Energy levels and branching ratios [00Tu01].

$^{142}_{61}$Pm

E^*	J^π	$T_{1/2}$ or	Branching ratios in percentage						
		E_f^*:	0.0	208.52	240.98	412.01	449.47	460.00	678.30
[keV]		Γ_{cm}	J_f^π: 1^+	$\langle 2\rangle^+$	$\langle 3\rangle^+$	$\langle 3\rangle^+$	$\langle 5\rangle^+$	$\langle 4\rangle^+$	$\langle 2\rangle^-$
0.0	1^+	40.5(5) s							
208.52(8)	$\langle 2\rangle^+$		100						
240.98(8)	$\langle 3\rangle^+$	1.1(3) ns	80	20.1					
412.01(12)	$\langle 3\rangle^+$			87	13				
449.47(13)	$\langle 5\rangle^+$	16.5(15) ns			100	x			
460.00(12)	$\langle 4\rangle^+$				100				
496.30(18)	$\langle 2\rangle^+$		32	31	37				
513.12(13)	$\langle 3\rangle^+$			100					
618.30(10)	$\langle 2\rangle^+$		66		34				
678.30(10)	$\langle 2\rangle^-$		100						
706.80(20)	$\langle 4\rangle^+$				36	25		39	
860.2(4)						100			
883.17(16)	$\langle 8\rangle^-$	2.0(2) ms					100		
926.2(11)	$\langle 10^+\rangle$	67(5) μs							
980.80(15)	$\langle 3\rangle^-$								100
998.01(16)	$\langle 5^-\rangle$							100	
1024.36(16)	$\langle 6\rangle^-$						87		
1076.70(18)	$\langle 4^-\rangle$								
1078.30(16)	$\langle 5\rangle$							100	
1163.80(23)	$\langle 4^-\rangle$								100
1185.20(23)	$\langle 5^-\rangle$								
1190.82(21)	$\langle 7\rangle^-$								
1198.2(4)	9^-								
1237.1(4)									
1309.8	$\langle 9^-\rangle$								
1335.0(11)									
1765.1	$\langle 9^+\rangle$								
1809.1	$\langle 10^+\rangle$								
1874.9(4)	10^-								
1927.0(4)	11^-								
1940.8(4)	$\langle 10\rangle$								
2070.0(5)	13^-								
2116.2(4)	12^-								
2189.9	$\langle 11^+\rangle$								
2240.7(4)	$\langle 10,11\rangle$								
2291.5(5)	15^-								
2394.1(5)	14^-								
2446.2(4)	$\langle 13\rangle$								
2695.2(5)									
2828.5	$\langle 13\rangle$								
3024.9(5)	13^-								
3063.4(5)	$\langle 16\rangle$								
3143.6	$\langle 14\rangle$								
3300.0	$\langle 12\rangle$								
3350.3(5)	$\langle 14^-\rangle$								

(continued) **$^{142}_{61}$Pm**

E^*	J^π	$T_{1/2}$ or	Branching ratios in percentage						
		E_f^*:	0.0	208.52	240.98	412.01	449.47	460.00	678.30
[keV]		Γ_{cm}	J_f^π: 1^+	$\langle 2\rangle^+$	$\langle 3\rangle^+$	$\langle 3\rangle^+$	$\langle 5\rangle^+$	$\langle 4\rangle^+$	$\langle 2\rangle^-$
3507.1									
3666.3(6)	$\langle 16^-\rangle$								
3670.4(5)	$\langle 17^-\rangle$								
3673.3(5)	$\langle 17^-\rangle$								
3737.9	$\langle 13\rangle$								
3798.1	$\langle 13\rangle$								
3820.1	$\langle 14\rangle$								
3865.6(5)	$\langle 19^-\rangle$								
3872.1	$\langle 15\rangle$								
3886.5	$\langle 14^-\rangle$								
4015.0	$\langle 16\rangle$								
4061.6	$\langle 15\rangle$								
4072.9									
4185									
4236.4	$\langle 17\rangle$								
4324.9									
4339.6	$\langle 16\rangle$								
4391.5									
4530.9(6)	$\langle 20\rangle$								
4640.3									
4774.1									
4786.9									
4870.8(6)									
4969.8	$\langle 16\rangle$								
5008.2	$\langle 18\rangle$								
5031.3									
5085.6(6)									
5356.4									
5614.8	$\langle 19\rangle$								
5617.8	$\langle 19\rangle$								
5672.0									
5810.1	$\langle 20\rangle$								
6475.4	$\langle 21\rangle$								
6815.0	$\langle 21\rangle$								
7030.0	$\langle 22\rangle$								

Additional data on this isotope can be found in [04Li31].

Energy levels and branching ratios [00Tu01]. Part 2

$^{142}_{61}$Pm

E^*	J^π					Branching ratios in percentage						
		E_f^*:	883.17	980.80	998.01	1024.36	1076.70	1198.2	1874.9	1927.0	1940.8	2070.0
[keV]		J_f^π:	$\langle 8\rangle^-$	$\langle 3\rangle^-$	$\langle 5^-\rangle$	$\langle 6\rangle^-$	$\langle 4^-\rangle$	9^-	10^-	11^-	$\langle 10\rangle$	13^-
926.2(11)	$\langle 10^+\rangle$		100									
1024.36(16)	$\langle 6\rangle^-$				13							
1076.70(18)	$\langle 4^-\rangle$			x								
1185.20(23)	$\langle 5^-\rangle$			56			44					
1190.82(21)	$\langle 7\rangle^-$				28	72						
1198.2(4)	9^-		100									
1237.1(4)							100					
1335.0(11)					100							
1874.9(4)	10^-		100									
1927.0(4)	11^-							73.4	26.59			
1940.8(4)	$\langle 10\rangle$		25.52					74.5				
2070.0(5)	13^-									100		
2116.2(4)	12^-								28.49		71.5	
2240.7(4)	$\langle 10,11\rangle$							100				
2291.5(5)	15^-											100
2394.1(5)	14^-											29.79
2446.2(4)	$\langle 13\rangle$									48.0		
3024.9(5)	13^-									100		

Energy levels and branching ratios [00Tu01]. Part 3

$^{142}_{61}$Pm

E^*	J^π					Branching ratios in percentage						
		E_f^*:	2116.2	2240.7	2291.5	2446.2	3024.9	3063.4	3350.3	3670.4	3673.3	3865.6
[keV]		J_f^π:	12^-	$\langle 10,11\rangle$	15^-	$\langle 13\rangle$	13^-	$\langle 16\rangle$	$\langle 14^-\rangle$	$\langle 17^-\rangle$	$\langle 17^-\rangle$	$\langle 19^-\rangle$
2394.1(5)	14^-		70.2									
2446.2(4)	$\langle 13\rangle$		24.00	28.00								
2695.2(5)						100						
3063.4(5)	$\langle 16\rangle$				100							
3350.3(5)	$\langle 14^-\rangle$						100					
3666.3(6)	$\langle 16^-\rangle$								100			
3670.4(5)	$\langle 17^-\rangle$				100							
3673.3(5)	$\langle 17^-\rangle$				75.0			25.00				
3865.6(5)	$\langle 19^-\rangle$									42.00	58.0	
4530.9(6)	$\langle 20\rangle$											100
4870.8(6)												100

Energy levels and branching ratios [01Tu07].

$^{143}_{61}$Pm

E^*	$2J^\pi$	L	$d\sigma/d\Omega$	$(2j+1)S_{lj}$	$S_{\tau\mathrm{d}}$	$S_{\tau\mathrm{d}}$	S'^{+}_{p}	S'^{+}_{p}	$S_{\mathrm{d}\tau}$	$S_{\mathrm{d}\tau}$	L	C^2S	$T_{1/2}$ or	Ref.
[keV]		(τ,d)	μb/sr		*mod.*	*stand*	(^{12}C,^{12}B)	(^{7}Li,^{6}He)	*mod.*	*stand*		(d,τ)	Γ_{cm}	
0.0	5^+	2	536(55)	2.99	0.54	0.52	0.31	0.41(7)	3.80	3.20	2	2.8(7)	265(7) d	79Do06
272.04(4)	7^+	4	44	1.01	0.25	0.32	0.16	0.25(7)	6.85	7.50	4	8.0(19)	1.06(8) ns	79Do06
959.7(1)	11^-	5	277(30)	11.1	0.82	0.71	0.88	0.77(15)	1.65	1.40	5	1.40	24.0(7) ns	71Wi04
1056.7(1)	3^+	2	18	0.098	0.05	0.06					2	0.44		79Do06
1173.2(1)	1^+	0	764(80)	1.51	1.08	1.12		0.81(13)	0.23	0.23	0	0.23		71Wi04
1259.8(10)	$\langle 9\rangle$													
1286.5(3)	$\langle 3,5\rangle$													
1403.1(1)	3^+	2	778(80)	3.15	1.13	1.31	0.68	0.93(14)	0.48	0.53	2	0.38		79Do06
1456.4(3)	9^+													
1514.9(1)	$3^+,5^+$													
1558.7(3)	$\mathrm{X}^{\langle+\rangle}$													
1565.8(2)	$\langle 5^+\rangle$													
1566.0(2)	$\langle 9\rangle^+$													
1613.9(2)	$5^+,3^+$	2	13(2)	0.046										80St10
1663.5(1)	11^+													
1753.5(1)	1^+	0	26(3)	0.045										80St10
1816.9(1)														
1824.6(2)														
1854.1(1)														
1898.4(1)	15^+												10.5(4) ns	
1950.8(1)	13^-		23											80St10
1969.5(5)														
2007.3(2)														
2060.3(1)	13^-													
2080.8(1)														
2108.3(6)														
2232.5(6)														
2274.5(12)	$3^+,5^+$													
2280.9(1)	$\langle 5\rangle^+$	2	8	0.031										80St10
2287.4(2)	17^+													
2331(3)	$3^+,5^+$	2	24	0.074										80St10
2410(3)			15											80St10
2436.9(1)	15^-													
2444.0(1)														
2464.9(1)			10											80St10
2548(3)	$3^+,5^+$	2	36	0.098										80St10
2613.5(2)														
2712(3)			17											80St10
2731.6(6)			26											80St10
2747(3)			11											80St10
2777(3)			35											80St10
2864(3)			21											80St10
2882.0(2)	17^-													
2905.3(5)			17											80St10
2929.9(2)	19^-													

(continued)

$^{143}_{61}$Pm

E^* [keV]	$2J^\pi$	L (τ,d)	$d\sigma/d\Omega$ μb/sr	$(2j+1)S_{lj}$	$S_{\tau\mathrm{d}}$ *mod.*	$S_{\tau\mathrm{d}}$ *stand*	S'^{+}_{p} (^{12}C,^{12}B)	S'^{+}_{p} (^{7}Li,^{6}He)	$S_{\mathrm{d}\tau}$ *mod.*	$S_{\mathrm{d}\tau}$ *stand*	L	C^2S (d,τ)	$T_{1/2}$ or Γ_{cm}	Ref.
2956(3)			28											80St10
3013.3(2)	21^-													
3053.5(10)			10											80St10
3061.1(10)														
3075.7(2)	19^-													
3098(3)			32											80St10
3213(3)			28											80St10
3357(3)			26											80St10
3376.8(2)	21^-													
3389.8(2)	23^-													
3524.2(4)	$\langle 23 \rangle$													
3601.6(2)	23^-													
3780(3)			31											80St10
3840(3)			31											80St10
3872(3)			42											80St10
3908(3)			34											80St10
4281.0(3)	25^+													
4292.6(2)	25^-													
4386.2(3)	27^+													
4580.3(3)	27^-													
4731.8(3)	27^-													
4993.0(3)	29^-													
≈5000	$\langle 9 \rangle^+$										4	7.7		79Do06
5115.9(3)	31^-													
5628.5(3)	31^+													
6075.6(3)	$\langle 33^- \rangle$													
6243.2(4)	$\langle 35^+ \rangle$													
6298.1(3)	35^+													
6769.4(4)	37^+													
7828.9(4)	41^+													
8072.7(5)	45^+													
8397.7(5)	$\langle 47^+ \rangle$													
8838.7(5)														
9068.7(5)														
9867.1(10)														
10335.7(10)														
10414.8(12)														
10535.0(14)														
13800	7^-												54 keV	
14550	3^-												79 keV	
15120	1^-												97 keV	
15240	9^-												30 keV	
15350	5^-												59 keV	
15680	7^-												39 keV	
15690	3^-												75 keV	

(continued) **$^{143}_{61}$Pm**

E^*	$2J^\pi$	L	$d\sigma/d\Omega$	$(2j+1)S_{lj}$	$S_{\tau\mathrm{d}}$	$S_{\tau\mathrm{d}}$	S'^{+}_{p}	S'^{+}_{p}	$S_{\mathrm{d}\tau}$	$S_{\mathrm{d}\tau}$	L	C^2S	$T_{1/2}$ or	Ref.
[keV]		(τ,d)	μb/sr		*mod.*	*stand*	(^{12}C,^{12}B)	(^{7}Li,^{6}He)	*mod.*	*stand*		(d,τ)	Γ_{cm}	
15750	5^-												76 keV	
			80St10	80St10	71Wi04	71Wi04	76Th05	81Cl01	71Wi04	71Wi04		79Do06		Ref.

Additional data on this isotope can be found in [00He20, 00Bh08, 71Wi04].
Two pairs of proton-transfer parameters $S_{\tau\mathrm{d}}$=$d\sigma/d\Omega_{exp}$/N(τ,d)(2J+1/2I+1)$d\sigma/d\Omega_{DWBA}$ and $S_{\mathrm{d}\tau}$=$d\sigma/d\Omega_{exp}$/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).
For the (τ,d)reaction cross section measured at 50° is presented.
Data for this isotope are considered in vol. LB I/18B.

Energy levels and branching ratios [01Tu07]. Part 2 **$^{143}_{61}$Pm**

E^*	$2J^\pi$		Branching ratios in percentage								
		E^*_{f}:	0.0	272	960	1057	1566	1663.5	1898.3	2060.3	2287.4
[keV]		$2J^\pi_{\mathrm{f}}$:	5^+	7^+	11^-	3^+	$\langle 5^+\rangle$	11^+	15^+	13^-	17^+
272.04(4)	7^+		100								
959.7(1)	11^-		19(2)	81(13)							
1056.7(1)	3^+		100								
1173.2(1)	1^+		100								
1259.8(10)	$\langle 9\rangle$		100								
1286.5(3)	$\langle 3,5\rangle$		<33	100							
1403.1(1)	3^+		100								
1456.4(3)	9^+		91(4)	9.4(24)							
1514.9(1)	$3^+,5^+$		72(3)	24(1)		4.0(4)					
1558.7(3)	$\mathrm{X}^{\langle+\rangle}$			100							
1565.8(2)	$\langle 5^+\rangle$			100							
1566.0(2)	$\langle 9\rangle^+$		29(6)	71(11)							
1613.9(2)	$5^+,3^+$			100							
1663.5(1)	11^+			100			<1				
1753.5(1)	1^+		100								
1816.9(1)			32(7)	68(7)							
1824.6(2)			69(14)			31(7)					
1854.1(1)			43(7)			57(14)					
1898.4(1)	15^+							100			
1950.8(1)	13^-				21(7)			79(2)			
1969.5(5)				100							
2007.3(2)				100							
2060.3(1)	13^-							100			
2080.8(1)			91(26)	9(2)							
2108.3(6)				100							
2232.5(6)				100							
2274.5(12)	$3^+,5^+$			100							
2280.9(1)	$\langle 5\rangle^+$			100							

(continued) **$^{143}_{61}$Pm**

E^*	$2J^\pi$					Branching ratios in percentage					
		E_f^*:	0.0	272	960	1057	1566	1663.5	1898.3	2060.3	2287.4
[keV]		$2J_f^\pi$:	5^+	7^+	11^-	3^+	$\langle 5^+ \rangle$	11^+	15^+	13^-	17^+
2287.4(2)	17^+								100		
2436.9(1)	15^-				100					x	
2444.0(1)			33(17)	67(9)							
2464.9(1)				100							
2613.5(2)			86(14)	14(4)							
2731.6(6)				100							
2882.0(2)	17^-								100		
2905.3(5)			19(6)	81(27)							
2929.9(2)	19^-										93
3053.5(10)			43(14)	57(29)							
3061.1(10)										x	
3075.7(2)	19^-										33

Energy levels and branching ratios [01Tu07]. Part 3 **$^{143}_{61}$Pm**

E^*	$2J^\pi$					Branching ratios in percentage					
		E_f^*:	2436.9	2882.0	2929.9	3013.3	3075.7	3389.8	4281.0	4292.6	4386.2
[keV]		$2J_f^\pi$:	15^-	17^-	19^-	21^-	19^-	23^-	25^+	25^-	27^+
2929.9(2)	19^-		7								
3013.3(2)	21^-				100						
3075.7(2)	19^-			26	41						
3376.8(2)	21^-				16	30	53				
3389.8(2)	23^-					100					
3524.2(4)	$\langle 23 \rangle$							100			
3601.6(2)	23^-				11	89					
4281.0(3)	25^+							100			
4292.6(2)	25^-					100					
4386.2(3)	27^+								81.6	18.39	
4580.3(3)	27^-							100			
4731.8(3)	27^-							100			
4993.0(3)	29^-									47.62	
5628.5(3)	31^+										100

Energy levels and branching ratios [01Tu07]. Part 4 **$^{143}_{61}$Pm**

E^*	$2J^\pi$	Branching ratios in percentage									
	E_f^*:	4580.3	4731.8	4993.0	5115.9	5628.5	6075.6	6298.1	6769.4	7828.9	8072.7
[keV]	$2J_f^\pi$:	27^-	27^-	29^-	31^-	31^+	$\langle 33^- \rangle$	35^+	37^+	41^+	45^+
4993.0(3)	29^-		52.4								
5115.9(3)	31^-	76.8		23.23							
6075.6(3)	$\langle 33^- \rangle$				100						
6243.2(4)	$\langle 35^+ \rangle$					100					
6298.1(3)	35^+					93.6	6.436				
6769.4(4)	37^+						x	100			
7828.9(4)	41^+								100		
8072.7(5)	45^+								51	48.64	
8397.7(5)	$\langle 47^+ \rangle$										100
8838.7(5)											100
9068.7(5)											x

Energy levels and branching ratios [01Tu07]. Part 5 **$^{143}_{61}$Pm**

E^*	$2J^\pi$	Branching ratios in percentage				
	E_f^*:	8397.7	8838.7	9068.7	9867.1	10335.7
[keV]	$2J_f^\pi$:	$\langle 47^+ \rangle$				
9068.7(5)		x	100			
9867.1(10)				x		
10335.7(10)				x	x	
10414.8(12)				x		
10535.0(14)						x

Energy levels and branching ratios [01So16]. **$^{144}_{61}$Pm**

E^*	J^π	L	σ (τ,d)	σ (α,t)	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
							E_f^*: 0.0	60.7	66.6	80.0	171.8
[keV]		(τ,d)	μb/sr	μb/sr	Γ_{cm}		J_f^π: 5^-	$\langle 4 \rangle^-$	$\langle 3 \rangle^-$	$\langle 2 \rangle^-$	$\langle 6 \rangle^-$
0.0	5^-	2	123(4)	27(1)	363(14) d	75Ma04					
60.727(15)	$\langle 4 \rangle^-$	2+4	150(8)	13(5)		75Ma04	100				
66.64(4)	$\langle 3 \rangle^-$	2+4	incl	22(6)		75Ma04		x			
80.03(3)	$\langle 2 \rangle^-$	2	38(5)	7.1(10)		75Ma04			x		
171.80(1)	$\langle 6 \rangle^-$	2+4	90(5)	20(1)		75Ma04	100				
195.43(2)	$\langle 5 \rangle^-$	4	16(4)	12(1)		75Ma04	18.2(9)	82(4)			
207.37(4)	$\langle 4 \rangle^-$	2+4	22(3)	7.2(13)		75Ma04			100		
232.40(2)	$\langle 6 \rangle^-$	2+4	24(3)	12(1)		75Ma04	100				
249.91(3)	$\langle 1 \rangle^-$	2+4	8.4(18)	2.6(4)		75Ma04				100	
279.29(3)	$\langle 3 \rangle^-$	2+4	17(2)	7.1(6)		75Ma04		62(2)	4.5(6)	23(1)	
363.25(3)	$\langle 2 \rangle^-$	2+4	7.4(9)	2.7(4)		75Ma04			41(3)	23(2)	

(continued)

$^{144}_{61}$Pm

E^* [keV]	J^π	L (τ,d)	σ (τ,d) μb/sr	σ (α,t) μb/sr	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage				
							E_f^*: 0.0	60.7	66.6	80.0	171.8
							J_f^π: 5^-	$\langle 4\rangle^-$	$\langle 3\rangle^-$	$\langle 2\rangle^-$	$\langle 6\rangle^-$
514.32(4)	$\langle 7\rangle^-$	4	9.6(10)	4.8(7)		75Ma04					38(4)
785.03(12)									100		
840.90(5)	$\langle 9\rangle^+$	5	51(5)	39(2)	0.78(20) μs	75Ma04					47.3
875.75(11)	X^-	2	58(6)	4.8(5)		75Ma04		<17	100		
896.31(13)		5	34(4)	18(1)		75Ma04					
899.09(14)	$\langle 2,3\rangle^+$									80(6)	
942.99(11)									49(5)	47(3)	
948.11(21)	$\langle 4,5\rangle^+$	5	15(1)	10.4(8)		75Ma04	65(7)	35(8)			
979(3)	$X^{\langle -\rangle}$		31(2)	2.6(3)		75Ma04					
1021.8(1)	$\langle 2,3\rangle^+$		16(2)	12(1)		75Ma04				88(9)	
1080.2(2)	$4^-,5^-$		453(24)	44(2)		75Ma04	18(4)				82(6)
1104(2)	X^+		19(10)	10.4(8)		75Ma04					
1127(2)	X^+		42(4)	16(1)		75Ma04					
1184(2)	X^-		263(12)	13(1)		75Ma04					
1214(2)	X^+		22(2)	13(1)		75Ma04					
1243(3)			30(2)	2.2(3)		75Ma04					
1273.81(8)	$\langle 10^+\rangle$										
1278(5)			5.8(11)			75Ma04					
1337.4(4)											
1377(2)			218(6)	13(2)		75Ma04					
1426(4)			38(2)			75Ma04					
1451(3)	X^+		34(3)	19(3)		75Ma04					
1455.34(9)	$\langle 8\rangle$										
1468(5)			20(3)			75Ma04					
1501(3)			70(3)			75Ma04					
1543(6)			4.2(14)			75Ma04					
1609(3)			62(3)	2.8(4)		75Ma04					
1640(5)			71(15)			75Ma04					
1654(5)			76(10)			75Ma04					
1704.8(1)	$\langle 10^+\rangle$										
1711.2(1)	$\langle 9^-\rangle$										
1850.7(1)	$\langle 9\rangle$										
1985.1(1)	$\langle 10^-\rangle$										
2072.2(1)	$\langle 11^-\rangle$										
2269.5(1)	$\langle 12^-\rangle$										
2312.1(1)	$\langle 11^+\rangle$										
2610.0(1)											
2647.1(1)	$\langle 12\rangle$										
2668.1(1)	$\langle 12^+\rangle$										
2774.4(1)	$\langle 13^+\rangle$										
2889.4(6)											
3059.8(1)	$\langle 14^+\rangle$										
3127.6(1)	$\langle 13\rangle$										
3348.6(1)	$\langle 14\rangle$										
3408.4(10)											

(continued) **$^{144}_{61}$Pm**

E^* [keV]	J^π	L (τ,d)	σ (τ,d) μb/sr	σ (α,t) μb/sr	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage				
							E_f^*:	0.0	60.7	66.6	80.0	171.8
							J_f^π:	5^-	$\langle 4\rangle^-$	$\langle 3\rangle^-$	$\langle 2\rangle^-$	$\langle 6\rangle^-$
3431.0(1)	$\langle 14^-\rangle$											
3510.8(1)	$\langle 15^+\rangle$											
3615.9(1)	$\langle 14\rangle$											
3727.4(15)												
3795.0(1)	$\langle 15\rangle$											
3899.4(1)	$\langle 15^-\rangle$											
3904.37(13)												
4035.0(9)												
4118.56(13)	$\langle 16^-\rangle$											
4227.36(14)	$\langle 16\rangle$											
4328.2(8)												
4505.06(16)	$\langle 17\rangle$											
4557.16(15)	$\langle 17^+\rangle$											
4659.0(11)												
4717.2(8)												
4818.76(17)	$\langle 18\rangle$											
5060.4(10)												
5118.65(19)												
5351.46(17)	$\langle 19\rangle$											
5454.0(10)												
5457.4(15)												
5850.46(20)	$\langle 20\rangle$											
6264.0(7)												
6347.5(12)												
7105.7(15)												
7558.6(15)												
7972.1(16)												
8510.3(19)												
8595.8(22)	$\langle 25$–$35\rangle$				≈2.7 us							
			75Ma04	75Ma04		Ref.						

Additional data on this isotope can be found in [93Go12, 93Gl03, 93Gl02, 76Ma27].

Energy levels and branching ratios [01So16]. Part 2 **$^{144}_{61}$Pm**

E^* [keV]	J^π	Branching ratios in percentage								
	E_f^*:	207.4	232.4	249.9	279.3	363.2	514.3	785.0	840.9	896.3
	J_f^π:	$\langle 4\rangle^-$	$\langle 6\rangle^-$	$\langle 1\rangle^-$	$\langle 3\rangle^-$	$\langle 2\rangle^-$	$\langle 7\rangle^-$		$\langle 9\rangle^+$	
279.29(3)	$\langle 3\rangle^-$	11(1)								
363.25(3)	$\langle 2\rangle^-$			10.7(6)	26(2)					
514.32(4)	$\langle 7\rangle^-$		62(2)							
840.90(5)	$\langle 9\rangle^+$		4.0				49			
896.31(13)									x	

(continued) **$^{144}_{61}$Pm**

E^*	J^π	Branching ratios in percentage								
	E_f^*:	207.4	232.4	249.9	279.3	363.2	514.3	785.0	840.9	896.3
[keV]	J_f^π:	$\langle 4\rangle^-$	$\langle 6\rangle^-$	$\langle 1\rangle^-$	$\langle 3\rangle^-$	$\langle 2\rangle^-$	$\langle 7\rangle^-$		$\langle 9\rangle^+$	
899.09(14)	$\langle 2,3\rangle^+$					20(6)				
942.99(11)								4.2(9)		
1273.81(8)	$\langle 10^+\rangle$								66(3)	34.3(16)
1337.4(4)					100					
1455.34(9)	$\langle 8\rangle$		100							
1704.8(1)	$\langle 10^+\rangle$								27.5(12)	
1711.2(1)	$\langle 9^-\rangle$						81(3)			
1850.7(1)	$\langle 9\rangle$						100			
2312.1(1)	$\langle 11^+\rangle$								31.7(14)	

Energy levels and branching ratios [01So16]. Part 3 **$^{144}_{61}$Pm**

E^*	J^π	Branching ratios in percentage								
	E_f^*:	943.0	1273.8	1455.3	1704.8	1711.2	1850.7	1985.1	2072.2	2269.5
[keV]	J_f^π:		$\langle 10^+\rangle$	$\langle 8\rangle$	$\langle 10^+\rangle$	$\langle 9^-\rangle$	$\langle 9\rangle$	$\langle 10^-\rangle$	$\langle 11^-\rangle$	$\langle 12^-\rangle$
1021.8(1)	$\langle 2,3\rangle^+$	12.0(14)								
1704.8(1)	$\langle 10^+\rangle$		72(4)							
1711.2(1)	$\langle 9^-\rangle$			18.6(15)						
1985.1(1)	$\langle 10^-\rangle$					88(4)	11.7(16)			
2072.2(1)	$\langle 11^-\rangle$				66(3)			34(3)		
2269.5(1)	$\langle 12^-\rangle$								100	
2312.1(1)	$\langle 11^+\rangle$		68(3)							
2610.0(1)			53(9)					47(5)		
2647.1(1)	$\langle 12\rangle$				58(3)					
2774.4(1)	$\langle 13^+\rangle$									19.3(9)
2889.4(6)										x
3431.0(1)	$\langle 14^-\rangle$									100
3615.9(1)	$\langle 14\rangle$									100

Energy levels and branching ratios [01So16]. Part 4 **$^{144}_{61}$Pm**

E^*	J^π	Branching ratios in percentage								
	E_f^*:	2312.1	2610.0	2647.1	2668.1	2774.4	2889.4	3059.8	3127.6	3348.6
[keV]	J_f^π:	$\langle 11^+\rangle$		$\langle 12\rangle$	$\langle 12^+\rangle$	$\langle 13^+\rangle$		$\langle 14^+\rangle$	$\langle 13\rangle$	$\langle 14\rangle$
2647.1(1)	$\langle 12\rangle$	42(3)								
2668.1(1)	$\langle 12^+\rangle$	100	x							
2774.4(1)	$\langle 13^+\rangle$	18.8(9)		6(2)	56(3)					
2889.4(6)					x					
3059.8(1)	$\langle 14^+\rangle$					100				

(continued) **$^{144}_{61}$Pm**

E^*	J^π	Branching ratios in percentage								
	E_f^*:	2312.1	2610.0	2647.1	2668.1	2774.4	2889.4	3059.8	3127.6	3348.6
[keV]	J_f^π:	$\langle 11^+ \rangle$		$\langle 12 \rangle$	$\langle 12^+ \rangle$	$\langle 13^+ \rangle$		$\langle 14^+ \rangle$	$\langle 13 \rangle$	$\langle 14 \rangle$
3127.6(1)	$\langle 13 \rangle$				73(4)	27(5)				
3348.6(1)	$\langle 14 \rangle$					52(4)	x		48(4)	
3408.4(10)						100				
3510.8(1)	$\langle 15^+ \rangle$							100		
3795.0(1)	$\langle 15 \rangle$							50(3)		43(2)
3899.4(1)	$\langle 15^- \rangle$							17(6)		
4227.36(14)	$\langle 16 \rangle$							100		

Energy levels and branching ratios [01So16]. Part 5 **$^{144}_{61}$Pm**

E^*	J^π	Branching ratios in percentage								
	E_f^*:	3408.4	3431.0	3510.8	3615.9	3795.0	3899.4	3904.4	4035.0	4118.6
[keV]	J_f^π:		$\langle 14^- \rangle$	$\langle 15^+ \rangle$	$\langle 14 \rangle$	$\langle 15 \rangle$	$\langle 15^- \rangle$			$\langle 16^- \rangle$
3727.4(15)		100								
3795.0(1)	$\langle 15 \rangle$		6.9(10)							
3899.4(1)	$\langle 15^- \rangle$		67(3)		>15					
3904.37(13)				37(3)	>12	51(3)				
4035.0(9)			100							
4118.56(13)	$\langle 16^- \rangle$			46(3)		12(1)	42(2)			
4328.2(8)								100		
4505.06(16)	$\langle 17 \rangle$									100
4557.16(15)	$\langle 17^+ \rangle$			57(2)						
4659.0(11)									100	
4717.2(8)								100		
5060.4(10)								100		

Energy levels and branching ratios [01So16]. Part 6 **$^{144}_{61}$Pm**

E^*	J^π	Branching ratios in percentage								
	E_f^*:	4227.4	4328.2	4505.1	4557.2	4659.0	4717.2	4818.8	5060.4	5118.6
[keV]	J_f^π:	$\langle 16 \rangle$		$\langle 17 \rangle$	$\langle 17^+ \rangle$			$\langle 18 \rangle$		
4557.16(15)	$\langle 17^+ \rangle$	43(2)								
4818.76(17)	$\langle 18 \rangle$				100					
5118.65(19)				100						
5351.46(17)	$\langle 19 \rangle$				68(6)			32(1)		
5454.0(10)						100				
5457.4(15)									100	
6264.0(7)			x				x			x

Energy levels and branching ratios [01So16]. Part 7

$^{144}_{61}$Pm

E^*	J^π		Branching ratios in percentage							
		E_f^*:	5351.5	5454.0	6264.0	6347.5	7105.7	7558.6	7972.1	8510.3
[keV]		J_f^π:	⟨19⟩							
5850.46(20)	⟨20⟩		100							
6264.0(7)				x						
6347.5(12)					100					
7105.7(15)						100				
7558.6(15)						100				
7972.1(16)							x	x		
8510.3(19)									100	
8595.8(22)	⟨25–35⟩									100

Energy levels and branching ratios [93Pe07].

$^{145}_{61}$Pm

E^*	$2J^\pi$	L	$(2j+1)S_{lj}$	σ (τ,d)	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
							E_f^*:	0.0	61.2	492	660	670
[keV]				μb/sr	Γ_{cm}		$2J_f^\pi$:	5^+	7^+	3^+	$\langle 3\rangle^+$	7^+
0.0	5^+	2	2.33	354	17.7(4) yr	80St10						
61.25(5)	7^+	4	1.59	56	2.64(6) ns	80St10		100				
492.3(2)	3^+	2	0.02	4		80St10		98	1.6(1)			
660.5(5)	$\langle 3\rangle^+$							18(1)	75(6)	7.1(6)		
669.7(3)	7^+							84(4)	16(2)			
713.6(5)	9^+								100			
726.5(4)	1^+	0	0.52	241		80St10				100		
750.4(3)	9^+							98(5)				2.2(3)
773	$\langle 3\rangle^+$	2	0.15	30		80St10						
794.6(4)	11^-	5	8.77	202	17.1(12) ns	80St10		4.6(18)	95(10)			
823.5(5)	5^+								34(5)	59(5)		7(1)
836.5(5)	11^+								99(5)			
883.8(3)	7^+							49(6)	41(4)		9(1)	
958.0(4)	$\langle 3\rangle^+$	2	1.41	299		80St10		92(9)		8.3(19)		
1057.3(5)	1^+	0	0.56	288		80St10				100		
1101.8(6)	9^-								38(4)			33(3)
1206.8(6)	11^+											13(2)
1215.2(5)								70(7)	20(4)			10(2)
1233.9(5)	$\langle 3\rangle^+$	2	0.25	62		80St10		66(9)				
1260(5)				5								
1284.0(6)	7^-,11^-											
1291.9(6)										32(6)		40(6)
1311.7(6)								35(5)		65(8)		
1346.9(6)	13^+											
1365.9(6)												
1384.9(7)	7^-	3	0.19	34		80St10						
1388.5(8)												
1397.2(7)	13^+											

(continued) **$^{145}_{61}$Pm**

E^*	$2J^\pi$	L	$(2j+1)S_{lj}$	σ (τ,d)	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
							E_f^*: 0.0	61.2	492	660	670
[keV]				μb/sr	Γ_{cm}		$2J_f^\pi$: 5^+	7^+	3^+	$\langle 3\rangle^+$	7^+
1455.7(8)											
1489	$\langle 3^+\rangle$	$\langle 2\rangle$	$\langle 0.2\rangle$	35		80St10					
1494(1)	13^+										
1502(1)	15^+										
1507	$\langle 3\rangle^+$	2	0.23	60		80St10					
1558(1)											
1563				21							
1649(1)	$\langle 15\rangle$										
1716	1^+	0	0.03	12		80St10					
1753	1^+	0	0.04	46		80St10					
1753	$\langle 11\rangle^-$	5	1.3	incl		80St10					
1809	$\langle 1^+\rangle$	$\langle 0\rangle$	0.02	11		80St10					
1849				7		80St10					
1978	1^+	0	0.18	121		80St10					
2008	$\langle 3\rangle^+$	2	0.53	141		80St10					
2112	1^+	0	0.12	77		80St10					
2168				8		80St10					
2190	$\langle 3^+\rangle$	$\langle 2\rangle$	$\langle 0.2\rangle$	49		80St10					
2210	$\langle 3^+\rangle$	$\langle 2\rangle$	$\langle 0.1\rangle$	33		80St10					
2282	$\langle 3\rangle^+$			82		80St10					
2294	$\langle 3\rangle^+$			incl		80St10					
2329				24		80St10					
2401				11		80St10					
2431				16		80St10					
2474				21		80St10					
2562				18		80St10					
			80St10	80St10		Ref.					

Additional data on this isotope can be found in [00KoZU, 96Ur03, 93Gl03, 92Gl03].
Data for this isotope are considered in vol. LB I/18B.

Energy levels and branching ratios [93Pe07]. Part 2 **$^{145}_{61}$Pm**

E^*	$2J^\pi$					Branching ratios in percentage					
		E_f^*:	714	750	795	823.5	836.5	1101.8	1206.8	1346.9	1397.2
[keV]		$2J_f^\pi$:	9^+	9^+	11^-	5^+	11^+	9^-	11^+	13^+	13^+
794.6(4)	11^-			x							
836.5(5)	11^+		1.2(2)								
1101.8(6)	9^-		8(2)		22(3)						
1206.8(6)	11^+		12(2)	67(4)			7.0(19)				
1233.9(5)	$\langle 3\rangle^+$					34(6)					
1284.0(6)	7^-,11^-		100								
1291.9(6)						28(6)					

(continued) **$^{145}_{61}$Pm**

E^*	$2J^\pi$						Branching ratios in percentage				
		E_f^*:	714	750	795	823.5	836.5	1101.8	1206.8	1346.9	1397.2
[keV]		$2J_f^\pi$:	9^+	9^+	11^-	5^+	11^+	9^-	11^+	13^+	13^+
1346.9(6)	13^+		57(7)				43(7)				
1365.9(6)			69(11)				31(3)				
1384.9(7)	7^-							100			
1388.5(8)			100								
1397.2(7)	13^+			55(7)					45(4)		
1455.7(8)			100								
1494(1)	13^+						100				
1502(1)	15^+						90(7)			10.2(12)	
1558(1)							100				
1649(1)	$\langle 15 \rangle$										100

Energy levels and branching ratios [97Pe22]. **$^{146}_{61}$Pm**

E^*	J^π	L	$T_{1/2}$ or		Branching ratios in percentage						
				E_f^*:	0.0	17.23	33.27	73.13	83.18	89.09	94.28
[keV]		(d,τ)	Γ_{cm}	J_f^π:	3^-		J				$\langle J$–1$\rangle$
0.0	3^-	4	5.53(5) yr								
17.23(8)											
33.27(7)	J										
73.13(7)					100						
83.18(7)					100						
89.09(7)		2			100						
94.28(8)	$\langle J$–1$\rangle$						100				
107.5	J						100				
136.42(6)					100						
149.86(6)					80(2)	19.9(7)					
166.93(6)								100			
187.82(7)					55(2)				25.3(9)	19.7(5)	
201.10(6)					57(2)		21.5(9)				21.2(9)
212.42(5)					55(2)	10.2(4)					
232.1	J						61(3)				39(2)
235.53(10)								100			
285.20(7)					68(3)					29.3(9)	
292.64(11)											
302.46(6)					68(2)						
310.58(6)					3.3(2)		43(2)				54(2)
352.5											
391.97(6)					26(1)	3.4(7)		28(1)			
417.91(8)							41(2)				
452.60(9)							16.9(11)				8.8(11)
518.33(14)											
532.17(7)					54(2)						

(continued) **$^{146}_{61}$Pm**

E^*	J^π	L	$T_{1/2}$ or		Branching ratios in percentage						
				E_f^*:	0.0	17.23	33.27	73.13	83.18	89.09	94.28
[keV]		(d,τ)	Γ_{cm}	J_f^π:	3^-		J				$\langle J$–1$\rangle$
564.42(12)											
581.64(11)											
589.50(11)											
649.03(8)									35(3)	37(3)	
665.82(12)											
675.53(8)											
699.52(12)											
703.48(12)											
758.50(8)											
765.28(7)											
767.2	J+2						37(4)				
791.50(9)											
810.82(12)											
820.7	J+1										
833.59(9)											
872.9	J+3										
873.72(12)											
920.82(12)											
1028.28(12)											
1111.8											
1353.1	J+4										
1440.3											
1511.6	J+5										
1966.8	J+6										
2005.2	J+6										
2236.3	J+7										
2551.1	J+8										
2605.9	J+8										
3037.5	J+10										
3054.6											
3247.4	J+10										
3790.8	J+12										
4099.1											
4110.7											
4180.8	J+14										
4219.8	J+13										
4872.5	J+14										
4969.0											
5250.6	J+16										
5338.7	J+16										
5378.6											
5454											
5640.1											
5686.2	J+16										
5787.2											

(continued) **$^{146}_{61}$Pm**

E^*	J^π	L	$T_{1/2}$ or	Branching ratios in percentage							
				E_f^*:	0.0	17.23	33.27	73.13	83.18	89.09	94.28
[keV]		(d,τ)	Γ_{cm}	J_f^π:	3^-		J				$\langle J$–1$\rangle$
5893.1	J+17										
5986.7	J+18										
6292.2											
6432.8											
6513.6											
6619.1	J+19										
6837.8											
6876.4											

Additional data on this isotope can be found in [95Rz02, 92Ue01].

Energy levels and branching ratios [97Pe22]. Part 2 **$^{146}_{61}$Pm**

E^*	J^π	Branching ratios in percentage										
		E_f^*:	107.5	136.42	149.86	166.93	187.82	201.10	212.42	232.1	235.53	292.64
[keV]		J_f^π:	J							J		
212.42(5)				25.0(8)	9.6(4)							
285.20(7)							2.9(5)					
292.64(11)					100							
302.46(6)				8.0(4)		23.5(12)						
352.5			100									
391.97(6)						4.5(3)		4.8(3)	34(1)			
417.91(8)				18(1)		41(2)						
452.60(9)								74(3)				
518.33(14)											100	
532.17(7)									46(2)			
564.42(12)							100					
581.64(11)									84(3)			16.3(20)
589.50(11)								89(4)				
649.03(8)							29(2)					
665.82(12)									100			
675.53(8)											54(3)	
699.52(12)				100								
758.50(8)					50(3)	29.8(27)		19.9(20)				
765.28(7)					38(2)				37(2)			
767.2	J+2									63(5)		
791.50(9)				48(6)								
810.82(12)				100								
820.7	J+1		28(2)							63(3)		
833.59(9)								15.7(43)				
873.72(12)				100								
920.82(12)				100								

Energy levels and branching ratios [97Pe22]. Part 3 **$^{146}_{61}$Pm**

E^*	J^π	Branching ratios in percentage										
	E_f^*:	302.46	310.58	352.5	391.97	518.33	532.17	765.28	767.2	820.7	872.9
[keV]	J_f^π:								J+2	J+1	J+3
589.50(11)			11.3(12)								
675.53(8)			24.6(16)		21.3(16)						
703.48(12)			100								
765.28(7)		16.2(9)					8.5(4)				
791.50(9)			52(4)								
820.7	J+1			9.0(6)		<1					
833.59(9)			84(4)								
872.9	J+3								42(3)	58(3)	
1028.28(12)								100			
1111.8				100							
1353.1	J+4										100
1511.6	J+5										94(6)

Energy levels and branching ratios [97Pe22]. Part 4 **$^{146}_{61}$Pm**

E^*	J^π	Branching ratios in percentage									
	E_f^*:	1111.8	1353.1	1511.6	1966.8	2005.2	2236.3	2551.1	2605.9	3037.5	3054.6
[keV]	J_f^π:		J+4	J+5	J+6	J+6	J+7	J+8	J+8	J+10	
1440.3		100									
1511.6	J+5		6.1(6)								
1966.8	J+6		67(4)	33(2)							
2005.2	J+6			100							
2236.3	J+7			85(4)	5.9(7)	9.6(9)					
2551.1	J+8				62(4)		38(2)				
2605.9	J+8					63(3)	37(2)				
3037.5	J+10							100			
3054.6							74(6)	26(3)	x		
3247.4	J+10								93(6)		7.5(7)
4099.1										100	

Energy levels and branching ratios [97Pe22]. Part 5 **$^{146}_{61}$Pm**

E^*	J^π	Branching ratios in percentage									
	E_f^*:	3247.4	3790.8	4099.1	4180.8	4219.8	4872.5	5250.6	5338.7	5378.6	5454
[keV]	J_f^π:	J+10	J+12		J+14	J+13	J+14	J+16	J+16		
3790.8	J+12	100									
4110.7			100								
4180.8	J+14		100								
4219.8	J+13		100								

(continued) **$^{146}_{61}$Pm**

E^*	J^π	Branching ratios in percentage									
	E_f^*:	3247.4	3790.8	4099.1	4180.8	4219.8	4872.5	5250.6	5338.7	5378.6	5454
[keV]	J_f^π:	J+10	J+12		J+14	J+13	J+14	J+16	J+16		
4872.5	J+14		100								
4969.0				100							
5250.6	J+16					100					
5338.7	J+16				100						
5378.6					100						
5454								100			
5640.1					62(10)		14(1)			25(4)	
5686.2	J+16				32(4)		68(5)				
5787.2									100		
5893.1	J+17								39(4)	14(3)	
5986.7	J+18								50(8)		
6292.2									100		
6432.8											100
6513.6											100

Energy levels and branching ratios [97Pe22]. Part 6 **$^{146}_{61}$Pm**

E^*	J^π	Branching ratios in percentage						
	E_f^*:	5640.1	5686.2	5787.2	5893.1	5986.7	6292.2	6619.1
[keV]	J_f^π:		J+16		J+17	J+18		J+19
5893.1	J+17	32(3)	15(3)					
5986.7	J+18				50(5)			
6619.1	J+19			26(2)		61(4)	13(2)	
6837.8								100
6876.4								100

Energy levels and branching ratios [92De38]. **$^{147}_{61}$Pm**

E^*	$2J^\pi$	σ (τ,d)	S'	σ (α,t)	σ (t,α)	S_N	L	C^2S	L	$T_{1/2}$ or	Ref.
[keV]		μb/sr	(τ,d)	μb/sr	μb/sr	(t,α)	(d,τ)	(d,τ)	(p,t)	Γ_{cm}	
0.0	7^+	36	1.67	72	430	4.12	4	7.9(20)	4	2.6234(2) yr	77MaYN
91.10(2)	5^+	263	2.33	142	345	1.70	2	1.6(5)	2	2.50(5) ns	79Do06
350											
380											
408.2(11)	9^+	4		2.9	16						79St01
410.51(3)	3^+	incl	0.03	incl	incl					0.139(14) ns	79St01
489.25(4)	7^+			1.0	30	0.29					79St01
500											

(continued) **$^{147}_{61}$Pm**

E^* [keV]	$2J^\pi$	σ (τ,d) μb/sr	S' (τ,d)	σ (α,t) μb/sr	σ (t,α) μb/sr	S_N (t,α)	L (d,τ)	C^2S (d,τ)	L (p,t)	$T_{1/2}$ or Γ_{cm}	Ref.
531.01(4)	5^+				≈7	0.19				0.083(15) ns	79St01
620											
632.8(6)	$\langle 1^+ \rangle$		1.22	60		<0.97					79St01
641.3(3)	$\langle 3,5 \rangle^+$	493						0.6			79Do06
649.3(4)	11^-		8.39	213	214	<2.6				12(2) ns	79St01
660											
667.2(3)	$\langle 11 \rangle^+$										
680.46(7)		14		6.7	205						79St01
685.89(3)	5^+	incl	0.08	incl	incl	0.85				0.25(10) ns	79St01
730.7(3)	$\langle 9 \rangle^+$	9	0.06	2.9	14	0.03					79St01
807.3(3)	$\langle 5,7 \rangle^-$	25	0.17	6.4	≈7	0.02					79St01
865.1(4)		26	0.17	8.0	51	0.20					79St01
910											
940		68	0.26	7.2	23	0.11					79St01
970.2(4)	$\langle 7 \rangle^-$	6		2.8	≈7						79St01
984.0(6)		incl		incl	incl						
1041.2(4)		44	0.23	9.9	18	0.08					79St01
1049.2(8)											
1051.2(4)	$\langle 13,15 \rangle^-$										
1072.5(3)	$\langle 11 \rangle^+$										
1077.5(3)	$\langle 7 \rangle^+$										
1119.2(8)		12	0.03								79St01
1159.5(4)	$\langle 9 \rangle^-$	11	0.07								79St01
1213.9(8)		6		2.1	11						79St01
1245.8(4)	$\langle 13^-,15^- \rangle$										
1360		41	0.21	7.4	43	0.17					79St01
1382.1(10)		57	0.18	≈1							79St01
1392.8(8)	$\langle 15 \rangle^+$			5.0							79St01
1406.4(3)	$\langle 7,9 \rangle^+$	4									79St01
1434.0(6)		11			40						79St01
1476*		18	0.57	11	7	0.12					79St01
1505*					14						79St01
1543*		11			15						79St01
1587		47	0.27	6.7	43						79St01
1596*				1.6							79St01
1627.8(10)		21	0.11	3.5							79St01
1646*		incl		7.3							79St01
1656		27	0.14		26						79St01
1670					incl						
1702*		21	1.31	22							79St01
1723*					18						79St01
1788*			0.18	2.4							79St01
1810					29						79St01
1832*		8									79St01
1872*		12									79St01

(continued) **$^{147}_{61}$Pm**

E^* [keV]	$2J^\pi$	σ (τ,d) μb/sr	S' (τ,d)	σ (α,t) μb/sr	σ (t,α) μb/sr	S_N (t,α)	L (d,τ)	C^2S (d,τ)	L (p,t)	$T_{1/2}$ or Γ_{cm}	Ref.
1892*		20	0.03	0.9							79St01
1910*					16						79St01
1930*		119	0.28	<5							79St01
1938*					15						79St01
2013*		67	0.34	17							79St01
2025*					14						79St01
2035*		10		2.3							79St01
2068*		13	0.56	4.8							79St01
2106*		42		3.1	19						79St01
2160*		25			10						79St01
2180*		26									79St01
2201*					18						79St01
2220*		21									79St01
		79St01	79St01	79St01	79St01	79St01		79Do06	77MaYN		Ref.

Additional data on this isotope can be found in [97Sa53, 95Ur01].

* E^* from [79St01] not included in Adopted Levels [92De38].

Cross sections of the (τ,d), (α,t) and (t,α) reactions were measured at 50°, 60° and 40°, respectively; data for 25°, 45° and 30° as well as sums of spectroscopic factors S'^{+}_{p} and S^{-}_{p} for different shell-model states can be found in [79St01].

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

Energy levels and branching ratios [92De38]. Part 2 **$^{147}_{61}$Pm**

E^* [keV]	$2J^\pi$	E^*_f: $2J^\pi_f$:	Branching ratios in percentage 0.0 7^+	91.1 5^+	408 9^+	410 3^+	489 7^+	531 5^+	641 $\langle 3,5\rangle^+$	649 11^-	667.2 $\langle 11\rangle^+$	680.46
91.10(2)	5^+		100									
408.2(11)	9^+		100									
410.51(3)	3^+		7.0(19)	93(5)								
489.25(4)	7^+		19(2)	81(4)								
531.01(4)	5^+		89(6)	8.6(21)		2.6(9)						
632.8(6)	$\langle 1^+\rangle$			100								
641.3(3)	$\langle 3,5\rangle^+$					100						
649.3(4)	11^-		18(2)		82							
667.2(3)	$\langle 11\rangle^+$		83		17.1(17)							
680.46(7)			29(4)	53(8)	18(6)							
685.89(3)	5^+		40(4)	14(5)		37(3)	8(2)					
730.7(3)	$\langle 9\rangle^+$			54(4)			46(10)					
807.3(3)	$\langle 5,7\rangle^-$		40(4)	45(4)			15(4)					
865.1(4)			72(6)		28(6)							
970.2(4)	$\langle 7\rangle^-$		38(8)		62(5)							
984.0(6)			76(9)		24(6)							

(continued) **$^{147}_{61}$Pm**

E^*	$2J^\pi$		Branching ratios in percentage									
		E_f^*:	0.0	91.1	408	410	489	531	641	649	667.2	680.46
[keV]		$2J_f^\pi$:	7^+	5^+	9^+	3^+	7^+	5^+	$\langle 3,5\rangle^+$	11^-	$\langle 11\rangle^+$	
1041.2(4)			29(6)	29(6)		42(3)						
1049.2(8)								44(11)				
1051.2(4)	$\langle 13,15\rangle^-$									100		
1072.5(3)	$\langle 11\rangle^+$				70(8)						30(6)	
1077.5(3)	$\langle 7\rangle^+$						39(7)					
1119.2(8)											38(9)	62(16)
1159.5(4)	$\langle 9\rangle^-$										100	
1213.9(8)									100			
1245.8(4)	$\langle 13^-,15^-\rangle$									65(15)		
1382.1(10)						100						
1392.8(8)	$\langle 15\rangle^+$										100	

Energy levels and branching ratios [92De38]. Part 3 **$^{147}_{61}$Pm**

E^*	$2J^\pi$		Branching ratios in percentage						
		E_f^*:	685.89	730.7	970.2	1051.2	1072.5	1077.5	1159.5
[keV]		$2J_f^\pi$:	5^+	$\langle 9\rangle^+$	$\langle 7\rangle^-$		$\langle 11\rangle^+$	$\langle 7\rangle^+$	$\langle 9\rangle^-$
1049.2(8)			56(14)						
1077.5(3)	$\langle 7\rangle^+$			61(6)					
1245.8(4)	$\langle 13^-,15^-\rangle$					35(3)			
1406.4(3)	$\langle 7,9\rangle^+$				24(7)		51(6)		25(3)
1434.0(6)								100	
1627.8(10)						100			

Energy levels and branching ratios [00Bh03]. **$^{148}_{61}$Pm**

E^*	J^π	$T_{1/2}$ or	Branching ratios in percentage						
			E_f^*:	0.0	75.70	137.2	137.9	215.3	219.9	292.0
[keV]		Γ_{cm}	J_f^π:	1^-	$1^-,2^-$		$5^-,6^-$			
0.0	1^-	5.368(2) d								
75.70(25)	$1^-,2^-$			x						
137.2(5)										
137.9(3)	$5^-,6^-$	41.29(11) d			x					
215.3(4)						x				
219.9(3)				x						
292.0(3)				x	x		x			
302.9(4)							x			
304.7(3)				x	x				x	
308.9(3)				x	x		x		x	

(continued) **$^{148}_{61}$Pm**

E^*	J^π	$T_{1/2}$ or	Branching ratios in percentage						
		E_f^*:	0.0	75.70	137.2	137.9	215.3	219.9	292.0
[keV]		Γ_{cm}	J_f^π: 1^-	$1^-,2^-$		$5^-,6^-$			
363.4(4)						x	x		
379.7(3)			x					x	x
385.3(5)					x		x		
388.1(3)			x	x		x			x
409.6(4)				x		x	x		
413.5(4)				x					x
440.1(3)				x		x			x
452.0(3)				x		x			x
462(6)									
526.4(4)							x		
529.4(5)									
543.4(4)						x	x		
545.7(4)						x			x
550.3(4)						x			x
561.3(4)				x				x	
564.2(4)						x			x
573.1(3)						x			x
611.2(5)							x		
622.7(6)									
641.9(5)								x	
655.7(5)									
660.5(6)									
669.5(4)									
672.9(4)									
700(6)									
715(6)									
726.3(3)									
745(6)									
797.0(6)									
800.5(7)									
810(6)									
859(6)									
910(6)									
958(6)									

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

Energy levels and branching ratios [00Bh03]. Part 2 **$^{148}_{61}$Pm**

E^*	J^π	Branching ratios in percentage									
	E_f^*:	302.9	304.7	308.9	363.4	379.7	385.3	388.1	409.6	413.5	440.1
[keV]	J_f^π:										
379.7(3)		x									
388.1(3)			x	x							
440.1(3)		x		x							
452.0(3)		x			x						
526.4(4)		x								x	
529.4(5)								x	x		
543.4(4)										x	
545.7(4)			x	x		x		x			
550.3(4)		x			x			x			
561.3(4)						x		x			
564.2(4)					x	x		x	x		
573.1(3)			x	x		x					x
611.2(5)										x	
622.7(6)			x								
641.9(5)				x							
655.7(5)							x		x		x
660.5(6)				x	x						
669.5(4)			x	x			x				x
672.9(4)								x	x	x	
726.3(3)			x		x	x		x			
797.0(6)		x									x
800.5(7)		x									

Energy levels and branching ratios [00Bh03]. Part 3 **$^{148}_{61}$Pm**

E^*	J^π	Branching ratios in percentage		
	E_f^*:	452.0	526.4	545.7
[keV]	J_f^π:			
622.7(6)				x
726.3(3)		x		
800.5(7)			x	

Energy levels and branching ratios [85Sz01, 94Si18]. **$^{149}_{61}$Pm**

E^*	$2J^\pi$	L	$d\sigma/d\Omega$	S_N	L	$d\sigma/d\Omega$	S_N	$S_p'^+$	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
											E_f^*:	0.0	114	189	211	240
[keV]		(τ,d)	μb/sr	(τ,d)	(α,t)	μb/sr	(α,t)		Γ_{cm}		$2J_f^\pi$:	7^+	5^+	3^+	5^+	11^-
0.0	7^+	4	35	1.8	4	108	2.6	2.2	53.08 h	76St10						
114.31(1)	5^+	2	146	2.2	2	171	2.5	2.4	2.53 ns	76St10		100				

(continued)

$^{149}_{61}$Pm

E^*	$2J^\pi$	L	$d\sigma/d\Omega$	S_N	L	$d\sigma/d\Omega$	S_N	S'^+_p	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
											E^*_f:	0.0	114	189	211	240
[keV]		(τ,d)	μb/sr	(τ,d)	(α,t)	μb/sr	(α,t)		Γ_{cm}		$2J^\pi_f$:	7^+	5^+	3^+	5^+	11^-
188.63(1)	3^+		3	0.043		2	0.033	0.039	3.27 ns	76St10		62	38			
211.31(1)	5^+		6	0.084		2	0.033	0.058	80 ps	76St10		95	5.3	0.020		
240.21(1)	11^-	5	62	4.8		147	3.9	4.3	35 μs	76St10		100				
270.17(1)	7^-	3	19	0.34		20	0.18	0.26	2.59 ns	76St10		60	33		7	0.10
288.21(1)	9^+											100				
360.04(1)	7^+											16	84			
387.56(1)	1^+	0	38	0.32		19	0.23	0.28	0.6 ns	76St10			11	86	3.0	
396.77(1)	5^+											2.1	17.8	73.4	3.0	
415.45(1)	3^+	2	50	0.71		56	0.85	0.78		76St10			70	30		
425.27(1)	7^+											21	40		31	
462.19(1)	3^-		3							76St10				5	2.0	
497.6(1)	$\langle 11^+ \rangle$											87				
510.1(2)	$\langle 15^-,13^- \rangle$								<3 ns							100
515.64(1)	$\langle 9 \rangle^-$		4			6				76St10		4.0				72
537.86(1)	5^-								$\leq$50 ps				37	6.8	22.6	
547.13(1)	$\langle 5,7^+ \rangle$											3.9	5	2.6		
552(3)	$\langle 11^- \rangle$	5	5	0.39		12	0.21	0.30		76St10						
558.30(4)	$\langle 7^+,9^+ \rangle$											12	12			
636.5(28)	1^+	0	14	0.09		8	0.11	0.10		76St10						
651.02(2)	$\langle 5^+ \rangle$											18	13	9	10	
654.84(1)	7^-								$\leq$0.18 ns			43	35		6.1	
666.55(12)	$\langle 7^-,9^+ \rangle$														20	36
716.72(17)	$\langle 3^-,5,7^+ \rangle$															
721.00(2)	7^+		5			6				76St10			67			
744.58(1)	$\langle 3,5^+ \rangle$	2	42	0.49		33	0.55	0.52		76St10			16.8	52	8.1	
750.38(3)	$\langle 7^-,9^+ \rangle$											8	31			37
751.5(19)	3^+															
758.65(8)	$\langle 5^+,7,9^+ \rangle$											43			29	
768.187(17)	$\langle 5,7^+ \rangle$											9.0	2.8		66	
771.35(22)	$\langle 11$–$15^- \rangle$															60
778.88(12)	$\langle 13^+ \rangle$															15
786.72(4)	$\langle 3^+,5^+ \rangle$											14		39	10	
791.01(20)	11^-	4,5	17	0.60		29	0.89	0.74		76St10						
808.64(17)	$\langle 11^+ \rangle$															
872.96(8)		[2]	34	0.39		27	0.48	0.44		76St10			x			
884.89(7)	$\langle 5^+ \rangle$														100	
885.8(5)	$\langle 11,13^+ \rangle$															
907.1(25)	1^+	0	43	0.28		12	0.15	0.28		76St10						
923.88(2)	$\langle 5^+,7 \rangle$											34	5		23	
942.92(2)	$\langle 3^+,5,7^+ \rangle$											4	11	48		
955(5)	$\langle 5^+ \rangle$					6				76St10						
1008(4)	1^+	0	$\approx$5	0.033				0.033		76St10						
1031.68(3)	$\langle 7^+ \rangle$	$\langle 5 \rangle$	6	0.65		22	0.73	0.69		76St10		3.9				
1043.40(5)	$\langle 3^+,5,7 \rangle$												<34		76	
1050.18(3)													21	79		

(continued) **$^{149}_{61}$Pm**

E^*	$2J^\pi$	L	$d\sigma/d\Omega$	S_N	L	$d\sigma/d\Omega$	S_N	S'^+_p	Ref.	Branching ratios in percentage				
										E^*_f:	0.0	114	189	211	240
[keV]		(τ,d)	μb/sr	(τ,d)	(α,t)	μb/sr	(α,t)			$2J^\pi_f$:	7^+	5^+	3^+	5^+	11^-
1141.53(2)	5^+	2	8	0.14		4	0.12	0.13	76St10		<3	11			
1156.04(2)	$\langle 3^+,5,7^+\rangle$										3		27		
1181(3)	$3^+,5^+$	2	4	0.11		4	0.14	0.12	76St10						
1190.26(2)	$\langle 5\rangle$		≈3			7			76St10		1.5	14		50	
1213(3)			≈4			≈4			76St10						
1234.10(1)	$\langle 7\rangle$										3			11	
1239.62(2)	$\langle 5^+,7\rangle$										1.8	30			
1264.16(5)	$\langle 5,7\rangle$	2,3	5			6			76St10		22	67			
1290.08(3)	$\langle 3^+,5,7\rangle$										4.6	3.8		71	
1312.11(2)	$\langle 5\rangle$										4	4	8	27	
1319			[4]						76St10						
1329(4)	3^+					3			76St10						
1367(4)			≈5						76St10						
1394.3(10)	3^+														
1405(3)	$9^-,11^-$	5	8	0.67		14	0.51	0.59	76St10						
1412.26(3)	$\langle 5,7\rangle$														
1448.24(7)	$\langle 3^+,5,7^+\rangle$										11		89		
1462(3)	$\langle 7^+$–$11^-\rangle$	4.5	≈7			12			76St10						
1495.84(5)	$\langle 5,7^+\rangle$										16	21	11	16	
1531(3)	$5^-,7^-$	3	6	0.12		4	0.11	0.11	76St10						
1568.58(5)	$\langle 5^+,7\rangle$		≈3						76St10		3	7		12	
1589(3)	$7^+,9^+$	4	9	0.32		12	0.50	0.41	76St10						
1642.3(25)	$\langle 3^+\rangle$	2	37	0.38		11	0.33	0.38	76St10						
1696(3)	$3^+,5^+$	2	14	0.15		6	0.20	0.15	76St10						
1765(3)	1^+	0	19	0.12				0.12	76St10						
1782(4)			≈4			4			76St10						
1834(4)			5						76St10						
			76St10	76St10		76St10	76St10	76St10	Ref.						

Additional data on this isotope can be found in [96Jo19].

Cross sections of the (τ,d) and (α,t) reactions were measured at 60° and for obtaining $S_N=(d\sigma/d\Omega)/N\sigma^{DWBA}(\theta)$ normalization factors N=6.0 and N=111, respectively, were used [76St10].

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

Energy levels and branching ratios [85Sz01, 94Si18]. Part 2 **$^{149}_{61}$Pm**

E^*	$2J^\pi$										
		E^*_f:	270.2	288.2	360.0	387.6	396.8	415.4	425.3	462.2	497.6
[keV]		$2J^\pi_f$:	7^-	9^+	7^+	1^+	5^+	3^+	7^+	3^-	$\langle 11^+\rangle$
396.77(1)	5^+		3.2(2)		0.5(2)						
425.27(1)	7^+		3(1)	5	1						
462.19(1)	3^-		34(1)			58(9)	1.8(6)				

(continued) **$^{149}_{61}$Pm**

E^*	$2J^\pi$		Branching ratios in percentage								
		E^*_f:	270.2	288.2	360.0	387.6	396.8	415.4	425.3	462.2	497.6
[keV]		$2J^\pi_f$:	7^-	9^+	7^+	1^+	5^+	3^+	7^+	3^-	$\langle 11^+\rangle$
497.6(1)	$\langle 11^+\rangle$			13(3)							
515.64(1)	$\langle 9\rangle^-$		24(6)								
537.86(1)	5^-		30(1)		0.8(1)		0.19(1)	1.3(1)	0.6(1)	1.1(1)	
547.13(1)	$\langle 5,7^+\rangle$		87(3)					1.1			
558.30(4)	$\langle 7^+,9^+\rangle$		15(6)		60(6)						
651.02(2)	$\langle 5^+\rangle$		15(1)			7	25(1)			3	
654.84(1)	7^-		1.43(4)	2.90(8)	3.05(8)		2.01(6)		2.58(7)		
666.55(12)	$\langle 7^-,9^+\rangle$		26(1)						18(7)		
716.72(17)	$\langle 3^-,5,7^+\rangle$		64(12)					36(10)			
721.00(2)	7^+				33(7)						
744.58(1)	$\langle 3,5^+\rangle$					4.2(2)	14.3(5)	1.8(9)		1.5(6)	
750.38(3)	$\langle 7^-,9^+\rangle$		25(1)								
758.65(8)	$\langle 5^+,7,9^+\rangle$			29(14)							
768.187(17)	$\langle 5,7^+\rangle$		1.6(4)					8.2(4)	13(3)		
778.88(12)	$\langle 13^+\rangle$			74(7)							12(2)
786.72(4)	$\langle 3^+,5^+\rangle$					20(8)					
791.01(20)	11^-			100							
808.64(17)	$\langle 11^+\rangle$				71(11)						
872.96(8)					x						
885.8(5)	$\langle 11,13^+\rangle$			100							
923.88(2)	$\langle 5^+,7\rangle$			23(4)	3(1)				12(1)		
942.92(2)	$\langle 3^+,5,7^+\rangle$				23(10)			14(4)			
1031.68(3)	$\langle 7^+\rangle$		25(2)	2.3(9)	9(3)						
1043.40(5)	$\langle 3^+,5,7\rangle$								24(8)		
1141.53(2)	5^+		41(3)		5(1)						
1156.04(2)	$\langle 3^+,5,7^+\rangle$				23(3)			47(1)			
1190.26(2)	$\langle 5\rangle$		3(1)				15(12)	2.0(9)	4.9(12)	11(1)	
1234.10(1)	$\langle 7\rangle$		3	2	0.5(1)		3		20(1)		
1239.62(2)	$\langle 5^+,7\rangle$			3(1)			52(5)				
1264.16(5)	$\langle 5,7\rangle$		11(5)								
1290.08(3)	$\langle 3^+,5,7\rangle$				12(1)		5.0(12)		3.8(14)		
1312.11(2)	$\langle 5\rangle$		16(2)		4(2)		1.1(6)	2(1)	3(1)	12(1)	
1394.3(10)	3^+							100			
1412.26(3)	$\langle 5,7\rangle$		<9		15(4)				8(2)		
1495.84(5)	$\langle 5,7^+\rangle$		16(5)		21(8)						
1568.58(5)	$\langle 5^+,7\rangle$		4(3)	6(3)			22(4)				

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

$^{149}_{61}$Pm

E^*	$2J^\pi$		Branching ratios in percentage									
		E^*_f:	510.1	515.6	537.9	547.1	558.3	651.0	654.8	721.0	744.6	750.4
[keV]		$2J^\pi_f$:		$\langle 9\rangle^-$	5^-	$\langle 5,7^+\rangle$	$\langle 7^+,9^+\rangle$	$\langle 5^+\rangle$	7^-	7^+	$\langle 3,5^+\rangle$	$\langle 7^-,9^+\rangle$
654.84(1)	7^-			2.7(1)	0.6(2)	0.5(1)	0.18(6)					
744.58(1)	$\langle 3,5^+\rangle$					1.1						
771.35(22)	$\langle 11–15^-\rangle$		40(6)									
786.72(4)	$\langle 3^+,5^+\rangle$					17						
808.64(17)	$\langle 11^+\rangle$						29(6)					
1031.68(3)	$\langle 7^+\rangle$				53(5)				7(3)			
1141.53(2)	5^+					35(3)						9(3)
1234.10(1)	$\langle 7\rangle$			5(1)	18(1)	9(1)	3	5(1)	8(1)	1(1)		7
1239.62(2)	$\langle 5^+,7\rangle$						8(2)	6(2)				
1312.11(2)	$\langle 5\rangle$								10(4)		9(2)	
1412.26(3)	$\langle 5,7\rangle$					45(22)	15(4)					17(7)
1568.58(5)	$\langle 5^+,7\rangle$					14(6)						32(9)

Energy levels and branching ratios [97Si03].

$^{151}_{61}$Pm

E^*	$2J^\pi$	L	σ (α,t)	σ (τ,d)	σ (τ,d)	S_N	σ (t,α)	L	S_N	σ (t,α)	L	S_N	$T_{1/2}$ or	Ref.
[keV]		(α,t)	μb/sr	μb/sr	μb/sr	(τ,d)	μb/sr	(t,α)	(t,α)	μb/sr	(d,τ)	(d,τ)	Γ_{cm}	
0.0	5^+	$\langle 2\rangle$	4.2	3.4	5.1	0.031	11	2	0.03	10.4			28.40(4) h	72Bu22
85.119(7)	7^+	$\langle 4\rangle$	60	19.1	27	0.56	138	4	0.75	102	4	2.5*		81Le21
116.794(6)	5^-		≈1	≤1			4.3	3	0.007				89(15) ps	79St06
175.075(6)	7^-		45	≈7.7	10.0	0.018	28	3	0.063	22			<0.2 ns	79St06
197.272(10)	9^+	$\langle 4\rangle$	2.8	1.0			12	4	0.054	4.8				79St06
255.692(7)	3^+		7.9	2.6	4.1	0.026				12.4		0.7	0.93(2) ns	79Do06
261.157(23)	$\langle 9^-\rangle$		incl	incl			24	5	0.12	incl				79St06
324.682(8)	5^+		129	130	154	0.80	198	2	0.50	160	2**	0.58		81Le21
329.6(1)	$\langle 11\rangle^+$													
343.8(1)	11^-	$\langle 5\rangle$	80	45	49	1.44	301	5	1.66	172	5**	2.7		81Le21
426.451(14)	1^+		7.7	8.4	9.1	0.026	51	0	0.11	54	2**	0.41	<0.2 ns	81Le21
427.150(15)	$\langle 7\rangle^+$		incl	incl						incl	4**	0.82		81Le21
486.7(1)	13^+													
497.5(1)	$\langle 13\rangle^-$													
507.885(11)	5^+	$\langle 4\rangle$	7.0	2.4	7.2	0.033	107	2	0.20	73				79St06
524.339(12)	$\langle 3\rangle^+$		9.0	15.0						72	2	0.24*		72Bu22
532.057(16)	$\langle 7^-\rangle$	$\langle 1\rangle$	incl	incl	18	0.14	88	3	0.17	incl				79St06
540.372(14)	3^-		incl	incl						incl			<0.1 ns	
552(1)	$\langle 9^+\rangle$		5.7	6.2	6.1		45			26	4	1.7*		72Bu22
577.40(1)	$\langle 5\rangle^-$									6.4				72Bu22
596(2)			1.6				30			22				72Bu22
597.1(2)	$\langle 15\rangle^-$													
640.1(10)	11^-	$\langle 5\rangle$	16.0	8.9	8.6	0.28	110	5	0.60	76				79St06
657.6(2)	$\langle 15^+\rangle$													

(continued) **$^{151}_{61}$Pm**

E^* [keV]	$2J^\pi$	L (α,t)	σ (α,t) μb/sr	σ (τ,d) μb/sr	σ (τ,d) μb/sr	S_N (τ,d)	σ (t,α) μb/sr	L (t,α)	S_N (t,α)	σ (t,α) μb/sr	L (d,τ)	S_N (d,τ)	$T_{1/2}$ or Γ_{cm}	Ref.
701(1)	$\langle 11^+ \rangle$		3.0				14			10.2				72Bu22
719.2(9)	7^+		2.6	3.0	$\langle 2 \rangle$	<0.04	32	4	0.16	21				79St06
746.55(2)	$\langle 3^- \rangle$													
755.57(1)	$\langle 5,7^- \rangle$													
773.60(2)	$\langle 1–5^+ \rangle$													
781.0(8)	7^+	$\langle 4 \rangle$	51	22	24	0.44	29	4	0.18	22	4**	1.1		81Le21
809.46(4)	$\langle 5^+,7^- \rangle$						1.7			3.2		incl		81Le21
827.5(2)	$\langle 17^- \rangle$													
840.97(1)	$\langle 3 \rangle^+$										2**	0.18		81Le21
852.30(6)	1^+	$\langle 0 \rangle$	9.0	28	35	0.07	12	0	0.026	≈12				79St06
852.99(2)	$5^{\langle + \rangle}$		incl	incl						incl			<0.1 ns	
853.9(2)	$\langle 17^+ \rangle$													
866(1)	$\langle 13^+ \rangle$													
870.58(5)	$\langle 5^+,7^- \rangle$		33	52	61	0.30	82			52				72Bu22
874.71(2)	3^+	$\langle 2 \rangle$	incl	incl	incl		incl	2	0.15	incl	2*			79St06
897.63(7)	$\langle 3,5 \rangle$													
914.31(1)	5^+	$\langle 2 \rangle$	27	48	52	0.25	27	2	0.046	17.6				79St06
943(3)	$\langle 7^+ \rangle$						40	4	0.25	32.1				79St06
943.11(5)	$\langle 3^+,5 \rangle$						incl			incl				
944.7(2)	$\langle 19^- \rangle$									incl				
957.89(6)	$\langle 5^+ \rangle$	$\langle 2 \rangle$	22	42	47	0.20	15	2	0.03					79St06
989.88(4)	5^+				8.6	0.035	6.8							79St06
998(3)	$\langle 5^+ \rangle$		2.3	6.1				2	0.071	≈3.				79St06
1010.71(9)	$\langle 3–9 \rangle$													
1037(1)	$\langle 7^+ \rangle$		2.2	5.9	6.9	0.10	14	4	0.08	7.5				79St06
1058.0(2)	$\langle 19^+ \rangle$				3.9									79St06
1072.91(8)	$\langle 3^+ \rangle$						12	$\langle 2 \rangle$	0.023	7.1				79St06
1102(3)	$\langle 3^+ \rangle$						16	$\langle 2 \rangle$	0.037	≈12				79St06
1133.21(2)	$\langle 5^+ \rangle$				3.6		15	$\langle 2 \rangle$	0.026	7.7				79St06
1175.6(1)	$\langle \leq 7 \rangle$		2.7	8.5						≈2.				72Bu22
1183.27(4)	$\langle 3,5 \rangle^+$				11	0.037								79St06
1200.97(5)	$\langle 3^+,5 \rangle$				22	0.57				4.1				72Bu22
1205(5)	$\langle 11^- \rangle$	$\langle 5 \rangle$	26	19										72Bu22
1222(2)	1^+			9.1	13	0.024				≈7.				72Bu22
1239.0(2)	$\langle 21^- \rangle$													
1245(3)							21			≈7.				79St06
1262(3)	$\langle 3,5 \rangle^+$		4.3	10.7	10	0.046				≈2.				72Bu22
1287.5(10)	$\langle 21^+ \rangle$													
1297.68(1)	5^+		2.9	8.4	9.0	0.035							48(10) ps	72Bu22
1312(3)														
1330.4(1)	$\langle 5^+ \rangle$			6.2	6.5	0.022	40	$\langle 2 \rangle$	0.078	26		1.0		79Do06
1355.81(10)	$\langle \leq 7 \rangle$													
1377(1)	$\langle 23^- \rangle$													
1394.77(9)	$\langle 3^- \rangle$			7.7	11	0.017	11		0.012					72Bu22
1424.57(6)	$\langle 5^- \rangle$		2.5	17.5	17	0.095	9.1							72Bu22

(continued) **$^{151}_{61}$Pm**

E^* [keV]	$2J^\pi$	L (α,t)	σ (α,t) μb/sr	σ (τ,d) μb/sr	σ (τ,d) μb/sr	S_N (τ,d)	σ (t,α) μb/sr	L (t,α)	S_N (t,α)	σ (t,α) μb/sr	L (d,τ)	S_N (d,τ)	$T_{1/2}$ or Γ_{cm}	Ref.
1444.98(5)	$\langle 5^+ \rangle$		12.7	6.1						5.1				72Bu22
1455(3)														
1464(3)							19			8.7				72Bu22
1489(2)	1^+			21	26	0.050	14		0.021					72Bu22
1520(1)	$\langle 23^+ \rangle$													
1531					7.4									79St06
1557(2)	1^+			37	49	0.087	14		0.021	12.2				72Bu22
1562.1(2)	$\langle 3^-,5^+ \rangle$													
1570(4)							6.9							79St06
1584(2)	$\langle 3^+,5^+ \rangle$				8.8	0.051								79St06
1589.9(2)	$\langle 3^-,5 \rangle$						4.6							79St06
1617.82(5)	$\langle 3,5 \rangle$				27	0.097	19							79St06
1618.42(3)	$\langle 3^+,5^+ \rangle$			21						10.1				72Bu22
1639.63(9)	$\langle 1^+–5^+ \rangle$													
1651.5(1)	$\langle 3^+,5 \rangle$													
1673(2)	$\langle 3^+,5^+ \rangle$			9.3	16	0.076								72Bu22
1711(2)	1^+			32	32	0.063								72Bu22
1713.1(1)	$\langle 3^+,5 \rangle$			incl										
1721(1)	$\langle 25^- \rangle$													
1734(2)	$3^+,5^+$			11	13	0.024								72Bu22
1741.25(4)	$\langle 1^+–5^+ \rangle$													
1762(3)					11		12			3.1				72Bu22
1779(1)	$\langle 25^+ \rangle$													
1793.7(2)	$\langle 5 \rangle$				20	0.020								79St06
1795.13(8)	$\langle 3,5 \rangle$													
1805.51(4)	$\langle 1^+–5^+ \rangle$													
1809.80(4)	$\langle 3,5 \rangle^+$													
1822.17(6)	1,3,5													
1848.57(7)	$\langle 5 \rangle$													
1853.70(4)	$\langle 5 \rangle^+$													
1854.50(8)	$\langle 3^+,5 \rangle$													
1873.63(4)	$\langle 5 \rangle^+$				17	0.043								79St06
1878(1)	$\langle 27^- \rangle$													
1878.60(6)	$\langle 5 \rangle$													
1892.05(2)	$\langle 5 \rangle^+$													
1897.4(1)	$\langle 3^+,5^+ \rangle$													
1903.18(4)	$\langle 5 \rangle^+$													
1910.68(7)	$\langle 3^+,5^+ \rangle$													
1927.98(6)	$\langle 5^+ \rangle$													
1933.10(4)	$\langle 1^+–5^+ \rangle$				19		19			8.2				72Bu22
1959.61(7)	$\langle 1^+–5^+ \rangle$													
1973.32(7)	$\langle 1^+–5^+ \rangle$						16							79St06
1989.7(1)	$\langle 3,5 \rangle$													
1993.81(5)	$\langle 5 \rangle^+$													
1998.25(5)	$\langle 5 \rangle^+$													

(continued) **$^{151}_{61}$Pm**

E^* [keV]	$2J^\pi$	L (α,t)	σ (α,t) μb/sr	σ (τ,d) μb/sr	σ (τ,d) μb/sr	S_N (τ,d)	σ (t,α) μb/sr	S_N (t,α)	σ (t,α) μb/sr	L (d,τ)	S_N (d,τ)	$T_{1/2}$ or Γ_{cm}	Ref.
2010.99(5)	$\langle 5\rangle^+$												
2015.93(9)	$\langle 3,5\rangle$												
2018.87(5)	$\langle 1^+–5^+\rangle$												
2022.4(3)	$\langle 3^+,5\rangle$												
2023.15(8)	$\langle 5\rangle$												
2024.0(1)	$\langle 1–5\rangle$												
2030(80)	$\langle 7^+,9^+\rangle$										1.4,0.6		79Do06
2038.0(1)	$\langle 1–5\rangle$												
2053.1(2)	$\langle 5^+\rangle$												
2084.92(8)	$\langle 1–5\rangle$						38						79St06
2106.9(1)	$\langle 3,5\rangle$												
2119.09(7)	$\langle 1^+–5^+\rangle$						52						79St06
2204.3(2)	$\langle 1^+–5^+\rangle$												
2268.6(2)	$\langle 5^+\rangle$												
2304.0(2)	$1^+–5^+$												
2434(1)	$\langle 31^-\rangle$												
2447(4)							21						79St06
2700(80)	$\langle 7^+,9^+\rangle$										7.6		79Do06
		72Bu22	72Bu22	72Bu22	79St06	79St06	79St06	79St06	72Bu		81Le21		Ref.

Additional data on this isotope can be found in [90Ve14, 90Ur01, 90Zy01].

* for $J=L+1/2$ [97Si03]

** composite peaks [81Le21] discussed also in [97Si03]

Values S_N for the (d,τ) reaction are spectroscopic factors defined by $d\sigma/d\Omega$(exp)=N$\times C^2 S d\sigma/d\Omega$(DWBA) with normalization factor N=2.95 [81Le21, 97Si03].

Values S_N for the (t,α) reaction are spectroscopic factors defined by $d\sigma/d\Omega$(exp)=N$\times C^2 S d\sigma/d\Omega$(DWBA) with normalization factor N=23.

S_N for (τ,d) reaction are spectroscopic factors defined by $d\sigma/d\Omega$(exp)/2N$d\sigma/d\Omega$(DWBA) [79St06].

Properties of low-lying levels are discussed in vol. I/18B [02Sc0A].

Energy levels and branching ratios [97Si03]. Part 2 **$^{151}_{61}$Pm**

E^*	$2J^\pi$		Branching ratios in percentage									
		E_f^*:	0.0	85.1	117	175	197	255.7	261.2	324.7	329.6	343.8
[keV]		$2J_f^\pi$:	5^+	7^+	5^-	7^-	9^+	3^+	$\langle 9^- \rangle$	5^+	$\langle 11 \rangle^+$	11^-
85.119(7)	7^+		100									
116.794(6)	5^-		99(1)	1.2(1)								
175.075(6)	7^-		77(2)	19(1)	4.5(3)							
197.272(10)	9^+		65(4)	35(6)								
255.692(7)	3^+		66(1)	1.8(3)	32(1)							
261.157(23)	$\langle 9^- \rangle$			76(4)		14(7)	10(4)					
324.682(8)	5^+		20(1)	15(1)	1.9(3)	12(1)		52(2)				
329.6(1)	$\langle 11 \rangle^+$			87(9)			13(4)		x			

(continued)

$^{151}_{61}$Pm

E^*	$2J^\pi$		Branching ratios in percentage									
		E_f^*:	0.0	85.1	117	175	197	255.7	261.2	324.7	329.6	343.8
[keV]		$2J_f^\pi$:	5^+	7^+	5^-	7^-	9^+	3^+	$\langle 9^- \rangle$	5^+	$\langle 11 \rangle^+$	11^-
343.8(1)	11^-					7(3)	66(7)		26(8)			
426.451(14)	1^+		12(2)					88(4)				
427.150(15)	$\langle 7 \rangle^+$		12(4)	6(1)	3(1)		4(1)	16(4)	6(1)	53(3)		
486.7(1)	13^+						68(7)				x	32(10)
497.5(1)	$\langle 13 \rangle^-$								16(5)		42(4)	42(4)
507.885(11)	5^+		4.1(6)	19(3)	2.3(7)	34(2)		7(1)		22(1)		
524.339(12)	$\langle 3 \rangle^+$		28(1)	18(1)	28(1)			9(1)		15(1)		
532.057(16)	$\langle 7^- \rangle$		11(1)	16(1)	2(1)	34(2)	4(1)		29(2)			
540.372(14)	3^-		0.7(2)		94(2)	3.5(2)		0.7(2)				
552(1)	$\langle 9^+ \rangle$									x		
577.40(1)	$\langle 5 \rangle^-$		11.4(4)	3.2(3)	31(1)	55(2)						
597.1(2)	$\langle 15 \rangle^-$											49(5)
657.6(2)	$\langle 15^+ \rangle$										69(21)	
701(1)	$\langle 11^+ \rangle$								x			
746.55(2)	$\langle 3^- \rangle$		0.5(3)		8.9(8)			5.9(6)		8(3)		
755.57(1)	$\langle 5,7^- \rangle$		76(2)	21(1)	1.4(6)	1.1(5)						
773.60(2)	$\langle 1–5^+ \rangle$							6(1)				
809.46(4)	$\langle 5^+,7^- \rangle$		39(4)	33(4)		4(1)	13(2)					
840.97(1)	$\langle 3 \rangle^+$		15(1)		2.1(5)			26(2)		1.4(2)		
852.30(6)	1^+		22(7)					78(5)				
852.99(2)	$5^{\langle + \rangle}$		2.2(4)	2.7(1)	61(1)	25(1)		2.2(2)				
870.58(5)	$\langle 5^+,7^- \rangle$		25(3)	34(3)	6(3)	8(4)	22(3)					
874.71(2)	3^+		9(1)		3(1)			29(2)		55(1)		
897.63(7)	$\langle 3,5 \rangle$		57(3)	26(4)	7(2)					3(2)		
914.31(1)	5^+		11(1)	2.6(2)	54(1)	17.4(4)		8.4(3)		3.4(2)		
943.11(5)	$\langle 3^+,5 \rangle$		68(3)	19(3)				3.9(12)				
957.89(6)	$\langle 5^+ \rangle$		16(8)	4(4)	49(8)							
989.88(4)	5^+		7(1)	13(4)	2(2)		5(1)	14(4)		13(1)		
1010.71(9)	$\langle 3–9 \rangle$		43(29)	57(29)								
1072.91(8)	$\langle 3^+ \rangle$		100									
1133.21(2)	$\langle 5^+ \rangle$			15(1)	64(1)	15(1)						
1175.6(1)	$\langle \leq 7 \rangle$							100				
1183.27(4)	$\langle 3,5 \rangle^+$				31(18)							
1200.97(5)	$\langle 3^+,5 \rangle$				3.1(8)					48(1)		
1297.68(1)	5^+		1.0(1)	0.10(1)	68(1)	20.9(4)		1.6(1)		0.88(7)		
1355.81(10)	$\langle \leq 7 \rangle$							91(13)				
1394.77(9)	$\langle 3^- \rangle$		31(5)					18(2)		20(2)		
1424.57(6)	$\langle 5^- \rangle$							56(3)				
1444.98(5)	$\langle 5^+ \rangle$		4	12(1)	23(2)	6(2)		24(1)				
1562.1(2)	$\langle 3^-,5^+ \rangle$					31(7)						
1589.9(2)	$\langle 3^-,5 \rangle$					11(3)						
1617.82(5)	$\langle 3,5 \rangle$		60(5)									
1618.42(3)	$\langle 3^+,5^+ \rangle$			2.9(4)	4.2(5)			42(2)		42(2)		
1639.63(9)	$\langle 1^+–5^+ \rangle$		7(5)									
1651.5(1)	$\langle 3^+,5 \rangle$			61(4)								

(continued) **$^{151}_{61}$Pm**

E^*	$2J^\pi$		Branching ratios in percentage									
		E^*_f:	0.0	85.1	117	175	197	255.7	261.2	324.7	329.6	343.8
[keV]		$2J^\pi_f$:	5^+	7^+	5^-	7^-	9^+	3^+	$\langle 9^- \rangle$	5^+	$\langle 11 \rangle^+$	11^-
1713.1(1)	$\langle 3^+,5 \rangle$			100								
1741.25(4)	$\langle 1^+–5^+ \rangle$							22(2)				
1793.7(2)	$\langle 5 \rangle$			20(12)		80(40)						
1795.13(8)	$\langle 3,5 \rangle$		4(1)									
1805.51(4)	$\langle 1^+–5^+ \rangle$							46(2)				
1848.57(7)	$\langle 5 \rangle$		5.7(5)		31(2)	6(1)						
1853.70(4)	$\langle 5 \rangle^+$					0.6(2)		12(1)				
1854.50(8)	$\langle 3^+,5 \rangle$		4.2(4)									
1873.63(4)	$\langle 5 \rangle^+$			2	5	2				0.6(1)		
1878.60(6)	$\langle 5 \rangle$				18(2)	3(2)		6(2)		40(4)		
1892.05(2)	$\langle 5 \rangle^+$		11(1)	4	16(1)	7		6				
1903.18(4)	$\langle 5 \rangle^+$		1.6(2)		11(1)			5		21(1)		
1910.68(7)	$\langle 3^+,5^+ \rangle$			4(2)	52(4)					5(4)		
1927.98(6)	$\langle 5^+ \rangle$				28(2)	16(1)						
1959.61(7)	$\langle 1^+–5^+ \rangle$							18(2)				
1973.32(7)	$\langle 1^+–5^+ \rangle$		3(1)									
1989.7(1)	$\langle 3,5 \rangle$				17(2)							
1993.81(5)	$\langle 5 \rangle^+$		1.8(4)	11(1)		19(1)		5(1)				
1998.25(5)	$\langle 5 \rangle^+$		0.8(3)				0.5(3)	2.7(3)				
2010.99(5)	$\langle 5 \rangle^+$		4	12(1)	8(1)	5				5		
2018.87(5)	$\langle 1^+–5^+ \rangle$		32(3)									
2023.15(8)	$\langle 5 \rangle$		8(1)	2(1)				8(1)				
2038.0(1)	$\langle 1–5 \rangle$		3.8(18)					66(6)				
2053.1(2)	$\langle 5^+ \rangle$		17(8)				58(25)	25(8)				
2084.92(8)	$\langle 1–5 \rangle$							16(3)				
2106.9(1)	$\langle 3,5 \rangle$		20(4)		8(4)							
2119.09(7)	$\langle 1^+–5^+ \rangle$		10(2)					66(6)				
2204.3(2)	$\langle 1^+–5^+ \rangle$		11(3)									
2268.6(2)	$\langle 5^+ \rangle$		12(12)			25(12)						
2304.0(2)	$1^+–5^+$		2(2)									

Energy levels and branching ratios [97Si03]. Part 3 **$^{151}_{61}$Pm**

E^*	$2J^\pi$		Branching ratios in percentage									
		E^*_f:	426.5	427.2	486.7	497.5	507.9	524.3	532.1	540.4	552	577.4
[keV]		$2J^\pi_f$:	1^+	$\langle 7 \rangle^+$	13^+	$\langle 13 \rangle^-$	5^+	$\langle 3 \rangle^+$	$\langle 7^- \rangle$	3^-	$\langle 9^+ \rangle$	$\langle 5 \rangle^-$
507.885(11)	5^+			12(1)								
524.339(12)	$\langle 3 \rangle^+$		0.8(4)				x					
532.057(16)	$\langle 7^- \rangle$			3(1)								
540.372(14)	3^-		1.5(5)									
552(1)	$\langle 9^+ \rangle$			x								
597.1(2)	$\langle 15 \rangle^-$				20(6)	31(9)						

(continued)

$^{151}_{61}$Pm

E^*	$2J^\pi$	Branching ratios in percentage										
	E_f^*:	426.5	427.2	486.7	497.5	507.9	524.3	532.1	540.4	552	577.4
[keV]	$2J_f^\pi$:	1^+	$\langle 7\rangle^+$	13^+	$\langle 13\rangle^-$	5^+	$\langle 3\rangle^+$	$\langle 7^-\rangle$	3^-	$\langle 9^+\rangle$	$\langle 5\rangle^-$
657.6(2)	$\langle 15^+\rangle$			x	31(9)						
701(1)	$\langle 11^+\rangle$		x							x	
746.55(2)	$\langle 3^-\rangle$	37(2)				29(1)	3(1)		2.6(3)		4.5(6)
773.60(2)	$\langle 1–5^+\rangle$	49(3)					41(3)		4(1)		
809.46(4)	$\langle 5^+,7^-\rangle$					11(3)					
827.5(2)	$\langle 17^-\rangle$				44(4)						
840.97(1)	$\langle 3\rangle^+$	3.4(2)	0.8(2)				0.9(2)		35(1)		15(1)
852.99(2)	$5^{(+)}$					0.41(10)		2.1(1)	2.4(2)		2.3(2)
853.9(2)	$\langle 17^+\rangle$			50(15)							
866(1)	$\langle 13^+\rangle$									x	
870.58(5)	$\langle 5^+,7^-\rangle$					5(2)					
874.71(2)	3^+					2.3(9)					0.9(5)
897.63(7)	$\langle 3,5\rangle$						6(3)				
914.31(1)	5^+		0.8(1)								0.5(1)
943.11(5)	$\langle 3^+,5\rangle$						9(1)				
957.89(6)	$\langle 5^+\rangle$										10(4)
989.88(4)	5^+		30(2)			8(1)	3(1)		4(2)		
1133.21(2)	$\langle 5^+\rangle$		1.9(2)			0.8(2)		0.6(3)			
1183.27(4)	$\langle 3,5\rangle^+$								13(1)		5(1)
1200.97(5)	$\langle 3^+,5\rangle$		33(3)				7(3)				
1297.68(1)	5^+		0.44(7)			0.5(1)	0.3(1)	0.9(1)			0.1(1)
1330.4(1)	$\langle 5^+\rangle$							55(15)	20(5)		23(6)
1394.77(9)	$\langle 3^-\rangle$					13(3)			17(8)		
1424.57(6)	$\langle 5^-\rangle$							16(3)			22(3)
1444.98(5)	$\langle 5^+\rangle$					4(2)		10(2)	10(2)		6(1)
1589.9(2)	$\langle 3^-,5\rangle$								89(15)		
1617.82(5)	$\langle 3,5\rangle$								21(2)		12(2)
1618.42(3)	$\langle 3^+,5^+\rangle$		5(1)								
1639.63(9)	$\langle 1^+–5^+\rangle$					21(6)	20(3)				
1651.5(1)	$\langle 3^+,5\rangle$								13(4)		27(13)
1741.25(4)	$\langle 1^+–5^+\rangle$								18(2)		
1795.13(8)	$\langle 3,5\rangle$					42(5)	25(7)				24(3)
1805.51(4)	$\langle 1^+–5^+\rangle$	18(11)									
1809.80(4)	$\langle 3,5\rangle^+$	8(1)					16(1)				9(1)
1848.57(7)	$\langle 5\rangle$							4.8(5)	9(2)		9(5)
1853.70(4)	$\langle 5\rangle^+$						6(1)				
1854.50(8)	$\langle 3^+,5\rangle$		4(2)			4(2)			56(10)		9(2)
1873.63(4)	$\langle 5\rangle^+$		1(1)			2	3(1)	13(1)	12(1)		6(1)
1878.60(6)	$\langle 5\rangle$		2(2)					13(4)	17(8)		
1892.05(2)	$\langle 5\rangle^+$							9	0.2(1)		6
1897.4(1)	$\langle 3^+,5^+\rangle$								11(5)		
1903.18(4)	$\langle 5\rangle^+$		9(1)				6(1)	4(1)			4(1)
1927.98(6)	$\langle 5^+\rangle$										5(3)
1933.10(4)	$\langle 1^+–5^+\rangle$					15(2)			3(2)		
1973.32(7)	$\langle 1^+–5^+\rangle$					56(5)					

(continued) **$^{151}_{61}$Pm**

E^*	$2J^\pi$	Branching ratios in percentage									
	E_f^*:	426.5	427.2	486.7	497.5	507.9	524.3	532.1	540.4	552	577.4
[keV]	$2J_f^\pi$:	1^+	$\langle 7\rangle^+$	13^+	$\langle 13\rangle^-$	5^+	$\langle 3\rangle^+$	$\langle 7^-\rangle$	3^-	$\langle 9^+\rangle$	$\langle 5\rangle^-$
1993.81(5)	$\langle 5\rangle^+$					13(4)		3(2)			
1998.25(5)	$\langle 5\rangle^+$	20(1)					4(1)				
2010.99(5)	$\langle 5\rangle^+$	3(1)							5(1)		
2015.93(9)	$\langle 3,5\rangle$										14(10)
2018.87(5)	$\langle 1^+–5^+\rangle$	15(2)									
2023.15(8)	$\langle 5\rangle$						28(3)	8(2)			
2084.92(8)	$\langle 1–5\rangle$										84(8)
2119.09(7)	$\langle 1^+–5^+\rangle$	18(2)				6(4)					
2304.0(2)	$1^+–5^+$	28(2)									

Energy levels and branching ratios [97Si03]. Part 4 **$^{151}_{61}$Pm**

E^*	$2J^\pi$	Branching ratios in percentage									
	E_f^*:	597.1	657.6	701	746.6	755.6	773.6	809.5	827.5	841.0	852.3
[keV]	$2J_f^\pi$:	$\langle 15\rangle^-$	$\langle 15^+\rangle$	$\langle 11^+\rangle$	$\langle 3^-\rangle$	$\langle 5,7^-\rangle$		$\langle 5^+,7^-\rangle$	$\langle 17^-\rangle$	$\langle 3\rangle^+$	1^+
827.5(2)	$\langle 17^-\rangle$	38(11)	19(6)								
840.97(1)	$\langle 3\rangle^+$				0.31(5)						
853.9(2)	$\langle 17^+\rangle$	50(15)									
866(1)	$\langle 13^+\rangle$			x							
914.31(1)	5^+				1.2(1)	1.1(1)					
944.7(2)	$\langle 19^-\rangle$	83(8)							17(5)		
957.89(6)	$\langle 5^+\rangle$				21(3)						
1058.0(2)	$\langle 19^+\rangle$								[100]		
1133.21(2)	$\langle 5^+\rangle$					1.4(3)		0.3(1)		1.4(3)	
1183.27(4)	$\langle 3,5\rangle^+$					36(8)		16(3)			
1200.97(5)	$\langle 3^+,5\rangle$				5(1)			1.6(8)			
1239.0(2)	$\langle 21^-\rangle$								[100]		
1297.68(1)	5^+				0.07(3)	2.6(1)		0.59(5)		0.37(4)	0.54(7)
1355.81(10)	$\langle \leq 7\rangle$										9(5)
1394.77(9)	$\langle 3^-\rangle$				2(1)						
1444.98(5)	$\langle 5^+\rangle$										2(1)
1562.1(2)	$\langle 3^-,5^+\rangle$				58(18)						
1617.82(5)	$\langle 3,5\rangle$									4(1)	
1639.63(9)	$\langle 1^+–5^+\rangle$						15(5)				7(3)
1741.25(4)	$\langle 1^+–5^+\rangle$				6		20(2)			16(2)	5(1)
1805.51(4)	$\langle 1^+–5^+\rangle$									32(2)	
1809.80(4)	$\langle 3,5\rangle^+$						18(1)			7(1)	
1822.17(6)	1,3,5					21(11)					
1853.70(4)	$\langle 5\rangle^+$				53(2)		26(2)			1.3(8)	
1854.50(8)	$\langle 3^+,5\rangle$							3(2)			
1873.63(4)	$\langle 5\rangle^+$				21(1)	6(1)		6(1)		3(1)	3(1)
1892.05(2)	$\langle 5\rangle^+$				4(1)	12(1)		2(1)		2(1)	

(continued) **$^{151}_{61}$Pm**

E^*	$2J^\pi$	Branching ratios in percentage									
	E_f^*:	597.1	657.6	701	746.6	755.6	773.6	809.5	827.5	841.0	852.3
[keV]	$2J_f^\pi$:	$\langle 15\rangle^-$	$\langle 15^+\rangle$	$\langle 11^+\rangle$	$\langle 3^-\rangle$	$\langle 5,7^-\rangle$		$\langle 5^+,7^-\rangle$	$\langle 17^-\rangle$	$\langle 3\rangle^+$	1^+
1903.18(4)	$\langle 5\rangle^+$				15(3)	2(1)					
1927.98(6)	$\langle 5^+\rangle$					37(3)					
1933.10(4)	$\langle 1^+–5^+\rangle$				24(2)		17(3)			10(2)	
1959.61(7)	$\langle 1^+–5^+\rangle$				58(5)		18(5)				
1989.7(1)	$\langle 3,5\rangle$					15(8)					
1993.81(5)	$\langle 5\rangle^+$					16(2)		31(4)			
1998.25(5)	$\langle 5\rangle^+$				10(1)		6(1)			13(5)	13(3)
2010.99(5)	$\langle 5\rangle^+$				6(1)	13(2)		9(4)			
2015.93(9)	$\langle 3,5\rangle$					21(5)		6(3)		42(11)	
2018.87(5)	$\langle 1^+–5^+\rangle$									21(11)	
2024.0(1)	$\langle 1–5\rangle$					53(13)					
2038.0(1)	$\langle 1–5\rangle$					30(9)					
2106.9(1)	$\langle 3,5\rangle$					32(24)	40(24)				
2204.3(2)	$\langle 1^+–5^+\rangle$				7(7)						

Energy levels and branching ratios [97Si03]. Part 5 **$^{151}_{61}$Pm**

E^*	$2J^\pi$	Branching ratios in percentage									
	E_f^*:	853.0	853.9	870.6	874.7	897.6	914.3	943	943.1	944.7	957.9
[keV]	$2J_f^\pi$:	$5^{\langle+\rangle}$	$\langle 17^+\rangle$	$\langle 5^+,7^-\rangle$	3^+	$\langle 3,5\rangle$	5^+	$\langle 7^+\rangle$	$\langle 3^+,5\rangle$	$\langle 19^-\rangle$	$\langle 5^+\rangle$
944.7(2)	$\langle 19^-\rangle$		<42								
1058.0(2)	$\langle 19^+\rangle$		x								
1200.97(5)	$\langle 3^+,5\rangle$				3.4(11)						
1239.0(2)	$\langle 21^-\rangle$									x	
1287.5(10)	$\langle 21^+\rangle$		x							x	
1297.68(1)	5^+	0.1(1)			0.5(3)		0.12(5)				
1330.4(1)	$\langle 5^+\rangle$			2.0(10)							
1377(1)	$\langle 23^-\rangle$									x	
1424.57(6)	$\langle 5^-\rangle$					6(2)					
1562.1(2)	$\langle 3^-,5^+\rangle$	11(9)									
1617.82(5)	$\langle 3,5\rangle$						4(1)				
1618.42(3)	$\langle 3^+,5^+\rangle$				4(2)						
1639.63(9)	$\langle 1^+–5^+\rangle$					17(4)					12(4)
1741.25(4)	$\langle 1^+–5^+\rangle$				8(3)						3(1)
1795.13(8)	$\langle 3,5\rangle$										4(2)
1805.51(4)	$\langle 1^+–5^+\rangle$										5(2)
1809.80(4)	$\langle 3,5\rangle^+$				1(1)	11(3)			2(1)		17(2)
1822.17(6)	1,3,5			42(10)		11(11)					
1848.57(7)	$\langle 5\rangle$					5(5)			14(5)		
1854.50(8)	$\langle 3^+,5\rangle$				20(4)						
1873.63(4)	$\langle 5\rangle^+$			7(1)					4(1)		
1892.05(2)	$\langle 5\rangle^+$			4(1)				4(1)			8(1)

(continued) **$^{151}_{61}$Pm**

E^*	$2J^\pi$	Branching ratios in percentage									
	E_f^*:	853.0	853.9	870.6	874.7	897.6	914.3	943	943.1	944.7	957.9
[keV]	$2J_f^\pi$:	$5^{\langle+\rangle}$	$\langle 17^+\rangle$	$\langle 5^+,7^-\rangle$	3^+	$\langle 3,5\rangle$	5^+	$\langle 7^+\rangle$	$\langle 3^+,5\rangle$	$\langle 19^-\rangle$	$\langle 5^+\rangle$
1897.4(1)	$\langle 3^+,5^+\rangle$	9(5)				42(18)		38(18)			
1903.18(4)	$\langle 5\rangle^+$			5(2)				8(2)			2(2)
1910.68(7)	$\langle 3^+,5^+\rangle$	14(9)							26(9)		
1927.98(6)	$\langle 5^+\rangle$					4(4)		9(4)			
1933.10(4)	$\langle 1^+–5^+\rangle$	9(4)				4(2)					
1998.25(5)	$\langle 5\rangle^+$				5(3)						
2015.93(9)	$\langle 3,5\rangle$					16(16)					
2018.87(5)	$\langle 1^+–5^+\rangle$	6(3)									
2022.4(3)	$\langle 3^+,5\rangle$			78(16)				22(11)			
2023.15(8)	$\langle 5\rangle$					24(12)					

Energy levels and branching ratios [97Si03]. Part 6 **$^{151}_{61}$Pm**

E^*	$2J^\pi$	Branching ratios in percentage									
	E_f^*:	989.9	1010.7	1058.0	1072.9	1133.2	1175.6	1183.3	1201.0	1239.0	1287.5
[keV]	$2J_f^\pi$:	5^+	$\langle 3–9\rangle$	$\langle 19^+\rangle$	$\langle 3^+\rangle$	$\langle 5^+\rangle$	$\langle \leq 7\rangle$	$\langle 3,5\rangle^+$	$\langle 3^+,5\rangle$	$\langle 21^-\rangle$	$\langle 21^+\rangle$
1377(1)	$\langle 23^-\rangle$									x	
1520(1)	$\langle 23^+\rangle$			x							
1721(1)	$\langle 25^-\rangle$									x	
1741.25(4)	$\langle 1^+–5^+\rangle$	2(1)									
1779(1)	$\langle 25^+\rangle$										x
1809.80(4)	$\langle 3,5\rangle^+$	11(1)									
1822.17(6)	1,3,5								26(8)		
1848.57(7)	$\langle 5\rangle$					16(4)					
1873.63(4)	$\langle 5\rangle^+$				3(1)						
1892.05(2)	$\langle 5\rangle^+$		4(1)								
1903.18(4)	$\langle 5\rangle^+$						1(1)	6(2)			
1933.10(4)	$\langle 1^+–5^+\rangle$								6(3)		
1959.61(7)	$\langle 1^+–5^+\rangle$	5(4)									
1973.32(7)	$\langle 1^+–5^+\rangle$	23(10)									
1998.25(5)	$\langle 5\rangle^+$				21(3)						
2018.87(5)	$\langle 1^+–5^+\rangle$	25(4)									
2024.0(1)	$\langle 1–5\rangle$								22(10)		
2304.0(2)	$1^+–5^+$						20(8)				

Energy levels and branching ratios [97Si03]. Part 7

$^{151}_{61}$Pm

E^*	$2J^\pi$	Branching ratios in percentage												
	E_f^*:	1330.4	1355.8	1377	1394.8	1445.0	1562.1	1617.8	1721	1809.8	1873.6	1878	1897.4	1910.7
[keV]	$2J_f^\pi$:	$\langle 5^+\rangle$	$\langle\leq 7\rangle$	$\langle 23^-\rangle$	$\langle 3^-\rangle$	$\langle 5^+\rangle$	$\langle 3^-,5^+\rangle$	$\langle 3,5\rangle$	$\langle 25^-\rangle$	$\langle 3,5\rangle^+$	$\langle 5\rangle^+$	$\langle 27^-\rangle$	$\langle 3^+,5^+\rangle$	$\langle 3^+,5^+\rangle$
1721(1)	$\langle 25^-\rangle$			x										
1779(1)	$\langle 25^+\rangle$			x										
1809.80(4)	$\langle 3,5\rangle^+$	1(1)												
1853.70(4)	$\langle 5\rangle^+$		0.8(5)											
1878(1)	$\langle 27^-\rangle$			x					x					
1933.10(4)	$\langle 1^+–5^+\rangle$	12(6)												
1973.32(7)	$\langle 1^+–5^+\rangle$									18(6)				
1989.7(1)	$\langle 3,5\rangle$					67(11)								
1998.25(5)	$\langle 5\rangle^+$						3(1)							
2010.99(5)	$\langle 5\rangle^+$		13(3)		6(3)									11(4)
2023.15(8)	$\langle 5\rangle$												21(13)	
2024.0(1)	$\langle 1–5\rangle$		26(8)											
2204.3(2)	$\langle 1^+–5^+\rangle$									81(33)				
2268.6(2)	$\langle 5^+\rangle$							62(38)						
2304.0(2)	$1^+–5^+$										50(15)			
2434(1)	$\langle 31^-\rangle$											x		

Energy levels and branching ratios [96Ar09].

$^{152}_{61}$Pm

E^*	J^π	$T_{1/2}$ or	Branching ratios in percentage						
			E_f^*:	0.0	16.03	25.02	44.45	200.48	220.96	294.55
[keV]		Γ_{cm}	J_f^π:	1^+						1^+
0.0	1^+	4.12(8) m								
16.03(4)	$0^–2^-$	2.1(10) ns		100						
25.02(7)	$\langle 0^+–2^+\rangle$			100						
44.45(4)	$0^–2^-$	≤1.0 ns		85(9)	12.7(12)	2.43(20)				
150(110)	4^-	7.52(8) m								
200.48(10)				12(2)	48(5)		40(3)			
220.96(18)							100			
294.55(4)	1^+			6.4(3)	57(3)	0.54(7)	36(2)	0.12(2)		
319.17(14)					100					
330.47(14)					100					
450.80(25)	0,1						19(7)	81(12)		
570.78(10)	1^+			25(3)		59(5)	5.2(9)		0.8(4)	4.4(9)
592.40(10)	1^+			61(5)	21(2)	5.6(10)	6.8(5)	1.3(3)		
659.90(12)	1^+			28(3)		42(5)				9(2)
150+X	$\langle 8\rangle$	13.8(2) m								

Additional data on this isotope can be found in [90Sh24].

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

$^{152}_{61}$Pm

E^*	J^π	Branching ratios in percentage	
	E_f^*:	319.17	330.47
[keV]	J_f^π:		
570.78(10)	1^+		5.9(8)
592.40(10)	1^+	3.2(12)	1.6(4)
659.90(12)	1^+	21(5)	

Energy levels and branching ratios [98He06].

$^{153}_{61}$Pm

E^*	$2J^\pi$	L	S_N	$2J^\pi$	S_N	σ (t,α)	A_y	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
										E_f^*: 0.0	32.2	65.6	105	151
[keV]			(d,τ)	(t,α)	(t,α)	μb/sr		Γ_{cm}		$2J_f^\pi$: 5–	5+	7–	7+	9–
0.0[a]	5^-			5–	0.006	≈2.6	–0.82(17)	5.25(2) m	78Bu18					
32.194(10)[b]	5^+	2		5+	0.03	14	0.44(9)	1.2(1) ns	81Le21	100				
65.559(19)[a]	7^-	3	0.05	7–	0.06	28	0.53(6)		81Le21	85(2)	15(5)			
105.48(2)[b]	7^+	4	1.4	7+	0.63	101	–0.53(3)	0.44(2) ns	81Le21	77(2)	11(1)	12.5(8)		
150.89(8)[a]	9^-			9–	0.10	15	–0.65(8)		78Bu18	<3.6		81(5)	19(1)	
198.85(7)[b]	$\langle 9^+ \rangle$	4		9+	0.05	11	0.08(11)		81Le21			100		
255(4)	11^-	5	0.85	11–	1.1	200	0.35(2)		81Le21					
311.3(4)[b]	$\langle 11^+ \rangle$					≈7	–0.03(13)		78Bu18					100
≈378[a]	$\langle 13^- \rangle$					≈7	–0.57(12)		78Bu18					
450.52(2)[c]	3^+	2		3+	0.014	9	–0.70(10)		81Le21	0.3(3)	85(3)		14.3(5)	
507.35(3)[c]	5^+	2	0.48	5+	0.28	138	0.30(3)		81Le21	2.3(5)	68(3)		8.1(5)	
560														
585.55(5)	7^+			7+	0.05	≈9	0.14(12)		78Bu18	4(1)	16(2)		47(3)	
628														
682(4)						10	0.16(12)		78Bu18					
705.82(6)	1^+–5^+	2	0.71			82	–0.18(4)		81Le21		7.2(7)			
770.79(5)	5^+			5+	0.42	204	0.40(2)		78Bu18	<0.5	8.0(7)		19(1)	
780	3^+,5^+	2	0.64						81Le21					
791.19(4)	3^+			3+	0.06	29	–0.46(7)		78Bu18		13(1)		14(1)	
850	$\langle 7^+ \rangle$	4							81Le21					
935(4)		4				31	0.03(7)		81Le21					
960	$\langle 3^- \rangle$													
967.01(8)	7^+	⟨2⟩		7+	0.38	53	–0.13(5)		81Le21	100				
1000	$\langle 7^- \rangle$													
1013.53(10)										12(3)		88(4)		
1018.68(22)		[2]	0.38						81Le21			9(3)		91(11)
1022(4)[d]	7^-	3	1.0	7–	0.29	120	0.34(3)		81Le21					
1113.22(7)	$\langle 1$–$5 \rangle^+$													
1114.93(15)										20(2)				
1152(4)[d]	11^-	5	1.3	11–	1.4	209	0.20(2)		81Le21					
1160.53(11)										12(2)	11(3)			
1175.93(8)										3(1)	9(1)		10(2)	
1179(4)	$\langle 3^+ \rangle$	2	0.52			35	–0.43(6)		81Le21					

(continued)

$^{153}_{61}$Pm

E^* [keV]	$2J^\pi$	L (d,τ)	S_N (d,τ)	$2J^\pi$ (t,α)	S_N (t,α)	σ (t,α) μb/sr	A_y	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage E_f^*: 0.0 $2J_f^\pi$: 5–	32.2 5+	65.6 7–	105 7+	151 9–
1202.29(6)										49(2)	17(1)	30(3)		
1208(4)[e]	3^+	2		3+	0.089	36	–0.32(6)		81Le21					
1213.13(11)											81(6)		19(3)	
1226.19(17)											74(4)		15(3)	
1257.12(19)										16(3)		49(3)		34(7)
1262(4)[e]	$\langle 5^+ \rangle$			$\langle 5+ \rangle$	0.074	33	0.10(6)							
1273	$7^+,9^+$	4							81Le21					
1296.13(7)										21(1)	10(1)	63(3)	6.0(4)	
1311(4)						15	–0.06(10)		78Bu18					
1345(4)[e]	7^+			7+	0.53	68	–0.33(4)		78Bu18					
1376(4)						25	–0.03(7)		78Bu18					
1437(4)						13	0.17(10)		78Bu18					
1476(4)						11	0.23(11)		78Bu18					
1629						22	0.22(8)		78Bu18					
≈1702						≈9	0.07(12)		78Bu18					
1731.87(16)														
≈1737						≈13	–0.12(10)		78Bu18					
≈1763						≈18	0.16(8)		78Bu18					
1775.56(16)														
≈1794						≈12	0.09(11)		78Bu18					
1824.56(18)										12(4)		88(29)		
≈1829						≈20	–0.22(8)		78Bu18					
1837.49(15)											61(7)		39(7)	
1850.46(11)										12(6)	26(6)	24(6)	38(8)	
≈1869						≈25	–0.04(7)		78Bu18					
1953						25	0.24(7)		78Bu18					
1987.72(6)										19(1)		3(2)	11(2)	
1997.80(7)										16(2)	58(2)		5.8(10)	
2004.89(8)														
2008.51(25)										30(4)				
2031.95(9)										51(2)				
2034.51(22)														
2060.34(15)										<3	14.9(10)	51(5)	34(4)	
2138						43	0.01(6)		78Bu18					
2172.5(3)														
2221						48	0.06(5)		78Bu18					
2280						≈24	0.11(8)		78Bu18					
2333						32	0.16(6)		78Bu18					
			81Le21		78Bu18	78Bu18	78Bu18		Ref.					

5 bands (A-E marked here a-e) are given in [06He06].

Values S_N for the (t,α) reaction are spectroscopic factors defined by $d\sigma/d\Omega(\text{exp})=\text{N}\times C^2 S d\sigma/d\Omega(\text{DWBA})$ with normalization factor N=23.

Energy levels and branching ratios [98He06]. Part 2 **$^{153}_{61}$Pm**

E^*	$2J^\pi$		Branching ratios in percentage									
		E_f^*:	198.8	450.5	507.3	585.5	705.8	770.8	791.2	967.0	1113.2	1160.5
[keV]	(t,α)	$2J_f^\pi$:	$\langle 9+\rangle$	3+	5+	7+		5+	3+	7+		
507.35(3)[c]	5+		2.0(4)	20(1)								
585.55(5)	7+			3.1(9)	29(2)							
705.82(6)				93(4)								
770.79(5)	5+		1.4(6)	5.1(5)	30(1)	37(1)						
791.19(4)	3+			26(1)	45(2)		1.8(3)					
1113.22(7)				14(1)			44(3)		42(3)			
1114.93(15)							43(3)	36(8)				
1160.53(11)				78(7)								
1175.93(8)				34(3)	45(3)							
1202.29(6)										4.4(8)		
1226.19(17)									11(2)			
1731.87(16)				4(2)			29(8)					28(5)
1775.56(16)								20(6)				80(7)
1987.72(6)				20(3)	18(2)	16(2)						
1997.80(7)				3.1(6)								
2004.89(8)				4.1(11)					54(3)		30(2)	
2008.51(25)							10(4)	60(7)				
2031.95(9)					37(4)		12(3)					
2034.51(22)							50(11)		50(6)			

Energy levels and branching ratios [98He06]. Part 3 **$^{153}_{61}$Pm**

E^*	$2J^\pi$	Branching ratios in percentage		
		E_f^*:	1175.9	1202.3
[keV]	(t,α)	$2J_f^\pi$:		
1731.87(16)			39(5)	
1987.72(6)				13(2)
1997.80(7)				16.8(10)
2004.89(8)			12.0(11)	
2172.5(3)				100