14)	1.21(12)	1.00(14)	3.07(12)
2287.5(3)						100					
2293.45(12)	1 ⁻	25(1)	x					75(7)			
2300.70(7)	1 ⁺	8.5(7)	79.7(19)								
2316.501(7)	1 ⁻ , 2 ⁻		59(4)						10(5)		
2322.6(10)						100					
2323.217(11)	2 ⁺	9(1)	36(2)				19(3)	13(1)			20(4)
2344.4(4)	1 ⁻	40(7)	60(11)								

(continued)

¹⁵⁶Gd₆₄

E^* [keV]	J^π	Branching ratios in percentage										
		$E_f^*:$ $J_f^\pi:$	0.0 0 ⁺	89 2 ⁺	288 4 ⁺	585 6 ⁺	965.1 8 ⁺	1049 0 ⁺	1129 2 ⁺	1154 2 ⁺	1168.19 0 ⁺	1242.48 1 ⁻
2349.637(8)	3 ⁺				32(3)							
2360.87(14)	1 ⁺		66(4)									
2367.44(4)	2 ⁺		30(2)	28(2)	16(2)						12(2)	
2382.471(11)	2 ⁺			55(3)								
2402.7	1 ⁺		65	35(7)								
2415.490(24)	3 ⁺			36(4)								
2430.56(10)						≤6						
2442.41(10) ^e	10 ⁺					x						
2446.16(3)	2 ⁺			77(5)						21(3)		
2523.02(19)	10 ⁺					28(9)						
2539	1 ⁻		43(9)	57								
2745	1 ⁻		36(4)	64								
2785	1 ⁺		65	35(6)								
2974	1 ⁺		66	34(7)								
3010	1 ⁺		65	35(13)								
3050.8(13)*	1 ⁺		74	26(12)								
3071.3(7)	1 ⁺		64	36(3)								
3096.1(7)	2 ⁺		100									
3117.7(8)*	1 ⁺		67	33(13)								
3151.3(17)	⟨2 ⁺ ⟩		x									
3158	1 ⁺		x									
3218	1 ⁺		69	31(7)								
3314	1 ⁻		35(11)	65								
3400	2 ⁺		x									

Energy levels and branching ratios [03Re20]. Part 3

¹⁵⁶Gd₆₄

E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	1248.01 3 ⁺	1258.08 2 ⁺	1276.14 3 [−]	1297.82 4 ⁺	1319.66 2 [−]	1355.42 4 ⁺	1366.46 1 [−]	1408.13 5 [−]	1416.08 10 ⁺	1462.30 4 ⁺
1355.422(2)	4 ⁺		0.016(3)			0.002(1)						
1462.297(3)	4 ⁺			0.50(5)		0.11(2)						
1468.506(2)	4 [−]				0.43(3)	0.14(2)	0.42(2)					
1506.863(2) ^d	5 ⁺		0.98(5)					0.06(1)				
1510.594(2)	4 ⁺		9.2(3)			0.06(1)		2.6(1)				
1622.535(2)	5 ⁺		0.6(2)					2.2(2)				
1643.653(6)	6 ⁺							2.0(5)				
1705.799(5) ^c	6 [−]									2.5(6)		
1715.192(5)	0 ⁺							7.0(3)				
1753.653(3)	6 ⁺											33(4)
1771.092(4)	2 ⁺			2.1(3)	6.5(3)			1.0(1)				
1780.486(3)	2 [−]		22(3)	2.2(2)	1.0(1)		1.5(1)					

(continued)

¹⁵⁶Gd
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E^* [keV]	J^π	Branching ratios in percentage									
		E_f^* : 1248.01 J_f^π : 3 ⁺	1258.08 2 ⁺	1276.14 3 ⁻	1297.82 4 ⁺	1319.66 2 ⁻	1355.42 4 ⁺	1366.46 1 ⁻	1408.13 5 ⁻	1416.08 10 ⁺	1462.30 4 ⁺
1798.717(10)	⟨5 ⁻ ⟩						100				
1827.841(4)	2 ⁺	11.1(6)	3(1)								0.28(3)
1851.239(7)	0 ⁺							13.2(10)			
1851.803(4)	3 ⁻	30(2)	1.9(2)	2.5(2)	1.6(1)		21(1)		0.4(1)		
1861.067(3)	4 ⁺	2.3(3)		3.5(3)					0.9(3)		
1893.390(6)	4 ⁺			2.0(4)	0.98(12)		8.6(4)		3.4(6)		0.8(1)
1914.835(5)	2 ⁺	4.1(2)	4.6(2)	9.2(11)			≤1.8	3.42(16)			
1916.449(4)	3 ⁺	3.5(3)	≤5		2.8(4)		4.4(2)				
1924.49(4) ^a	12 ⁺									100	
1934.155(5)	2 ⁻	1.0(3)		≤5		42(1)		21(1)			
1934.355(5)	3 ⁻	0.2	0.1	0.1		0.1	0.2	0.01			
1946.375(6)	1 ⁻		2.8(3)								
1952.364(3)	4 ⁻	54(4)		1.5(4)		5.0(2)	19(1)		2.8(3)		
1952.385(7)	0 ⁻					3.8(7)		5.5(11)			
1958.50(10) ^b	9 ⁻									7(3)	
1962.064(3)	5 ⁺	12(5)			8.1(10)						
1965.113(5)	4 ⁻	63(3)		4.1(5)			14.3(8)		1.9(5)		2.8(3)
1965.950(4)	1 ⁺					21.59(9)		7.17(4)			
1995.455(4)	4 ⁻								4.2(7)		
2003.749(5)	2 ⁺	14(1)		33(5)		6.1(5)					
2010.350(4)	4 ⁺	31(2)			3.8(4)		8.1(4)				1.4(2)
2016.952(8)	5 ⁻			6(1)							
2020.594(5)	4 ⁺				8(1)						
2024.945(5)	3 ⁻		12(1)	56(4)					≤4.7		
2026.664(6)	1 ⁺		1.54(7)			1.15(9)		0.24(7)			
2029.784(4)	4 ⁻			6(2)			31(2)		6(1)		
2044.944(5)	4 ⁻	0.022(8)					0.224(12)				0.077(10)
2054.134(6)	2 ⁺		5.1(4)		2.2(3)	2.3(3)					0.71(8)
2070.290(4)	3 ⁺	12(2)				17(1)	8				
2103.28(4)	3 ⁻	6.5(3)		0.9(3)		1.8(2)	6.4(2)				1.7(2)
2106.645(5)	3 ⁺	1.3(10)	2.8(5)			≤21					1.4(3)
2155.554(7)	4 ⁻			23(4)					41(2)		
2174.338(5)	2 ⁺		26(2)	26(1)							
2175.07(4)	4	64(4)		3.8(17)	6(2)		4.2(13)		3.4(13)		
2181.384(25)	2 ⁺						22(3)				
2186.784(13)	1 ⁺		0.27(5)			13.0(1)		1.65(5)			
2190.653(5)	2 ⁺	11.1(6)		8(2)							
2199.778(12)	2 ⁻							15(1)			
2205.569(6)	1 ⁻		13.0(3)					1.3(2)			
2216.614(5)	2 ⁺	11(3)				3.8(5)					
2220.0(3)	10 ⁺									[100]	
2227.625(9)	3 ⁻	25.2(15)									5.9(4)
2232.59(7)	4 ⁻	56(7)					31(3)				
2240.375(4)	2 ⁺ , 3 ⁺	15(2)	5.8(7)								
2254.314(4)	4 ⁺										8(2)

(continued)

¹⁵⁶Gd₆₄

E^*	J^π	Branching ratios in percentage										
[keV]		E^*_f : J^π_f :	1248.01 3 ⁺	1258.08 2 ⁺	1276.14 3 ⁻	1297.82 4 ⁺	1319.66 2 ⁻	1355.42 4 ⁺	1366.46 1 ⁻	1408.13 5 ⁻	1416.08 10 ⁺	1462.30 4 ⁺
2256.746(4)	3 ⁺		32(4)				12(3)	13(1)				5(1)
2269.937(23)	1 ⁺			7.53(14)					0.95(12)			
2316.501(7)	1 ⁻ , 2 ⁻						13.8(12)					
2349.637(8)	3 ⁺				17(2)							4.2(3)
2359.98(10) ^b	11 ⁻										88(6)	
2367.44(4)	2 ⁺			14(2)								
2382.471(11)	2 ⁺				44(7)							
2427.43(8) ^c	10 ⁻										40(4)	
2430.56(10)											100	
2442.41(10) ^e	10 ⁺										33(5)	
2490.57(20) ^f	J										100	
2523.02(19)	10 ⁺										72(9)	
2686.7 ^c	11 ⁺										29(4)	
2707.78(21)	⟨12 ⁺ ⟩										100	

Energy levels and branching ratios [03Re20]. Part 4

¹⁵⁶Gd₆₄

E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	1468.51 4 ⁻	1506.86 5 ⁺	1510.59 4 ⁺	1538.85 3 ⁻	1540.19 6 ⁺	1622.54 5 ⁺	1643.65 6 ⁺	1705.80 6 ⁻	1715.19 0 ⁺	1753.65 6 ⁺
1622.535(2)	5 ⁺			0.9(1)	24(2)							
1705.799(5) ^c	6 ⁻		6.0(4)									
1753.653(3)	6 ⁺				16(2)			51(3)				
1771.092(4)	2 ⁺					0.10(1)						
1780.486(3)	2 ⁻		0.18(3)									
1798.717(10)	⟨5 ⁻ ⟩						x					
1849.84(6) ^c	7 ⁺			[44]								
1861.067(3)	4 ⁺				86(3)			5.30(21)				
1909.26(4)	7 ⁺							9(1)				20(3)
1914.835(5)	2 ⁺					0.64(7)						
1916.449(4)	3 ⁺			0.7(2)								
1934.155(5)	2 ⁻		0.7(1)									
1934.355(5)	3 ⁻				0.01							
1952.364(3)	4 ⁻			16(1)	1.1(1)	0.60(9)				0.26(4)		
1962.037(12)	1 ⁻										0.52(7)	
1962.064(3)	5 ⁺				24.2(8)			47(3)				3.8(3)
1965.113(5)	4 ⁻			8.0(3)	4.11(16)	1.67(16)		0.49(10)				
1995.455(4)	4 ⁻		52(3)			9(1)		1.3(2)				
2010.350(4)	4 ⁺						2.9(3)	0.8(1)	1.5(1)			
2016.952(8)	5 ⁻		8.7(4)					2.4(2)				
2020.594(5)	4 ⁺		0.9(2)						2.1(1)			
2024.945(5)	3 ⁻		2.4(2)			9(1)						

(continued)

¹⁵⁶Gd₆₄

E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	1468.51 4 ⁻	1506.86 5 ⁺	1510.59 4 ⁺	1538.85 3 ⁻	1540.19 6 ⁺	1622.54 5 ⁺	1643.65 6 ⁺	1705.80 6 ⁻	1715.19 0 ⁺	1753.65 6 ⁺
2027.61(4) ^c	8 ⁻									53(2)		
2029.784(4)	4 ⁻			13(1)	7.2(4)	2.5(4)		32(1)				
2044.944(5)	4 ⁻			0.259(10)	88.8(4)			10.61(5)				
2047.805(6)	2 ⁺					1.0(2)						
2054.134(6)	2 ⁺				2.24(14)							
2070.290(4)	3 ⁺		11.1(5)			0.9(1)						
2079.42(6)	8 ⁺											24(3)
2103.28(4)	3 ⁻				0.8(2)							
2116.454(5)	5 ⁻				39(2)			52(5)				9.0(6)
2137.60(5)	7 ⁻											32(3)
2155.554(7)	4 ⁻		32(2)	2.8(7)		≤10				0.7(2)		
2174.338(5)	2 ⁺					2.6(2)						
2175.07(4)	4		x	10(1)		x						
2181.384(25)	2 ⁺										1.1(2)	
2205.569(6)	1 ⁻										7.1(2)	
2240.375(4)	2 ⁺ , 3 ⁺					4.0(4)						
2254.314(4)	4 ⁺				40(4)			6(1)				
2256.746(4)	3 ⁺		5(1)					1.4(3)				
2349.637(8)	3 ⁺							47(3)				
2415.490(24)	3 ⁺		58(5)									

Energy levels and branching ratios [03Re20]. Part 5

¹⁵⁶Gd₆₄

E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	1771.09 2 ⁺	1780.49 2 ⁻	1798.72 (5 ⁻)	1827.84 2 ⁺	1849.84 7 ⁺	1851.24 0 ⁺	1851.80 3 ⁻	1861.07 4 ⁺	1893.39 4 ⁺	1909.26 7 ⁺
1934.355(5)	3 ⁻			0.01								
1952.364(3)	4 ⁻			0.30(6)								
1962.064(3)	5 ⁺									4.8(6)		
1995.455(4)	4 ⁻								0.20(7)			
2010.350(4)	4 ⁺		0.18(4)						0.3			
2011.38(7)	8 ⁺					64(6)						
2020.594(5)	4 ⁺				0.55(10)				0.7(1)			
2029.784(4)	4 ⁻			0.7(1)	0.5(1)					0.5(1)		
2047.805(6)	2 ⁺		0.73(5)									
2054.134(6)	2 ⁺			0.16(3)								
2079.42(6)	8 ⁺											35(3)
2137.60(5)	7 ⁻											68(2)
2174.338(5)	2 ⁺			1.9(2)					1.3(1)			
2181.384(25)	2 ⁺							0.2(1)				
2186.784(13)	1 ⁺							0.10(1)				
2190.653(5)	2 ⁺		0.27(5)			≤1.0						

(continued)

¹⁵⁶Gd₆₄

E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	1771.09 2 ⁺	1780.49 2 ⁻	1798.72 ⟨5 ⁻ ⟩	1827.84 2 ⁺	1849.84 7 ⁺	1851.24 0 ⁺	1851.80 3 ⁻	1861.07 4 ⁺	1893.39 4 ⁺	1909.26 7 ⁺
<hr/>												
2199.778(12)	2 ⁻			0.8(2)								
2205.569(6)	1 ⁻		9.3(2)									
2216.614(5)	2 ⁺		9.0(4)								0.86(8)	
2227.625(9)	3 ⁻				0.46(12)							
2240.375(4)	2 ⁺ , 3 ⁺			20.2(8)								
2249.65(8) ^c	9 ⁺						[15]					
2254.314(4)	4 ⁺									5.0(6)		
2256.746(4)	3 ⁺					≤0.6				2.0(4)		
2269.937(23)	1 ⁺		1.58(9)									
2316.501(7)	1 ⁻ , 2 ⁻					8.9(8)			4.8(2)			
2323.217(11)	2 ⁺		0.6(1)							1.1(2)		
2415.490(24)	3 ⁺					6(1)						

Energy levels and branching ratios [03Re20]. Part 6

¹⁵⁶Gd₆₄

E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	1914.84 2 ⁺	1916.45 3 ⁺	1924.49 12 ⁺	1934.16 2 ⁻	1934.36 3 ⁻	1946.38 1 ⁻	1952.36 4 ⁻	1952.39 0 ⁻	1958.50 9 ⁻	1965.95 1 ⁺
2070.290(4)	3 ⁺			0.18(3)								
2103.28(4)	3 ⁻			≤0.16								
2181.384(25)	2 ⁺	0.65										
2190.653(5)	2 ⁺											0.31(3)
2205.569(6)	1 ⁻	1.6(3)										
2240.375(4)	2 ⁺ ,3 ⁺								2.47(13)			
2254.314(4)	4 ⁺					5.3(5)						
2256.746(4)	3 ⁺											0.7(1)
2269.937(23)	1 ⁺									1.44(14)		
2300.70(7)	1 ⁺							11.8(16)				
2302.825(7)	2 ⁺							100				
2316.501(7)	1 ⁻ ,2 ⁻				1.8(2)			1.3(2)				
2323.217(11)	2 ⁺	0.26(8)										
2359.98(10) ^b	11 ⁻										12(6)	
2382.471(11)	2 ⁺											0.39(12)
2446.16(3)	2 ⁺		2.2(3)									
2475.82(7) ^a	14 ⁺			100								
2823.7 ^f	$J+2$			46(5)								
2829.59(10) ^b	13 ⁻			86(7)								
2922.6 ^e	12 ⁺			42(8)								

Energy levels and branching ratios [03Re20]. Part 7

¹⁵⁶Gd₆₄

E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	1995.46 4 [−]	2003.75 2 ⁺	2010.35 4 ⁺	2011.38 8 ⁺	2020.59 4 ⁺	2026.66 1 ⁺	2027.61 8 [−]	2047.81 2 ⁺	2054.13 2 ⁺	2070.29 3 ⁺
2174.338(5)	2 ⁺				0.20(6)			0.4(1)				
2186.784(13)	1 ⁺							0.10(1)				
2190.653(5)	2 ⁺			≤0.14				≤0.15				
2216.614(5)	2 ⁺							0.18(4)		0.29(5)		
2240.375(4)	2 ⁺ ,3 ⁺	0.15(4)					0.38(4)					
2249.65(8) ^c	9 ⁺				≤97							
2254.314(4)	4 ⁺	≤8										
2256.746(4)	3 ⁺			≤0.6								
2302.825(7)	2 ⁺									0.28(15)		
2323.217(11)	2 ⁺										0.34(6)	0.35(6)
2360.87(14)	1 ⁺											34(8)
2382.471(11)	2 ⁺										0.7(2)	
2427.43(8) ^c	10 [−]								60(4)			
2442.41(10) ^e	10 ⁺				29(5)							

Energy levels and branching ratios [03Re20]. Part 8

¹⁵⁶Gd₆₄

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	2106.65 3 ⁺	2121.43 2 ⁻	2249.65 9 ⁺	2359.98 11 ⁻	2427.43 10 ⁻	2442.41 10 ⁺	2475.82 14 ⁺	2490.57 J	2686.7 11 ⁺	2823.7 $J+2$
2254.314(4)	4 ⁺	≤2.0										
2259.88(6)	1 ⁻			15.2(17)								
2382.471(11)	2 ⁺	0.29(10)										
2442.41(10) ^e	10 ⁺				38							
2686.7 ^c	11 ⁺				71(7)			x				
2823.7 ^f	$J+2$									54(5)		
2829.59(10) ^b	13 ⁻				14(3)							
2897.03(22) ^c	12 ⁻					100						
2922.6 ^e	12 ⁺							58(8)				
3059.5(8) ^a	16 ⁺								100			
3175.2 ^c	13 ⁺										100	
3234.9 ^f	$J+4$								12(3)			88(6)
3350.4 ^b	⟨15 ⁻ ⟩								79(7)			

Energy levels and branching ratios [03Re20]. Part 9

¹⁵⁶₆₄Gd

E^*	J^π	Branching ratios in percentage										
[keV]	$E_f^*:$ $J_f^\pi:$	2829.59 13 [−]	2897.03 12 [−]	2922.6 12 ⁺	3059.5 16 ⁺	3175.2 13 ⁺	3234.9 $J+4$	3350.4 ⟨15 [−] ⟩	3427.1 14 [−]	3437.9 14 ⁺	3673.5 18 ⁺	
3350.4 ^b	⟨15 [−] ⟩	21(4)										
3427.1 ^c	14 [−]		100									
3437.9 ^e	14 ⁺			100								
3673.5 ^a	18 ⁺				100							
3715.2 ^c	15 ⁺					100						
3715.4 ^f	$J+6$				20(2)		80(7)					
3914.3 ^b	⟨17 [−] ⟩				47(6)			53(6)				
3995.1 ^e	16 ⁺									100		
4003.1 ^c	16 [−]								100			
4325.9 ^a	20 ⁺										100	
4523.7 ^b	⟨19 [−] ⟩										16(3)	

Energy levels and branching ratios [03Re20]. Part 10

¹⁵⁶₆₄Gd

<i>E</i> [*] [keV]	<i>J</i> ^π	Branching ratios in percentage								
		<i>E</i> _f [*] : <i>J</i> _f ^π :	3715.4 <i>J</i> +6	3914.3 ⟨17 [−] ⟩	4003.1 16 [−]	4257.9 <i>J</i> +8	4325.9 20 ⁺	4523.7 ⟨19 [−] ⟩	5026.0 22 ⁺	5778.7 24 ⁺
4257.9 ^f	<i>J</i> +8		100							
4523.7 ^b	⟨19 [−] ⟩			84(8)						
4602.5 ^c	⟨18 [−] ⟩				100					
4857.4 ^f	⟨ <i>J</i> +10⟩					100				
5026.0 ^a	22 ⁺						100			
5182.6 ^b	⟨21 [−] ⟩							100		
5778.7 ^a	24 ⁺								100	
6582.6 ^a	⟨26 ⁺ ⟩									100

Energy levels and branching ratios [96He17].

¹⁵⁷₆₄Gd

<i>E</i> [*]	2 <i>J</i> ^π	<i>L</i>	σ (t,p)	ε	σ (d,p)	<i>L</i>	σ (d,t)	σ (τ,α)	<i>I</i> _{s,0}	<i>B</i> (<i>M</i> 1)	g <i>Γ</i> _o	<i>T</i> _{1/2} or	Ref.
[keV]			μb/sr	<i>rel.</i>	μb/sr		μb/sr	μb/sr	[eVb]	[μ _N ²]	[meV]	<i>Γ</i> _{cm}	
0.0	3 [−]	0	174	100	55	1	100	1				Stable	89Lo07
54.533(6)	5 [−]		7				2					130(8) ps	67Tj01
63.917(5)	5 ⁺				2		2					0.46(4) μs	67Tj01
115.717(7)	7 ⁺						3						67Tj01
131.455(9)	7 [−]		6		132	3	150	8				95(5) ps	67Tj01
180.23(1)	9 ⁺		1		25		65	4					67Tj01
227.31(5)	9 [−]		3		9		13					17(2) ps	67Tj01
272.17(4)	11 ⁺				3								03Bo25

(continued)

¹⁵⁷Gd₆₄

E^*	$2J^\pi$	L	σ (t,p)	ε	σ (d,p)	L	σ (d,t)	σ (τ,α)	$I_{s,0}$	$B(M1)$	$g\Gamma_o$	$T_{1/2}$ or	Ref.
[keV]			$\mu\text{b/sr}$	<i>rel.</i>	$\mu\text{b/sr}$		$\mu\text{b/sr}$	$\mu\text{b/sr}$	[eVb]	$[\mu_N^2]$	[meV]	Γ_{cm}	
315(3)					3								67Tj01
346.96(6)	11^-		3		5		9					12(1) ps	67Tj01
361.05(6)	13^+				50	6	49	47					03Bo25
372(3)							3						67Tj01
426.53(4)	11^-					5	69	31				19(2) μs	03Bo25
434.426(6)	5^-	1			28		24	incl				0.03 ps	67Tj01
474.629(6)	3^+				31	2	404	7				<0.1 ns	67Tj01
478.87(8)	13^-							incl				7.3(6) ps	
508.91(1)	15^+	1					46						03Bo25
514.671(8)	7^-				103		incl						67Tj01
524.850(7)	5^+						9						67Tj01
566(1)													
607.589(16)	7^+												03Bo25
617.34(4)	9^-				20	11	7						03Bo25
640.22(9)	15^-	1										4.3(3) ps	
655.7(5)													
664.55(9)	9^+				6	37							03Bo25
682.84(3)	1^+				70	844	incl						67Tj01
683.233(9)	3^+						12					<0.3 ns	
686.668(9)	5^+						incl						
696(2)													
701.38(3)	1^-	2			128	59							67Tj01
722.9(2)						45							67Tj01
729.14(3)	3^-												03Bo25
741.66(5)	9^+				20	9							03Bo25
751.432(13)	3^+					13							67Tj01
762.664(17)	3^-	4											
771.321(17)	7^+	incl				10							03Bo25
788.52(3)	5^-												03Bo25
793.63(4)	1^-	3			70	66							03Bo25
801.57(11)	17^-											2.6(2) ps	
809.09(3)	3^-	1				260							67Tj01
814.20(3)	5^-	incl			84	143							67Tj01
816.47(5)	5^+												03Bo25
816.575(1)	$\langle 5, 7^- \rangle$												
827(1)													
840.32(9)	7^-	1			38	43	40						67Tj01
850(3)						20							67Tj01
875(2)													
887.85(16)	5^-												03Bo25
902(3)	$\langle 7^- \rangle$	1			39	20							67Tj01
916													
919.61(6)	7^+	1				7							03Bo25
952(1)													
968(3)	$\langle 9^- \rangle$	1			51	12							67Tj01

(continued)

¹⁵⁷Gd₆₄

E^*	$2J^\pi$	L	σ (t,p)	ε	σ (d,p)	L	σ (d,t)	σ (τ,α)	$I_{s,0}$	$B(M1)$	$g\Gamma_o$	$T_{1/2}$ or	Ref.
[keV]			$\mu\text{b/sr}$	$rel.$	$\mu\text{b/sr}$		$\mu\text{b/sr}$	$\mu\text{b/sr}$	[eVb]	$[\mu_N^2]$	[meV]	Γ_{cm}	
970.8(5)													
981(5)	$\langle 9^- \rangle$				4		6	18					71Lo01
996.6(9)													
1002.76(14)	19^-											1.81(16) ps	
1015(2)													
1040.95(5)	$\langle 1,3 \rangle^+$				4								67Tj01
1044(7)	3^-	0	8	6									
1049.80(4)	5												03Bo25
≈ 1060	$\langle 11^- \rangle$												
1059.75(12)	5												03Bo25
1062.5(6)													
1093.04(6)	$\langle 1^+, 3^+ \rangle$												
1112(4)			3		43								67Tj01
1136.7(3)													
1142.0(8)	5^+				14		44						67Tj01
1152.5**	3^-												97Wa04
1157.0(9)	5^+												
1184.5(5)			1		5		6						67Tj01
1185.87(15)	21^-											1.15(17) ps	
1204(5)			2		5		3						67Tj01
1231.43(8)	$7^{(+)}$												03Bo25
1245.6(6)							3						67Tj01
1249.6(4)	$\langle 1^+, 3^+ \rangle$												
1282.4(9)	$\langle 1^+, 3^+ \rangle$		1		3								67Tj01
1292.4**	1^+												97Wa04
1297.1(7)	$\langle 1^+, 3^+ \rangle$						11						67Tj01
1305(5)							7						67Tj01
1316.1(5)	$\langle 1^-, 3^- \rangle$		3		13		3						67Tj01
1330.67(25)	$\langle 1^+, 3^+ \rangle$				7								67Tj01
1339.10(24)	$\langle 1^+, 3^+ \rangle$						5						67Tj01
1349.4(5)	$\langle 1^-, 3^- \rangle$				11		4						67Tj01
1381(2)			3										
1386.51(16)	$\langle 1,3 \rangle$												
1396(5)	$\langle 7^- \rangle$				95		6						67Tj01
1403(2)		$\langle 3 \rangle$	5										89Lo07
1412.2**	3^+						3						97Wa04
1424.8(10)	23^-											0.60(5) ps	
1437.2(6)					2								67Tj01
1446.5(9)	5^+												
1455(2)													
1467.4(13)	5		4		19		6						67Tj01
1477.90(23)			incl										
1489.71(22)	$\langle 1^+, 3^+ \rangle$				19								67Tj01
1510(2)													
1521.60(23)	$\langle 3^- \rangle$	0	16	13	5		4						89Lo07

(continued)

¹⁵⁷Gd₆₄

E^*	$2J^\pi$	L	σ (t,p)	ε	σ (d,p)	L	σ (d,t)	σ (τ,α)	$I_{s,0}$	$B(M1)$	$g\Gamma_0$	$T_{1/2}$ or	Ref.
[keV]			$\mu\text{b/sr}$	<i>rel.</i>	$\mu\text{b/sr}$		$\mu\text{b/sr}$	$\mu\text{b/sr}$	[eVb]	$[\mu_N^2]$	[meV]	Γ_{cm}	
1525.6(3)	$\langle 1,3 \rangle^+$												
1552.0(5)	$\langle 1^+, 3^+ \rangle$				11								67Tj01
1556.3(5)							23						67Tj01
1562.7(5)	$\langle 1,3 \rangle^+$												
1564.7(17)	$\langle 1,3 \rangle^+$												
1568.5(4)							11						67Tj01
1574.1(4)			2										
1583.7(4)	$\langle 1^+, 3^+ \rangle$		incl										
1589.69(13)	$\langle 1,3 \rangle$		5		50	2	31						67Tj01
1606.8(6)													
1611.88(18)	$\langle 1,3 \rangle^-$				17		4						67Tj01
1616.68(20)	$\langle 1,3 \rangle^-$				incl								67Tj01
1627.9**	5^+												97Wa04
1630(3)	25^-												
1635.8(4)	$\langle 1,3 \rangle^+$						4						67Tj01
1649.0(6)													
1658.29(19)	$\langle 1,3 \rangle$				34								67Tj01
1666.60(14)	$\langle 1,3 \rangle^-$						4						67Tj01
1678.9(7)	$\langle 1,3 \rangle^+$												
1692.2(4)													
1699.5**	3^+												97Wa04
1701.7(5)													
1717.66(15)	$\langle 1,3 \rangle$												
1720.70(16)	$\langle 1,3 \rangle$						6						67Tj01
1736.4(3)	$\langle 1,3 \rangle^-$						7						67Tj01
1740.3(4)	$\langle 1,3 \rangle^-$				62		19						67Tj01
1750.14(15)	$\langle 1,3 \rangle^-$												
1759.8**	1^+				11								97Wa04
1788.2(5)	$\langle 1,3 \rangle^+$												
1798.6(7)	$\langle 3^- \rangle$	$\langle 0 \rangle$	5	5	19								89Lo07
1802.0(3)													
1810					15		6						67Tj01
1824.04(19)	$\langle 1,3 \rangle^-$						61	9					67Tj01
1825(5)	7^+												
1836.2(3)	$\langle 1,3 \rangle^-$		3		35								67Tj01
1845.4(4)**	$\langle 1,3 \rangle^-$		incl		35								67Tj01
1850.7(4)	$\langle 1,3 \rangle^+$												
1854.9(5)	$\langle 1,3 \rangle^+$												
1861.72(18)	$\langle 1,3 \rangle^-$												
1869.8(12)					40								67Tj01
1889.26(18)	$\langle 1,3 \rangle^-$												
1896.36(25)	$\langle 1,3 \rangle^+$		3										
1902(15)	11^-												
1906.1(4)					188			20					67Tj01
1915.88(14)	$\langle 1,3 \rangle^-$												

(continued)

¹⁵⁷Gd
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E^*	$2J^\pi$	L	σ (t,p)	ε	σ (d,p)	L	σ (d,t)	σ (τ,α)	$I_{s,0}$	$B(M1)$	$g\Gamma_o$	$T_{1/2}$ or	Ref.
[keV]			$\mu\text{b/sr}$	$rel.$	$\mu\text{b/sr}$		$\mu\text{b/sr}$	$\mu\text{b/sr}$	[eVb]	$[\mu_N^2]$	[meV]	Γ_{cm}	
1920.91(25)	$\langle 1,3 \rangle$												
1929(5)					27								67Tj01
1937.18(20)	$\langle 1,3 \rangle^-$												
1947.6**	5^-												97Wa04
1953.0(5)	$\langle 1,3 \rangle^+$												
1956.9(2)*	$1^-, 3^-$	$\langle 0 \rangle$	5	5					2.55(39)	0.029(4)	2.5(4)		89Lo07
1959.3(9)													
1963.3(8)													
1976.1(4)*	$\langle 1,3 \rangle$								1.73(36)	0.020(4)	1.8(4)		95Ma69
1983.6(4)	$\langle 1,3 \rangle^-$												
1992.01(23)	$\langle 1,3 \rangle^-$												
1997.3(5)	$\langle 1,3 \rangle^+$		2										
2015.8(7)													
2028.6(6)													
2038.04(25)	$\langle 1,3 \rangle^-$												
2044.4(5)													
2052.2(3)													
2072.0(3)	$\langle 1,3 \rangle$								3.58(41)	0.039(4)	4.0(5)		95Ma69
2086(1)													
2094.2(3)	$\langle 1,3 \rangle^+$												
2099.3(3)													
2118.1(4)	$1^-, 3^-$	$\langle 0 \rangle$	3	3									89Lo07
2123.3(7)													
2129.6(3)									3.28(37)	0.035(4)	3.9(4)		95Ma69
2135.9(4)													
2146.7(3)	$\langle 1,3 \rangle^-$												
2164.81(16)	$\langle 1,3 \rangle^-$												
2173.6(3)	$\langle 1,3 \rangle^-$												
2180.0(8)									1.73(32)	0.018(3)	2.1(4)		95Ma69
2181.2(3)													
2188.56(20)	$\langle 1,3 \rangle^-$												
2198.80(21)	$\langle 1,3 \rangle^-$								4.23(38)	0.043(4)	5.3(5)		95Ma69
2207.75(21)	$\langle 1,3 \rangle^-$												
2218.1(3)	$\langle 1,3 \rangle^-$												
2230.3(3)	$\langle 1,3 \rangle^-$												
2233.2**	$\langle 5 \rangle^-$												97Wa04
2242.2(6)													
2250.5(5)									1.91(50)	0.019(5)	2.5(7)		95Ma69
2253									1.45(35)	0.015(3)	1.9(5)		95Ma69
2259.48(25)	$\langle 1,3 \rangle^-$												
2276.2(8)													
2290.66(25)	$\langle 1,3 \rangle^-$								2.14(33)	0.021(3)	2.9(5)		95Ma69
2303.4(7)													
2307.6(7)									2.01(29)	0.029(3)	2.8(4)		95Ma69
2317.1(3)	$\langle 1,3 \rangle^-$												

(continued)

¹⁵⁷Gd₆₄

E^*	$2J^\pi$	L	σ (t,p)	ε	σ (d,p)	L	σ (d,t)	σ (τ,α)	$I_{s,0}$	$B(M1)$	$g\Gamma_o$	$T_{1/2}$ or	Ref.
[keV]			$\mu\text{b/sr}$	<i>rel.</i>	$\mu\text{b/sr}$		$\mu\text{b/sr}$	$\mu\text{b/sr}$	[eVb]	$[\mu_N^2]$	[meV]	Γ_{cm}	
2328.1(4)													
2329.0**													97Wa04
2333.61(25)	$\langle 1,3 \rangle^-$								1.82(30)	0.018(3)	2.6(4)		95Ma69
2342.8(4)													
2346									1.59(36)	0.015(3)	2.3(5)		95Ma69
2352.6(4)													
2367.3(3)	$\langle 1,3 \rangle^-$												
2373.39(19)	$\langle 1,3 \rangle^-$												
2380.8(4)	$\langle 1,3 \rangle^-$												
2387.1(5)													
2393.4(7)													
2397									1.57(28)	0.015(3)	2.4(4)		95Ma69
2401.3(4)									1.67(28)	0.016(3)	2.5(4)		95Ma69
2413.3(5)	$\langle 1,3 \rangle^+$												
2438.0**	$\langle 3,5 \rangle^-$												97Wa04
2441.6(4)	$\langle 1,3 \rangle^-$												
2446									1.24(28)	0.011(3)	1.9(4)		95Ma69
2465.7(7)													
2469.3(6)	$\langle 1,3 \rangle^-$												
2488									2.10(30)	0.019(3)	3.4(5)		95Ma69
2491.9(3)	$\langle 1,3 \rangle^+$												
2504									2.32(28)	0.021(3)	3.8(5)		95Ma69
2509									1.74(31)	0.016(3)	2.8(5)		95Ma69
2518.1(8)									1.02(29)	0.009(3)	1.7(5)		95Ma69
2523.9(5)													
2527									1.62(36)	0.014(3)	2.7(6)		95Ma69
2537									1.80(30)	0.016(3)	3.0(5)		95Ma69
2540.4(8)									1.76(35)	0.016(3)	3.0(6)		95Ma69
2547									3.11(32)	0.027(3)	5.3(6)		95Ma69
2555.8(4)									2.13(29)	0.019(3)	3.6(5)		95Ma69
2562.5(4)									1.58(31)	0.014(3)	2.7(5)		95Ma69
2571.3(4)													
2581									1.23(33)	0.011(3)	2.1(5)		95Ma69
2585.2(3)	$\langle 1,3 \rangle^-$												
2590.1(5)	$\langle 1,3 \rangle^-$								3.37(30)	0.029(3)	5.9(5)		95Ma69
2595.2(6)									2.99(28)	0.026(2)	5.2(5)		95Ma69
2607.8(3)	$\langle 1,3 \rangle^-$												
2611.7**	$\langle 1,3 \rangle^-$												97Wa04
2614.7(4)	$\langle 1,3 \rangle^-$												
2626.0(5)													
2633.5(4)	$\langle 1,3 \rangle^-$								4.87(38)	0.042(3)	8.9(7)		95Ma69
2650.6(6)													
2657									3.81(33)	0.032(3)	7.0(6)		95Ma69
2659.2(5)	$\langle 1,3 \rangle^+$												
2663.2(11)													

(continued)

¹⁵⁷Gd₆₄

E^*	$2J^\pi$	L	σ (t,p)	ε	σ (d,p)	L	σ (d,t)	σ (τ,α)	$I_{s,0}$	$B(M1)$	$g\Gamma_o$	$T_{1/2}$ or	Ref.
[keV]			$\mu\text{b/sr}$	<i>rel.</i>	$\mu\text{b/sr}$		$\mu\text{b/sr}$	$\mu\text{b/sr}$	[eVb]	$[\mu_N^2]$	[meV]	Γ_{cm}	
2666.3(5)	$\langle 1,3 \rangle^+$												
2674									1.78(25)	0.031(5)	6.8(10)		95Ma69
2689									1.32(28)	0.011(2)	2.5(5)		95Ma69
2694									1.32(29)	0.011(2)	2.5(5)		95Ma69
2706									2.46(29)	0.050(5)	11.6(12)		95Ma69
2721									1.41(24)	0.012(2)	2.7(5)		95Ma69
2736.3**	5^-												97Wa04
2744									2.65(28)	0.022(2)	5.2(6)		95Ma69
2760									1.87(30)	0.015(2)	3.7(6)		95Ma69
2778									1.51(25)	0.026(4)	6.5(10)		95Ma69
2787									1.51(29)	0.012(2)	3.0(6)		95Ma69
2798									3.32(31)	0.027(2)	6.8(6)		95Ma69
2808.4**													97Wa04
2827									3.84(33)	0.053(5)	13.9(14)		95Ma69
2841									3.75(33)	0.030(3)	7.9(7)		95Ma69
2846									1.30(33)	0.010(3)	2.7(7)		95Ma69
2858									3.77(33)	0.030(3)	8.0(7)		95Ma69
2862.0**	5^-												97Wa04
2863									1.48(23)	0.012(2)	3.2(5)		95Ma69
2871.6**													97Wa04
2878.0**	$\langle 1,3 \rangle^+$												97Wa04
2883									1.68(24)	0.013(2)	3.6(5)		95Ma69
2906									1.83(24)	0.014(2)	4.0(5)		95Ma69
2916									2.23(25)	0.034(4)	9.8(12)		95Ma69
2925									3.47(31)	0.036(4)	10.4(12)		95Ma69
2947.4**	$\langle 3,5 \rangle^+$												97Wa04
3020									4.10(36)	0.049(5)	15.5(15)		95Ma69
3035									2.10(26)	0.016(2)	5.0(6)		95Ma69
3040									2.48(27)	0.018(2)	5.9(6)		95Ma69
3049									1.27(26)	0.027(6)	8.8(18)		95Ma69
3057									1.45(26)	0.011(2)	3.5(6)		95Ma69
3078									1.69(24)	0.022(3)	7.4(12)		95Ma69
3084									2.87(30)	0.047(5)	15.9(15)		95Ma69
3088									2.06(26)	0.015(2)	5.1(7)		95Ma69
3100									1.87(24)	0.014(2)	4.7(6)		95Ma69
3106									2.64(38)	0.019(3)	6.6(9)		95Ma69
3119.0**	$\langle 3,5 \rangle$												97Wa04
3121.8**													97Wa04
3124.2**	$\langle 3,5 \rangle^-$												97Wa04
3131									3.16(30)	0.023(2)	8.1(8)		95Ma69
3154									1.56(24)	0.011(2)	4.0(6)		95Ma69
3158									1.68(29)	0.034(4)	12.5(15)		95Ma69
3162									1.10(28)	0.008(2)	2.9(7)		95Ma69
3171.5**	$\langle 1,3 \rangle^+$												97Wa04
3228									0.88(20)	0.006(1)	2.4(5)		95Ma69

(continued)

¹⁵⁷Gd₆₄

E^*	$2J^\pi$	L	σ (t,p)	ε	σ (d,p)	L	σ (d,t)	σ (τ,α)	$I_{s,0}$	$B(M1)$	$g\Gamma_o$	$T_{1/2}$ or	Ref.
[keV]			$\mu\text{b/sr}$	<i>rel.</i>	$\mu\text{b/sr}$		$\mu\text{b/sr}$	$\mu\text{b/sr}$	[eVb]	$[\mu_N^2]$	[meV]	Γ_{cm}	
3233									1.04(24)	0.007(2)	2.8(7)		95Ma69
3239									1.88(22)	0.013(2)	5.1(6)		95Ma69
3251									0.73(18)	0.005(1)	2.0(5)		95Ma69
3268									0.71(21)	0.005(1)	2.0(6)		95Ma69
3272									0.71(20)	0.005(1)	2.0(6)		95Ma69
3288									1.17(19)	0.008(1)	3.3(5)		95Ma69
3319.6**													97Wa04
3325.8**													97Wa04
3333									1.17(23)	0.008(2)	3.4(7)		95Ma69
3346									1.47(22)	0.010(1)	4.3(7)		95Ma69
3356									1.32(27)	0.009(2)	3.9(8)		95Ma69
3375									0.90(21)	0.006(1)	2.7(6)		95Ma69
3413									1.64(28)	0.011(2)	5.0(9)		95Ma69
3456									1.24(26)	0.008(2)	3.8(8)		95Ma69
3472									1.04(23)	0.007(1)	3.3(7)		95Ma69
3479									0.72(24)	0.005(2)	2.3(8)		95Ma69
3506									1.74(26)	0.011(2)	5.6(8)		95Ma69
3528									1.01(23)	0.006(1)	3.3(7)		95Ma69
3574.0**													97Wa04
3663									1.79(35)	0.011(2)	6.3(12)		95Ma69
3680									2.04(40)	0.012(2)	7.2(14)		95Ma69
3684									1.58(32)	0.010(2)	5.6(11)		95Ma69
3713									1.84(33)	0.011(2)	6.6(12)		95Ma69
3715.4**													97Wa04
3717									2.33(35)	0.014(2)	8.4(12)		95Ma69
3734									1.58(45)	0.010(3)	5.7(16)		95Ma69
3739									1.27(31)	0.008(2)	4.6(11)		95Ma69
3775									1.17(39)	0.007(2)	4.4(14)		95Ma69
3821									1.29(34)	0.016(4)	10.0(28)		95Ma69
3833.3**													97Wa04
3842									1.41(55)	0.008(3)	5.4(22)		95Ma69
3853.2**													97Wa04
3891.7**													97Wa04
3926.0**													97Wa04
3967.7**													97Wa04
3998.7**													97Wa04
4051.9**													97Wa04
4073.7**													97Wa04
4117.6**													97Wa04
4132.3**													97Wa04
4144.4**													97Wa04
4176.6**													97Wa04
4201.2**													97Wa04
4249.7**													97Wa04
4280.4**													97Wa04

(continued)

¹⁵⁷Gd₆₄

E^*	$2J^\pi$	L	σ (t,p)	ε	σ (d,p)	L	σ (d,t)	σ (τ,α)	$I_{s,0}$	$B(M1)$	gI_o	$T_{1/2}$ or	Ref.
[keV]			$\mu\text{b/sr}$	<i>rel.</i>	$\mu\text{b/sr}$		$\mu\text{b/sr}$	$\mu\text{b/sr}$	[eVb]	$[\mu_N^2]$	[meV]	Γ_{cm}	
4299.7**													97Wa04
4369.8**													97Wa04
4431.4**													97Wa04
			89Lo07	89Lo07	67Tj01		67Tj01	71Lo01	95Ma69	95Ma69	95Ma69		Ref.

Additional data on this isotope can be found in [97BoZY, 97Wa04, 95Or04, 84Pe03, 69Ya08].

Abundance: 15.65(2) %.* The assumed M1 γ -transition widths gI_o ; these and other data on dipole excitation of levels in Dy and Gd isotopes are from [95Ma69] where branching ratios can be found.

** From [97Wa04], additional (in most cases) to that in the compilation [96He17].

 σ (τ,α) was measured at 60°, data for 90° can be found in [71Lo01].The value of relative population in the (t,p) reaction at 30° (Q-reduced) [89Lo07] is given as ε . σ (d,p) and σ (d,t) were measured at 90° with the deuteron energy 12 MeV [67Tj01].

Data for this isotope are considered in vol. LB I/18C.

Energy levels and branching ratios [96He17]. Part 2

¹⁵⁷Gd₆₄

E^*	$2J^\pi$	Branching ratios in percentage										
		E_f^* :	0.0	54.5	63.9	115.7	131.4	180.2	227.3	347.2	434.426	474.629
[keV]		$2J_f^\pi$:	3 ⁻	5 ⁻	5 ⁺	7 ⁺	7 ⁻	9 ⁺	9 ⁻	11 ⁻	5 ⁻	3 ⁺
54.533(6)	5 ⁻		100									
63.917(5)	5 ⁺		93(9)	6.6(10)								
115.717(7)	7 ⁺				100							
131.455(9)	7 ⁻		23(2)	77(2)								
180.23(1)	9 ⁺				23(6)	77(38)						
227.31(5)	9 ⁻			48(2)			52(2)					
346.96(6)	11 ⁻						57(1)			43(1)		
426.53(4)	11 ⁻							67(3)		33(1)		
434.426(6)	5 ⁻		2.4(2)	1.8(2)	75(4)	20(1)	0.46(7)					
474.629(6)	3 ⁺		12(1)	4.4(3)	82(4)	1.4(1)						
478.87(8)	13 ⁻								71(3)	29(3)		
514.671(8)	7 ⁻	x			35(2)	39(2)	2.0(3)	24(2)				
524.850(7)	5 ⁺	7.0(7)		4.6(4)	22(2)	62(3)	2.9(3)	0.8(2)				
607.589(16)	7 ⁺			12(2)	≤14	32(4)		56(6)				
640.22(9)	15 ⁻									74(4)		
683.233(9)	3 ⁺		5.5(5)	2.4(3)	85(4)	3.5(3)						3.5(3)
686.668(9)	5 ⁺			1.6(3)	34(2)	54(3)	1.2(2)	2.8(4)			1.5(8)	2.1(3)
701.38(3)	1 ⁻		70(9)		12(3)						18(4)	
722.9(2)				21(6)		79(40)						
729.14(3)	3 ⁻		40(10)	30(10)		30(10)						
741.66(5)	9 ⁺	x		77(8)								6(2)
751.432(13)	3 ⁺	≤10		5.2(5)	86(9)	3.3(7)						3.0(6)
762.664(17)	3 ⁻		74(11)								4(2)	19(3)

(continued)

 $^{157}_{64}\text{Gd}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		$E_f^*:$ $2J_f^\pi:$	0.0 3 ⁻	54.5 5 ⁻	63.9 5 ⁺	115.7 7 ⁺	131.4 7 ⁻	180.2 9 ⁺	227.3 9 ⁻	347.2 11 ⁻	434.426 5 ⁻	474.629 3 ⁺
771.321(17)	7 ⁺			6(2)	11(2)	43(4)		36(3)	≤9			
814.20(3)	5 ⁻		13(4)		≤79	35(4)	43(13)					9(5)
816.575(1)	⟨5,7 ⁻ ⟩		9(1)	≈4	34(3)	39(4)	6(3)					x
919.61(6)	7 ⁺			36(10)		32(10)		32(10)				
1049.80(4)	5				79(8)	21(6)						
1059.75(12)	5		23(7)		25(7)	26(8)				12(4)		15(4)
1231.43(8)	7 ⁽⁺⁾				51(12)	21(6)		28(9)				
1956.9(2)*	1 ⁻ ,3 ⁻	x										
1976.1(4)*	⟨1,3⟩	x										
2072.0(3)	⟨1,3⟩	x										
2129.6(3)		x										
2180.0(8)		x										
2198.80(21)	⟨1,3⟩ ⁻	x										
2250.5(5)		x										
2253		x										
2290.66(25)	⟨1,3⟩ ⁻	x										
2307.6(7)		x										
2333.61(25)	⟨1,3⟩ ⁻	x										
2346		x										
2397		x										
2401.3(4)		x										
2446		x										
2488		x										
2504		x										
2509		x										
2518.1(8)		x										
2527		x										
2537		x										
2540.4(8)		x										
2547		x										
2555.8(4)		x										
2562.5(4)		x										
2581		x										
2590.1(5)	⟨1,3⟩ ⁻	x										
2595.2(6)		x										
2633.5(4)	⟨1,3⟩ ⁻	x										
2657		x										
2674		49(11)	51									
2689		x										
2694		x										
2706		40(6)					60					
2721		x										
2744		x										
2760		x										
2778		46(10)				54						

(continued)

¹⁵⁷Gd₆₄

<i>E</i> [*]	2 <i>J</i> ^π	<i>E</i> _f [*] :	0.0	54.5	63.9	Branching ratios in percentage						
[keV]		2 <i>J</i> _f ^π :	3 [−]	5 [−]	5 ⁺	115.7	131.4	180.2	227.3	347.2	434.426	474.629
			3 [−]	5 [−]	5 ⁺	7 ⁺	7 [−]	9 ⁺	9 [−]	11 [−]	5 [−]	3 ⁺
2787			x									
2798			x									
2827			57		43(6)							
2841			x									
2846			x									
2858			x									
2863			x									
2883			x									
2906			x									
2916			51				49(9)					
2925			74	26(5)								
3020			62	38(6)								
3035			x									
3040			x									
3049			35(10)			65						
3057			x									
3078			56				44(10)					
3084			45(6)	55								
3088			x									
3100			x									
3106			x									
3131			x									
3154			x									
3158			35(7)		65							
3162			x									
3228			x									
3233			x									
3239			x									
3251			x									
3268			x									
3272			x									
3288			x									
3333			x									
3346			x									
3356			x									
3375			x									
3413			x									
3456			x									
3472			x									
3479			x									
3506			x									
3528			x									
3663			x									
3680			x									
3684			x									

(continued)

¹⁵⁷Gd₆₄

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		E_f^* : $2J_f^\pi$:	0.0 3 ⁻	54.5 5 ⁻	63.9 5 ⁺	115.7 7 ⁺	131.4 7 ⁻	180.2 9 ⁺	227.3 9 ⁻	347.2 11 ⁻	434.426 5 ⁻	474.629 3 ⁺
3713			x									
3717			x									
3734			x									
3739			x									
3775			x									
3821			49(19)	51								
3842			x									

Energy levels and branching ratios [96He17]. Part 3

¹⁵⁷Gd₆₄

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E_f^* : $2J_f^\pi$:	478.87 13 ⁻	514.671 7 ⁻	524.850 5 ⁺	607.589 7,5 ⁺	640.56 15 ⁻	686.668 5 ⁺ ,7 ⁺	801.57 17 ⁻	1002.76 19 ⁻	1185.87 21 ⁻
640.22(9)	15 ⁻		26(4)								
683.233(9)	3 ⁺				0.58(16)						
686.668(9)	5 ⁺				2.9(6)						
741.66(5)	9 ⁺			11(2)	6(2)						
751.432(13)	3 ⁺				2.7(5)						
762.664(17)	3 ⁻				3(1)						
771.321(17)	7 ⁺				1.8(10)	1.8(10)					
801.57(11)	17 ⁻		84(6)				16(6)				
816.575(1)	⟨5,7 ⁻ ⟩				3(1)	2(1)		2(1)			
1002.76(14)	19 ⁻						84(10)		16(10)		
1185.87(15)	21 ⁻								x	x	
1424.8(10)	23 ⁻									100	
1630(3)	25 ⁻										100

Energy levels and branching ratios [04He05].

¹⁵⁸Gd₆₄

E^* [keV]	J^π	L (t,p)	σ (t,p) $\mu\text{b/sr}$	ε <i>rel.</i>	L	σ (p,t) rel.u.	σ (p,t) $\mu\text{b/sr}$	$\Gamma_{\gamma o}$ [meV]	Ref.	Branching ratios in percentage					
										E_f^* : J_f^π :	0.0 0 ⁺	79.5 2 ⁺	261 4 ⁺	539 6 ⁺	904 8 ⁺
0.0	0 ⁺	0	255	100	0	1000(8)	586		02Le34						
79.5138(2)	2 ⁺		24				259		73Fl04	100					
261.457(2)	4 ⁺		7				19		73Fl04		100				
539.021(7)	6 ⁺		3				≤2		73Fl04				100		
904.12(3)	8 ⁺								01Go36					100	
977.145(2)	1 ⁻		3				≤2		73Fl04	57(3)	43(2)				
1023.697(2)	2 ⁻								01Go36		100				

(continued)

¹⁵⁸Gd
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E^*	J^π	L	σ (t,p)	ε	L	σ (p,t)	σ (p,t)	Γ_{γ_0}	Ref.	Branching ratios in percentage					
[keV]		(t,p)	$\mu\text{b/sr}$	$rel.$		rel.u.	$\mu\text{b/sr}$	[meV]		E_f^* : J_f^π :	0.0 0 ⁺	79.5 2 ⁺	261 4 ⁺	539 6 ⁺	904 8 ⁺
1041.638(2)	3 ⁻		8				10		73F104			68(1)	32.1(6)		
1158.968(2)	4 ⁻								01Go36				97(14)		
1176.479(5)	5 ⁻								01Go36				79(5)	21(1)	
1187.143(3)	2 ⁺	2	20	10			37		73F104	44(1)	55(4)	1.0(1)			
1196.165(8)	0 ⁺	0	incl		0	3.7(6)	≤ 1		02Le34		100				
1259.869(2)	2 ⁺		3				3		73F104	32(2)	18(1)	45(3)			
1263.514(3)	1 ⁻		incl				incl	14(3)	89Pi05	40(2)	60(4)				
1265.518(3)	3 ⁺		incl				incl		89Lo07		82(5)	18(2)			
1350	10 ⁺														100
1358.467(3)	4 ⁺		10				≤ 2		73F104		25(2)	75(5)	<4.4		
1371.938(5)	6 ⁻								01Go36						
1380.626(6)	4 ⁺								01Go36		17(2)	81(5)			
1391	7 ⁻													x	x
1402.936(3)	3 ⁻								01Go36		54(3)	46(3)			
1406.699(2)	4 ⁺								01Go36		55(3)	15(2)	16(1)		
1414			6						89Lo07						
1440															
1452.352(6)	0 ⁺	$\langle 0 \rangle$	5	3	0	305(6)	148		02Le34	x	95(10)				
1481.421(4)	5 ⁺								01Go36				81(5)	19(2)	
1499.096(5)	5 ⁺								01Go36				79(4)	21(2)	
1517.476(2)	2 ⁺		4				65		73F104	37(3)	43(3)	15(1)			
1554			1						89Lo07						
1576.930(16)	0 ⁺				0	5.4(7)			02Le34						
1624	6 ⁺												x	x	
1636	6 ⁺												x	x	
1636.292(4)	4 ⁻		3						89Lo07						
1639.34(9)	$\langle 5^- \rangle$								01Go36				75(6)	25(4)	
1653													100		
1667.372(6)	$\langle 4 \rangle^+$						3		73F104		38(3)	35(3)	24(3)		
1684	9 ⁻														100
1716.801(5)	5 ⁻								01Go36						
1743.145(14)	0 ⁺	0	10	6	0	0.6(3)			02Le34		78(8)				
1791.792(9)	2 ⁺								01Go36		12(2)	24(2)			
1793.569(7)	2 ⁻								01Go36	0.20(8)	2.4(3)	0.8(2)			
1814.139(7)	6 ⁻								01Go36						
1819															
1847.88(3)	1 ⁺								01Go36		1.5(3)				
1856.315(15)	1 ⁻								01Go36	52(6)					
1861.277(7)	3 ⁻		5						89Lo07		30(4)				
1866	12 ⁺														
1894.597(25)	$\langle 2^+ \rangle$								01Go36		3.6(9)	2.0(5)			
1894.612(8)	2 ⁻								01Go36		19(3)				
1901.593(16)	4 ⁺								01Go36				53(10)		
1916.933(6)	$\langle 4-6 \rangle^-$		5						89Lo07						
1920.258(6)	4 ⁺								01Go36				19(5)	10(5)	

(continued)

¹⁵⁸Gd
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E^*	J^π	L	σ (t,p)	ε	L	σ (p,t)	σ (p,t)	Γ_{γ_0}	Ref.	Branching ratios in percentage					
[keV]		(t,p)	$\mu\text{b/sr}$	$rel.$		rel.u.	$\mu\text{b/sr}$	[meV]		E_f^* : J_f^π :	0.0 0 ⁺	79.5 2 ⁺	261 4 ⁺	539 6 ⁺	904 8 ⁺
1930.200(24)	1 ⁺								01Go36		0.62(12)	2.1(4)			
1935.5(6)	0 ⁺				0	30.8(14)			02Le34						
1941.26(3)	3 ⁺		1						89Lo07						
1948															
1952.424(25)	$\langle 0 \rangle^+$														
1953.761(23)	4 ⁻	$\langle 0 \rangle$	11	7					89Lo07				83(10)		
1957.27(9)	0 ⁺		incl		0	3.2(5)			02Le34		100				
1964.104(24)	2 ⁺								01Go36	2.0(2)	19(1)	2.0(3)			
1972(3)	$\langle 0^+ \rangle$	$\langle 0 \rangle$	11	7	0	0.4(2)			02Le34						
1978.035(8)	3 ⁻		incl						01Go36						
1997															
2017.879(11)	$\langle 5^+ \rangle$								01Go36						
2023.838(13)	1 ⁺								01Go36	34(5)	52(6)				
2033.921(17)	3 ⁺								01Go36						
2035.69(4)	$\langle 2^+ \rangle$		2						89Lo07	5.7(1)	64(6)	30(3)			
2041			incl												
2049.009(22)	2 ⁻								01Go36						
2063															
2083.935(24)	2 ⁺								01Go36						
2089.251(8)	3 ⁺								01Go36		9.8(8)				
2095.20(16)	$\langle 4^+ \rangle$		3						89Lo07		28(3)	42(3)			
2120.24(4)	2 ⁺ ,3								01Go36		46(7)	42(4)			
2134			12						89Lo07						
2153.174(9)	$\langle 2,3 \rangle^+$										x				
2176	$\langle 5^- \rangle$														
2214.93(13)	1								01Go36						
2215.47(8)	$\langle 1-3 \rangle^+$								01Go36						
2215.523(22)	1									x	x				
2221.63(5)	2 ⁻ ,3 ⁻								01Go36						
2237			10						89Lo07						
2249.61(5)	2 ⁺ -4 ⁺								01Go36						
2260.158(18)	2 ⁺ ,3 ⁺		8						89Lo07	26(3)	37(11)				
2267.16(11)	$\langle 1 \rangle$,2 ⁺		5					10(2)	01Go36	65(5)	35(3)				
2269.255(14)	$\langle 0-2 \rangle^+$		incl								1.7(4)				
2276.02(3)	0 ⁺		incl		0	39.6(22)			02Le34		x		x		
2283.9									94Al41		100				
2285	$\langle 6^- \rangle$														
2289.46(12)	1,2 ⁺								01Go36	67(6)	33(3)				
2296			3						89Lo07						
2322.2									94Al41		x		x		
2325.11(6)	1 ⁻ ,2 ⁺								01Go36	0.6(2)	14.3(10)				
2326.02(9)									01Go36						
2327.44(25)	X ⁽⁺⁾														
2338.0(8)	0 ⁺		5		0	10.7(7)			02Le34						
2340.3(3)	2 ⁺									11(4)	89(9)				

(continued)

¹⁵⁸Gd
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E^*	J^π	L	σ (t,p)	ε	L	σ (p,t)	σ (p,t)	$\Gamma_{\gamma o}$	Ref.	Branching ratios in percentage					
[keV]		(t,p)	$\mu\text{b/sr}$	$rel.$		rel.u.	$\mu\text{b/sr}$	[meV]		E_f^* : J_f^π :	0.0 0 ⁺	79.5 2 ⁺	261 4 ⁺	539 6 ⁺	904 8 ⁺
2344.48(15)	X ⁽⁺⁾								94Al41			100			
2355.09(15)	X ⁽⁺⁾		4						89Lo07						
2369.6(15)															
2384															
2395.42(13)	$\langle 3^+ \rangle$		4						89Lo07		16(3)	7(3)			
2418	$\langle 7^- \rangle$		incl												
2433.1(8)			3												
2446.49(15)	1							9(2)	89Pi05		49(4)	51(3)			
2450.74(12)	2 ⁺								01Go36		52(2)				
2475.4(3)	1,2 ⁺		12						89Lo07		22(3)	29(5)			
2480.5(14)															
2485.6(7)			6						89Lo07						
2499.22(10)	$\langle 1,2 \rangle^+$								94Al41		11.4(7)	2.7(11)			
2501.0(3)	X ⁽⁺⁾											100			
2534.1(3)	X ⁽⁺⁾														
2538.9(10)	$\langle 2^+ \rangle$								94Al41			100			
2564.91(17)	1 ⁽⁺⁾		4					10(2)	89Pi05		81(6)	19(4)			
2594.73(20)									94Al41			100			
2600	$\langle 3^+ \rangle$		7						94Al41						
2600.23(22)	1 ⁽⁺⁾							11(2)	89Pi05		58(5)	42(5)			
2620.94(20)												8(2)			
2631.0(3)	X ⁽⁺⁾														
2642(2)											55(23)	45(15)			
2643.4(8)	0 ⁺				0	18.1(10)			02Le34						
2644.6														100	
2657.0									94Al41		x	x			
2670.6(3)											16(7)				
2674.56(18)	$\langle 1 \rangle, 2^+$								01Go36		49(6)				
2686.9(4)	1		5						89Lo07		61(7)	39(5)			
2687.1(3)	0 ⁺	$\langle 0 \rangle$	incl	4	0	1.7(10)			02Le34						
2701.7(3)	2 ⁺								94Al41		x	x	x		
2723.7(10)															
2741															
2750.36(19)									94Al41		53(6)	47(6)			
2759.5	X ⁽⁺⁾								94Al41			100			
2761.96(21)											9(2)				
2769(7)			11						89Lo07						
2782.3(3)	X ⁽⁺⁾								94Al41			100			
2794.9(8)			9												
2802.9	1							27(4)	89Pi05		71	29(5)			
2805.1(3)	1								01Go36		76(11)				
2822.3(6)	1 ⁻							21(4)	89Pi05		33(3)	67(7)			
2829.4(7)									94Al41		100				
2832.0(3)	1								01Go36		100				
2842	1		7					18(3)	89Pi05		60	40(8)			

(continued)

¹⁵⁸Gd
64

E^*	J^π	L	σ (t,p)	ε	L	σ (p,t)	σ (p,t)	Γ_{γ_0}	Ref.	Branching ratios in percentage				
[keV]		(t,p)	$\mu\text{b/sr}$	<i>rel.</i>		rel.u.	$\mu\text{b/sr}$	[meV]		E_f^* : 0.0	79.5	261	539	904
										J_f^π : 0 ⁺	2 ⁺	4 ⁺	6 ⁺	8 ⁺
2844.2(5)										100				
2854.8(5)	1,2 ⁺								01Go36	57(7)	43(7)			
2859.6(6)														
2879.0(2)	X ⁽⁺⁾								94Al41	x	x	x		
2886														
2896.1(6)														
2909.8(3)	0 ⁺				0	8.7(13)			02Le34					
2913.4(7)														
2934.7(10)														
2960.7(8)										100				
2964.2(5)	2 ⁺								01Go36	64(7)	36(8)			
2981.5(10)														
2986.1(4)	1							17(3)	89Pi05	69	31(8)			
2997.7(4)	X ⁽⁺⁾								94Al41		100			
3008.3(9)									94Al41		x	x		
3012.05(15)	X ⁽⁺⁾													
3029.1(4)									94Al41		100			
3038.1(4)	1							15(3)	89Pi05	78	22(9)			
3045.6(15)														
3059.9(6)	1,2 ⁺								01Go36	41(9)	59(12)			
3065.0(5)	1,2 ⁺								01Go36	56(8)	44(9)			
3066.9(4)														
3076.7(16)	0 ⁺				0	3(5)								
3080.0(6)														
3108	1							54(7)	89Pi05	63	37(4)			
3109.9(11)	0 ⁺				0	1.3(5)								
3118.5(15)														
3141.5(7)									94Al41		100			
3149.9(7)	X ⁽⁺⁾								94Al41		100			
3161	1 ⁻							22(5)	89Pi05	42	58(13)			
3171.2(6)														
3192(1)	1 ⁺							83(10)	89Pi05	71	29(4)			
3195.5(6)														
3200.8(6)	1 ⁺							98(11)	89Pi05	65	35(3)			
3228.6(7)														
3234.5(5)														
3247.2(4)														
3258.2(6)	1 ⁻							19(5)	89Pi05	35	65(15)			
3263.9(6)														
3271.4(8)														
3288.0(5)	1							9.6(27)	89Pi05	69	31(16)			
3292.0										100				
3299	1							47(7)	89Pi05	68	32(5)			
3351.9(7)														
3411.7(4)														

(continued)

¹⁵⁸Gd
64

E^*	J^π	L	σ (t,p)	ε	L	σ (p,t)	σ (p,t)	Γ_{γ_0}	Ref.	Branching ratios in percentage					
[keV]		(t,p)	$\mu\text{b/sr}$	<i>rel.</i>		rel.u.	$\mu\text{b/sr}$	[meV]		E_f^* :	0.0	79.5	261	539	904
										J_f^π :	0 ⁺	2 ⁺	4 ⁺	6 ⁺	8 ⁺
3428	1							13(3)	89Pi05		61	39(14)			
3436.4(4)	X ⁽⁺⁾														
3448.8(4)	X ⁽⁺⁾														
3470	1							11(3)	89Pi05		72	28(17)			
3534.8(5)	X ⁽⁺⁾														
3570.9(12)									94Al41	x	x				
3577	1							17(5)	89Pi05	79	21(17)				
3592.4(5)	X ⁽⁻⁾														
3600.5(10)									94Al41	x	x				
3626.9(5)															
3632.7(7)															
3647.5(8)															
3661.6(6)									94Al41	x	x				
3702.6(12)												x		x	
3750.1(15)															
3794.6(10)	X ⁽⁺⁾														
3820	1 ⁻							41(14)	89Pi05	43	57(18)				
3846.7(4)	X ⁽⁺⁾														
3878.8(4)	X ⁽⁺⁾														
3921	1 ⁻							61(25)	89Pi05	33	67(23)				
3923.3(11)									94Al41	x	x				
3948.0(6)															
3965.1(7)															
4015.8(8)															
4110.7(8)	X ⁽⁺⁾														
4139.6(4)	X ⁽⁺⁾														
4161.5(8)	X ⁽⁺⁾														
4236.9(6)															
4830.9(9)									94Al41						
4968.1(23)									94Al41						
4997.7(11)									94Al41						
			89Lo07	89Lo07		02Le34	73F104	89Pi05	Ref.						

Additional data on this isotope can be found in [02Za13, 02Le34, 01Bo36, 01Kh0A, 00De59, 99Bo10, 96De04, 95Bo20, 94Al41, 93Su16, 90Zi05, 81Bu10, 73Fl04, 67Bl05, 66Sh14].

Abundance: 24.84(7) %.

The second value σ (p,t) is the linear sum of the differential cross section from 5 to 70°.

For the level at $E^*=1264$ keV parameters $\Gamma_{\gamma_0}^{\text{red}}=7.0(16)$ meV and $B(E1)=20(5)$ in units $10^{-3}e^2fm^2$ were given in [91Zi01].

Data for this isotope are considered in vol. LB I/18C.

Energy levels and branching ratios [04He05]. Part 2

¹⁵⁸Gd
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E^* [keV]	J^π	σ (p,t) $\mu\text{b/sr}$	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage						
					E_f^* : J_f^π :	977.1 1 ⁻	1023.7 2 ⁻	1041.6 3 ⁻	1158.97 4 ⁻	1176.48 5 ⁻	1187.14 2 ⁺
0.0	0 ⁺	3750	Stable	02Le34							
79.5138(2)	2 ⁺	1010	2.52(3) ns	73Fl04							
261.457(2)	4 ⁺	250	0.148(2) ns	73Fl04							
539.021(7)	6 ⁺			73Fl04							
904.12(3)	8 ⁺		5.1(4) ps	01Go36							
977.145(2)	1 ⁻		1.43 ps	73Fl04							
1023.697(2)	2 ⁻		>3.5 ps	01Go36							
1041.638(2)	3 ⁻	95	0.54(15) ps	73Fl04							
1158.968(2)	4 ⁻		3.3 ps	01Go36			2.9(3)	0.53(7)			
1176.479(5)	5 ⁻		0.32 ps	01Go36				0.05(1)			
1187.143(3)	2 ⁺	260	0.61(4) ps	73Fl04							
1196.165(8)	0 ⁺		5.5 ps	02Le34	0.08(1)						
1259.869(2)	2 ⁺		3.6(3) ps	73Fl04	2.3(2)	0.25(2)	3.1(3)				
1263.514(3)	1 ⁻		13(4) fs	89Pi05							
1265.518(3)	3 ⁺		1.11 ps	89Lo07							
1350	10 ⁺		1.85(15) ps								
1358.467(3)	4 ⁺		0.69 ps	73Fl04							0.11(1)
1371.938(5)	6 ⁻			01Go36					[92]	[8.3]	
1380.626(6)	4 ⁺			01Go36				1.74(17)			
1391	7 ⁻										
1402.936(3)	3 ⁻		<0.048 ps	01Go36							
1406.699(2)	4 ⁺		1.11 ps	01Go36				10.9(7)	0.18(2)	3.6(3)	0.07(1)
1414				89Lo07							
1440											
1452.352(6)	0 ⁺	730	1.04 ps	02Le34	2.8(2)						
1481.421(4)	5 ⁺			01Go36							
1499.096(5)	5 ⁺			01Go36							
1517.476(2)	2 ⁺	440	1.39(15) ps	73Fl04	0.3(2)	0.45(3)	2.4(2)				
1554				89Lo07							
1576.930(16)	0 ⁺			02Le34	70(12)						23(6)
1624	6 ⁺										
1636	6 ⁺										
1636.292(4)	4 ⁻			89Lo07							
1639.34(9)	$\langle 5^- \rangle$			01Go36							
1653											
1667.372(6)	$\langle 4 \rangle^+$			73Fl04				0.8(2)		1.2(1)	
1684	9 ⁻										
1716.801(5)	5 ⁻			01Go36							
1743.145(14)	0 ⁺			02Le34							
1791.792(9)	2 ⁺			01Go36	20(1)	6(1)	26(2)				
1793.569(7)	2 ⁻		6.3 ps	01Go36	12.8(8)	8.4(6)	2.9(2)	<0.65			52(3)
1814.139(7)	6 ⁻			01Go36							
1819											
1847.88(3)	1 ⁺			01Go36	48(6)	49(3)					
1856.315(15)	1 ⁻			01Go36	35(2)	<7.7					6.8(7)

(continued)

¹⁵⁸Gd
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E^* [keV]	J^π	σ (p,t) $\mu\text{b/sr}$	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage						
					E_f^* : J_f^π :	977.1 1 ⁻	1023.7 2 ⁻	1041.6 3 ⁻	1158.97 4 ⁻	1176.48 5 ⁻	1187.14 2 ⁺
1861.277(7)	3 ⁻			89Lo07		8.3(7)		<13	1.7(1)		20(1)
1866	12 ⁺		0.98(8) ps								
1894.597(25)	$\langle 2^+ \rangle$			01Go36		28(4)	24(2)	39(3)			
1894.612(8)	2 ⁻			01Go36		32(6)	24(8)	x			15(1)
1901.593(16)	4 ⁺			01Go36				32(3)		3.4(5)	
1916.933(6)	$\langle 4-6 \rangle^-$			89Lo07							
1920.258(6)	4 ⁺			01Go36							1.9(3)
1930.200(24)	1 ⁺			01Go36		25(2)	22(1)				50(2)
1935.5(6)	0 ⁺			02Le34							
1941.26(3)	3 ⁺			89Lo07				[16]	[64]		
1948											
1952.424(25)	$\langle 0 \rangle^+$					27(3)					7.8(6)
1953.761(23)	4 ⁻			89Lo07					<10.3		
1957.27(9)	0 ⁺			02Le34							
1964.104(24)	2 ⁺			01Go36		20(1)	5(1)	24(3)			12(1)
1972(3)	$\langle 0^+ \rangle$			02Le34							
1978.035(8)	3 ⁻			01Go36		37(3)	26(2)	14(1)			12(1)
1997											
2017.879(11)	$\langle 5^+ \rangle$			01Go36							
2023.838(13)	1 ⁺			01Go36							
2033.921(17)	3 ⁺			01Go36			33(2)		26(2)		4.8(3)
2035.69(4)	$\langle 2^+ \rangle$			89Lo07							
2041											
2049.009(22)	2 ⁻			01Go36			22(2)	41(3)			
2063											
2083.935(24)	2 ⁺			01Go36							
2089.251(8)	3 ⁺			01Go36		14(4)		13(1)			36(4)
2095.20(16)	$\langle 4^+ \rangle$			89Lo07				30(3)			
2120.24(4)	2 ⁺ ,3			01Go36							
2134				89Lo07							
2153.174(9)	$\langle 2,3 \rangle^+$										28(3)
2176	$\langle 5^- \rangle$										
2214.93(13)	1			01Go36							
2215.47(8)	$\langle 1-3 \rangle^+$			01Go36							100
2215.523(22)	1										
2221.63(5)	2 ⁻ ,3 ⁻			01Go36							72(4)
2237				89Lo07							
2249.61(5)	2 ⁺ -4 ⁺			01Go36							45(4)
2260.158(18)	2 ⁺ ,3 ⁺			89Lo07			9(2)	12(3)			6.8(9)
2267.16(11)	$\langle 1 \rangle$,2 ⁺		33(8) fs	01Go36							
2269.255(14)	$\langle 0-2 \rangle^+$					17(2)					
2276.02(3)	0 ⁺			02Le34							94(19)
2283.9				94Al41							
2285	$\langle 6^- \rangle$										
2289.46(12)	1,2 ⁺			01Go36							

(continued)

¹⁵⁸Gd
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E^*	J^π	σ (p,t)	$T_{1/2}$ or	Ref.	Branching ratios in percentage						
[keV]		$\mu\text{b/sr}$	Γ_{cm}		E_{f}^* : J_{f}^π :	977.1 1 ⁻	1023.7 2 ⁻	1041.6 3 ⁻	1158.97 4 ⁻	1176.48 5 ⁻	1187.14 2 ⁺
2296				89Lo07							
2322.2				94Al41							
2325.11(6)	1 ⁻ , 2 ⁺			01Go36		51(3)	5.7(6)	1.9(3)			6.6(8)
2326.02(9)				01Go36							
2327.44(25)	X ⁽⁺⁾										
2338.0(8)	0 ⁺			02Le34							
2340.3(3)	2 ⁺										
2344.48(15)	X ⁽⁺⁾			94Al41							
2355.09(15)	X ⁽⁺⁾			89Lo07							
2369.6(15)											
2384											
2395.42(13)	$\langle 3^+ \rangle$			89Lo07			41(9)	36(5)			
2418	$\langle 7^- \rangle$										
2433.1(8)											
2446.49(15)	1		29(8) fs	89Pi05							
2450.74(12)	2 ⁺			01Go36							48(21)
2475.4(3)	1, 2 ⁺			89Lo07							
2480.5(14)											
2485.6(7)				89Lo07							
2499.22(10)	$\langle 1, 2 \rangle^+$			94Al41			9(2)				49(4)
2501.0(3)	X ⁽⁺⁾										
2534.1(3)	X ⁽⁺⁾										
2538.9(10)	$\langle 2^+ \rangle$			94Al41							
2564.91(17)	1 ⁽⁺⁾		33(9) fs	89Pi05							
2594.73(20)				94Al41							
2600	$\langle 3^+ \rangle$			94Al41							
2600.23(22)	1 ⁽⁺⁾		28(10) fs	89Pi05							
2620.94(20)						27(9)	18(5)				47(18)
2631.0(3)	X ⁽⁺⁾										
2642(2)											
2643.4(8)	0 ⁺			02Le34							
2644.6											
2657.0				94Al41							
2670.6(3)						84(20)					
2674.56(18)	$\langle 1 \rangle, 2^+$			01Go36		9(2)	43(5)				
2686.9(4)	1			89Lo07							
2687.1(3)	0 ⁺			02Le34							
2701.7(3)	2 ⁺			94Al41							
2723.7(10)											
2741											
2750.36(19)				94Al41							
2759.5	X ⁽⁺⁾			94Al41							
2761.96(21)						33(6)	58(11)				
2769(7)				89Lo07							
2782.3(3)	X ⁽⁺⁾			94Al41							

(continued)

¹⁵⁸Gd
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E^*	J^π	σ (p,t)	$T_{1/2}$ or	Ref.	Branching ratios in percentage						
[keV]		$\mu\text{b/sr}$	Γ_{cm}		E_{f}^* : J_{f}^π :	977.1 1 ⁻	1023.7 2 ⁻	1041.6 3 ⁻	1158.97 4 ⁻	1176.48 5 ⁻	1187.14 2 ⁺
2794.9(8)											
2802.9	1		12.5(21) fs	89Pi05							
2805.1(3)	1			01Go36							24(8)
2822.3(6)	1 ⁻		8.2(22) fs	89Pi05							
2829.4(7)				94Al41							
2832.0(3)	1			01Go36							
2842	1		16(3) fs	89Pi05							
2844.2(5)											
2854.8(5)	1,2 ⁺			01Go36							
2859.6(6)							100				
2879.0(2)	X ⁽⁺⁾			94Al41							
2886											
2896.1(6)											
2909.8(3)	0 ⁺			02Le34							
2913.4(7)											
2934.7(10)											
2960.7(8)											
2964.2(5)	2 ⁺			01Go36							
2981.5(10)											
2986.1(4)	1		20(4) fs	89Pi05							
2997.7(4)	X ⁽⁺⁾			94Al41							
3008.3(9)				94Al41							
3012.05(15)	X ⁽⁺⁾										
3029.1(4)				94Al41							
3038.1(4)	1		24(6) fs	89Pi05							
3045.6(15)											
3059.9(6)	1,2 ⁺			01Go36							
3065.0(5)	1,2 ⁺			01Go36	x						
3066.9(4)											
3076.7(16)	0 ⁺										
3080.0(6)											
3108	1		5.7(9) fs	89Pi05							
3109.9(11)	0 ⁺										
3118.5(15)											
3141.5(7)				94Al41							
3149.9(7)	X ⁽⁺⁾			94Al41							
3161	1 ⁻		9.0(27) fs	89Pi05							
3171.2(6)											
3192(1)	1 ⁺		4.1(6) fs	89Pi05							
3195.5(6)											
3200.8(6)	1 ⁺		3.2(4) fs	89Pi05							
3228.6(7)											
3234.5(5)											
3247.2(4)											
3258.2(6)	1 ⁻		9(3) fs	89Pi05							

(continued)

<div>¹⁵⁸Gd</div> <div>₆₄</div>											
<i>E</i> [*] [keV]	<i>J</i> ^π	<i>σ</i> (p,t) μb/sr	<i>T</i> _{1/2} or <i>Γ</i> _{cm}	Ref.	Branching ratios in percentage						
					<i>E</i> _f [*] : <i>J</i> _f ^π :	977.1 1 [−]	1023.7 2 [−]	1041.6 3 [−]	1158.97 4 [−]	1176.48 5 [−]	1187.14 2 ⁺
3263.9(6)											
3271.4(8)											
3288.0(5)	1		34(13) fs	89Pi05							
3292.0											
3299	1		7.0(11) fs	89Pi05							
3351.9(7)											
3411.7(4)											
3428	1		23(8) fs	89Pi05							
3436.4(4)	X ⁽⁺⁾										
3448.8(4)	X ⁽⁺⁾										
3470	1		31(12) fs	89Pi05							
3534.8(5)	X ⁽⁺⁾										
3570.9(12)				94Al41							
3577	1		24(10) fs	89Pi05							
3592.4(5)	X ^(−)										
3600.5(10)				94Al41							
3626.9(5)											
3632.7(7)											
3647.5(8)											
3661.6(6)				94Al41							
3702.6(12)											
3750.1(15)											
3794.6(10)	X ⁽⁺⁾										
3820	1 [−]		5.2(23) fs	89Pi05							
3846.7(4)	X ⁽⁺⁾										
3878.8(4)	X ⁽⁺⁾										
3921	1 [−]		2.7(15) fs	89Pi05							
3923.3(11)				94Al41							
3948.0(6)											
3965.1(7)											
4015.8(8)											
4110.7(8)	X ⁽⁺⁾										
4139.6(4)	X ⁽⁺⁾										
4161.5(8)	X ⁽⁺⁾										
4236.9(6)											
4830.9(9)				94Al41							
4968.1(23)				94Al41							
4997.7(11)				94Al41							
		73Fl04		Ref.							

Energy levels and branching ratios [04He05]. Part 3

¹⁵⁸Gd
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E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	1196.17 0 ⁺	1259.87 2 ⁺	1263.51 1 ⁻	1265.52 3 ⁺	1350 10 ⁺	1358.47 4 ⁺	1380.63 4 ⁺	1402.94 3 ⁻	1406.70 4 ⁺	1452.35 0 ⁺
1402.936(3)	3 ⁻			0.02(1)	0.04(1)							
1406.699(2)	4 ⁺			0.31(3)		0.03(1)						
1452.352(6)	0 ⁺				1.83(14)							
1481.421(4)	5 ⁺					0.60(3)		0.06(2)	0.15(3)			
1499.096(5)	5 ⁺								0.21(6)			
1517.476(2)	2 ⁺				1.48(10)			0.03(1)		0.22(3)		
1576.930(16)	0 ⁺		7(2)									
1636.292(4)	4 ⁻					0.10(3)		4.6(4)	90(7)		0.30(3)	
1667.372(6)	⟨4⟩ ⁺									0.90(5)		
1716.801(5)	5 ⁻							3.5(2)	50(3)		0.18(6)	
1743.145(14)	0 ⁺				21.9(13)							
1791.792(9)	2 ⁺		1.9(1)	8(1)						2.3(2)	0.12(2)	
1793.569(7)	2 ⁻					20.2(12)						
1847.88(3)	1 ⁺				0.61(7)					0.7(2)		
1856.315(15)	1 ⁻				5.1(3)					0.35(10)		
1861.277(7)	3 ⁻					22(1)		18(1)				
1866	12 ⁺						100					
1894.597(25)	⟨2 ⁺ ⟩				1.6(6)	<1.0				1.9(3)		
1894.612(8)	2 ⁻				7.5(5)					2.0(3)		
1901.593(16)	4 ⁺									11.4(7)		
1920.258(6)	4 ⁺					0.8(2)		3.9(5)	57(3)			
1941.26(3)	3 ⁺					[20]						
1952.424(25)	⟨0⟩ ⁺				65(4)							
1953.761(23)	4 ⁻					14.0(17)		2.7(5)				
1964.104(24)	2 ⁺					16(1)						
1978.035(8)	3 ⁻				0.9(3)	5.0(4)		4.5(3)				
2017.879(11)	⟨5 ⁺ ⟩								53(19)			
2023.838(13)	1 ⁺	5.9(5)	8.6(5)									<1.9
2033.921(17)	3 ⁺					24(3)		12.1(7)				
2035.69(4)	⟨2 ⁺ ⟩		0.4(3)								<1.5	
2049.009(22)	2 ⁻				26(2)					11.0(7)		
2083.935(24)	2 ⁺	17(2)			52(3)					31(2)		
2089.251(8)	3 ⁺		7.1(7)	8(2)						9.1(7)		
2120.24(4)	2 ⁺ ,3		7.6(10)								4.0(4)	
2153.174(9)	⟨2,3⟩ ⁺		13(2)			50(3)		<10			6.4(11)	
2215.523(22)	1	x										
2221.63(5)	2 ⁻ ,3 ⁻					28(2)						
2249.61(5)	2 ⁺ -4 ⁺					36(3)		19(2)				
2260.158(18)	2 ⁺ ,3 ⁺					9.2(9)						
2269.255(14)	⟨0-2⟩ ⁺				77(8)							
2325.11(6)	1 ⁻ ,2 ⁺				10.1(8)					9.5(11)		
2475.4(3)	1,2 ⁺		48(10)									
2499.22(10)	⟨1,2⟩ ⁺					28(6)						

Energy levels and branching ratios [04He05]. Part 4

¹⁵⁸Gd₆₄

E^* [keV]	J^π	Branching ratios in percentage									
		E_f^* : 1481.42 J_f^π : 5 ⁺	1499.10 5 ⁺	1517.48 2 ⁺	1576.93 0 ⁺	1636.29 4 ⁻	1716.80 5 ⁻	1743.15 0 ⁺	1791.79 2 ⁺	1793.57 2 ⁻	1814.14 6 ⁻
1636.292(4)	4 ⁻	3.8(4)	1.65(21)								
1667.372(6)	⟨4⟩ ⁺			0.08(2)							
1716.801(5)	5 ⁻	30(2)	16(1)								
1743.145(14)	0 ⁺			0.51(5)							
1814.139(7)	6 ⁻	50(4)	26(2)			2.6(9)	21(4)				
1856.315(15)	1 ⁻				0.05(1)						
1894.612(8)	2 ⁻									0.45(6)	
1916.933(6)	⟨4-6⟩ ⁻	50(3)	28(2)			7.4(5)	14.7(11)				
1920.258(6)	4 ⁺	3.4(3)	1.77(13)			1.57(11)	0.23(2)				
1952.424(25)	⟨0⟩ ⁺			0.23(12)					0.08(2)		
1953.761(23)	4 ⁻	<2.9									
1978.035(8)	3 ⁻									0.04(2)	
2017.879(11)	⟨5 ⁺ ⟩		37(11)			4.1(4)	4.3(8)				0.9(3)
2023.838(13)	1 ⁺								0.03(1)		
2089.251(8)	3 ⁺			<4.6						2.4(2)	
2120.24(4)	2 ⁺ ,3			0.34(12)							
2153.174(9)	⟨2,3⟩ ⁺									1.9(2)	
2215.523(22)	1			62(12)				<59	38(4)		
2260.158(18)	2 ⁺ ,3 ⁺									0.12(3)	

Energy levels and branching ratios [04He05]. Part 5

¹⁵⁸Gd₆₄

E^* [keV]	J^π	Branching ratios in percentage							
		E_f^* : 1847.88 J_f^π : 1 ⁺	1861.28 3 ⁻	1894.61 2 ⁻	1930.20 1 ⁺	1953.76 4 ⁻	2023.84 1 ⁺	2033.92 3 ⁺	2035.69 ⟨2 ⁺ ⟩
1978.035(8)	3 ⁻		0.41(6)						
2089.251(8)	3 ⁺		0.49(5)						
2153.174(9)	⟨2,3⟩ ⁺		1.32(8)						
2260.158(18)	2 ⁺ ,3 ⁺		0.07(3)		0.53(4)	0.04(1)		0.04(1)	
2269.255(14)	⟨0-2⟩ ⁺						4.6(3)		
2276.02(3)	0 ⁺	4.2(13)		1.0(3)					0.69(13)

Energy levels and branching ratios [04Gr26, 03He11].

¹⁵⁹Gd₆₄

E^* [keV]	$2J^\pi$	σ (t,p)	ε	L	σ (d,p)	$S_{\ell j}$	σ (d,t)	$G_{\ell j}$	$T_{1/2}$	Ref.	Branching ratios in percentage			
		$\mu\text{b/sr}$	rel.	(t,p)	$\mu\text{b/sr}$	x10 ³	$\mu\text{b/sr}$	x10 ³			E_f^* : 0.0 $2J_f^\pi$: 3 ⁻	50.6 5 ⁻	67.8 5 ⁺	118.7 7 ⁺
0.0	3 ⁻	91	100	0	197	62	551	66	18.479(4) h	04Gr26				
50.627(9)	5 ⁻	5			7	⟨3⟩	22	8		04Gr26		100		

(continued)

¹⁵⁹Gd
64

E^*	$2J^\pi$	σ (t,p)	ε	L	σ (d,p)	$S_{\ell j}$	σ (d,t)	$G_{\ell j}$	$T_{1/2}$	Ref.	Branching ratios in percentage				
[keV]		$\mu\text{b/sr}$	<i>rel.</i>	(t,p)	$\mu\text{b/sr}$	$\times 10^3$	$\mu\text{b/sr}$	$\times 10^3$			E_f^* :	0.0	50.6	67.8	118.7
											$2J_f^\pi$:	3 ⁻	5 ⁻	5 ⁺	7 ⁺
67.83(2)	5 ⁺				3	2	6	3	26.2(8) ns	04Gr26	29.3	7.3			
118.69(3)	7 ⁺						63	91		04Gr26				100	
121.90(2)	7 ⁻	5			242	91	672	184		04Gr26	26.7	73.3			
146.316(6)	5 ⁻	2			71	27	106	36		04Gr26	10.7	19.8	69.5		
185.0(4)	9 ⁺	3			85	118	307	90		04Gr26				100	
212.6(6)	9 ⁻				24	70	55	177		04Gr26					
227.41(2)	7 ⁻	5			328	121	252	66		04Gr26	29.7	24.2	5.6	5.20	
273.9(6)	11 ⁺				4	27	6	61		04Gr26					
324.9(5)	11 ⁻				8	40	18	33		04Gr26					
330.48(1)	9 ⁻				35	70	22	71		04Gr26					
372.7(4)	13 ⁺				44	373	121	756		04Gr26					
456.4(5)	11 ⁻				28	78	26	47		04Gr26					
465	$\langle 1,3 \rangle$									03He11					
507.72(2)	1 ⁻	5			626	219	251	30		04Gr26	100				
558.21(1)	3 ⁻	2			66	$\langle 58 \rangle$	23	2		04Gr26	42.2	57.8			
588.52(3)	5 ⁻	5			182	67	63	59		04Gr26	6.67	46.7			
601.98(1)	3 ⁺				1	3	9	4		04Gr26	64.2	31.3	4.5		
633.60(12)	7 ⁺				10	12	4	5		04Gr26					
636	$\langle 1,3 \rangle$									03He11					
646.70(2)	5 ⁺									04Gr26	43.3	26.7			
674	$\langle 1,3 \rangle$									03He11					
683	$\langle 1,3 \rangle$									03He11					
684.16(25)	11 ⁻				12	$\langle 32 \rangle$	188	$\langle 978 \rangle$		04Gr26					
705.3(4)	7 ⁻	6			332	$\langle 110 \rangle$	42	117		04Gr26					
710.38(8)	7 ⁺									04Gr26			37.5		
732.87(5)	5 ⁻ , 7 ⁻									04Gr26				13.3	86.7
744.38(2)	3 ⁺				61	31	1367	920		04Gr26	21.4	17.9	60.7		
759.8(8)	9 ⁻	4			29	$\langle 74 \rangle$				04Gr26					
781.56(2)	1 ⁺				38	12	454	126		04Gr26	31.2		62.5		
800.45(4)	5 ⁺						50	36		04Gr26	14.3		14.3	50.0	
818.89(7)	5 ⁺						10	15		04Gr26			12.0	20.0	40.0
819.5(8)	11 ⁺ , 13 ⁺				1	7				04Gr26					
835.5(8)	9 ⁺				16	$\langle 5 \rangle$				04Gr26					
855	$\langle 9^+ \rangle$									03He11					
858.51(7)	3 ⁺				4	2	39	27		04Gr26	23.5	11.8	44.1	20.6	
872.64(5)	5 ⁻	3								89Lo07	11.6		38.7	16.6	
874.5(11)	$\langle 1^+ \rangle$				6	$\langle 4 \rangle$				04Gr26					
876.5(4)	7 ⁺				5	3	47	$\langle 163 \rangle$		04Gr26					
880.63(24)	1 ⁺ -5 ⁺									04Gr26			40.0	60.0	
915.83(1)	1,3									04Gr26					
926.63(29)	7 ⁻				3	3	24	662		04Gr26					
938.7(5)	11 ⁻				10	$\langle 29 \rangle$	12	11		04Gr26					
948.35(28)	7 ⁻	3			360	716	19	47		04Gr26			22.1	44.1	
962.4(6)	3 ⁺									04Gr26					
974.29(5)	1 ⁺				58	20	1341	359		04Gr26	23.8				

(continued)

¹⁵⁹Gd
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E^* [keV]	$2J^\pi$	σ (t,p) $\mu\text{b/sr}$	ε <i>rel.</i>	L (t,p)	σ (d,p) $\mu\text{b/sr}$	$S_{\ell j}$ $\times 10^3$	σ (d,t) $\mu\text{b/sr}$	$G_{\ell j}$ $\times 10^3$	$T_{1/2}$	Ref.	Branching ratios in percentage				
											E_f^* : $2J_f^\pi$:	0.0 3 ⁻	50.6 5 ⁻	67.8 5 ⁺	118.7 7 ⁺
1001.6(1)	3 ⁺				7	3	276	173		04Gr26		90.9			
1014.9(8)	1 ⁺									04Gr26					
1043(2)	$\langle 1,3 \rangle$									03He11					
1043.2(5)	9 ⁻				12	26	3	2		04Gr26					
1056(3)	$\langle 13^+ \rangle$	3								03He11					
1059.6(5)	5 ⁺				8	4	101	78		04Gr26					
1061.7(1)	1 ⁻ , 3 ⁻									04Gr26					
1079.4(1)	1 ⁻				24	8	80	37		04Gr26			47.8		
1093.0(7)	13 ⁺				13	88				04Gr26					
1110.3(1)	3 ⁻	29	41	0	34	12	105	194		04Gr26				29.4	
1120.3(5)	7 ⁺						23	92		04Gr26					
1128.7(1)	1 ⁺						71	43		04Gr26		52.4	47.6		
1128.8(5)	3 ⁺									04Gr26					
1134.7(4)	7 ⁻				260	42	25	$\langle 52 \rangle$		04Gr26					
1139.8(1)	1 ⁻						95	170		04Gr26		90.5			
1145.6(1)	3 ⁻	10			21	8	335	615		04Gr26			72.7		
1151.0(9)	$\langle 1^+ \rangle$				34	7				04Gr26					
1159.9(1)	5 ⁺				28	13	207	108		04Gr26		11.8	51.0		37.2
1162.7(2)	$\langle 5^- \rangle$									03He11				48(4)	21(2)
1170.9(4)	1 ⁺						26	6		04Gr26					
1178.4(6)	1 ⁺ -5 ⁺									04Gr26					
1178.6(5)	5 ⁻						16	55		04Gr26					
1186(5)	$\langle 11^- \rangle$									03He11					
1190.5(6)	5 ⁺	4					18	9		04Gr26					
1194.2(8)	7 ⁺ , 9 ⁺				8	9				04Gr26					
1202.6(5)	9 ⁺						57	206		04Gr26					
1203.5(7)	9 ⁻				34	66				04Gr26					
1216.9(8)	1 ⁻						2	3		04Gr26					
1229.3(5)	9 ⁺				22	24	7	68		04Gr26					
1233.8(10)	$\langle 5^+ \rangle$									03He11					
1239.4(4)	7 ⁻				8	$\langle 3 \rangle$	90	$\langle 123 \rangle$		04Gr26					
1253.1(5)	5 ⁻									04Gr26					
1283.8(6)	$\langle 7^+, 9^+ \rangle$				44	$\langle 47 \rangle$				04Gr26					
1284.4(1)	3 ⁻	4					58	100		04Gr26					
1296.5(5)	3 ⁻				6	2	7	9		04Gr26					
1303.4(4)	7 ⁻				11	3	16	75		04Gr26					
1315.8(3)	1 ⁺						4	1		04Gr26					
1322.2(11)	3 ⁺ , 5 ⁺				1	2				04Gr26					
1325.1(3)	5 ⁻	4					3	5		04Gr26					
1336	$\langle 1,3 \rangle$									03He11					
1343.8(2)	5 ⁻				7	$\langle 4 \rangle$	100	320		04Gr26					
1351.8(3)	$\langle 5^+ \rangle$									03He11		27(4)	73(7)		
1356.6(9)	3 ⁺						5	4		04Gr26					
1365.9(6)	9 ⁻						15	121		04Gr26					
1373.0(8)	9 ⁻						6	45		04Gr26					

(continued)

¹⁵⁹Gd
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E^*	$2J^\pi$	σ (t,p)	ε	L	σ (d,p)	$S_{\ell j}$	σ (d,t)	$G_{\ell j}$	$T_{1/2}$	Ref.	Branching ratios in percentage				
[keV]		$\mu\text{b/sr}$	<i>rel.</i>	(t,p)	$\mu\text{b/sr}$	$\times 10^3$	$\mu\text{b/sr}$	$\times 10^3$			E_f^* :	0.0	50.6	67.8	118.7
											$2J_f^\pi$:	3 ⁻	5 ⁻	5 ⁺	7 ⁺
1379.2(10)	1 ⁺						5	1		04Gr26					
1390	$\langle 11^- \rangle$									03He11					
1392.3(6)	1 ⁺						18	3		04Gr26					
1394.1(6)	5 ⁻ , 7 ⁻				26	8				04Gr26					
1394.5(2)	1 ⁺ , 3 ⁺									04Gr26					
1400.2(5)	1 ⁻ , 3 ⁻									04Gr26			100		
1406.9(10)	5 ⁻						2	4		04Gr26					
1414.8(5)	5 ⁺						25	14		04Gr26					
1418.4(4)	1 ⁺ , 3 ⁺									04Gr26					
1419.3(5)	9 ⁺				20	$\langle 17 \rangle$	30	91		04Gr26					
1430.0(6)	1, 3 $\langle^- \rangle$	9								03He11					
1430.9(2)	3 ⁺ , 5 ⁺				174	66	101	45		04Gr26		100			
1442.8(5)	9 ⁻						26	$\langle 190 \rangle$		04Gr26					
1446.5(6)	1 ⁺ , 3 ⁺									04Gr26					
1454.4(9)	1 ⁺						7	2		04Gr26					
1468.3(2)	3 ⁺				7	3				04Gr26		100			
1468.9(7)	1 ⁻	1					3	$\langle 3 \rangle$		04Gr26					
1477.8(1)	3 ⁺				19	8	5	3		04Gr26					
1488.2(5)	7 ⁺						17	79		04Gr26					
1491.8(7)	7 ⁺ , 9 ⁺				31	33				04Gr26					
1493.8(10)	5 ⁻ , 7 ⁻						3	5		04Gr26					
1505.1(7)	1 $\langle^+ \rangle$, 3									04Gr26					
1508.6(4)	5 ⁺				17	7	37	16		04Gr26					
1520.9(1)	1 ⁻	2			103	28	7	9		03He11		57(6)	26(3)	17(3)	
1532.4(4)	7 ⁺						12	49		04Gr26					
1540.5(3)	5 ⁺				39	8	29	13		04Gr26					
1545.5(3)	1, 3									04Gr26					
1548.5(9)	$\langle 3^+ \rangle$						2	$\langle 3 \rangle$		04Gr26					
1557.1(10)	1 ⁺ , 3 ⁺									04Gr26					
1560.4(7)	7 ⁺ , 9 ⁺				93	102				04Gr26					
1560.6(1)	3 ⁻						16	25		04Gr26					
1571.2(7)	7 ⁺ , 9 ⁺				48	44				04Gr26					
1571.9(1)	1 ⁺						100	23		04Gr26					
1576.9(4)										03He11					
1579.6(6)	1 ⁻				1	8				04Gr26					
1580.2(7)	5 ⁺						54	28		04Gr26					
1581.9(12)	$\langle 1, 3 \rangle^+$									03He11					
1582.3(9)	1 ⁻ , 3 ⁻									04Gr26					
1584.5(2)	3 ⁺	3			39	10				04Gr26					
1593.1(2)	1 ⁺ , 3 ⁺									04Gr26					
1593.2(6)	5 ⁺				66	153	8	4		04Gr26					
1603.3(1)	3 ⁻	4	7	$\langle 0 \rangle$	582	186	15	25		04Gr26					
1611.1(8)	5 ⁻						2	8		04Gr26					
1615.1(6)	1 ⁺ , 3 ⁺									04Gr26					
1621.6(7)	3 ⁺ , 5 ⁺				70	23				04Gr26					

(continued)

¹⁵⁹Gd
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E^*	$2J^\pi$	σ (t,p)	ε	L	σ (d,p)	$S_{\ell j}$	σ (d,t)	$G_{\ell j}$	$T_{1/2}$	Ref.	Branching ratios in percentage				
[keV]		$\mu\text{b/sr}$	<i>rel.</i>	(t,p)	$\mu\text{b/sr}$	$\times 10^3$	$\mu\text{b/sr}$	$\times 10^3$			E_f^* :	0.0	50.6	67.8	118.7
											$2J_f^\pi$:	3 ⁻	5 ⁻	5 ⁺	7 ⁺
1622.3(4)	11 ⁻						16	$\langle 143 \rangle$		04Gr26					
1627.2(4)	5 ⁺				60	23				04Gr26					
1631.4(5)	9 ⁺						9	$\langle 20 \rangle$		04Gr26					
1635.0(10)	1 ⁺ ,3 ⁺									04Gr26					
1637.8(5)	3 ⁻				105	$\langle 44 \rangle$	6	8		04Gr26					
1642.5(1)	1 ⁻ ,3 ⁻									04Gr26					
1644.1(8)	5 ⁻						4	13		04Gr26					
1646.2(8)	3 ⁺ ,5 ⁺				69	21				04Gr26					
1656.6(4)	3 ⁺				68	23	35	16		04Gr26					
1668.3(5)	5 ⁺				51	18	25	9		04Gr26					
1669.8(15)	1 ⁺ ,3 ⁺									04Gr26					
1672.9(7)	7 ⁺	3					4	$\langle 20 \rangle$		04Gr26					
1673.3(1)	1 ⁻ ,3 ⁻									04Gr26					
1675.5(10)	3 ⁺ ,5 ⁺				37	13				04Gr26					
1682.9(6)	5 ⁻ ,7 ⁻						1	5		04Gr26					
1685.4(8)	3 ⁺ ,5 ⁺				31	12				04Gr26					
1690.6(5)	5 ⁺						22	9		04Gr26					
1693.5(6)	5 ⁻	4			96	$\langle 31 \rangle$				04Gr26					
1702.5(4)	7 ⁻				52	16	12	21		04Gr26					
1704.6(10)	1,3									04Gr26					
1713.2(15)	5 ⁺						2	$\langle 1 \rangle$		04Gr26					
1719.1(12)	3 ⁺				35	10	2	$\langle 2 \rangle$		04Gr26					
1721.7(2)	1,3									04Gr26					
1729.4(6)	5 ⁻				14	3	3	10		04Gr26					
1745.7(5)	$\langle 5^+ \rangle$				10	$\langle 5 \rangle$	2	$\langle 1 \rangle$		04Gr26					
1746.0(8)	1 ⁺ ,3 ⁺									04Gr26					
1751.0(10)	7 ⁺ ,9 ⁺					44				04Gr26					
1753.6(12)	1 ⁺						3	1		04Gr26					
1758.7(1)	3 ⁻				12	4	1	1		04Gr26					
1770.3(9)										03He11					
1772.6(1)	1,3									04Gr26					
1773.8(7)	3 ⁻						5	8		04Gr26					
1774.1(6)	5									04Gr26					
1782.5(1)	1 ⁻ ,3 ⁻	7			104	34				04Gr26					
1783.8(7)	$\langle 7^- \rangle$						6	15		04Gr26					
1792.0(9)	$\langle 1^+ \rangle$						2	1		04Gr26					
1807.2(10)	7 ⁻						4	9		04Gr26					
1808.5(3)	1,3									04Gr26					
1809.2(12)	5 ⁻ ,7 ⁻				54	16				04Gr26					
1813.4(6)	3 ⁺				54	13	25	12		04Gr26					
1825.3(2)	1 ⁻						2	3		04Gr26					
1826.2(9)	1 ⁺				20	7				04Gr26					
1831.0(2)	3 ⁺						5	2		04Gr26					
1840.0(7)	1 ⁺	13	25	$\langle 0 \rangle$			90	19		04Gr26					
1840.9(15)	1 ⁻ ,3 ⁻	incl								04Gr26					

(continued)

¹⁵⁹Gd
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E^*	$2J^\pi$	σ (t,p)	ε	L	σ (d,p)	$S_{\ell j}$	σ (d,t)	$G_{\ell j}$	$T_{1/2}$	Ref.	Branching ratios in percentage				
[keV]		$\mu\text{b/sr}$	<i>rel.</i>	(t,p)	$\mu\text{b/sr}$	$\times 10^3$	$\mu\text{b/sr}$	$\times 10^3$			E_f^* :	0.0	50.6	67.8	118.7
											$2J_f^\pi$:	3 ⁻	5 ⁻	5 ⁺	7 ⁺
1841.0(3)	5	incl								04Gr26					
1846.6(8)	5 ⁻ ,7 ⁻				28	8				04Gr26					
1848	$\langle 3^- \rangle$									03He11					
1851.9(5)	1 ⁺						4	1		04Gr26					
1859.4(14)	5 ⁻						3	7		04Gr26					
1868.5(3)	$\langle 1^-, 3^- \rangle$									03He11					
1869.0(2)	3 ⁺	1					17	8		04Gr26					
1872.7(6)	5 ⁺				14	$\langle 6 \rangle$	12	5		04Gr26					
1880.7(10)	1,3									04Gr26					
1883.7(1)	1 ⁻				21	6	18	$\langle 20 \rangle$		04Gr26					
1891.3(2)	3 ⁺ ,5 ⁺						5	2		04Gr26					
1892.0(8)	1 ⁻ ,3 ⁻				54	20				04Gr26					
1896.8(30)	1 ⁺ ,3 ⁺									04Gr26					
1900.1(4)	3 ⁺						8	3		04Gr26					
1908.5(9)	5 ⁺						10	2		04Gr26					
1910.4(17)	$\langle 1^-, 3^- \rangle$				10	4				04Gr26					
1917.5(7)	3 ⁺						12	4		04Gr26					
1917.6(5)	5									04Gr26					
1918.4(8)	$\langle 1^-, 3^- \rangle$				26	10				04Gr26					
1925.9(15)	$\langle 1^-, 3^- \rangle$	3					5	$\langle 2 \rangle$		04Gr26					
1926.0(9)	1 ⁺ ,3 ⁺									04Gr26					
1927.9(8)	$\langle 1^-, 3^- \rangle$				25	8				04Gr26					
1930.6(14)	5 ⁻						3	11		04Gr26					
1933.3(11)	5 ⁻ ,7 ⁻				25	6				04Gr26					
1938.4(7)	$\langle 7^+ \rangle$						7	25		04Gr26					
1945.88(23)	1 ⁻						6	5		04Gr26					
1954.50(22)	3 ⁻						7	9		04Gr26					
1958.1(6)	1 ⁻ ,3 ⁻				50	14				04Gr26					
1964.6(4)	5 ⁺						405	146		04Gr26					
1971.47(18)	1 ⁽⁺⁾				26	$\langle 14 \rangle$				04Gr26					
1972.5(8)	5 ⁺						30	11		04Gr26					
1980.3(10)	1 ⁺						26	5		04Gr26					
1983.3(8)	1 ⁺				152	80				04Gr26					
1989.2(19)	3 ⁻	4					6	8		04Gr26					
1996.4(4)	5									04Gr26					
1997.3(7)	1 ⁺						71	15		04Gr26					
1997.3(6)	3 ⁻				197	56				04Gr26					
2003.2(8)	3 ⁺				25	7				04Gr26					
2006.5(14)	5 ⁻						12	26		04Gr26					
2007.5(4)	1 ⁺ ,3 ⁺									04Gr26					
2011.7(1)	3 ⁻				48	$\langle 20 \rangle$	5	8		04Gr26					
2032.7(4)	5 ⁽⁺⁾				22	$\langle 5 \rangle$	73	28		04Gr26					
2033.0(2)	1 ⁻ ,3 ⁻									04Gr26					
2038.3(17)	1 ⁻ ,3 ⁻									04Gr26					
2039.6(2)	3 ⁺						59	25		04Gr26					

(continued)

¹⁵⁹Gd
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E^*	$2J^\pi$	σ (t,p)	ε	L	σ (d,p)	$S_{\ell j}$	σ (d,t)	$G_{\ell j}$	$T_{1/2}$	Ref.	Branching ratios in percentage				
[keV]		$\mu\text{b/sr}$	<i>rel.</i>	(t,p)	$\mu\text{b/sr}$	$\times 10^3$	$\mu\text{b/sr}$	$\times 10^3$			E_f^* :	0.0	50.6	67.8	118.7
											$2J_f^\pi$:	3 ⁻	5 ⁻	5 ⁺	7 ⁺
2042.0(6)	$\langle 3^+, 5^+ \rangle$				77	$\langle 17 \rangle$				04Gr26					
2044.5(15)	5 ⁻	4					17	42		04Gr26					
2048.7(6)	1 ⁻				173	$\langle 41 \rangle$				04Gr26					
2050.9(2)	1 ⁺						16	4		04Gr26					
2053.0(13)	1 ⁻ , 3 ⁻									04Gr26					
2058.0(8)	7 ⁻				222	51				04Gr26					
2074.2(1)	1 ⁻ , 3 ⁻						21	24		04Gr26					
2074.1(6)	$\langle 5^-, 7^- \rangle$				38	$\langle 11 \rangle$				04Gr26					
2081.9(8)	1 ⁺						14	20		04Gr26					
2087.6(9)	1 ⁻ , 3 ⁻									04Gr26					
2088.1(10)	5 ⁺				27	$\langle 12 \rangle$				04Gr26					
2092.5(7)	5 ⁺				29	$\langle 5 \rangle$	76	27		04Gr26					
2100.8(6)	1 ⁻ , 3 ⁻				25	8				04Gr26					
2103.0(8)	5									04Gr26					
2105.1(6)	3 ⁺						31	13		04Gr26					
2115.1(10)	3 ⁻						21	18		04Gr26					
2116.7(5)	1 ⁺ , 3 ⁺									04Gr26					
2121.7(12)	5 ⁻ , 7 ⁻				63	14				04Gr26					
2121.7(5)	1 ⁻ , 3 ⁻									04Gr26					
2125.8(14)	3 ⁻						6	9		04Gr26					
2134.3(12)	1 ⁻ , 3 ⁻									04Gr26					
2136.8(10)	3 ⁺ , 5 ⁺						15	7		04Gr26					
2149.9(10)	5 ⁺						25	10		04Gr26					
2150.9(4)	1, 3									04Gr26					
2158.6(2)	1, 3									04Gr26					
2162.0(20)	5 ⁺						24	10		04Gr26					
2162.6(8)	1 ⁻ , 3 ⁻	4								04Gr26					
2165.4(2)	1, 3									04Gr26					
2169.2(20)	3 ⁺						16	7		04Gr26					
2176.2(20)	$\langle 5^+ \rangle$						8	6		04Gr26					
2178.7(10)	1 ⁻ , 3 ⁻									04Gr26					
2182.4(1)	1 ⁻ , 3 ⁻									04Gr26					
2186.0(20)	5 ⁺						11	7		04Gr26					
2188.0(2)	1 ⁻ , 3 ⁻									04Gr26					
2190.8(14)	1 ⁻ , 3 ⁻	4								04Gr26					
2193.8(5)	3 ⁺						22	10		04Gr26					
2200.8(10)	1 ⁻ , 3 ⁻									04Gr26					
2203.1(11)	3 ⁺						22	10		04Gr26					
2203.8(4)	5									04Gr26					
2206.6(10)	1, 3									04Gr26					
2210.7(3)	1 ⁻ , 3 ⁻									04Gr26					
2212.8(9)	5 ⁺						23	10		04Gr26					
2215.0(3)	1, 3									04Gr26					
2222.0(4)	5 ⁻						8	7		04Gr26					
2234.3(1)	3 ⁻						5	8		04Gr26					

(continued)

¹⁵⁹Gd
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E^*	$2J^\pi$	σ (t,p)	ε	L	σ (d,p)	$S_{\ell j}$	σ (d,t)	$G_{\ell j}$	$T_{1/2}$	Ref.	Branching ratios in percentage				
[keV]		$\mu\text{b/sr}$	<i>rel.</i>	(t,p)	$\mu\text{b/sr}$	$\times 10^3$	$\mu\text{b/sr}$	$\times 10^3$			E_f^* :	0.0	50.6	67.8	118.7
											$2J_f^\pi$:	3 ⁻	5 ⁻	5 ⁺	7 ⁺
2242.4(7)	5 ⁺						93	30		04Gr26					
2252.4(27)	1 ⁺ ,3 ⁺									04Gr26					
2252.8(16)	5 ⁺						32	12		04Gr26					
2257.0(1)	1 ⁻ ,3 ⁻									04Gr26					
2261.2(2)	3 ⁺						12	7		04Gr26					
2271.9(21)	5 ⁺	5					8	3		04Gr26					
2280.9(7)	1 ⁻ ,3 ⁻									04Gr26					
2283.7(2)	3 ⁺						11	6		04Gr26					
2287.8(2)	1 ⁻ ,3 ⁻									04Gr26					
2297.3(12)	3 ⁺						15	7		04Gr26					
2300.8(4)	1 ⁺ ,3 ⁺									04Gr26					
2303.6(4)	5									04Gr26					
2306.0(20)	3 ⁺						7	6		04Gr26					
2315.2(2)	1 ⁻ ,3 ⁻						21	11		04Gr26					
2335.4(8)										03He11					
2347.0(5)	$\langle 1^-, 3^- \rangle$									03He11					
2352.0(17)										03He11					
2357.8(5)	$\langle 1^-, 3^- \rangle$	4								89Lo07					
2377.6(8)										03He11					
2388.6(8)	$\langle 1^-, 3^- \rangle$									03He11					
2448		6								89Lo07					
2492		6								89Lo07					
2560										03He11					
2616		8								89Lo07					
2648		5								89Lo07					
2708	$\langle 3^- \rangle$	5		12	$\langle 0 \rangle$					89Lo07					
2733		4								89Lo07					

Additional data on this isotope can be found in [00Po07, 84Pe03, 80Pe07, 75Ja18, 73Ma43, 67Tj01].

Given in the 3-rd and 5-th columns experimental values $d\sigma/d\Omega$ for the (d,p) and (d,t) reactions (at 30°) were used [04Gr26] for an estimation of the corresponding spectroscopic factors $S_{\ell j}$ and $G_{\ell j}$.

Data for this isotope are considered in vol. LB I/18C.

Energy levels and branching ratios [04Gr26, 03He11]. Part 2

¹⁵⁹Gd
64

E^*	$2J^\pi$	Branching ratios in percentage									
		E_f^* :	121.9	146.3	185.0	212.6	227.41	507.72	558.21	646.70	781.56
[keV]		$2J_f^\pi$:	7 ⁻	5 ⁻	9 ⁺	9 ⁻	7 ⁻	1 ⁻	3 ⁻	5 ⁺	1 ⁺
											5 ⁻
212.6(6)	9 ⁻		100								
227.41(2)	7 ⁻		13.0	22.3							
330.48(1)	9 ⁻			36.4			63.6				
588.52(3)	5 ⁻		46.7								

(continued)

¹⁵⁹Gd
64

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		E_f^* : $2J_f^\pi$:	121.9 7 ⁻	146.3 5 ⁻	185.0 9 ⁺	212.6 9 ⁻	227.41 7 ⁻	507.72 1 ⁻	558.21 3 ⁻	646.70 5 ⁺	781.56 1 ⁺	872.64 5 ⁻
646.70(2)	5 ⁺		30.0									
710.38(8)	7 ⁺		25.0			37.5						
781.56(2)	1 ⁺							6.25				
800.45(4)	5 ⁺		21.4									
818.89(7)	5 ⁺				16.0					12.0		
872.64(5)	5 ⁻			11.0			22.1					
948.35(28)	7 ⁻				22.1		11.8					
974.29(5)	1 ⁺							66.7	9.5			
1001.6(1)	3 ⁺			9.09								
1079.4(1)	1 ⁻			52.2								
1110.3(1)	3 ⁻			70.6								
1139.8(1)	1 ⁻										9.5	
1145.6(1)	3 ⁻										27.3	
1162.7(2)	$\langle 5^- \rangle$			20(7)			12(2)					
1394.5(2)	1 ⁺ , 3 ⁺											100

Energy levels and branching ratios [96Re22, 05Re01].

¹⁶⁰Gd
64

E^*	J^π	L	σ (t,p)	ε	$d\sigma/d\Omega$	Γ_o^{red}	$B(E1)$	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		(t,p)	$\mu\text{b/sr}$	$rel.$	$\mu\text{b/sr}$	[meV']	$10^{-3}ef$	Γ_{cm}		E_f^* : J_f^π :	0.0 0 ⁺	75.3 2 ⁺	248 4 ⁺	515 6 ⁺	868 8 ⁺
0.0	0 ⁺	0	233	100	45200			Stable	67Bl05						
75.26(1)	2 ⁺		21		594			2.69(3) ns	67Bl05	100					
248.52(6)	4 ⁺		7		198				67Bl05		100				
514.75(8)	6 ⁺		4		20				67Bl05				100		
867.9	8 ⁺														100
913(7)			9						86Lo15						
946															
988.40(8)	2 ⁺		4		82			1.30(6) ps	67Bl05	43(1)	55(1)	1.9(2)			
1016															
1057.5(1)	3 ⁺		3						86Lo15		72(1)	28(1)			
1070.4(1)	4 ⁺				7				67Bl05		37(1)	61(4)	1.7(8)		
1147.8(1)	4 ⁺		23		32				67Bl05		23(3)	51(2)	26(1)		
1192.7(1)	5 ⁺												32(2)	13(3)	
1224.3(1)	1 ⁽⁻⁾				3	6.7(19)	19.1(53)	0.02(1) ps	91Zi01	39(1)	59(1)				
1261.1(1)	5 ⁺												75(3)	17(1)	
1290.1(1)	3 ⁻		13		108			0.05(1) ps	67Bl05		65(1)	34(1)			
1295.6(2)	$\langle 4^+, 5^+ \rangle$												53(3)	12(2)	
1300.7	10 ⁺														100
1325.7(2)	$\langle 0^+ \rangle$										100				
1331.1(2)	6 ⁺												2.9(17)	82(6)	
1351.1(1)	1, 2 ⁺									20(1)	68(2)				

(continued)

¹⁶⁰Gd
64

E^*	J^π	L	σ (t,p)	ε	$d\sigma/d\Omega$	$\Gamma_{\gamma o}$	Γ_o^{red}	$B(E1)$	Ref.	Branching ratios in percentage				
[keV]		(t,p)	$\mu\text{b/sr}$	<i>rel.</i>	$\mu\text{b/sr}$	[meV]	[meV']	$10^{-3}ef$		E_f^* : 0.0	75.3	248	515	868
										J_f^π : 0 ⁺	2 ⁺	4 ⁺	6 ⁺	8 ⁺
1377.1(1)	$\langle 2^+ \rangle$										91(5)	4.8(14)		
1379.6(2)	0 ⁺	0	22	14					86Lo15		100			
1388.6(2)	$\langle 2^+ \rangle$									61(3)	21(7)			
1392.8(1)	6 ⁺											17(6)	43(4)	
1427.9(1)	5 ⁻				6				67Bl05			71(4)	<32	
1435.99(11)	2 ⁺									12(1)	19(2)	62(4)		
1460.3(4)	$\langle 3^- \rangle$				30				67Bl05	39(4)	61(9)			
1531.74(9)	2 ⁺ -4 ⁺									8(4)	14(8)			
1537.41(13)	4 ⁺									9(3)	30(6)	7(4)		
1548.61(23)	$\langle 7^+ \rangle$											50(12)		
1568.69(12)	1,2 ⁺									38(3)	28(2)			
1584.03(10)	2 ⁺									4(1)	7.6(7)			
1586.99(13)	1,2 ⁺									72(4)	28(2)			
1599.12(13)	1,2 ⁺									26(2)	38(2)			
1634.0(3)														
1643	$\langle 7^- \rangle$												x	x
1653.1(2)	4 ⁺ ,5,6 ⁺											40(3)	49(5)	
1665.4(2)	$\langle 3^+ \rangle$									36(4)	39(4)			
1685.5(3)														
1688.0(2)	$\langle 3^- \rangle$		6		39				67Bl05		28(5)			
1717	$\langle 8^+ \rangle$												x	x
1720.2(13)														
1779.1(2)														
1806.3	12 ⁺													
1913.0(1)														
1941	$\langle 9^- \rangle$													x
1966.6(2)	1 ⁻					9.9(13)	1.6(4)	4.6(11)	91Zi01	41(4)	59(5)			
1971.5(4)	1 $\langle^- \rangle$,2 ⁺				5				67Bl05	47(6)	42(11)			
1996.7(1)	2 ⁺													
2031.1(3)														
2052.2(1)	2 ⁺ ,3,4 ⁺										22(4)			
2059.4(6)					21				67Bl05					
2108.6(3)														
2111.5(2)														
2118	$\langle 10^+ \rangle$													x
2121.1(2)	4 ⁺											9(6)		
2139(7)			9		19				67Bl05					
2163(1)	1					4.6(7)			94Fr03	63	37(10)			
2176.3(3)														
2230.8(3)														
2238.0(3)		$\langle 0 \rangle$	9	18					86Lo15					
2244.4(3)														
2253.5(3)														
2278(1)	1					2.4(6)			94Fr03	58	42(14)			
2313	$\langle 11^- \rangle$													

(continued)

¹⁶⁰Gd
64

E^*	J^π	L	σ (t,p)	ε	L	$d\sigma/d\Omega$	$\Gamma_{\gamma o}$	Γ_o^{red}	$B(E1)$	Ref.	Branching ratios in percentage				
[keV]		(t,p)	$\mu\text{b/sr}$	<i>rel.</i>	(d,d')	$\mu\text{b/sr}$	[meV]	[meV']	$10^{-3}ef$		E_f^* : 0.0	75.3	248	515	868
											J_f^π : 0 ⁺	2 ⁺	4 ⁺	6 ⁺	8 ⁺
2319.1(3)															
2346.5(3)															
2348(1)	1 ⁺		12				11.0(9)			86Lo15	67	33(3)			
2368.4(5)															
2376.8(3)															
2377.3	14 ⁺														
2379.0(3)															
2407.6(4)			14							86Lo15					
2450.2(4)															
2471(1)	1 ⁻						16.4(26)			94Fr03	40	60(7)			
2537.7(3)															
2547.9(3)															
2582	$\langle 12^+ \rangle$														
2596.7(4)															
2670(1)	1 ⁺						14.0(11)			89Pi05	65	35(3)			
2761(1)	1						5.5(14)			94Fr03	36(8)	64			
2796(1)	1 ⁺						62.9(41)			89Pi05	64	36.2(14)			
2820(1)	1 ⁽⁺⁾						17.2(28)			94Fr03	43	57(8)			
2999(1)	1						4.4(7)			94Fr03	74	26(9)			
3008.1	16 ⁺														
3032(1)	1 ⁻						12.7(18)			94Fr03	40	60(7)			
3131(1)	1 ⁻						22.9(22)			94Fr03	54	46(4)			
3166(1)	1 ⁽⁻⁾						24.8(29)			89Pi05	61	39(7)			
3170(1)	1 ⁺						51.3(47)			94Fr03	62	38(4)			
3228(1)	1						8.9(18)			94Fr03	49	51(10)			
3277(1)	1 ⁺						78.2(76)			89Pi05	65	35(3)			
3292(1)	1						8.3(13)			94Fr03	76	24(7)			
3308(1)	1 ⁺						59.6(63)			89Pi05	63	37(2)			
3328(1)	1						31.0(38)			89Pi05	x	x			
3331(1)	1 ⁺						incl				68	32(3)			
3340(1)	1 ⁺						35.8(45)			94Fr03	63	37(3)			
3357(1)	1						18.2(25)			94Fr03	71	29(4)			
3376(1)	1						20.9(29)			94Fr03	70	30(3)			
3415(1)	1 ⁻						53.5(73)			94Fr03	68	32(2)			
3460(1)	1 ⁻						49.3(79)			89Pi05	71	29(2)			
3477(1)	1 ⁽⁺⁾						52.1(90)			94Fr03	70	30(3)			
3537(1)	1						22.8(53)			94Fr03	68	32(3)			

(continued)

¹⁶⁰Gd₆₄

E^*	J^π	L	σ (t,p)	ε	L	$d\sigma/d\Omega$	$\Gamma_{\gamma o}$	Γ_o^{red}	$B(E1)$	Ref.	Branching ratios in percentage				
[keV]		(t,p)	$\mu\text{b/sr}$	<i>rel.</i>	(d,d')	$\mu\text{b/sr}$	[meV]	[meV']	$10^{-3}ef$		E_f^* : 0.0	75.3	248	515	868
											J_f^π : 0 ⁺	2 ⁺	4 ⁺	6 ⁺	8 ⁺
3550(1)	1						28.7(70)			94Fr03	71	29(5)			
		86Lo15	86Lo15	86Lo15			94Fr03	91Zi01	91Zi01	Ref.					

Additional data on this isotope can be found in [05Re01, 97Do20, 95Ma69, 95An28, 94Fr03, 93Su16, 93Fr06, 90Zi05, 89Pi05].

Abundance: 21.86(19) %.

8 bands are assigned to excited states of this nucleus in [05Re18].

For levels at $E^*=1224$ and 1966 keV $\Gamma_o^{\text{red}}=6.7(19)$ and $1.6(4)$ meV and $B(E1)=19(5)$ and $4.6(11)$ in units $10^{-3}e^2fm^2$ were given in [91Zi01]; other $B(E1)$ and $B(M1)$ can be found in [94Fr03].

Parameter ε is the relative population (Q-value corrected) for L=0 two-neutron transition.

Data for this isotope are considered in vol. LB I/18C.

Energy levels and branching ratios [96Re22, 05Re01]. Part 2

¹⁶⁰Gd₆₄

E^*	J^π	Branching ratios in percentage									
		E_f^* : 988	1057	1070	1147.78	1192.69	1224.28	1261.07	1290.10	1295.57	1300.7
[keV]		J_f^π : 2 ⁺	3 ⁺	4 ⁺	4 ⁺	5 ⁺	1 ⁽⁻⁾	5 ⁺	3 ⁻	$\langle 4^+, 5^+ \rangle$	10 ⁺
1192.7(1)	5 ⁺			55(6)							
1224.3(1)	1 ⁽⁻⁾	2.4(6)									
1261.1(1)	5 ⁺		8(4)								
1290.1(1)	3 ⁻	1.5(5)									
1295.6(2)	$\langle 4^+, 5^+ \rangle$		12(10)	18(2)	4(4)						
1331.1(2)	6 ⁺					15(4)					
1351.1(1)	1,2 ⁺				5(3)		6.4(12)				
1377.1(1)	$\langle 2^+ \rangle$		2.4(4)	1.5(8)							
1388.6(2)	$\langle 2^+ \rangle$	3(1)	3(1)		12(9)						
1392.8(1)	6 ⁺				39(16)						
1427.9(1)	5 ⁻					12(3)			16(4)		
1435.99(11)	2 ⁺				7(1)						
1531.74(9)	2 ⁺ -4 ⁺	22(2)	14(2)	1.9(6)	40(4)						
1537.41(13)	4 ⁺	3(1)	10(1)	8(1)						16(11)	
1548.61(23)	$\langle 7^+ \rangle$						50(10)				
1568.69(12)	1,2 ⁺	26(3)									
1584.03(10)	2 ⁺			85(10)					3.2(5)		
1599.12(13)	1,2 ⁺						8(3)				
1653.1(2)	4 ⁺ ,5,6 ⁺							11(5)			
1665.4(2)	$\langle 3^+ \rangle$								11(4)		
1688.0(2)	$\langle 3^- \rangle$		26(9)						46(8)		
1806.3	12 ⁺										100
1941	$\langle 9^- \rangle$										x
1996.7(1)	2 ⁺	10(2)	4(1)	13(2)							
2052.2(1)	2 ⁺ ,3,4 ⁺	19(4)			12(8)				14(4)		
2118	$\langle 10^+ \rangle$										x

(continued)

¹⁶⁰₆₄Gd

<i>E</i> [*]	<i>J</i> ^π	Branching ratios in percentage										
[keV]		<i>E</i> _f [*] : <i>J</i> _f ^π :	988 2 ⁺	1057 3 ⁺	1070 4 ⁺	1147.78 4 ⁺	1192.69 5 ⁺	1224.28 1 ⁽⁻⁾	1261.07 5 ⁺	1290.10 3 ⁻	1295.57 ⟨4 ⁺ ,5 ⁺ ⟩	1300.7 10 ⁺
2121.1(2)	4 ⁺		21(7)	14(3)		19(10)	6(2)		12(5)			
2313	⟨11 ⁻ ⟩											x
2582	⟨12 ⁺ ⟩											x

Energy levels and branching ratios [96Re22, 05Re01]. Part 3

¹⁶⁰₆₄Gd

<i>E</i> [*]	<i>J</i> ^π	Branching ratios in percentage										
[keV]		<i>E</i> _f [*] : <i>J</i> _f ^π :	1325.73 ⟨0 ⁺ ⟩	1331.11 6 ⁺	1351.09 1,2 ⁺	1377.06 ⟨2 ⁺ ⟩	1392.80 6 ⁺	1435.99 2 ⁺	1531.74 2 ⁺ ,3,4 ⁺	1537.41 4 ⁺	1568.69 1,2 ⁺	1584.03 2 ⁺
1537.41(13)	4 ⁺					17(3)						
1568.69(12)	1,2 ⁺				8(10)							
1599.12(13)	1,2 ⁺				28(9)							
1665.4(2)	⟨3 ⁺ ⟩					15(3)						
1717	⟨8 ⁺ ⟩						x					
1971.5(4)	1 ⁽⁻⁾ ,2 ⁺							11(9)				
1996.7(1)	2 ⁺	2.8(9)			2(1)			6(3)	2.8(9)	0.9(3)	4(1)	37(2)
2052.2(1)	2 ⁺ ,3,4 ⁺					14(8)					5(3)	
2121.1(2)	4 ⁺			12(2)			5(5)					

Energy levels and branching ratios [96Re22, 05Re01]. Part 4

¹⁶⁰₆₄Gd

<i>E</i> [*]	<i>J</i> ^π	Branching ratios in percentage								
[keV]		<i>E</i> _f [*] : <i>J</i> _f ^π :	1586.99 1,2 ⁺	1599.12 1,2 ⁺	1665.39 ⟨3 ⁺ ⟩	1717 ⟨8 ⁺ ⟩	1779.07	1806.3 12 ⁺	2118 ⟨10 ⁺ ⟩	2377.3 14 ⁺
1996.7(1)	2 ⁺			10(2)	1.7(9)		4(6)			
2052.2(1)	2 ⁺ ,3,4 ⁺		14(4)							
2118	⟨10 ⁺ ⟩					x				
2313	⟨11 ⁻ ⟩							x		
2377.3	14 ⁺							100		
2582	⟨12 ⁺ ⟩							x	x	
3008.1	16 ⁺									100

Energy levels and branching ratios [00Re14].

¹⁶¹Gd
64

E^* [keV]	$2J^\pi$	σ (d,p)	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage			
					$E_f^*:$ $2J_f^\pi:$	0 5 ⁻	71.9 7 ⁻	355 1 ⁻
0	5 ⁻	20	3.66(5) m	67Tj01				
71.9(2)	7 ⁻	≈ 20		67Tj01		x		
163.7(2)	9 ⁻	22		67Tj01		x	x	
276(3)	11 ⁻							
314.3(3)	3 ⁻	52		67Tj01		x		
355(1)	1 ⁻	168		67Tj01				
394.7(1)	3 ⁻	15		67Tj01		x		
438(3)	7 ⁻	195		67Tj01				
438(3)	5 ⁻							
510(3)	9 ⁺	24		67Tj01				
529(3)	7 ⁻	67		67Tj01				
≈ 585	11 ⁺							
604(3)	9 ⁻	13		67Tj01				
645(3)	11 ⁻	15		67Tj01				
681(3)	13 ⁺	51		67Tj01				
≈ 753	11 ⁻	≈ 2		67Tj01				
804.3(1)						x		
≈ 809	5 ⁻	≈ 3		67Tj01				
824(1)								x
834(3)	$\langle 1,3 \rangle^-$	82		67Tj01				
851(1)								
889(3)	7 ⁻							
898(2)								
925(3)		28		67Tj01				
972	[13 ⁺]	64		67Tj01				
994(3)	9 ⁻	16		67Tj01				
1036(1)								
1049(5)		16		67Tj01				
1097(5)		9		67Tj01				
1123(5)	11 ⁻	11		67Tj01				
1128(1)								
1177(5)		35		67Tj01				
1273(1)						x		
1311(1)	1 ⁻	5		67Tj01				
1338(1)	3 ⁻	300		67Tj01		x		
1380(1)		79		67Tj01				
1403(5)	5 ⁻	98		67Tj01				
1408(1)		93		67Tj01				
1466(5)	7 ⁻	46		67Tj01				
1490(1)	1 ⁺	157		67Tj01		x		
1501(5)	3 ⁺	137		67Tj01				
1523(1)		33		67Tj01				
1545(1)								
1556(5)	5 ⁺	309		67Tj01				
1591(5)	7 ⁺	37		67Tj01				

(continued)

¹⁶¹₆₄Gd

E^* [keV]	$2J^\pi$	σ (d,p)	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage			
					E_f^* : $2J_f^\pi$:	0 5 ⁻	71.9 7 ⁻	355 1 ⁻
1615(5)		50		67Tj01				
1643(5)		19		67Tj01				
1664(5)		27		67Tj01				
1751(1)								
1803(1)								
1848(1)								
1923(1)								
		67Tj01		Ref.				

Additional data on this isotope can be found in [95Ma69].

 σ (d,p) was measured at 90° with $E_d=12$ MeV, data for 60-125° can be found in [67Tj01].

Energy levels and branching ratios [99He21].

¹⁶²₆₄Gd

E^* [keV]	J^π	L (t,p)	σ (t,p) $\mu\text{b/sr}$	ε <i>rel.</i>	$T_{1/2}$ or Γ_{cm}	Ref.
0	0 ⁺	0	188	100	8.4(2) m	86Lo15
71.6	2 ⁺		19			05Jo24
237	4 ⁺		9			86Lo15
491	6 ⁺		3			86Lo15
827.3	8 ⁺					
864(7)	2 ⁺	2	3			86Lo15
930(7)	$\langle 3^+ \rangle$		2			86Lo15
1015(7)	4 ⁺		≈ 23			86Lo15
1238.9	10 ⁺					
1427(7)	0 ⁺	0	39	33		86Lo15
1461(7)			10			86Lo15
1492(7)	$\langle 2^+ \rangle$		2			86Lo15
1641(7)			2			86Lo15
1702(7)	0 ⁺	0	18	17		86Lo15
1719.5	12 ⁺					
1749(7)			3			86Lo15
2163(7)			26			86Lo15
2261.3	14 ⁺					
2346(7)			8			86Lo15
2432(7)			5			86Lo15
2464(7)			15			86Lo15
		86Lo15	86Lo15	86Lo15		Ref.

Additional data on this isotope can be found in [97Do20, 95Ma69].

Parameter ε is the relative population (Q-value corrected) for L=0 two-neutron transition.The plot of 2⁺ level energies versus neutron number (N=92-106, Z=60-72) can be found in [05Jo24].

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

E^*	J^π	Branching ratios in percentage							
[keV]		$E_f^*:$ $J_f^\pi:$	0 0^+	72.1 2^+	237 4^+	491 6^+	827 8^+	1239 10^+	1719 12^+
71.6	2^+		x						
237	4^+			x					
491	6^+				x				
827.3	8^+					x			
1238.9	10^+						x		
1719.5	12^+							x	
2261.3	14^+								x