Energy levels and branching ratios [95Ra12].

$^{133}_{57}$La

E^*	$2J^\pi$	L	I_t	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
						E_f^*:	0.0	87.94	97.26	130.8	477.2
[keV]		(α,t)	*rel.*	Γ_{cm}		$2J_f^\pi$:	5^+	5^+	3^+	7^+	9^+
0.0	5^+			3.912(8) h							
87.939(11)	5^+		25	1.30(10) ns	73Na08		100				
97.259(10)	3^+			≤0.4 ns			100				
130.80(1)	7^+		40	1.12(18) ns	73Na08		100	0.44(7)	x		
174.1(4)	$\langle 1\rangle^+$			0.83(18) ns			2.5(6)		97(14)		
477.22(2)	9^+						90	0.49(4)		9.5(2)	
495.02(3)	7^+						23(1)	9(1)	22(1)	46(1)	
535.60(2)	11^-	5	100	62(3) ns	73Na08		0.5(2)			8.1(2)	91(2)
541.20(3)	$\langle 7\rangle^+$						49(6)	16.5(6)	23(2)	11.9(4)	0.08(2)
563.35(3)	9^+							47(1)		53(1)	0.04(2)
591.25(6)							77(10)			≈23	x
654.56(4)	11^+									98(3)	1.6(6)
765.36(6)	X^+						3.4(4)	51(15)		20(7)	
784.55(2)	7^-						78(2)			3.6(3)	7.5(3)
838.21(4)	$\langle 5,7,9\rangle^+$						19(3)			51(4)	12(3)
867.15(7)	$\langle 5^+,7^+\rangle$						38(4)	23(4)	13(2)	19(3)	
950.33(5)	$\langle 9\rangle^+$							35(1)		45(2)	
980.00(8)	15^-										
1045.94(2)	9^-									0.6(1)	
1092.37(5)	$\langle 7,9\rangle^+$							25(2)		11(3)	19(2)
1153.35(5)	13^-										
1188.62(5)	13^+										100
1194.62(8)								31(8)			
1218.85(15)	$\langle 5^+,7^+\rangle$								14(4)		
1220.00(21)	$\langle 11^+\rangle$										24(11)
1260.55(14)	13^+										
1311.07(9)											
1318.59(12)											100
1365.02(4)	$\langle 9,11\rangle^-$										12(3)
1377.93(15)	15^+										
1382.0(5)											
1396.43(4)	$7^-,9^-$									12(1)	
1468.88(4)	$9^-,11^-$										
1495.8(3)	$\langle 11\rangle$										100
1561.22(10)	$\langle 11^-,13^+\rangle$										
1657.4(6)											
1661.13(19)	19^-										
1663.8(5)											
1690.66(4)	11^-										20(2)
1715.41(5)	$7^-,9^-$									81(2)	4.8(10)
1734.26(14)											
1735.46(4)	$\langle 11\rangle^-$										5(1)
1738.12(18)	17^-										
1748.28(7)	7,9										
1753.64(5)										14(3)	

(continued) **$^{133}_{57}$La**

E^*	$2J^\pi$	L	I_t	$T_{1/2}$ orRef.		Branching ratios in percentage				
					E_f^*:	0.0	87.94	97.26	130.8	477.2
[keV]		(α,t)	*rel.*	Γ_{cm}	$2J_f^\pi$:	5^+	5^+	3^+	7^+	9^+
1778.22(9)									33(8)	29(8)
1784.19(6)									39(3)	
1784.80(18)										
1806.61(7)	9,11									
1815.8(5)	⟨15⟩									
1850.90(5)	⟨9⟩$^-$								36(1)	
1857.38(3)	7^-					1.9(5)	30(1)		5(1)	6(1)
1912.82(5)	⟨9⟩$^-$						2.9(9)		20.9(9)	1.6(7)
1954.1(4)	⟨15$^+$⟩									
1958.67(16)	⟨9$^-$,11⟩									
1967.79(5)	⟨7,9⟩$^-$								4(1)	
1983.39(10)									61(3)	23(3)
2018.26(6)	7^-					31(1)			23(1)	
2029.84(9)	⟨7,9$^+$⟩					6(1)	18(1)		10(1)	
2035.22(7)										33(6)
2036.04(3)	⟨7,9⟩$^-$								0.5(1)	
2039.51(20)	17^+									
2062.18(4)	⟨7,9⟩$^-$								5.5(8)	
2075.57(19)	17^+									
2122.53(20)	⟨9$^-$,11⟩									
2132.08(7)	⟨7,9$^+$⟩					4.8(5)	87(3)		9(2)	
2137.19(7)	⟨9$^-$,11⟩									
2155.47(9)										30(5)
2175.0(7)										
2175.64(9)	⟨9,11⟩$^-$									
2199.95(6)	⟨7⟩						18(1)		0.8(1)	5(1)
2201.30(23)	⟨19$^-$⟩									
2220.0(4)										
2249.98(9)	⟨7$^+$,9⟩					0.34(9)			57(3)	
2261.71(21)										
2262.44(25)	19^+									
2289.29(23)										
2298.5(3)							53(4)		47(5)	
2359.90(14)										
2367.35(17)	⟨7$^+$,9$^+$⟩					2.6(7)	17(1)		5(1)	23(8)
2368.35(14)	17^+									
2424.1(12)										
2449.62(24)	23^-									
2501.30(11)	⟨9$^-$,11$^+$⟩									
2503.67(19)	19^+									
2534.77(23)	21^-									
2572.76(24)								6.0(14)	2.5(10)	10(2)
2580.99(25)	⟨21$^-$⟩									
2682.25(25)	21^+									
2716.0(4)										

(continued) **$^{133}_{57}$La**

E^*	$2J^\pi$	L	I_t	$T_{1/2}$ orRef.		Branching ratios in percentage				
					E^*_f:	0.0	87.94	97.26	130.8	477.2
[keV]		(α,t)	*rel.*	Γ_{cm}	$2J^\pi_f$:	5^+	5^+	3^+	7^+	9^+
2727.2(6)	⟨19⟩									
2734.8(4)						9(2)			18(2)	
2851.10(22)	⟨9^-,11^+⟩								0.8(3)	5.5(7)
2884.7(6)	⟨21^+⟩									
2891.3(3)	⟨23⟩									
2894.3(4)	⟨21^+⟩									
2915.9(3)	⟨23^-⟩									
2927.9(3)	23^+									
3003.8(4)										
3104.6(4)	⟨25⟩									
3111.2(4)	⟨23^+⟩									
3258.9(4)	⟨25^+⟩									
3269.9(6)										
3276.9(9)	⟨23^+⟩									
3278.3(4)	⟨25⟩									
3292.3(4)	27^-									
3363.1(3)	⟨27^-⟩									
3382.4(4)	⟨25^+⟩									
3431.4(3)	25^-									
3448.6(3)	25									
3551.6(9)										
3600.0(3)	⟨27^-⟩									
3614.9(4)	27^+									
3647.3(5)	⟨27⟩									
3762.3(3)	⟨27^-⟩									
3778.5(4)	⟨27^+⟩									
3948.2(4)	⟨29^-⟩									
4012.2(5)	⟨29⟩									
4030.8(4)	29^+									
4055.6(5)										
4072.0(5)										
4134.3(5)	⟨29^+⟩									
4226.3(6)	31^-									
4359.3(9)	⟨29⟩									
4396.4(5)										
4475.3(5)	⟨31^+⟩									
4511.1(6)	⟨31⟩									
4512.3(5)										
4568.8(10)										
4830.9(6)										
4870.8(6)										
4926.6(6)										
4938.4(6)	⟨33^+⟩									
5004.0(6)										
5038.3(6)										

(continued) **$^{133}_{57}$La**

E^*	$2J^\pi$	L	I_t	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
						E_f^*:	0.0	87.94	97.26	130.8	477.2
[keV]		(α,t)	*rel.*	Γ_{cm}		$2J_f^\pi$:	5^+	5^+	3^+	7^+	9^+
5197.8(6)	35^-										
5219.7(13)											
5220.6(6)											
5319.1(8)											
5351.9(6)	$\langle 35^+ \rangle$										
6144.0(7)	$\langle 39^- \rangle$										
6283.2(7)	$\langle 39^+ \rangle$										
		73Na08	73Na08		Ref.						

Additional data on this isotope can be found in [91Hi03].
I_t in the (α,t) reaction was estimated in units number of triton tracks per 1mm strip [73Na08].

Energy levels and branching ratios [95Ra12]. Part 2 **$^{133}_{57}$La**

E^*	$2J^\pi$					Branching ratios in percentage						
		E_f^*:	495.0	535.6	541.2	563.3	591.2	654.6	765.4	784.6	838.2	867.2
[keV]		$2J_f^\pi$:	7^+	11^-	$\langle 7 \rangle^+$	9^+		11^+	X^+	7^-		$\langle 5^+,7^+ \rangle$
591.25(6)					x							
654.56(4)	11^+		0.3(1)	0.6(3)								
765.36(6)	X^+				26(3)							
784.55(2)	7^-			10.7(2)		≈0.6						
838.21(4)	$\langle 5,7,9 \rangle^+$					17(3)						
867.15(7)	$\langle 5^+,7^+ \rangle$		6(2)									
950.33(5)	$\langle 9 \rangle^+$		5(2)					3(1)		12(4)	0.37(7)	
980.00(8)	15^-			100								
1045.94(2)	9^-			90(3)	2.2(5)					7.54(17)		
1092.37(5)	$\langle 7,9 \rangle^+$		27(2)		5(1)			12(1)				
1153.35(5)	13^-			100								
1194.62(8)			69(6)									
1218.85(15)	$\langle 5^+,7^+ \rangle$				76(23)						11(3)	
1220.00(21)	$\langle 11^+ \rangle$				76(33)							
1260.55(14)	13^+					82(8)		18.3(19)				
1311.07(9)						61(8)		39(7)				
1365.02(4)	$\langle 9,11 \rangle^-$			51(2)		8(2)				<2		
1377.93(15)	15^+							100				
1382.0(5)				100								
1396.43(4)	$7^-,9^-$									88(3)		
1468.88(4)	$9^-,11^-$									31(3)		
1657.4(6)								100				
1663.8(5)				x								
1690.66(4)	11^-							3.0(15)		10.9(7)		
1715.41(5)	$7^-,9^-$			3.9(10)	5.0(13)					5.8(14)		
1735.46(4)	$\langle 11 \rangle^-$			16(1)		6.2(4)		2.7(4)		13.3(3)		

(continued) **$^{133}_{57}$La**

E^*	$2J^\pi$	Branching ratios in percentage									
	E_f^*:	495.0	535.6	541.2	563.3	591.2	654.6	765.4	784.6	838.2	867.2
[keV]	$2J_f^\pi$:	7^+	11^-	$\langle 7\rangle^+$	9^+		11^+	X^+	7^-		$\langle 5^+,7^+\rangle$
1748.28(7)	7,9			68(4)					18(5)		
1753.64(5)			17(4)		69(4)						
1778.22(9)						38(8)					
1784.19(6)					19(5)		≈4				
1784.80(18)			51(7)						26(7)		
1806.61(7)	9,11		46(4)				54(4)				
1850.90(5)	$\langle 9\rangle^-$			5(1)	24(1)		18(1)	13(1)	3(1)		
1857.38(3)	7^-	15(1)		5(2)	7(1)			12(2)	7(1)		
1912.82(5)	$\langle 9\rangle^-$		52(1)				12(3)		7(1)		
1958.67(16)	$\langle 9^-,11\rangle$		15(7)		30(10)						
1967.79(5)	$\langle 7,9\rangle^-$		39(1)		7(1)				36(1)		
1983.39(10)			4(2)		13(3)						
2018.26(6)	7^-				1.0(3)				11(1)		
2029.84(9)	$\langle 7,9^+\rangle$				≈5				13(2)		
2035.22(7)					26(3)						
2036.04(3)	$\langle 7,9\rangle^-$		33(1)	22.7(6)					2.3(2)		1.2(2)
2062.18(4)	$\langle 7,9\rangle^-$		46(1)	10.5(6)	5.4(4)		0.9(5)		11.6(8)		
2137.19(7)	$\langle 9^-,11\rangle$		≈2.6		22(2)				3.2(20)		
2155.47(9)			21(3)				≈9				
2175.64(9)	$\langle 9,11\rangle^-$		12(2)		12(2)						
2199.95(6)	$\langle 7\rangle$		22(1)	5(1)	13(1)						
2249.98(9)	$\langle 7^+,9\rangle$						13(1)		30(3)		
2367.35(17)	$\langle 7^+,9^+\rangle$	10(5)					42(8)				
2501.30(11)	$\langle 9^-,11^+\rangle$			≈14			8(4)				
2572.76(24)											82(14)
2851.10(22)	$\langle 9^-,11^+\rangle$		3.7(6)				4.3(8)				

Energy levels and branching ratios [95Ra12]. Part 3 **$^{133}_{57}$La**

E^*	$2J^\pi$	Branching ratios in percentage									
	E_f^*:	950.3	980.0	1045.9	1092.4	1153.4	1188.6	1220.0	1260.55	1318.6	1365.0
[keV]	$2J_f^\pi$:	$\langle 9\rangle^+$	15^-	9^-	$\langle 7,9\rangle^+$	13^-	13^+	$\langle 11^+\rangle$	13^+		$\langle 9,11\rangle^-$
1153.35(5)	13^-		<5.7								
1365.02(4)	$\langle 9,11\rangle^-$		<4	16(2)		14(1)					
1396.43(4)	$7^-,9^-$			<3.1							
1468.88(4)	$9^-,11^-$			53(2)		15(2)				x	
1561.22(10)	$\langle 11^-,13^+\rangle$		87(9)			≈13					
1657.4(6)		x									
1661.13(19)	19^-		100								
1663.8(5)						x					
1690.66(4)	11^-			49(1)			5(1)				
1734.26(14)			100								

(continued) **$^{133}_{57}$La**

E^*	$2J^\pi$	Branching ratios in percentage									
	E_f^*:	950.3	980.0	1045.9	1092.4	1153.4	1188.6	1220.0	1260.55	1318.6	1365.0
[keV]	$2J_f^\pi$:	$\langle 9\rangle^+$	15^-	9^-	$\langle 7,9\rangle^+$	13^-	13^+	$\langle 11^+\rangle$	13^+		$\langle 9,11\rangle^-$
1735.46(4)	$\langle 11\rangle^-$			43(1)			2.4(2)				
1738.12(18)	17^-		54(5)			46(23)					
1748.28(7)	7,9			14(2)							
1784.19(6)											38(2)
1784.80(18)				24(10)							
1815.8(5)	$\langle 15\rangle$					100					
1857.38(3)	7^-			7(2)							
1912.82(5)	$\langle 9\rangle^-$			≈3.0							
1954.1(4)	$\langle 15^+\rangle$							100	x		
1958.67(16)	$\langle 9^-,11\rangle$					54(8)					
1967.79(5)	$\langle 7,9\rangle^-$										7(1)
2018.26(6)	7^-			22(1)							
2029.84(9)	$\langle 7,9^+\rangle$			47(2)							
2036.04(3)	$\langle 7,9\rangle^-$			20.7(6)	4.0(3)						
2039.51(20)	17^+						53(6)		47(25)		
2062.18(4)	$\langle 7,9\rangle^-$			8.9(5)							7.1(4)
2075.57(19)	17^+						31(3)		17(2)		
2122.53(20)	$\langle 9^-,11\rangle$		16(8)	47(8)		≈37					
2137.19(7)	$\langle 9^-,11\rangle$			50(6)		≈4.0					
2155.47(9)				22(3)							
2175.64(9)	$\langle 9,11\rangle^-$	6(2)		39(3)		32(3)					
2199.95(6)	$\langle 7\rangle$			20(1)							13(1)
2201.30(23)	$\langle 19^-\rangle$		100								
2261.71(21)			[100]								
2289.29(23)							53(26)		47(24)		
2359.90(14)				59(12)							
2368.35(14)	17^+						57(17)		7(2)		
2501.30(11)	$\langle 9^-,11^+\rangle$			9(3)		55(6)					13(4)
2734.8(4)											72(36)
2851.10(22)	$\langle 9^-,11^+\rangle$					86(7)					

Energy levels and branching ratios [95Ra12]. Part 4 **$^{133}_{57}$La**

E^*	$2J^\pi$	Branching ratios in percentage									
	E_f^*:	1377.9	1396.4	1468.9	1561.2	1661.1	1663.8	1715.4	1735.5	1738.1	1748.3
[keV]	$2J_f^\pi$:	15^+	$7^-,9^-$	$9^-,11^-$		19^-		$7^-,9^-$	$\langle 11\rangle^-$	17^-	7,9
1468.88(4)	$9^-,11^-$		1.5(6)								
1690.66(4)	11^-		12.4(6)								
1735.46(4)	$\langle 11\rangle^-$		10.2(6)		0.6(3)						
1850.90(5)	$\langle 9\rangle^-$							x			x
1857.38(3)	7^-		3(1)								
1954.1(4)	$\langle 15^+\rangle$	x									

(continued) **$^{133}_{57}$La**

E^*	$2J^\pi$	Branching ratios in percentage										
	E_f^*:	1377.9	1396.4	1468.9	1561.2	1661.1	1663.8	1715.4	1735.5	1738.1	1748.3
[keV]	$2J_f^\pi$:	15^+	7^-,9^-	9^-,11^-		19^-		7^-,9^-	$\langle 11\rangle^-$	17^-	7,9
1967.79(5)	$\langle 7,9\rangle^-$			6.5(6)							
2018.26(6)	7^-		12(5)								
2035.22(7)				≈6							
2036.04(3)	$\langle 7,9\rangle^-$		1.8(3)					0.9(2)	1.7(3)		
2075.57(19)	17^+	52(6)									
2137.19(7)	$\langle 9^-,11\rangle$		19(2)								
2155.47(9)			19(3)								
2175.0(7)							x				
2201.30(23)	$\langle 19^-\rangle$					x					
2220.0(4)		100									
2261.71(21)							x				
2262.44(25)	19^+	100									
2359.90(14)					41(7)						
2368.35(14)	17^+	36(11)									
2449.62(24)	23^-					100					
2503.67(19)	19^+	19(2)									
2534.77(23)	21^-					55(17)				45(22)	
2580.99(25)	$\langle 21^-\rangle$					100					
2716.0(4)						100					
2727.2(6)	$\langle 19\rangle$					x					
2915.9(3)	$\langle 23^-\rangle$					x					
3269.9(6)						x					

Energy levels and branching ratios [95Ra12]. Part 5 **$^{133}_{57}$La**

E^*	$2J^\pi$	Branching ratios in percentage									
	E_f^*:	1753.6	1778.2	1784.2	1806.6	1815.8	1857.4	2039.5	2075.6	2175.0	2201.3
[keV]	$2J_f^\pi$:				9,11	$\langle 15\rangle$	7^-	17^+	17^+		$\langle 19^-\rangle$
1850.90(5)	$\langle 9\rangle^-$		x								
2035.22(7)					35(2)						
2036.04(3)	$\langle 7,9\rangle^-$	2.0(1)					8.6(3)				
2062.18(4)	$\langle 7,9\rangle^-$			≈4.3							
2175.0(7)						100					
2199.95(6)	$\langle 7\rangle$						4(1)				
2424.1(12)										x	
2503.67(19)	19^+								≤12		
2884.7(6)	$\langle 21^+\rangle$							x			
2894.3(4)	$\langle 21^+\rangle$							[100]	≤100		
2915.9(3)	$\langle 23^-\rangle$										x
3003.8(4)											76(7)

Energy levels and branching ratios [95Ra12]. Part 6 **$^{133}_{57}$La**

E^*	$2J^\pi$					Branching ratios in percentage						
		E_f^*:	2261.7	2262.4	2368.3	2449.6	2503.7	2534.8	2581.0	2682.2	2727.2	2884.7
[keV]		$2J_f^\pi$:		19^+	17^+	23^-	19^+	21^-	$\langle 21^-\rangle$	21^+	$\langle 19\rangle$	$\langle 21^+\rangle$
2503.67(19)	19^+				81(41)							
2682.25(25)	21^+			[76]	[24]							
2891.3(3)	$\langle 23\rangle$									100		
2894.3(4)	$\langle 21^+\rangle$						x				x	
2927.9(3)	23^+									100		
3003.8(4)			24(2)									
3111.2(4)	$\langle 23^+\rangle$											x
3269.9(6)									x			
3276.9(9)	$\langle 23^+\rangle$			x								
3292.3(4)	27^-					100						
3363.1(3)	$\langle 27^-\rangle$					100						
3382.4(4)	$\langle 25^+\rangle$									14(6)		
3431.4(3)	25^-					35(3)		65(7)				
3448.6(3)	25					[100]			x			
3551.6(9)						100						
3600.0(3)	$\langle 27^-\rangle$					21(2)						
3762.3(3)	$\langle 27^-\rangle$					x						

Energy levels and branching ratios [95Ra12]. Part 7 **$^{133}_{57}$La**

E^*	$2J^\pi$					Branching ratios in percentage						
		E_f^*:	2891.3	2894.3	2915.9	2927.9	3104.6	3111.2	3258.9	3278.3	3292.3	3382.4
[keV]		$2J_f^\pi$:	$\langle 23\rangle$	$\langle 21^+\rangle$	$\langle 23^-\rangle$	23^+	$\langle 25\rangle$	$\langle 23^+\rangle$	$\langle 25^+\rangle$	$\langle 25\rangle$	27^-	$\langle 25^+\rangle$
3104.6(4)	$\langle 25\rangle$		21(4)			79(10)						
3258.9(4)	$\langle 25^+\rangle$		37(11)			63(19)						
3278.3(4)	$\langle 25\rangle$		40(11)			60						
3382.4(4)	$\langle 25^+\rangle$					54(5)		32(3)				
3600.0(3)	$\langle 27^-\rangle$										20(10)	
3614.9(4)	27^+					37(4)			≤43	63(6)		
3647.3(5)	$\langle 27\rangle$						100					
3762.3(3)	$\langle 27^-\rangle$				x							
3778.5(4)	$\langle 27^+\rangle$							38(17)				62(6)
4012.2(5)	$\langle 29\rangle$						100					
4030.8(4)	29^+								x			
4055.6(5)										x		
4072.0(5)											100	
4134.3(5)	$\langle 29^+\rangle$											[100]
4226.3(6)	31^-										100	
4359.3(9)	$\langle 29\rangle$										100	

Energy levels and branching ratios [95Ra12]. Part 8 **$^{133}_{57}$La**

E^*	$2J^\pi$		Branching ratios in percentage									
		E_f^*:	3431.4	3448.6	3600.0	3614.9	3647.3	3762.3	3778.5	3948.2	4012.2	4030.8
[keV]		$2J_f^\pi$:	25^-	25	$\langle 27^- \rangle$	27^+	$\langle 27 \rangle$	$\langle 27^- \rangle$	$\langle 27^+ \rangle$	$\langle 29^- \rangle$	$\langle 29 \rangle$	29^+
3600.0(3)	$\langle 27^- \rangle$		38(21)	20(10)								
3948.2(4)	$\langle 29^- \rangle$				61(6)			39(17)				
4012.2(5)	$\langle 29 \rangle$						≤28					
4030.8(4)	29^+					100						
4055.6(5)						100						
4396.4(5)										100		
4475.3(5)	$\langle 31^+ \rangle$					[100]						
4511.1(6)	$\langle 31 \rangle$						28(13)				72(35)	
4512.3(5)										x		
4926.6(6)											100	

Energy levels and branching ratios [95Ra12]. Part 9 **$^{133}_{57}$La**

E^*	$2J^\pi$		Branching ratios in percentage									
		E_f^*:	4072.0	4226.3	4396.4	4475.3	4512.3	4568.8	4830.9	5038.3	5197.8	5351.9
[keV]		$2J_f^\pi$:		31^-		$\langle 31^+ \rangle$					35^-	$\langle 35^+ \rangle$
4512.3(5)				100								
4568.8(10)			100									
4830.9(6)					100							
4870.8(6)					100							
4938.4(6)	$\langle 33^+ \rangle$					100						
5004.0(6)							100					
5038.3(6)					x							
5197.8(6)	35^-			100								
5219.7(13)								100				
5220.6(6)									x			
5319.1(8)					x					x		
5351.9(6)	$\langle 35^+ \rangle$					100						
6144.0(7)	$\langle 39^- \rangle$										100	
6283.2(7)	$\langle 39^+ \rangle$											100

Energy levels and branching ratios [94Se07, 81Se18]. **$^{134}_{57}$La**

E^*	J^π	$T_{1/2}$ or	Branching ratios in percentage						
			E_f^*:	0.0	31.9	54.6	93.7	122.9	136.3	162.3
[keV]		Γ_{cm}	J_f^π:	1^+	$\langle 2 \rangle^+$	$\langle 2 \rangle^+$	$\langle 2,3 \rangle^+$		$\langle 2,3 \rangle^+$	1^+
0.0	1^+	6.45(16) m								
31.897(16)	$\langle 2 \rangle^+$			100						
54.601(14)	$\langle 2 \rangle^+$			79(12)	21(4)					

(continued) **$^{134}_{57}$La**

E^*	J^π	$T_{1/2}$ or		Branching ratios in percentage						
			E_f^*:	0.0	31.9	54.6	93.7	122.9	136.3	162.3
[keV]		Γ_{cm}	J_f^π:	1^+	$\langle 2\rangle^+$	$\langle 2\rangle^+$	$\langle 2,3\rangle^+$		$\langle 2,3\rangle^+$	1^+
93.698(17)	$\langle 2,3\rangle^+$			5.6(15)	9(3)	85(19)				
122.86(14)				100						
136.32(4)	$\langle 2,3\rangle^+$				100					
162.312(9)	1^+			52(4)	48(4)		0.17(6)			
164.28(14)				100				x		
187.009(11)	$\langle 2\rangle^+$			100						
205.28(4)	$\langle 2\rangle^+$			88(11)	12(6)					
220.27(14)				37(15)				37(15)		
252.484(14)	$\langle 1\rangle^+$			5.4(7)	6.7(9)	20(2)	56(4)		3.9(4)	8.0(7)
0.0+Y										
274.72(14)				74(7)				15(3)		
294.264(12)	$\langle 1\rangle^+$			57(5)	3.6(6)	13.7(11)	1.7(3)			18(2)
53.4+Y		<5 ns								
329.3(6)										
336.44(17)										
336.44+X		29(4) μs								
355.479(12)	1^+			4.5(5)	7.9(9)	45(4)	$\leq$1.7			21(2)
381.7(6)								100		
382.8(5)	$\langle 3^+\rangle$									
467.1(7)										
211.7+Y										
483.9(5)	$\langle 3^+\rangle$									
490.3(5)										
241.0+Y										
543.9(5)	$\langle 4^+\rangle$									
570.4(5)										
574.8(8)										
591.48(21)										
648.0(5)	$\langle 4^+\rangle$									
659.7(7)										
452.6+Y										
715.2(7)										
727.1(6)										
746.4(3)										
501.7+Y										
762.8(7)										
518.7+Y										
852.8(7)										
899.8(6)										
919.7(8)										
668.7+Y	$\langle 8^+\rangle$									
765.2+Y										
813.7+Y	$\langle 9^+\rangle$									
925.8+Y										
976.6+Y										

(continued) **$^{134}_{57}$La**

E^*	J^π	$T_{1/2}$ or	Branching ratios in percentage						
		E_f^*:	0.0	31.9	54.6	93.7	122.9	136.3	162.3
[keV]		Γ_{cm}	J_f^π: 1^+	$\langle 2\rangle^+$	$\langle 2\rangle^+$	$\langle 2,3\rangle^+$		$\langle 2,3\rangle^+$	1^+
1194.8+Y	$\langle 10^+\rangle$								
1234.0+Y									
1412.2+Y									
1471.6+Y									
1510.2+Y									
1532.7+Y	$\langle 11^+\rangle$								
1555.6+Y									
1710.4+Y									
1739.3+Y									
1798.8+Y									
1969.3+Y	$\langle 12^+\rangle$								
2133.1+Y									
2146.2+Y									
2320.9+Y									
2403.6+Y	$\langle 13^+\rangle$								
2849.7+Y	$\langle 14^+\rangle$								

Additional data on this isotope can be found in [96Li13, 92Ol03].

Energy levels and branching ratios [94Se07, 81Se18]. Part 2 **$^{134}_{57}$La**

E^*	J^π		Branching ratios in percentage							
		E_f^*:	164.3	187.0	205.3	220.3	252.5	0.0+Y	274.7	294.264
[keV]		J_f^π:		$\langle 2\rangle^+$	$\langle 2\rangle^+$		$\langle 1\rangle^+$			$\langle 1\rangle^+$
220.27(14)			26(15)							
274.72(14)			11(4)							
294.264(12)	$\langle 1\rangle^+$			6.4(5)						
53.4+Y								100		
329.3(6)									100	
336.44(17)			16(5)	7(4)		63(13)			14(7)	
355.479(12)	1^+			6.2(5)	1.9(2)		13(1)			1.0(3)
382.8(5)	$\langle 3^+\rangle$				100					
483.9(5)	$\langle 3^+\rangle$				100					
591.48(21)					100					
899.8(6)									100	

Energy levels and branching ratios [94Se07, 81Se18]. Part 3 **$^{134}_{57}$La**

E^*	J^π	Branching ratios in percentage							
	E^*_f:	53.4+Y	329.3	336.44	382.8	211.7+Y	483.9	241.0+Y	543.9
[keV]	J^π_f:				$\langle 3^+ \rangle$		$\langle 3^+ \rangle$		$\langle 4^+ \rangle$
467.1(7)					100				
211.7+Y		100							
490.3(5)					100				
241.0+Y		100							
543.9(5)	$\langle 4^+ \rangle$				100				
570.4(5)					59(29)		41(24)		
574.8(8)			100						
648.0(5)	$\langle 4^+ \rangle$				100				
659.7(7)									100
452.6+Y								100	
715.2(7)					100				
727.1(6)									100
746.4(3)				100					
501.7+Y						100			
762.8(7)					100				
518.7+Y						100		x	
668.7+Y	$\langle 8^+ \rangle$					32(16)		68(7)	
765.2+Y								100	
925.8+Y								100	
976.6+Y						50(20)			

Energy levels and branching ratios [94Se07, 81Se18]. Part 4 **$^{134}_{57}$La**

E^*	J^π	Branching ratios in percentage							
	E^*_f:	570.4	659.7	518.7+Y	668.7+Y	813.7+Y	976.6+Y	1195+Y	1234+Y
[keV]	J^π_f:				$\langle 8^+ \rangle$	$\langle 9^+ \rangle$		$\langle 10^+ \rangle$	
852.8(7)		100							
919.7(8)			100						
813.7+Y	$\langle 9^+ \rangle$				100				
976.6+Y				50(30)					
1194.8+Y	$\langle 10^+ \rangle$					100			
1234.0+Y				40(15)			60(04)		
1412.2+Y					56(22)	44(22)			
1471.6+Y					100				
1510.2+Y									100
1532.7+Y	$\langle 11^+ \rangle$					41(18)		59(18)	
1555.6+Y					100				
1710.4+Y								100	
1798.8+Y								x	
1969.3+Y	$\langle 12^+ \rangle$							x	
2133.1+Y									100

Energy levels and branching ratios [94Se07, 81Se18]. Part 5

$^{134}_{57}$La

E^*	J^π		Branching ratios in percentage					
		E_f^*:	1510+Y	1533+Y	1710+Y	1739+Y	1969+Y	2404+Y
[keV]		J_f^π:		$\langle 11^+ \rangle$			$\langle 12^+ \rangle$	$\langle 13^+ \rangle$
1739.3+Y			100					
1969.3+Y	$\langle 12^+ \rangle$			100				
2146.2+Y						100		
2320.9+Y					100			
2403.6+Y	$\langle 13^+ \rangle$			100			x	
2849.7+Y	$\langle 14^+ \rangle$						15(5)	85(10)

Energy levels and branching ratios [98Se07].

$^{135}_{57}$La

E^*	$2J^\pi$	L	I_α	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
						E_f^*:	0.0	119.5	206.5	265.5	300.1
[keV]		(τ,d)	*rel.*	Γ_{cm}		$2J_f^\pi$:	5^+	7^+	5^+	3^+	1^+
0.0	5^+		500	19.5(2) h	73Na08						
119.53(1)	7^+		300	4.0(1) ns	73Na08		100				
206.50(1)	5^+			0.52(3) ns			95(3)	5.1(2)			
265.55(1)	3^+			<0.08 ns			100	≈0.2	0.20(1)		
300.05(1)	1^+			<0.08 ns			94(2)		0.007(3)	6.5(5)	
583.48(14)	9^+						91	8.6(5)			
604.56(1)	3^+,5^+						78(4)	5.8(6)	13.9(5)	0.7(2)	1.7(1)
665.56(2)	5^+						16(3)	49(2)	8.8(9)	24(1)	2(1)
712.35(9)	$\langle 3^-,5^- \rangle$						100				
715.9(2)	$\langle 11^+ \rangle$							100			
783.60(1)	3^+						33(1)	0.27(6)	16.2(5)	43(2)	5.9(2)
785.7(2)	11^-	5	600	<20 ns	73Na08						
828.37(1)	3^+						88(3)		6.7(4)	2.5(3)	2.1(1)
872.31(1)	$\langle 1 \rangle^+$								9.0(6)	56(2)	31(1)
984.36(1)	3^+						2.9(3)		12.7(8)	13(1)	14(1)
993.43(6)	1^+–5^+						≈14			≈71	≈9
1038.52(2)	3^+,5^+						17(3)		13(4)	44(6)	14(1)
1171.42(1)	3^+						2.0(1)	0.7(1)	3.3(2)	16.1(5)	42(2)
1377.7(3)	$\langle 15^- \rangle$										
1385.5(3)	$\langle 13^+ \rangle$										
1437.2(3)	$\langle 13^- \rangle$										
1439.48(2)	3^+						7(1)		12(1)	23(2)	11(1)
1449.63(2)	1^+,3^+						0.38(8)		≈0.2	52(2)	32(2)
1479.66(3)	1^+,3^+						2.0(7)	13(7)	6(3)	36(5)	13(2)
1500.7(2)	$\langle 15^+ \rangle$										
1568.9(2)											
1599.25(3)	1^+,3^+						3(1)		4(1)	14(8)	27(3)
1757.2(3)	$\langle 15^- \rangle$										
1766.98(2)	3^+						20(2)		12(1)	10(1)	36(2)
1797.14(7)	1^+,3						38(4)			55(5)	7(3)

(continued) **$^{135}_{57}$La**

E^*	$2J^\pi$	L	I_α	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
						E_f^*: 0.0	119.5	206.5	265.5	300.1
[keV]		(τ,d)	*rel.*	Γ_{cm}		$2J_f^\pi$: 5^+	7^+	5^+	3^+	1^+
1850.73(15)	1,3					1.1(3)			57(5)	25(5)
1988.0(4)										
2121.5(3)	$\langle 17^- \rangle$									
2132.4(3)	$\langle 19^- \rangle$									
2232.6(3)	$\langle 19^- \rangle$									
2265.8(4)	$\langle 21^- \rangle$			<20 ns						
2304.0(4)	$\langle 17^+ \rangle$									
2400.8(4)	$\langle 19^+ \rangle$									
2494.2(3)	$\langle 19^+ \rangle$									
2507.1(3)	$\langle 19^+ \rangle$									
2626.3(4)	$\langle 21^+ \rangle$									
2735.5(3)	$\langle 23^- \rangle$			25.9(15) ns						
2795.7(3)	$\langle 21^- \rangle$									
2811.3(4)	$\langle 23^+ \rangle$									
2973.2(4)	$\langle 25^- \rangle$									
3079.3(4)	$\langle 25^+ \rangle$									
3105.6(3)	$\langle 23^- \rangle$									
3170.0(4)										
3181.0(4)	$\langle 23^- \rangle$									
3438.3(4)	$\langle 27^- \rangle$									
3500.0(3)	$\langle 25^- \rangle$									
3522.5(5)	$\langle 27^+ \rangle$									
3638.6(4)	$\langle 27^- \rangle$									
3837.2(4)	$\langle 27^- \rangle$									
3890.5(5)	$\langle 29^+ \rangle$									
3959.0(4)	$\langle 29^- \rangle$									
4262.6(4)	$\langle 29^- \rangle$									
4318.5(4)	$\langle 31^- \rangle$									
4552.7(4)										
4695.2(4)	$\langle 31^- \rangle$									
4820.6(5)	$\langle 33^- \rangle$									
5001.2(5)										
5209.4(4)	$\langle 33^- \rangle$									
5379.1(5)	$\langle 35^- \rangle$									
5461.4(4)	$\langle 35^- \rangle$									
5564										
5772.4(5)	$\langle 37^- \rangle$									
6158.6(5)	$\langle 39^- \rangle$									
6630.6(6)	$\langle 41^- \rangle$									
7159.6(6)	$\langle 43^- \rangle$									
12815	$\langle 3^+ \rangle$									
13053	$\langle 1^+ \rangle$									
14222	$\langle 7^- \rangle$									
14360	$\langle 3^- \rangle$									
14767	$\langle 1^- \rangle$									

(continued) **$^{135}_{57}$La**

E^*	$2J^\pi$	L	I_α	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
					E^*_f:	0.0	119.5	206.5	265.5	300.1
[keV]		(τ,d)	*rel.*	Γ_{cm}	$2J^\pi_f$:	5^+	7^+	5^+	3^+	1^+
14936										
15514	$\langle 1^-,3^-\rangle$									
15773										
		73Na08	73Na08		Ref.					

I_α in the (α,t) reaction was estimated in units number of triton tracks per 1mm strip [73Na08].

Energy levels and branching ratios [98Se07]. Part 2 **$^{135}_{57}$La**

E^*	$2J^\pi$					Branching ratios in percentage						
		E^*_f:	583.5	604.6	665.6	712.4	715.9	783.6	785.7	828.4	872.3	984.4
[keV]		$2J^\pi_f$:	9^+	$3^+,5^+$	5^+	$\langle 3^-,5^-\rangle$	$\langle 11^+\rangle$	3^+	11^-	3^+	$\langle 1\rangle^+$	3^+
665.56(2)	5^+			0.8(2)								
783.60(1)	3^+			0.09(1)	1.18(6)							
785.7(2)	11^-		100									
828.37(1)	3^+			≈0.4	0.43(7)	0.37(5)						
872.31(1)	$\langle 1\rangle^+$			1.9(1)				1.74(5)		0.11(1)		
984.36(1)	3^+			54(2)	1.2(2)			1.7(2)		≈0.3	0.3(1)	
993.43(6)	1^+–5^+					≈5						
1038.52(2)	$3^+,5^+$			≈3		≈4				≈4		
1171.42(1)	3^+			7.7(3)	0.67(5)	≈0.2		7.7(2)		1.3(1)	16(2)	0.26(5)
1377.7(3)	$\langle 15^-\rangle$								100			
1385.5(3)	$\langle 13^+\rangle$		100									
1437.2(3)	$\langle 13^-\rangle$								100			
1439.48(2)	3^+			14(2)	27(3)	≈1		≈1		3(1)		
1449.63(2)	$1^+,3^+$			6.2(6)				≈2			2.4(10)	4.4(10)
1479.66(3)	$1^+,3^+$			≈21						3.0(2)		7(3)
1500.7(2)	$\langle 15^+\rangle$		≤6				100		≤6			
1568.9(2)											100	
1599.25(3)	$1^+,3^+$			≈3	13(3)			12(2)		16(5)	≈5	
1766.98(2)	3^+				4(1)			≈1		2.6(6)	6.7(6)	≈4
1850.73(15)	1,3							17(4)				

Energy levels and branching ratios [98Se07]. Part 3 **$^{135}_{57}$La**

E^*	$2J^\pi$					Branching ratios in percentage						
		E^*_f:	993.4	1038.5	1377.7	1385.5	1437.2	1500.7	1757.2	2121.5	2132.4	2232.6
[keV]		$2J^\pi_f$:		$3^+,5^+$	$\langle 15^-\rangle$	$\langle 13^+\rangle$	$\langle 13^-\rangle$	$\langle 15^+\rangle$	$\langle 15^-\rangle$	$\langle 17^-\rangle$	$\langle 19^-\rangle$	$\langle 19^-\rangle$
1171.42(1)	3^+		0.8	1.4(2)								
1439.48(2)	3^+			≈1								

(continued) **$^{135}_{57}$La**

E^*	$2J^\pi$					Branching ratios in percentage						
		E_f^*:	993.4	1038.5	1377.7	1385.5	1437.2	1500.7	1757.2	2121.5	2132.4	2232.6
[keV]		$2J_f^\pi$:		$3^+,5^+$	$\langle 15^- \rangle$	$\langle 13^+ \rangle$	$\langle 13^- \rangle$	$\langle 15^+ \rangle$	$\langle 15^- \rangle$	$\langle 17^- \rangle$	$\langle 19^- \rangle$	$\langle 19^- \rangle$
1599.25(3)	$1^+,3^+$			≈3								
1757.2(3)	$\langle 15^- \rangle$				90(1)		8.5(17)	1.0(5)				
1766.98(2)	3^+			≈4								
1988.0(4)							100					
2121.5(3)	$\langle 17^- \rangle$				100		≤11					
2132.4(3)	$\langle 19^- \rangle$								100			
2232.6(3)	$\langle 19^- \rangle$				100							
2265.8(4)	$\langle 21^- \rangle$										100	
2304.0(4)	$\langle 17^+ \rangle$					100						
2400.8(4)	$\langle 19^+ \rangle$							100				
2494.2(3)	$\langle 19^+ \rangle$							100				
2507.1(3)	$\langle 19^+ \rangle$							100				
2795.7(3)	$\langle 21^- \rangle$									100		
3105.6(3)	$\langle 23^- \rangle$											100
3181.0(4)	$\langle 23^- \rangle$											100

Energy levels and branching ratios [98Se07]. Part 4 **$^{135}_{57}$La**

E^*	$2J^\pi$					Branching ratios in percentage						
		E_f^*:	2265.8	2494.2	2507.1	2626.3	2735.5	2795.7	2811.3	2973.2	3079.3	3105.6
[keV]		$2J_f^\pi$:	$\langle 21^- \rangle$	$\langle 19^+ \rangle$	$\langle 19^+ \rangle$	$\langle 21^+ \rangle$	$\langle 23^- \rangle$	$\langle 21^- \rangle$	$\langle 23^+ \rangle$	$\langle 25^- \rangle$	$\langle 25^+ \rangle$	$\langle 23^- \rangle$
2626.3(4)	$\langle 21^+ \rangle$			64(18)	36(24)							
2735.5(3)	$\langle 23^- \rangle$		100									
2811.3(4)	$\langle 23^+ \rangle$					100						
2973.2(4)	$\langle 25^- \rangle$						100					
3079.3(4)	$\langle 25^+ \rangle$								100			
3170.0(4)							65(5)					35(7)
3438.3(4)	$\langle 27^- \rangle$						63(2)			37(3)		
3500.0(3)	$\langle 25^- \rangle$						16(5)	x		10(3)		18(2)
3522.5(5)	$\langle 27^+ \rangle$										100	
3638.6(4)	$\langle 27^- \rangle$									42(1)		
3837.2(4)	$\langle 27^- \rangle$											100(37)

Energy levels and branching ratios [98Se07]. Part 5 **$^{135}_{57}$La**

E^*	$2J^\pi$					Branching ratios in percentage						
		E_f^*:	3170.0	3181.0	3438.3	3500.0	3522.5	3638.6	3837.2	3959.0	4262.6	4318.5
[keV]		$2J_f^\pi$:		$\langle 23^- \rangle$	$\langle 27^- \rangle$	$\langle 25^- \rangle$	$\langle 27^+ \rangle$	$\langle 27^- \rangle$	$\langle 27^- \rangle$	$\langle 29^- \rangle$	$\langle 29^- \rangle$	$\langle 31^- \rangle$
3500.0(3)	$\langle 25^- \rangle$		56(1)									
3638.6(4)	$\langle 27^- \rangle$					58(2)						
3837.2(4)	$\langle 27^- \rangle$			≤26								
3890.5(5)	$\langle 29^+ \rangle$						100					
3959.0(4)	$\langle 29^- \rangle$							100				
4262.6(4)	$\langle 29^- \rangle$							100				
4318.5(4)	$\langle 31^- \rangle$									100		
4552.7(4)					100							
4695.2(4)	$\langle 31^- \rangle$								100			
4820.6(5)	$\langle 33^- \rangle$											100
5209.4(4)	$\langle 33^- \rangle$									100	≤38	
5461.4(4)	$\langle 35^- \rangle$											22(16)

Energy levels and branching ratios [98Se07]. Part 6 **$^{135}_{57}$La**

E^*	$2J^\pi$				Branching ratios in percentage					
		E_f^*:	4552.7	4820.6	5001.2	5209.4	5461.4	5772.4	6158.6	6630.6
[keV]		$2J_f^\pi$:		$\langle 33^- \rangle$		$\langle 33^- \rangle$	$\langle 35^- \rangle$	$\langle 37^- \rangle$	$\langle 39^- \rangle$	$\langle 41^- \rangle$
5001.2(5)			100							
5379.1(5)	$\langle 35^- \rangle$			100						
5461.4(4)	$\langle 35^- \rangle$					78(9)				
5564					x					
5772.4(5)	$\langle 37^- \rangle$						100			
6158.6(5)	$\langle 39^- \rangle$							100		
6630.6(6)	$\langle 41^- \rangle$								100	
7159.6(6)	$\langle 43^- \rangle$									100

Energy levels and branching ratios [02So05]. **$^{136}_{57}$La**

E^*	J^π	L	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
					E_f^*:	0.0	21.80	44.33	140.0	158.3
[keV]		(τ,d)	Γ_{cm}		J_f^π:	1^+	$\langle 2 \rangle^+$	$\langle 3 \rangle^+$	$\langle 4 \rangle^+$	$\langle 5 \rangle^+$
0.0	1^+	2*	9.87(3) m	77KhZZ						
21.80(20)	$\langle 2 \rangle^+$	2*		77KhZZ		100				
44.33(25)	$\langle 3 \rangle^+$	2*		77KhZZ			100			
140.0(3)	$\langle 4 \rangle^+$	4**		77KhZZ				100		
158.3	$\langle 5 \rangle^+$	4**		77KhZZ					100	
172.03(25)	$\langle 3 \rangle$						38(19)	62(28)		
173.5(4)	$\langle 5 \rangle$	4**		77KhZZ					100	

(continued) **$^{136}_{57}$La**

E^*	J^π	L	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
				E_f^*:	0.0	21.80	44.33	140.0	158.3
[keV]		(τ,d)	Γ_{cm}	J_f^π:	1^+	$\langle 2\rangle^+$	$\langle 3\rangle^+$	$\langle 4\rangle^+$	$\langle 5\rangle^+$
211.98(15)	$\langle 2\rangle$				100				
230.1	$\langle 6\rangle$								100
241									
257	$\langle 4\rangle^+$	2*		77KhZZ					
270.14(25)	$\langle 3\rangle$		17(4) ns			36(17)		40(19)	
274.6(3)							50(25)		
304	2^+–6^+	4**		77KhZZ					
331.6(3)							52(26)		
342.6(4)									
346.0(6)									
381.5(4)	$\langle 4\rangle$								
393.0(6)									
414.19(16)	$\langle 3\rangle$				70(35)				
436.9(4)									
548.00(19)					46(23)				
563.8(3)	$\langle 3\rangle$				63(31)				
570.9(3)					68(32)				
403									
484									
594									
617									
629									
659.0(6)									
704									
710.7(4)									
726									
749.23(19)	$\langle 3\rangle$				59(29)				
752.6(4)									
798									
829									
840									
945.5(3)									
972									
988.1(3)									
999									
1006									
1028									
1076									
1114									
1155									
1180									
1211									
1247									
1257									
230+X	$\langle 8^+\rangle$		114(3) ms						

(continued) **$^{136}_{57}$La**

E^*	J^π	L	$T_{1/2}$ orRef.		Branching ratios in percentage				
				E^*_f:	0.0	21.80	44.33	140.0	158.3
[keV]		(τ,d)	Γ_{cm}	J^π_f:	1^+	$\langle 2\rangle^+$	$\langle 3\rangle^+$	$\langle 4\rangle^+$	$\langle 5\rangle^+$
259.1+X	$\langle 6^+\rangle$								
311.9+X	$\langle 9^-\rangle$								
510.1+X	$\langle 7^-\rangle$								
636.0+X									
992.8+X	$\langle 11^-\rangle$								
1095.1+X	$\langle 8^+\rangle$								
1251.3+X	$\langle 9^+\rangle$								
1491.4+X	$\langle 10^-\rangle$								
1657.7+X	$\langle 10^+\rangle$								
2082.0+X	$\langle 13^-\rangle$								
2083.0+X	$\langle 11^+\rangle$								
2339.2+X	$\langle 11^-\rangle$								
2341.4+X	$\langle 12^+\rangle$								
2550.3+X	$\langle 13^-\rangle$								
2581.7+X	$\langle 14^-\rangle$								
2662.0+X	$\langle 12^+\rangle$								
2760.6+X	$\langle 14^-\rangle$								
2780.7+X	$\langle 13^+\rangle$								
2937.7+X	$\langle 15^-\rangle$								
2953.7+X	$\langle 15^-\rangle$								
3039.6+X	$\langle 15^-\rangle$								
3092.3+X									
3129.7+X	$\langle 16^-\rangle$								
3187.7+X	$\langle 14^+\rangle$								
3284.0+X	$\langle 14^+\rangle$								
3360.5+X									
3375.6+X	$\langle 16^-\rangle$								
3460.0+X	$\langle 15^+\rangle$								
3790.5+X									
3813.6+X	$\langle 17^-\rangle$								
3832.0+X	$\langle 16^+\rangle$								
4035.7+X	$\langle 15^+\rangle$								
4363+X	$\langle 18^-\rangle$								
4632.7+X	$\langle 16^+\rangle$								
5045+X	$\langle 19^-\rangle$								
5479+X	$\langle 17^+\rangle$								

Additional data on this isotope can be found in [05Zh16, 01Cy01, 99Dr18].

* According to [77KhZZ, 02So05] about 90% of the L(p)=2 strength is concentrated in these four levels.

** The L(p)=4 strength appears mostly in these four levels.

The level systematics of positive parity bands in ^{132,134,136}La can be found in [05Zh16].

The uncertain energy parameter X still prevents the production of the total level scheme [05Zh16].

Energy levels and branching ratios [02So05]. Part 2 **$^{136}_{57}$La**

E^*	J^π		Branching ratios in percentage									
		E_f^*:	172.03	173.5	211.98	230.1	270.14	381.5	230+X	259.1+X	311.9+X	510.1+X
[keV]		J_f^π:	⟨3⟩	⟨5⟩	⟨2⟩	⟨6⟩	⟨3⟩	⟨4⟩	⟨8^+⟩	⟨6^+⟩	⟨9^-⟩	⟨7^-⟩
270.14(25)	⟨3⟩		24(12)									
274.6(3)			50(25)									
331.6(3)			48(24)									
342.6(4)							100					
346.0(6)			100									
381.5(4)	⟨4⟩						100					
393.0(6)					100							
414.19(16)	⟨3⟩				30(15)							
436.9(4)			100									
548.00(19)					54(27)							
563.8(3)	⟨3⟩				37(19)							
570.9(3)					32(16)							
659.0(6)					100							
710.7(4)								100				
749.23(19)	⟨3⟩				41(21)							
752.6(4)							100					
945.5(3)					100							
988.1(3)					100							
230+X	⟨8^+⟩			x		x						
311.9+X	⟨9^-⟩								x			
510.1+X	⟨7^-⟩								x			
636.0+X											x	
992.8+X	⟨11^-⟩										x	
1095.1+X	⟨8^+⟩									x		x

Energy levels and branching ratios [02So05]. Part 3 **$^{136}_{57}$La**

E^*	J^π		Branching ratios in percentage									
		E_f^*:	636.0+X	992.8+X	1095+X	1251+X	1491+X	1658+X	2082+X	2083+X	2341+X	2550+X
[keV]		J_f^π:		⟨11^-⟩	⟨8^+⟩	⟨9^+⟩	⟨10^-⟩	⟨10^+⟩	⟨13^-⟩	⟨11^+⟩	⟨12^+⟩	⟨13^-⟩
1095.1+X	⟨8^+⟩		x									
1251.3+X	⟨9^+⟩				x							
1491.4+X	⟨10^-⟩			x								
1657.7+X	⟨10^+⟩					x						
2082.0+X	⟨13^-⟩			x								
2083.0+X	⟨11^+⟩					x		x				
2339.2+X	⟨11^-⟩						x		x			
2341.4+X	⟨12^+⟩							x		x		
2550.3+X	⟨13^-⟩						x	x				
2581.7+X	⟨14^-⟩								x			
2662.0+X	⟨12^+⟩									x		
2760.6+X	⟨14^-⟩									x		x

(continued) **$^{136}_{57}$La**

E^*	J^π	Branching ratios in percentage										
	E_f^*:	636.0+X	992.8+X	1095+X	1251+X	1491+X	1658+X	2082+X	2083+X	2341+X	2550+X	
[keV]	J_f^π:		$\langle 11^- \rangle$	$\langle 8^+ \rangle$	$\langle 9^+ \rangle$	$\langle 10^- \rangle$	$\langle 10^+ \rangle$	$\langle 13^- \rangle$	$\langle 11^+ \rangle$	$\langle 12^+ \rangle$	$\langle 13^- \rangle$	
2780.7+X	$\langle 13^+ \rangle$									x		
3092.3+X								x				
3284.0+X	$\langle 14^+ \rangle$									x		

Energy levels and branching ratios [02So05]. Part 4 **$^{136}_{57}$La**

E^*	J^π	Branching ratios in percentage									
	E_f^*:	2582+X	2761+X	2781+X	2954+X	3040+X	3092+X	3188+X	3284+X	3361+X	3376+X
[keV]	J_f^π:	$\langle 14^- \rangle$	$\langle 14^- \rangle$	$\langle 13^+ \rangle$	$\langle 15^- \rangle$	$\langle 15^- \rangle$		$\langle 14^+ \rangle$	$\langle 14^+ \rangle$		$\langle 16^- \rangle$
2937.7+X	$\langle 15^- \rangle$	x									
2953.7+X	$\langle 15^- \rangle$	x									
3039.6+X	$\langle 15^- \rangle$		x								
3129.7+X	$\langle 16^- \rangle$				x						
3187.7+X	$\langle 14^+ \rangle$			x							
3284.0+X	$\langle 14^+ \rangle$			x							
3360.5+X		x					x				
3375.6+X	$\langle 16^- \rangle$					x					
3460.0+X	$\langle 15^+ \rangle$								x		
3790.5+X										x	
3813.6+X	$\langle 17^- \rangle$										x
4035.7+X	$\langle 15^+ \rangle$							x			

Energy levels and branching ratios [02So05]. Part 5 **$^{136}_{57}$La**

E^*	J^π	Branching ratios in percentage				
	E_f^*:	3460+X	3814+X	4036+X	4363+X	4633+X
[keV]	J_f^π:	$\langle 15^+ \rangle$	$\langle 17^- \rangle$	$\langle 15^+ \rangle$	$\langle 18^- \rangle$	$\langle 16^+ \rangle$
3832.0+X	$\langle 16^+ \rangle$	x				
4363+X	$\langle 18^- \rangle$		x			
4632.7+X	$\langle 16^+ \rangle$			x		
5045+X	$\langle 19^- \rangle$				x	
5479+X	$\langle 17^+ \rangle$					x

Energy levels and branching ratios [94Tu02]. **$^{137}_{57}$La**

E^*	$2J^\pi$	I_α	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
				E_f^*:	0.0	10.56	447.1	493.0	641.9
[keV]		*rel.*	Γ_{cm}	$2J_f^\pi$:	7^+	5^+	5^+	$\langle 3\rangle^+$	1^+
0.0	7^+	400	60000(2) yr	73Na08					
10.56(5)	5^+	incl	89(4) ns	73Na08	100				
447.15(8)	5^+				87(4)	13.0(4)			
493.03(10)	$\langle 3\rangle^+$				19(1)	81(3)			
641.94(8)	1^+					94(5)		6.3(25)	
709.30(11)	$\langle 3\rangle^+$				3.3(6)	97(5)			
762.30(10)	11^+				100				
781.55(13)	$\langle 7\rangle^+$				33(4)	67(4)	x		
835.30(12)	9^+				19(1)	81(4)			
917.42(17)	9^+				82(14)	18(3)			
926.35(13)	5^+				22(1)	34(1)	8	34(1)	
1004.4(2)	11^-	400	≤0.5 ns	73Na08	4.7(6)	0.42(6)			
1171.4(3)	$\langle 1^+,3^-\rangle$					43(4)	21(10)	26(10)	10(5)
1174.4								100	
1255.1									
1314.2							100		
1365.0								100	
1473.6	$\langle 7\rangle^+$								
1535.1									
1651.6	$\langle 9\rangle^-$								
1723.0	13^+								
1728.2	13^-								
1786.3	15^-								
1790.9	15^+								
1801.1									
1863.5	$\langle 15\rangle$								
1869.5	19^-		364(5) ns						
1880.9									
1894.4									
1962.1									
1973.3									
2009.6									
2025									
2053.2									
2064									
2100.9									
2104									
2155									
2206									
2337.0									
2415									
2473									
2583									
2687									
2771									

(continued) **$^{137}_{57}$La**

E^*	$2J^\pi$	I_α	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
					E_f^*: 0.0	10.56	447.1	493.0	641.9
[keV]		*rel.*	Γ_{cm}		$2J_f^\pi$: 7^+	5^+	5^+	$\langle 3\rangle^+$	1^+
2869									
2931									
3002									
3117									
3191									
3249									
3300									
3434									
3539									
7846	$\langle 3^+\rangle$								
8133	$\langle 1^+\rangle$								
9609	$\langle 7^-\rangle$								
9985	$\langle 3^-\rangle$								
10461	$\langle 1^-\rangle$								
10636	$\langle 5^-,7^-\rangle$								
11130	$\langle 5^-,7^-\rangle$								
11188	$\langle 1^-,3^-\rangle$								
		73Na08		Ref.					

I_α in the (α,t) reaction was estimated in units number of triton tracks per 1mm strip [73Na08].
Data for this isotope are considered in vol. LB I/18B.

Energy levels and branching ratios [94Tu02]. Part 2 **$^{137}_{57}$La**

E^*	$2J^\pi$	Branching ratios in percentage									
	E_f^*:	709.3	762.3	781.5	835.30	917.42	1004.44	1723.0	1728.2	1786.3	1790.9
[keV]	$2J_f^\pi$:	$\langle 3\rangle^+$	11^+	$\langle 7\rangle^+$	9^+	9^+	11^-	13^+	13^-	15^-	15^+
835.30(12)	9^+			x							
926.35(13)	5^+	2.6(3)		x							
1004.4(2)	11^-				93(6)	1.9(3)					
1255.1							100				
1473.6	$\langle 7\rangle^+$		100								
1535.1				100							
1651.6	$\langle 9\rangle^-$						100				
1723.0	13^+		x		x						
1728.2	13^-						100				
1786.3	15^-						x		x		
1790.9	15^+		100								
1801.1							100				
1863.5	$\langle 15\rangle$							x			x
1869.5	19^-									100	
1880.9										100	
1894.4							100				

(continued) **$^{137}_{57}$La**

E^*	$2J^\pi$	Branching ratios in percentage									
	E_f^*:	709.3	762.3	781.5	835.30	917.42	1004.44	1723.0	1728.2	1786.3	1790.9
[keV]	$2J_f^\pi$:	$\langle 3\rangle^+$	11^+	$\langle 7\rangle^+$	9^+	9^+	11^-	13^+	13^-	15^-	15^+
1962.1							100				
1973.3							100				
2053.2											100

Energy levels and branching ratios [94Tu02]. Part 3 **$^{137}_{57}$La**

E^*	$2J^\pi$	Branching ratios in percentage				
	E_f^*:	1863.5	1880.9	1894.4	1962.1	
[keV]	$2J_f^\pi$:	$\langle 15\rangle$				
2009.6		100			x	
2100.9				100		
2337.0			100			

Energy levels and branching ratios [03So13]. **$^{138}_{57}$La**

E^*	J^π	L	S_N	L	S_N	S_{pd}	L	S_N	$T_{1/2}$ or	Ref.
[keV]		(τ,d)	(τ,d)	(p,d)	(p,d)	*rel.*	(d,t)	(d,t)	Γ_{cm}	
0.0	5^+	4	1.3(1)	2	0.79	1.48	2	1.18(5)	$1.02(1)\cdot10^{11}$ yr	75IsZY
72.57(3)	$\langle 3\rangle^+$	2+4	0.13+0.4	2+0	0.26+0.18	0.5+0.3	0	0.26(9)	116(5) ns	73He02
							+2	+0.5(2)		75IsZY
116.17(6)	$\langle 2\rangle^+$	2+4	0.24+0.8	2	0.22	0.41	2	0.33(2)		75IsZY
161.18(6)	$\langle 3\rangle^+$	2+4	0.84+1.7	2	0.055	0.10	0	0.03(1)		75IsZY
							+2	0.04(2)		75IsZY
192.19(5)	$\langle 2\rangle^+$	2+4	0.45+1.0	2+0	0.03+0.04	0.06+0.08	2	0.16(2)		75IsZY
230.41(7)	$\langle 4\rangle^+$	4	0.4(1)	2	0.59	1.11	2	0.85(8)		75IsZY
292.98(7)	$\langle 1\rangle^+$	2	0.65(5)							
413.31(6)	$\langle 3\rangle^+$			2+0	0.08+0.19	0.15+0.36	0	0.26(12)		75IsZY
							+2	0.16(8)		75IsZY
479.34(17)	$\langle 4\rangle^+$	2	0.77(8)	2+0	0.02+0.31	0.04+0.58	0	0.49(7)		75IsZY
510.45(6)	$\langle 3\rangle^+$						0	≈0.2*		75IsZY
518.68(16)	$\langle 4\rangle^+$	2+4	0.89+1.5	2+0	0.02+0.40	0.03+0.75	0	≈0.4*		75IsZY
642.34(9)	$\langle 2\rangle^+$	0	0.04(1)							75IsZY
737.69(9)	$\langle 2\rangle^-$						5	1.12(11)		75IsZY
738.7(2)	$\langle 4\rangle^-$									
823.37(12)	$\langle 3\rangle^-$						5	0.81(8)		75IsZY
836(1)	$\langle 7,8\rangle^-$						5	1.65(12)		75IsZY
842.79(16)										
888(2)										

(continued) **$^{138}_{57}$La**

E^* [keV]	J^π	L (τ,d)	S_N (τ,d)	L (p,d)	S_N (p,d)	S_{pd} *rel.*	L (d,t)	S_N (d,t)	$T_{1/2}$ or Γ_{cm}	Ref.
900.6(3)	$\langle 4\rangle^-$						5	0.79(9)		75IsZY
929(3)										
936.9(5)	$\langle 5\rangle^-$						5	1.43(15)		75IsZY
947.79(17)										
961.4(5)	$\langle 6\rangle^-$						5	1.42(15)		75IsZY
1033(2)										
1057.9(2)	$1^+,2^+$	0	0.10(1)							75IsZY
1067(2)	$\langle 7,8\rangle^-$						5	1.61(11)		75IsZY
1096(2)	$1^+,2^+$	0	0.05(1)							75IsZY
1102.6(2)										
1150(3)										
1155(2)										
1178(5)	$1^+,2^+$	0	0.03(1)							75IsZY
1200.3(3)										
1228.5(3)	$1^+,2^+$	0	0.05(2)							75IsZY
1243.0(3)	$\langle 4\rangle^-$	5	2.0(2)							75IsZY
1255(1)	$\langle 9\rangle^-$						5	2.66(22)		
1267(1)	$\langle 5,6\rangle^-$	5	2.4(3)							75IsZY
1302(2)										
1344(3)										
1358.7(3)	$\langle 2\rangle^+$	0	0.08(2)							75IsZY
1375(2)										
1385.0(3)										
1425(2)	$1^+,2^+$	0	0.03(1)							75IsZY
1455(2)	$1^+,2^+$	0	0.16(5)							75IsZY
1466(2)										
1490.5(3)										
1520(3)										
1531(2)	$1^+,2^+$									
1545(3)										
1570(2)	$1^+,2^+$	0	0.09(2)							75IsZY
1581(2)	$\langle 5,6\rangle^-$	5	2.7(9)							75IsZY
1599(2)										
1624(4)	$1^+,2^+$	0	0.11(2)							75IsZY
1645(2)	$\langle 7\rangle^-$	5	3.2(4)							75IsZY
1656(3)										
1676(3)										
1687(2)	$1^+,2^+$	0	0.14(3)							75IsZY
1707(2)										
1713(2)	X^+	2	0.31(6)							75IsZY
1722.5(10)										
1733.1(4)	$1^+,2^+$	0	0.20(4)							75IsZY
1739(2)										
1756(4)	X^+	2	0.11(2)							75IsZY
1788.5(7)	X^+	2	0.12(2)							75IsZY

(continued) **$^{138}_{57}$La**

E^*	J^π	L	S_N	L	S_N	S_{pd}	L	S_N	$T_{1/2}$ or	Ref.
[keV]		(τ,d)	(τ,d)	(p,d)	(p,d)	*rel.*	(d,t)	(d,t)	Γ_{cm}	
			75IsZY		73He02	73He02		75IsZY		Ref.
			03So13					03So13		Ref.

Abundance: 0.090(1) %.
* For the levels at E^*=510–518 keV total values S=0.60(11) (L=0) and S<0.01 (L=2) were given in [75IsZY].

Energy levels and branching ratios [03So13]. Part 2 **$^{138}_{57}$La**

E^*	J^π	Branching ratios in percentage								
	E_f^*:	0.0	72.57	116.2	161.2	192.2	230.4	293.0	413.3	479.34
[keV]	J_f^π:	5^+	$\langle 3\rangle^+$	$\langle 2\rangle^+$	$\langle 3\rangle^+$	$\langle 2\rangle^+$	$\langle 4\rangle^+$	$\langle 1\rangle^+$	$\langle 3\rangle^+$	$\langle 4\rangle^+$
72.57(3)	$\langle 3\rangle^+$	100								
116.17(6)	$\langle 2\rangle^+$		100							
161.18(6)	$\langle 3\rangle^+$		88(7)	12(4)						
192.19(5)	$\langle 2\rangle^+$		29(2)	71(6)						
230.41(7)	$\langle 4\rangle^+$	96(8)	4.4(6)							
292.98(7)	$\langle 1\rangle^+$			82(7)		18(2)				
413.31(6)	$\langle 3\rangle^+$		68(5)	5.7(5)		23(2)	3.0(3)			
479.34(17)	$\langle 4\rangle^+$	16(2)	78(6)				6.0(9)			
510.45(6)	$\langle 3\rangle^+$		40(4)	17(1)		39(3)	3.1(6)			
518.68(16)	$\langle 4\rangle^+$	11(2)	76(8)		13(2)					
642.34(9)	$\langle 2\rangle^+$		23(2)	4.6(4)	39(6)	13(1)			17(2)	
737.69(9)	$\langle 2\rangle^-$				49(4)	11(1)		24(2)	3.0(3)	
738.7(2)	$\langle 4\rangle^-$	100								
842.79(16)		84(8)					16(3)			
900.6(3)	$\langle 4\rangle^-$	64(6)					36(4)			
936.9(5)	$\langle 5\rangle^-$						[100]			
947.79(17)							78(8)			
961.4(5)	$\langle 6\rangle^-$	100								
1057.9(2)	$1^+,2^+$		48(5)	20(2)		16(1)		17(2)		
1102.6(2)					46(5)	54(5)				
1200.3(3)		44(7)								
1228.5(3)	$1^+,2^+$			32(3)	30(3)			38(3)		
1243.0(3)	$\langle 4\rangle^-$	47(11)								
1385.0(3)									32(7)	
1490.5(3)									82(8)	
1722.5(10)								x	x	
1788.5(7)	X^+									36(5)

Energy levels and branching ratios [03So13]. Part 3

$^{138}_{57}$La

E^*	J^π	Branching ratios in percentage							
	E_f^*:	510.45	518.68	642.34	737.69	823.37	842.79	947.79	961.4
[keV]	J_f^π:	$\langle 3\rangle^+$	$\langle 4\rangle^+$	$\langle 2\rangle^+$	$\langle 2\rangle^-$	$\langle 3\rangle^-$			$\langle 6\rangle^-$
642.34(9)	$\langle 2\rangle^+$	3.8(4)							
737.69(9)	$\langle 2\rangle^-$	12(1)							
823.37(12)	$\langle 3\rangle^-$				100				
947.79(17)							22(2)		
1200.3(3)			56(6)						
1243.0(3)	$\langle 4\rangle^-$							53(5)	
1358.7(3)	$\langle 2\rangle^+$				75(13)	25(7)			
1385.0(3)		68(7)							
1490.5(3)			18(4)						
1733.1(4)	$1^+,2^+$			47(5)		53(5)			
1788.5(7)	X^+		33(5)						30(5)

Energy levels and branching ratios [01Bu16].

$^{139}_{57}$La

E^*	$2J^\pi$	L	$S_{\tau d}$	$S_{\tau d}$	I_α	C^2S	L	σ (d,p)	$S_{d\tau}$	$S_{d\tau}$	C^2S	${\Gamma_\circ}^2/\Gamma$	$\Gamma_\circ$	Ref.
[keV]			*mod.*	*stand*	*rel.*	(^{7}Li,^{6}He)	(d,p)	μb/sr	*mod.*	*stand*	(d,τ)	[meV]	[meV]	
0.0	7^+	4	0.43	0.54	100	0.72(17)	2	277	6.21	6.07	5.65			80Cl08
165.858(1)	5^+	2	0.94	0.90	350	1.03(15)			1.71	1.29	1.53			71Wi04
1209.0(3)	1^+	0	0.09	0.10		0.14(4)			0.10	0.10	0.02			71Wi04
1219.0(2)	9^+													
1256.8(1)	$\langle 5\rangle^+$													
1381.3(1)	$\langle 9^+\rangle$													
1420(12)	$\langle 11\rangle^-$	5	0.84	0.71	350	1.19(22)					0.75			73Na08
1420.5(2)	$5^+,7^+$													
1476.4(2)	$\langle 9^+\rangle$													
1537.7(1)	$\langle 11^+\rangle$													
1537.9(2)	7^+							17						
1558.4(2)	$3^+,5^+$	2	0.06	0.07		0.06(2)					0.04			71Wi04
1578.0(1)	$5^+,7^+$	[2]												71Wi04
1579.8(8)	9	[0]												71Wi04
1683.3(3)	7^+													
1716.1(1)	5^+													
1761.2(3)														
1766.2(2)	$3^+,5^+$	2	0.73	0.83		1.22(18)								80Cl08
1780(15)	1^+	0	0.65	0.67		0.28(4)								80Cl08
1856.2(3)	$3^+,5^+$	2	0.26	0.30		0.43(8)								71Wi04
1892.9(11)														
1920.7(2)	$\langle 7^+\rangle$													
1940.9(2)	$\langle 7^+\rangle$													
1962.9(4)	$\langle 5\rangle^+$	2	0.16	0.19		0.28(6)					0.02			71Jo18
1820(4)														

(continued) **$^{139}_{57}$La**

E^* [keV]	$2J^\pi$	L	$S_{\tau d}$ *mod.*	$S_{\tau d}$ *stand*	I_α *rel.*	C^2S (^{7}Li,^{6}He)	L (d,p)	σ (d,p) μb/sr	$S_{d\tau}$ *mod.*	$S_{d\tau}$ *stand*	C^2S (d,τ)	$\Gamma_\circ{}^2/\Gamma$ [meV]	$\Gamma_\circ$ [meV]	Ref.
1837(4)														
2035*														
2060.5(5)														
2126(3)														
2157.9(11)														
2232(5)	$\langle 7,11\rangle$					0.24(8)								80Cl08
2240(12)	$3^+,5^+$	2	0.08	0.10		0.12(4)								71Wi04
2310(19)*	1^+	0	0.13	0.13		0.15(5)								71Wi04
2383*														
2401*						0.21(7)								80Cl08
2438*														
2466*														
2573*														
2597*														
2685	X^-													
2780*	$X^{\langle -\rangle}$													
2810*	$X^{\langle +\rangle}$													
2870*	X^+													
2890*	$X^{\langle -\rangle}$													
3147(4)								21						
3355(2)	X^-						3	384						71Du02
3375(2)	$\langle 15\rangle^-$						3	621						71Du02
3433(2)								33						
3485(2)	X^-						3	62						71Du02
3517(2)	X^-						3	308						71Du02
3555(2)	X^-							267						
3611(2)	X^-						3	47						71Du02
3688(2)	X^-						3	211						71Du02
3748(2)	X^-						3	144						71Du02
3785(2)	X^-						3	99						71Du02
3805(2)	X^-						3	404						71Du02
3841(2)								32						
3868(2)								19						
3905(2)	X^-						3	118						71Du02
3927(2)	$\langle 17\rangle^-$						3	948						71Du02
3952(2)	X^-						3	128						71Du02
3980(2)	X^-						3	174						71Du02
4014(2)	X^-						3	117						71Du02
4095(2)	X^-						3	108						71Du02
4148(2)	X^-						3	139						71Du02
4230(2)	X^-						3	87						71Du02
4336(2)	$X^{\langle -\rangle}$						$\langle 1+3\rangle$	244						71Du02
4394(2)	$X^{\langle -\rangle}$						$\langle 1+3\rangle$	29						71Du02
6019(1)	7^-											0.50(6)	25(8)	72Wo21
6114.0(4)	$9^{\langle -\rangle}$												22(11)*	70Sz01

(continued) **$^{139}_{57}$La**

E^*	$2J^\pi$	L	$S_{\tau d}$	$S_{\tau d}$	I_α	C^2S	L	σ (d,p)	$S_{d\tau}$	$S_{d\tau}$	C^2S	${\Gamma_\circ}^2/\Gamma$	$\Gamma_\circ$	Ref.
[keV]			*mod.*	*stand*	*rel.*	(^{7}Li,^{6}He)	(d,p)	μb/sr	*mod.*	*stand*	(d,τ)	[meV]	[meV]	
6417(2)	9^-											0.78(8)	63(8)	72Wo21
6759(2)	7												11(6)**	70Sz01
7279														
7632(4)	7^-											0.28(4)	47(6)	72Wo21
8527														
8582.1(8)	7,9													70Sz01
16181	$\langle 7^-\rangle$													
16811	$\langle 3^-\rangle$													
17267	$\langle 1^-\rangle$													
17485	$\langle 9^-\rangle$													
17615	$\langle 5^-\rangle$													
17755	$\langle 13^+\rangle$													
17822	$\langle 9^-\rangle$													
17872	$\langle 7^-\rangle$													
17891	$\langle 5^-\rangle$													
17961	$\langle 3^-\rangle$													
18020	$\langle 9^-\rangle$													
18123	$\langle 7^-\rangle$													
18143	$\langle 5^-\rangle$													
18296	$\langle 7^-\rangle$													
18338	$\langle 3^-\rangle$													
18362	$\langle 5^-\rangle$													
18367	$\langle 1^-\rangle$													
18516	$\langle 5^-\rangle$													
18630	$\langle 3^-\rangle$													
			71Wi04	71Wi04	73Na08	80Cl08		71Du02	71Du02	71Wi04	71Wi04	71Jo16	72Wo21	72Wo21	Ref.

Additional data on this isotope can be found in [93BeZW, 72Ba02, 70Mo30, 70Sc27].
Abundance: 99.910(1) %.
* Members of an unresolved multiplet [70Sc27].
** $\Gamma_\circ$ from [70Sc27].
I_α in (α,t) reaction was estimated in units number of triton tracks per 1mm strip [73Na08].
Two pairs of proton-transfer parameters $S_{\tau d}$=$d\sigma/d\Omega_{\rm exp}$/N($\tau$,d)(2J+1/2I+1)$d\sigma/d\Omega_{DWBA}$ and $S_{d\tau}$=$d\sigma/d\Omega_{exp}$/N(d,τ)$d\sigma/d\Omega_{DWBA}$ were given in [71Wi04] as "the standard" (*stand*, the second) and "the modified" (*mod.* values, see definitions therein).
C^2S for the (d,τ) reaction with assumed $2J^\pi$=3^+ for E^*=1560 keV are normalized to ΣC^2S=8 [71Jo16].
Cross sections of (d,p) reaction are for 45°, data for other four angles can be found in [71Du02].
Data for this isotope are considered in vol. LB I/18B.

Energy levels and branching ratios [01Bu16]. Part 2

$^{139}_{57}$La

E^*	$2J^\pi$	L	$T_{1/2}$ or	Ref.	Branching ratios in percentage							
					E_f^*:	0.0	165.8	1219.0	1256.8	1381.3	1420	1420.5
[keV]			Γ_{cm}		$2J_f^\pi$:	7^+	5^+	9^+	$\langle 5\rangle^+$	$\langle 9^+\rangle$	$\langle 11\rangle^-$	$5^+,7^+$
0.0	7^+	4	Stable	80Cl08								
165.858(1)	5^+	2	1.499(19) ns	71Wi04		100						
1209.0(3)	1^+	0		71Wi04			100					
1219.0(2)	9^+		0.57(5) ps			90.0(10)	10.0(10)					
1256.8(1)	$\langle 5\rangle^+$					42.0(10)	58.0(10)					
1381.3(1)	$\langle 9^+\rangle$					4.6(5)	95(10)					
1420(12)	$\langle 11\rangle^-$	5		73Na08								
1420.5(2)	$5^+,7^+$					91(9)	9.1(9)					
1476.4(2)	$\langle 9^+\rangle$					9.09(15)	91(5)					
1537.7(1)	$\langle 11^+\rangle$					100						
1537.9(2)	7^+		0.024(4) ps			50(2)	50(2)					
1558.4(2)	$3^+,5^+$	2		71Wi04		57(6)	43(4)					
1578.0(1)	$5^+,7^+$			71Wi04		100						
1579.8(8)	9			71Wi04		100						
1683.3(3)	7^+					100	<2					
1716.1(1)	5^+					100						≤56
1761.2(3)						3.7(13)	96(8)					
1766.2(2)	$3^+,5^+$	2		80Cl08		57(22)	43(9)					
1780(15)	1^+	0		80Cl08								
1856.2(3)	$3^+,5^+$	2		71Wi04			100					
1892.9(11)						100						
1920.7(2)	$\langle 7^+\rangle$					55(7)	45(5)					
1940.9(2)	$\langle 7^+\rangle$											
1962.9(4)	$\langle 5\rangle^+$	2		71Jo18			100					
1820(4)												
1837(4)												
2035*												
2060.5(5)						100	≤80					
2126(3)												
2157.9(11)												
2232(5)	$\langle 7,11\rangle$	4		80Cl08								
2240(12)	$3^+,5^+$	2		71Wi04								
2310(19)*	1^+	0		71Wi04								
2383*												
2401*		$\langle 5\rangle$		80Cl08								
2438*												
2466*												
2573*												
2597*												
2685	X^-											
2780*	$X^{\langle -\rangle}$											
2810*	$X^{\langle +\rangle}$											
2870*	X^+											
2890*	$X^{\langle -\rangle}$											
3147(4)												

(continued) **$^{139}_{57}$La**

E^* [keV]	$2J^\pi$	L	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage						
					E_f^*:	0.0	165.8	1219.0	1256.8	1381.3	1420	1420.5
					$2J_f^\pi$:	7^+	5^+	9^+	$\langle 5\rangle^+$	$\langle 9^+\rangle$	$\langle 11\rangle^-$	5^+,7^+
3355(2)	X^-			71Du02								
3375(2)	$\langle 15\rangle^-$			71Du02								
3433(2)												
3485(2)	X^-			71Du02								
3517(2)	X^-			71Du02								
3555(2)	X^-											
3611(2)	X^-			71Du02								
3688(2)	X^-			71Du02								
3748(2)	X^-			71Du02								
3785(2)	X^-			71Du02								
3805(2)	X^-			71Du02								
3841(2)												
3868(2)												
3905(2)	X^-			71Du02								
3927(2)	$\langle 17\rangle^-$			71Du02								
3952(2)	X^-			71Du02								
3980(2)	X^-			71Du02								
4014(2)	X^-			71Du02								
4095(2)	X^-			71Du02								
4148(2)	X^-			71Du02								
4230(2)	X^-			71Du02								
4336(2)	$X^{\langle -\rangle}$			71Du02								
4394(2)	$X^{\langle -\rangle}$			71Du02								
6019(1)	7^-		51(+14-6) meV	72Wo21		53	11.3	7.6				
6114.0(4)	$9^{\langle -\rangle}$		68(34) meV	70Sz01		39	≈0	7	<1	4	9	9
6417(2)	9^-		81(+13-7) meV	72Wo21		77(1)				2(1)	3(1)	3(1)
6759(2)	7			70Sz01		13(2)	26(2)	3(2)	16	18(2)		
7279						21						
7632(4)	7^-		0.17(4) eV	72Wo21		86(5)						
8527						70(4)		11(1)				
8582.1(8)	7,9			70Sz01		76(2)		17(8)				
16181	$\langle 7^-\rangle$		65.2(5) keV									
16811	$\langle 3^-\rangle$		98(1) keV									
17267	$\langle 1^-\rangle$		89(1) keV									
17485	$\langle 9^-\rangle$		48(4) keV									
17615	$\langle 5^-\rangle$		73(1) keV									
17755	$\langle 13^+\rangle$		34(9) keV									
17822	$\langle 9^-\rangle$		66(11) keV									
17872	$\langle 7^-\rangle$		76(3) keV									
17891	$\langle 5^-\rangle$		66(2) keV									
17961	$\langle 3^-\rangle$		57(6) keV									
18020	$\langle 9^-\rangle$		118 keV									
18123	$\langle 7^-\rangle$		95(11) keV									
18143	$\langle 5^-\rangle$		57(4) keV									
18296	$\langle 7^-\rangle$		64(5) keV									

(continued) **$^{139}_{57}$La**

E^*	$2J^\pi$	L	$T_{1/2}$ or	Ref.	Branching ratios in percentage						
					E^*_f:	0.0	165.8	1219.0	1256.8	1381.3	1420	1420.5
[keV]			Γ_{cm}		$2J^\pi_f$:	7^+	5^+	9^+	$\langle 5\rangle^+$	$\langle 9^+\rangle$	$\langle 11\rangle^-$	$5^+,7^+$
18338	$\langle 3^-\rangle$		94(5) keV									
18362	$\langle 5^-\rangle$		68(5) keV									
18367	$\langle 1^-\rangle$		84(4) keV									
18516	$\langle 5^-\rangle$		76 keV									
18630	$\langle 3^-\rangle$		2 keV									
				Ref.								

Energy levels and branching ratios [01Bu16]. Part 3 **$^{139}_{57}$La**

E^*	$2J^\pi$	Branching ratios in percentage										
	E^*_f:	1476.4	1537.7	1537.9	1578.0	1579.8	1683.3	1716.1	1761.2	1766.2	1820	
[keV]	$2J^\pi_f$:	$\langle 9^+\rangle$	$\langle 11^+\rangle$	7^+	$5^+,7^+$	9	7^+	5^+		$3^+,5^+$		
1940.9(2)	$\langle 7^+\rangle$		34		27					39		
2157.9(11)					40(11)		x					
6019(1)	7^-	2.5	3.0			14.7	7.2					
6114.0(4)	$9^{\langle -\rangle}$	4		2		3	7			8		
6417(2)	9^-		5(1)			3(1)		2	1			
6759(2)	7			4(2)	5(2)		3(2)					
7279						14					13	
8527				19(1)								
8582.1(8)	7,9					7(5)						

Energy levels and branching ratios [01Bu16]. Part 4 **$^{139}_{57}$La**

E^*	$2J^\pi$	Branching ratios in percentage									
	E^*_f:	1837	1856.2	1892.9	1920.7	1940.9	1962.9	2060.5	2126	2157.9	2232
[keV]	$2J^\pi_f$:		$3^+,5^+$		$\langle 7^+\rangle$	$\langle 7^+\rangle$	$\langle 5\rangle^+$				$\langle 7,11\rangle$
2157.9(11)			60(8)								
6019(1)	7^-						0.6		0.6		
6114.0(4)	$9^{\langle -\rangle}$		2	2				2(1)		3(1)	
6417(2)	9^-	0.7			0.5		1	1			2
6759(2)	7							12(2)			
7279					22				30		
7632(4)	7^-					14(2)					

Energy levels and branching ratios [94Pe19].

$^{140}_{57}$La

E^*	J^π	L	$d\sigma/d\Omega$	I_γ	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
							E_f^*: 0.0	29.9	34.6	43.8	48.8
[keV]		(d,p)	μb/sr	arb.u	Γ_{cm}		J_f^π: 3^-	2^-	5^-	1^-	6^-
0.0	3^-	3	147(9)	1259(48)	1.6781(3) d	87Pe09					
29.9640(7)	2^-	3	220(56)	225(9)	0.25(4) ns	87Pe09	100				
34.647(1)	5^-	3	215(41)	1626(64)		87Pe09	100				
43.812(5)	1^-				0.52(14) ns		<0.16	100			
48.865(5)	6^-	3	448(31)			87Pe09			100		
63.171(2)	4^-	3	299(19)	9558(380)		87Pe09	96(4)		4.4(5)		
92.8(15)			9(3)								
103.80(2)	6^-		20(2)						8.4(6)		92(3)
162.658(2)	2^-	3	89(8)	205(9)	≤0.01 ns	87Pe09	96(1)	3.13(8)		0.9(1)	
272.338(2)	4^-			2151(84)			60(11)	x	35(8)		
284.673(8)	7^-	3	477(27)			87Pe09					94(22)
318.256(9)	3^-	⟨3⟩	40(4)	9501(385)		87Pe09		76(14)			
322.056(3)	5^-		incl						1.9(5)		
467.53(2)	1^-	3	34(2)		≤7.7 ns	87Pe09	≤0.02	20.7(1)		33.2(3)	
575.539(9)	2^-,3^-	⟨3⟩	39(6)			87Pe09					
581.07(1)	0^-							0.013(1)		99.9(3)	
592.11(3)	2^-									x	
602.009(3)	4^-	1	423(30)	704(28)		87Pe09	9(2)		66(12)		12(3)
658.261(4)	3^-	1	488(30)	2358(92)		87Pe09	25(7)	9(1)	15(3)		
673.02(1)	4^-								x		
711.215(8)	3^-	1	228(15)	106(7)		87Pe09		7(4)			
744.717(3)	4^-	1	191(14)	3601(145)		87Pe09	2.2(8)		11(4)		
754.83(2)	1^-,2^-							x		x	
771.44(5)	X^-	1	660(38)	3586(143)		87Pe09			6(1)		47(9)
796.248(8)	2^-		31(8)	60(4)			x	10(4)			
830.89(1)	2^-,3^-						x			x	
905.75(2)	2^-										
912.165(8)	3^-,4^-		33(4)	15(3)				24(6)		32(12)	12(4)
913.87	3^-–5^-										
917.535	2,3,4^-							x			
930.3(8)			4(1)								
941.75	2^-–4^-						x				
968.66(6)	3^-,4^-			4(3)							
986.70(2)	4^-,5^-										
1035.66(1)	4^-	1	60(6)	261(14)		87Pe09					21(12)
1055.067(6)	4^-,5^-	1	339(24)	335(13)		87Pe09	8(3)		23(6)		12(4)
1076.9(14)	⟨2–5⟩$^-$	1	28(4)			87Pe09					
1093.58(5)	2^-–4^-					87Pe09					
1097.27(23)				16(4)		87Pe09					
1100.94(2)	3^-,4^-	1	157(11)	416(17)		87Pe09					
1109.77(2)	3^-,4^-					87Pe09					
1116.80(2)	⟨2–5⟩$^-$	1	79(7)	418(17)		87Pe09					
1137.0(10)			108(8)			87Pe09					
1147.4(3)			43(6)	14(2)		87Pe09					
1161.02(19)				31(3)		87Pe09					

(continued) **$^{140}_{57}$La**

E^* [keV]	J^π	L (d,p)	$d\sigma/d\Omega$ μb/sr	I_γ arb.u	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage				
							E_f^*: 0.0	29.9	34.6	43.8	48.8
							J_f^π: 3^-	2^-	5^-	1^-	6^-
1169.1(10)			19(4)	158(8)		87Pe09					
1187.38(7)						87Pe09					
1190.50(19)			115(8)	24(3)		87Pe09					
1207.36(14)				36(3)		87Pe09					
1209.80(7)			60(7)	275(12)		87Pe09					
1227.1(17)			21(8)			87Pe09					
1245.6(6)			24(3)			87Pe09					
1254.78(21)				8(5)		87Pe09					
1259.96(6)				754(31)		87Pe09					
1262.4(6)			31(4)			87Pe09					
1279.9(8)			27(3)			87Pe09					
1284.12(11)				79(10)		87Pe09					
1295.49			48(5)	39(4)		87Pe09					
1312.5(14)			21(2)			87Pe09					
1328.0(22)			13(3)			87Pe09					
1339.54(7)				185(11)		87Pe09					
1340.72(14)			111(7)	66(6)		87Pe09					
1352.2(10)	$X^{\langle - \rangle}$		incl			87Pe09					
1370.2(9)			26(3)			87Pe09					
1388.0(15)			18(3)			87Pe09					
1403.3(6)	X^-	3	14(3)			87Pe09					
1415.08(4)	X^-					87Pe09					
1418.4(9)	X^-	3	79(6)	334(15)		87Pe09					
1422.39(7)				486(25)		87Pe09					
1425.65(7)				241(11)		87Pe09					
1433.24(6)	X^-	3	104(20)	1069(55)		87Pe09					
1442.63(6)	X^-	3	56(25)	546(32)		87Pe09					
1461.1(8)	X^-	3	90(15)			87Pe09					
1469.60(7)				495(25)		87Pe09					
1477.06(7)		3	45(20)	455(24)		87Pe09					
1481.31(6)	X^-			1984(82)		87Pe09					
1495.32(6)	X^-	3	46(20)	1932(81)		87Pe09					
1508.2(22)	X^-	3	55(11)			87Pe09					
1519.3(9)	X^-	3	74(8)			87Pe09					
1527.48(36)		3		22(2)		87Pe09					
1532.29(16)	X^-			52(4)		87Pe09					
1547.66(11)				77(4)		87Pe09					
1550.92(6)				776(32)		87Pe09					
1554.48(6)	X^-	3	66(19)	791(32)		87Pe09					
1564.50(7)				222(10)		87Pe09					
1568.9(7)	X^-	3	42(25)			87Pe09					
1577.55(66)				6(3)		87Pe09					
1580.05(7)	X^-	3	62(19)	184(8)		87Pe09					
1596.08(7)				184(8)		87Pe09					
1600.1(9)			37(19)			87Pe09					

(continued)

$^{140}_{57}$La

E^*	J^π	L	$d\sigma/d\Omega$	I_γ	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
							E_f^*: 0.0	29.9	34.6	43.8	48.8
[keV]		(d,p)	μb/sr	arb.u	Γ_{cm}		J_f^π: 3^-	2^-	5^-	1^-	6^-
1617.97(11)	$X^{\langle-\rangle}$	$\langle3\rangle$	92(10)	60(4)		87Pe09					
1621.69(12)				47(3)		87Pe09					
1630.2(10)	$X^{\langle-\rangle}$	$\langle3\rangle$	45(8)			87Pe09					
1635.99(7)				90(4)		87Pe09					
1643.6(11)	$X^{\langle-\rangle}$	$\langle1\rangle$	60(8)			87Pe09					
1651.78(8)				102(5)		87Pe09					
1655.37(30)	$X^{\langle-\rangle}$	$\langle1\rangle$	31(8)	18(4)		87Pe09					
1660.88(12)				33(4)		87Pe09					
1662.99(7)				79(4)		87Pe09					
1672.18(7)	$X^{\langle-\rangle}$	$\langle1\rangle$	64(20)	239(9)		87Pe09					
1676.67(25)				38(5)		87Pe09					
1683.82(7)	$X^{\langle-\rangle}$	$\langle1\rangle$	51(15)	607(28)		87Pe09					
1688.00(24)				38(6)		87Pe09					
1701.05(7)			61(10)	283(10)		87Pe09					
1709.38(36)		1		20(4)		87Pe09					
1718.75(7)	X^-	1	127(12)	583(24)		87Pe09					
1723.12(7)				343(15)		87Pe09					
1730.1(16)			95(37)			87Pe09					
1735.56(6)				821(33)		87Pe09					
1736.66(7)				327(15)		87Pe09					
1743.72(7)			97(15)	256(14)		87Pe09					
1748.01(10)				96(5)		87Pe09					
1756.15(7)			83(12)	240(10)		87Pe09					
1765.52(7)				228(10)		87Pe09					
1774.58(24)				44(5)		87Pe09					
1777.56(7)	X^-	1	73(15)	343(15)		87Pe09					
1789.10(15)				45(4)		87Pe09					
1792.67(20)	X^-	1	86(18)	31(4)		87Pe09					
1801.07(7)				169(7)		87Pe09					
1804.95(10)				78(4)		87Pe09					
1810.4(8)			69(19)			87Pe09					
1813.95(16)				40(3)		87Pe09					
1815.0(7)						00Va30					
1819.48(8)				127(6)		87Pe09					
1823.12(10)			79(22)	89(5)		87Pe09					
1838.90(21)				23(2)		87Pe09					
1841.96(7)			58(12)	456(19)		87Pe09					
1848.62(17)				54(3)		87Pe09					
1854.09(20)				22(3)		87Pe09					
1859.66(10)			123(16)	54(3)		87Pe09					
1866.42(11)				79(4)		87Pe09					
1871.56(14)				42(3)		87Pe09					
1875.32(14)				60(4)		87Pe09					
1879.71(6)				724(32)		87Pe09					
1895.69(6)				761(33)		87Pe09					

(continued) **$^{140}_{57}$La**

E^*	J^π	L	$d\sigma/d\Omega$	I_γ	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
							E_f^*:	0.0	29.9	34.6	43.8	48.8
[keV]		(d,p)	μb/sr	arb.u	Γ_{cm}		J_f^π:	3^-	2^-	5^-	1^-	6^-
1902.08(6)				96(5)		87Pe09						
1941.15(7)				415(17)		87Pe09						
1947.61(7)				203(9)		87Pe09						
1954.79(28)				60(8)		87Pe09						
1963.43(10)				299(14)		87Pe09						
1971.86(7)				772(37)		87Pe09						
1986.19(7)				191(9)		87Pe09						
1989.28(11)				103(5)		87Pe09						
1997.18(6)				460(18)		87Pe09						
2005.90(11)				126(6)		87Pe09						
2018.22(7)				455(19)		87Pe09						
2023.76(7)				339(15)		87Pe09						
2040.13(18)				47(5)		87Pe09						
2041.92(8)				167(9)		87Pe09						
2045.02(7)				246(10)		87Pe09						
2048.58(7)				449(17)		87Pe09						
2065.47(7)				271(12)		87Pe09						
2069.67(9)				161(8)		87Pe09						
2077.99(6)				2049(82)		87Pe09						
2082.16(9)				183(9)		87Pe09						
2091.97(30)				59(8)		87Pe09						
2094.23(23)				81(8)		87Pe09						
2103.31(9)				276(12)		87Pe09						
2109.47(9)				259(11)		87Pe09						
2116.72(16)				53(6)		87Pe09						
2120.03(7)				417(16)		87Pe09						
2125.40(7)				738(30)		87Pe09						
2129.68(7)				475(19)		87Pe09						
2143.89(6)				966(38)		87Pe09						
2148.94(17)				47(9)		87Pe09						
2159.80(20)				31(3)		87Pe09						
2162.60(9)				189(9)		87Pe09						
2172.44(7)				652(26)		87Pe09						
2175.94(10)				140(7)		87Pe09						
2183.63(9)				231(10)		87Pe09						
2191.70(7)				588(26)		87Pe09						
2197.05(48)				109(8)		87Pe09						
2199.63(7)				363(17)		87Pe09						
2218.13(9)				52(3)		87Pe09						
2219.73(10)				39(3)		87Pe09						
2231.54(14)				84(4)		87Pe09						
2235.97(7)				627(26)		87Pe09						
2241.24(10)				120(7)		87Pe09						
2244.08(8)				184(9)		87Pe09						
2247.81(8)				172(9)		87Pe09						

(continued) **$^{140}_{57}$La**

E^*	J^π	L	$d\sigma/d\Omega$	I_γ	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
							E_f^*: 0.0	29.9	34.6	43.8	48.8
[keV]		(d,p)	μb/sr	arb.u	Γ_{cm}		J_f^π: 3^-	2^-	5^-	1^-	6^-
2257.31(9)				158(8)		87Pe09					
2264.34(10)				115(6)		87Pe09					
2273.49(21)				60(7)		87Pe09					
2277.43(18)				70(7)		87Pe09					
2280.37(10)				141(8)		87Pe09					
2291.83(20)				25(4)		87Pe09					
2297.90(7)				1035(41)		87Pe09					
2308.42(7)				198(10)		87Pe09					
2311.72(17)				57(5)		87Pe09					
2321.65(14)				90(8)		87Pe09					
2323.48(7)				273(12)		87Pe09					
2332.39(11)				72(5)		87Pe09					
2340.29(10)				89(5)		87Pe09					
2346.09(23)				45(6)		87Pe09					
2351.14(15)				94(7)		87Pe09					
2356.15(7)				286(13)		87Pe09					
2361.32(10)				152(8)		87Pe09					
2369.10(16)				67(5)		87Pe09					
2393.39(7)				408(17)		87Pe09					
2396.46(7)				409(17)		87Pe09					
2403.24(4)				725(30)		87Pe09					
2413.32(7)				272(14)		87Pe09					
2421.96(8)				277(14)		87Pe09					
2425.83(8)				268(14)		87Pe09					
2434.69(31)				39(5)		87Pe09					
2436.70(8)				214(11)		87Pe09					
2446.34(7)				198(12)		87Pe09					
2450.35(7)				166(6)		87Pe09					
2458.58(10)				150(7)		87Pe09					
2462.77(7)				263(13)		87Pe09					
2468.67(10)				162(8)		87Pe09					
2472.88(7)				359(18)		87Pe09					
2483.35(20)				34(9)		87Pe09					
2484.84(11)				141(8)		87Pe09					
2492.96(7)				350(15)		87Pe09					
2499.41(7)				370(17)		87Pe09					
2520.97(7)				221(11)		87Pe09					
2523.00(10)				119(6)		87Pe09					
2539.65(28)				21(4)		87Pe09					
2543.21(7)				208(9)		87Pe09					
2549.38(44)				54(10)		87Pe09					
2553.80(7)				491(22)		87Pe09					
2562.81(8)				327(15)		87Pe09					
2566.53(23)				77(7)		87Pe09					
2596.18(7)				531(22)		87Pe09					

(continued) **$^{140}_{57}$La**

E^*	J^π	L	$d\sigma/d\Omega$	I_γ	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
							E_f^*:	0.0	29.9	34.6	43.8	48.8
[keV]		(d,p)	μb/sr	arb.u	Γ_{cm}		J_f^π:	3^-	2^-	5^-	1^-	6^-
2599.12(7)				370(17)		87Pe09						
2605.21(7)				329(16)		87Pe09						
2622.16(11)				167(9)		87Pe09						
2628.59(8)				267(12)		87Pe09						
2643.93(13)				459(37)		87Pe09						
2648.41(26)				263(34)		87Pe09						
2815.77(10)				229(12)		87Pe09						
2939.3(11)						00Va30						
3009.7(9)						00Va30						
			67Ke02	90Is09		Ref.						

Additional data on this isotope can be found in [02Ad04, 96Ve07, 93RoZX, 90Me03, 88BoZH].
Cross section of the (d,p) reaction is given for 45°, see data for other angles in [67Ke02].
I_γ is the photon intensity in number of γ per 10^5 captured thermal neutrons [90Is09].

Energy levels and branching ratios [94Pe19]. Part 2 **$^{140}_{57}$La**

E^*	J^π		Branching ratios in percentage									
		E_f^*:	63.2	104	163	272.3	318.3	322.1	467.5	575.5	581.1	602.0
[keV]		J_f^π:	4^-	6^-	2^-	4^-	3^-	5^-	1^-	2^-,3^-	0^-	4^-
162.658(2)	2^-		0.0003(2)									
272.338(2)	4^-		4.8(10)									
284.673(8)	7^-			6(2)								
318.256(9)	3^-		2.0(5)		20.7(43)	1.4(1)						
322.056(3)	5^-		3.1(7)	94(20)		0.71(8)						
467.53(2)	1^-				46.1(6)							
575.539(9)	2^-,3^-				100							
581.07(1)	0^-				0.015(1)				0.066(5)			
592.11(3)	2^-		x						x			
602.009(3)	4^-		x			x		13(3)		x		
658.261(4)	3^-		29(7)		21(4)				x			1.4(1)
673.02(1)	4^-									x		
711.215(8)	3^-				93(16)							
744.717(3)	4^-		x	10(2)	x		7.2(15)	70(13)				
754.83(2)	1^-,2^-									x		
771.44(5)	X^-		24(6)	15(3)								8(2)
796.248(8)	2^-						43(10)				47(10)	
830.89(1)	2^-,3^-					x						
912.165(8)	3^-,4^-		14(4)									15(4)
913.87	3^-–5^-							x				
917.535	2,3,4^-									x		
1055.067(6)	4^-,5^-		24(6)			14(4)						

Energy levels and branching ratios [94Pe19]. Part 3 **$^{140}_{57}$La**

E^*	J^π		Branching ratios in percentage						
		E_f^*:	658.3	673.0	711.2	744.7	754.8	771.4	796.2
[keV]		J_f^π:	3^-	4^-	3^-	4^-	1^-,2^-	X^-	2^-
711.215(8)	3^-			x					
744.717(3)	4^-		x						
830.89(1)	2^-,3^-		x						x
905.75(2)	2^-				x		x		
912.165(8)	3^-,4^-					4(1)			x
913.87	3^-–5^-				x	x			
941.75	2^-–4^-		x						
1035.66(1)	4^-				17(10)	62(15)			
1055.067(6)	4^-,5^-							20(4)	