

Energy levels and branching ratios [94Ra12].

²⁰¹Bi
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E^*	$2J^\pi$	$T_{1/2}$ or Γ_{cm}
[keV]		
0	9^-	108(3) m
846.3(2)	1^+	59.1(6) m
890.25(14)	5^-	
904.24(13)	$\langle 7 \rangle^-$	
964.40(15)	11^-	
967.48(17)	13^-	
1086.21(20)	3^+	260(30) ps
1186.60(18)	$\langle 7 \rangle^-$	
1274.46(21)	$3^+, 5^+$	
1379.37(24)	15^-	
1441.73(18)	7^-	
1470.87(22)	$\langle 5 \rangle^-$	
1474.6(3)	17^-	
1483.55(24)	$\langle 3 \rangle^-$	
1501.89(17)	$\langle 13^+ \rangle$	
1504.41(23)		
1616.3(4)	$1^+, 3^+, 5^+$	
1665.1(3)		
1719.16(22)	$\langle 11, 13 \rangle^+$	
1746.5(3)	17^+	7(2) ns
1762.9(4)		
1778.92(22)		
1817.86(24)	$\langle 1, 3, 5^+ \rangle$	
1848.16(25)		
1858.03(25)	3^+	
1927.32(19)		
1932.2(3)	21^+	<25 ns
1932.2+X	$\langle 25^+ \rangle$	118(28) ns
1944.24(17)	$\langle 5^-, 7, 9^- \rangle$	
1971.2+X	$\langle 27^+ \rangle$	105(75) ns
2034.3(7)		
2053.59(23)	5^+	
2065.85(19)	$5^+, 7^+$	
2299.00+X	$\langle 27^+ \rangle$	
2386.7(5)		
2422.1(3)		
2434.9(3)	$\langle 1, 3, 5^+ \rangle$	
2455.5(3)	$\langle 1^+, 3^+, 5^+ \rangle$	
2484.3(4)	$\langle 1, 3, 5^+ \rangle$	
2549.39+X	$\langle 27^+ \rangle$	
2589.6+X	≥ 25	
2592.89(20)	$\langle 3^-, 5, 7^+ \rangle$	
2651.01+X	$\langle 29^+ \rangle$	
2668.20+X	$\langle 29^+ \rangle$	
2739.90+X	$\langle 29^- \rangle$	124(4) ns

(continued)

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E^*	$2J^\pi$	$T_{1/2}$ or Γ_{cm}
[keV]		
2902.1(3)	$\langle 1,3,5^+ \rangle$	
2905.9(3)	$\langle 1,3,5^+ \rangle$	
2994.6+X	≥ 23	
3011.4+X	≥ 25	
3238.81+X	$\langle 31^- \rangle$	
3422.8+X	≥ 25	
3526.19+X	$\langle 33^- \rangle$	
3592.2+X		
3638.52+X	$\langle 33^- \rangle$	
3706.6+X	≥ 31	
3810.44+X	$\langle 33^- \rangle$	
3922.6+X	$\langle 35^- \rangle$	
4484.6+X	$\langle 35^- \rangle$	
5282.4+X	$\langle 37^- \rangle$	

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

Energy levels and branching ratios [94Ra12]. Part 2

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E^*	$2J^\pi$	Branching ratios in percentage							
		E_f^* :	0	846.34	890.25	904.24	964.40	967.48	1086.21
[keV]		$2J_f^\pi$:	9 ⁻	1 ⁺	5 ⁻	$\langle 7 \rangle^-$	11 ⁻	13 ⁻	3 ⁺
846.3(2)	1 ⁺		100						
890.25(14)	5 ⁻		100						
904.24(13)	$\langle 7 \rangle^-$		100						
964.40(15)	11 ⁻		100						
967.48(17)	13 ⁻		100						
1086.21(20)	3 ⁺			99(3)	0.60(9)				
1186.60(18)	$\langle 7 \rangle^-$		91(4)		8.5(7)				
1274.46(21)	3 ⁺ , 5 ⁺			63(3)					36.5(1)
1379.37(24)	15 ⁻						3.44(16)	97(2)	
1441.73(18)	7 ⁻		9.0(8)		21.4(8)	70(4)			
1470.87(22)	$\langle 5 \rangle^-$		76(5)			24(3)			
1483.55(24)	$\langle 3 \rangle^-$			11(1)	89(4)				
1501.89(17)	$\langle 13^+ \rangle$		2.1(3)				69(4)	29.2(12)	
1504.41(23)			8.5(19)				91(5)		
1616.3(4)	1 ⁺ , 3 ⁺ , 5 ⁺								100
1665.1(3)								100	
1719.16(22)	$\langle 11,13 \rangle^+$						92(6)		
1762.9(4)							100		
1778.92(22)					53(6)	47(3)			
1817.86(24)	$\langle 1,3,5^+ \rangle$			44(2)					29(2)
1848.16(25)			65(6)			35(5)			

(continued)

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E^* [keV]	$2J^\pi$	Branching ratios in percentage							
		$E_f^*:$ $2J_f^\pi:$	0 9 ⁻	846.34 1 ⁺	890.25 5 ⁻	904.24 ⟨7⟩ ⁻	964.40 11 ⁻	967.48 13 ⁻	1086.21 3 ⁺
1858.03(25)	3 ⁺								46(3)
1927.32(19)			49(7)			51(5)			
1944.24(17)	⟨5 ⁻ , 7, 9 ⁻ ⟩		36(4)		36(4)	28(4)			
2053.59(23)	5 ⁺			9.9(4)					87(1)
2065.85(19)	5 ⁺ , 7 ⁺				13.2(12)				18.6(12)
2386.7(5)									100
2422.1(3)					21	79			
2434.9(3)	⟨1, 3, 5 ⁺ ⟩			29(4)					43(4)
2455.5(3)	⟨1 ⁺ , 3 ⁺ , 5 ⁺ ⟩			43(3)					45(3)
2484.3(4)	⟨1, 3, 5 ⁺ ⟩			23(4)					77(5)
2592.89(20)	⟨3 ⁻ , 5, 7 ⁺ ⟩			15(2)	34(2)	18(2)			21(2)
2902.1(3)	⟨1, 3, 5 ⁺ ⟩			12(3)					30(6)
2905.9(3)	⟨1, 3, 5 ⁺ ⟩			55(9)					45(11)

Energy levels and branching ratios [94Ra12]. Part 3

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E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		$E_f^*:$ $2J_f^\pi:$	1274.46 3 ⁺ , 5 ⁺	1379.37 15 ⁻	1441.73 7 ⁻	1474.6 17 ⁻	1501.89 ⟨13 ⁺ ⟩	1746.5 17 ⁺	1932+X ⟨25 ⁺ ⟩	1971+X ⟨27 ⁺ ⟩	2299+X ⟨27 ⁺ ⟩	2549+X ⟨27 ⁺ ⟩
1474.6(3)	17 ⁻			100								
1719.16(22)	⟨11, 13⟩ ⁺					8.0(13)						
1746.5(3)	17 ⁺				100							
1817.86(24)	⟨1, 3, 5 ⁺ ⟩	28(2)										
1858.03(25)	3 ⁺	54(3)										
1932.2(3)	21 ⁺							100				
1932.2+X	⟨25 ⁺ ⟩								100			
1971.2+X	⟨27 ⁺ ⟩								100			
2034.3(7)						100						
2053.59(23)	5 ⁺	3.4(3)										
2065.85(19)	5 ⁺ , 7 ⁺	58(2)		10.1(7)								
2299.00+X	⟨27 ⁺ ⟩								100			
2434.9(3)	⟨1, 3, 5 ⁺ ⟩	28(3)										
2455.5(3)	⟨1 ⁺ , 3 ⁺ , 5 ⁺ ⟩	12(2)										
2549.39+X	⟨27 ⁺ ⟩ ⁺							96(1)			4.2(3)	
2589.6+X	≥25							100				
2592.89(20)	⟨3 ⁻ , 5, 7 ⁺ ⟩	12(2)										
2651.01+X	⟨29 ⁺ ⟩									100		
2668.20+X	⟨29 ⁺ ⟩							66(3)				34(2)
2739.90+X	⟨29 ⁻ ⟩										23(1)	38(4)
2902.1(3)	⟨1, 3, 5 ⁺ ⟩	58(6)										
2994.6+X	≥23							100				
3011.4+X	≥25											38(9)

Energy levels and branching ratios [94Ra12]. Part 4

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E^*	$2J^\pi$	Branching ratios in percentage										
[keV]		E_f^* : $2J_f^\pi$:	2590+X ≥ 25	2651+X $\langle 29^+ \rangle$	2668+X $\langle 29^+ \rangle$	2740+X $\langle 29^- \rangle$	2995+X ≥ 23	3239+X $\langle 31^- \rangle$	3423+X ≥ 25	3526+X $\langle 33^- \rangle$	3639+X $\langle 33^- \rangle$	4485+X $\langle 35^- \rangle$
2739.90+X	$\langle 29^- \rangle$		4	35(10)	x							
3011.4+X	≥ 25		62(9)									
3238.81+X	$\langle 31^- \rangle$					100						
3422.8+X	≥ 25						100					
3526.19+X	$\langle 33^- \rangle$					79(1)		21(3)				
3592.2+X									100			
3638.52+X	$\langle 33^- \rangle$			100								
3706.6+X	≥ 31							49(3)		51		
3810.44+X	$\langle 33^- \rangle$							16.4(14)		84(2)		
3922.6+X	$\langle 35^- \rangle$									100		
4484.6+X	$\langle 35^- \rangle$										100	
5282.4+X	$\langle 37^- \rangle$											100

Energy levels and branching ratios [97Sc07].

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<i>E</i> [*] [keV]	<i>J</i> ^π	<i>T</i> _{1/2} or <i>Γ</i> _{cm}
0	5 ⁺	1.72(5) h
7(4)	⟨7 ⁺ ⟩	
41(4)	⟨4 ⁺ ⟩	
72(3)	⟨5 ⁺ ⟩	
605(4)	⟨8 ⁻ ⟩	
615(7)	⟨10 ⁻ ⟩	3.04(6) μs
1239.1(1)	⟨11 ⁻ ⟩	
1481.3(2)	⟨12 ⁻ ⟩	
1803.7(2)	⟨12⟩	
1807.1(3)	⟨13 ⁻ ⟩	
1844.7(3)	⟨14 ⁻ ⟩	
1852.7(3)	⟨13 ⁻ ⟩	
2036.8(3)	⟨14 ⁺ ⟩	
2203.3(4)	⟨12 ⁻ ⟩	
2204+X		
2240+Y		
2339.1(4)	⟨13 ⁻ ⟩	
2368+X		
2420+Y		
2556.4(4)	⟨15 ⁻ ⟩	2.0(2) ns
2607.1(5)	⟨17 ⁺ ⟩	310(50) ns
2627+X		
2634+Y		
2899+Y		

(continued)

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<i>E</i> [*]	<i>J</i> ^π	<i>T</i> _{1/2} or
[keV]		<i>Γ</i> _{cm}
2979+X		
3060.4(5)	⟨16 [−] ⟩	
3161.0(6)	⟨18 ⁺ ⟩	
3224+Y		
3396.6(6)		
3403+X		
3600.1(6)		
3614+Y		
3639.8	⟨17 [−] ⟩	
3754.2	⟨18 [−] ⟩	
3884+X		
4150.3	⟨19 [−] ⟩	
4414+X		
4984+X		

Additional data on this isotope can be found in [93Cl02].
Two bands a,b are assigned to excited states of this nucleus in [97Sc07].
Data for this isotope are considered in vol. LB I/18C.

Energy levels and branching ratios [97Sc07]. Part 2

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<i>E</i> [*]	<i>J</i> ^π	Branching ratios in percentage										
		<i>E</i> _f [*] :	0	7	605	615	1239.1	1481.3	1803.7	1807.1	1844.7	1852.7
[keV]		<i>J</i> _f ^π :	5 ⁺	⟨7 ⁺ ⟩	⟨8 [−] ⟩	⟨10⟩ [−]	⟨11⟩ [−]	⟨12⟩ [−]	⟨12⟩	⟨13⟩ [−]	⟨14 [−] ⟩	⟨13⟩ [−]
41(4)	⟨4 ⁺ ⟩		100									
72(3)	⟨5⟩ ⁺			100								
605(4)	⟨8 [−] ⟩			100								
615(7)	⟨10⟩ [−]				100							
1239.1(1)	⟨11⟩ [−]					100						
1481.3(2)	⟨12⟩ [−]					90(14)	10(2)					
1803.7(2)	⟨12⟩						100					
1807.1(3)	⟨13⟩ [−]							100				
1844.7(3)	⟨14 [−] ⟩							93(14)		7(2)		
1852.7(3)	⟨13⟩ [−]							100	x	x		
2036.8(3)	⟨14 ⁺ ⟩									≈33	7(1)	60(9)
2203.3(4)	⟨12 [−] ⟩						100					
2339.1(4)	⟨13 [−] ⟩							79(12)				
2556.4(4)	⟨15 [−] ⟩										29(5)	

Energy levels and branching ratios [97Sc07]. Part 3

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E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	2036.8 $\langle 14^+ \rangle$	2203.3 $\langle 12^- \rangle$	2204+X	2240+Y	2339.1 $\langle 13^- \rangle$	2368+X	2420+Y	2556.4 $\langle 15^- \rangle$	2607.1 $\langle 17^+ \rangle$	2627+X
2339.1(4)	$\langle 13^- \rangle$			21(3)								
2368+X					x							
2420+Y						x						
2556.4(4)	$\langle 15^- \rangle$		49(7)				22(4)					
2607.1(5)	$\langle 17^+ \rangle$									100		
2627+X								x				
2634+Y									x			
2979+X												x
3060.4(5)	$\langle 16^- \rangle$									100		
3161.0(6)	$\langle 18^+ \rangle$										100	
3396.6(6)											100	

Energy levels and branching ratios [97Sc07]. Part 4

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E^*	J^π	Branching ratios in percentage											
[keV]		E^*_f :	2634+Y	2899+Y	2979+X	3060.4	3161.0	3224+Y	3403+X	3639.8	3754.2	3884+X	4414+X
		J^π_f :				$\langle 16^- \rangle$	$\langle 18^+ \rangle$			$\langle 17^- \rangle$	$\langle 18^- \rangle$		
2899+Y			x										
3224+Y				x									
3403+X					x								
3600.1(6)							100						
3614+Y								x					
3639.8	$\langle 17^- \rangle$					100							
3754.2	$\langle 18^- \rangle$						85			15(4)			
3884+X									x				
4150.3	$\langle 19^- \rangle$										100		
4414+X												x	
4984+X													x

Energy levels and branching ratios [93Ra11].

²⁰³Bi
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E^* [keV]	$2J^\pi$	$T_{1/2}$ or Γ_{cm}
0	9^-	11.76(5) h
883.39(20)	11^-	
893.49(6)	5^-	
908.64(5)	7^-	
932.51(23)	13^-	

(continued)

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E^*	$2J^\pi$	$T_{1/2}$ or Γ_{cm}
[keV]		
1090.95(5)	7^-	303(5) ms
1098.14(7)	1^+	
1123.92(8)	9^-	
1231.16(18)	9^-	
1247.81(22)	15^-	
1248.5(3)	13^-	
1277.10(20)	$\langle 7 \rangle^-$	
1299.1(3)		410(30) ps
1312.93(7)	3^+	
1352.83(7)	7^-	
1408.8(11)	13^-	
1479.3(10)	$\langle 5, 7 \rangle$	
1484.0(11)	$\langle 13 \rangle^-$	
1488.09(8)	$\langle 5 \rangle^+$	
1494.4(9)	$\langle 15^- \rangle$	
1499.0(3)	$\langle 17^- \rangle$	
1561.1(11)	13^+	
1575.5(4)	$\langle 17^- \rangle$	
1610.0(2)	$\langle 7 \rangle^-$	
1672.7(4)	15^-	
1714.4(10)	$\langle 5^- \rangle$	
1799.03(14)		
1892.6(11)	13^+	90(7) ns
1903.5(3)	17^+	
1990.6(4)	$21^{\langle + \rangle}$	
2028.6(10)		194(30) ns
2041.5(11)	25^+	
2088.1(11)	$\langle 21 \rangle^+$	
2135.84(7)	$\langle 3, 5 \rangle^+$	
2231.11(8)	$\langle 3^+, 5^+ \rangle$	
2287.01(13)		22.4(9) ns
2566.66(14)		
2689.38(11)		
2731.1(11)	27^+	
2752.09(13)		
2855.6(11)	27^+	
3032.3(11)	29^-	
3130.47(11)		
3529.8(11)	31^-	
3826.1(12)	33^-	
4470.2(15)	35^-	4.13(7) ns
4544.4(18)	$\langle 37 \rangle^-$	

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

Energy levels and branching ratios [93Ra11]. Part 2

²⁰³Bi
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E^* [keV]	$2J^\pi$	Branching ratios in percentage							
		$E_f^*:$ $2J_f^\pi:$	0 9 ⁻	883.39 11 ⁻	893.49 5 ⁻	908.64 7 ⁻	932.51 13 ⁻	1090.95 7 ⁻	1098.14 1 ⁺
883.39(20)	11 ⁻		100						
893.49(6)	5 ⁻		100						
908.64(5)	7 ⁻		100						
932.51(23)	13 ⁻		100						
1090.95(5)	7 ⁻		97(6)		2.7(9)	0.6(3)			
1098.14(7)	1 ⁺				11.3(8)	89(3)			
1123.92(8)	9 ⁻		100			≤10			
1231.16(18)	9 ⁻			57				≈43	
1247.81(22)	15 ⁻			≈7			93(9)		
1248.5(3)	13 ⁻		16(4)	84(8)					
1277.10(20)	⟨7⟩ ⁻		100					≤25	
1312.93(7)	3 ⁺				14.5(15)				86(7)
1352.83(7)	7 ⁻		54(6)					≈46	
1488.09(8)	⟨5⟩ ⁺								27(3)
1561.1(11)	13 ⁺			100					
1892.6(11)	13 ⁺			100					
2135.84(7)	⟨3,5⟩ ⁺				50(3)				3(1)
2231.11(8)	⟨3 ⁺ ,5 ⁺ ⟩				60(5)				11(2)
2287.01(13)									17(8)
2566.66(14)					31(8)	31(8)		38(10)	
2689.38(11)					29(7)	34(6)		26(6)	
3130.47(11)					28(6)				19(5)

Energy levels and branching ratios [93Ra11]. Part 3

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E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		$E_f^*:$ $2J_f^\pi:$	1123.92 9 ⁻	1247.81 15 ⁻	1248.5 13 ⁻	1312.93 3 ⁺	1352.83 7 ⁻	1488.09 ⟨5⟩ ⁺	1499.0 ⟨17 ⁻ ⟩	1575.5 ⟨17 ⁻ ⟩	1672.7 15 ⁻	1903.5 17 ⁺
1408.8(11)	13 ⁻			100								
1479.3(10)	⟨5,7⟩						100					
1484.0(11)	⟨13⟩ ⁻				100							
1488.09(8)	⟨5⟩ ⁺					73(7)						
1494.4(9)	⟨15 ⁻ ⟩			100								
1499.0(3)	⟨17 ⁻ ⟩			25(5)	75(15)							
1575.5(4)	⟨17 ⁻ ⟩			100								
1610.0(2)	⟨7⟩ ⁻	100										
1672.7(4)	15 ⁻				100							
1714.4(10)	⟨5 ⁻ ⟩						100					
1799.03(14)						100						
1903.5(3)	17 ⁺			53(5)					38(4)	≈2	7(1)	
1990.6(4)	21 ⁽⁺⁾											100
2028.6(10)												100

(continued)

²⁰³₈₃Bi

<i>E</i> [*]	<i>2J</i> ^π	Branching ratios in percentage										
[keV]		<i>E</i> _f [*] :	1123.92	1247.81	1248.5	1312.93	1352.83	1488.09	1499.0	1575.5	1672.7	1903.5
		<i>2J</i> _f ^π :	9 [−]	15 [−]	13 [−]	3 ⁺	7 [−]	⟨5⟩ ⁺	⟨17 [−] ⟩	⟨17 [−] ⟩	15 [−]	17 ⁺
2088.1(11)	⟨21⟩ ⁺											100
2135.84(7)	⟨3,5⟩ ⁺					25(2)		22(2)				
2231.11(8)	⟨3 ⁺ ,5 ⁺ ⟩					17(2)		12(2)				
2287.01(13)						38(9)		46(9)				
2689.38(11)								11(5)				
2752.09(13)								100				
3130.47(11)						53(11)						

Energy levels and branching ratios [93Ra11]. Part 4

²⁰³₈₃Bi

<i>E</i> [*]	<i>2J</i> ^π	Branching ratios in percentage									
[keV]		<i>E</i> _f [*] :	1990.6	2041.5	2731.1	2855.6	3032.3	3529.8	3826.1	4470.2	
		<i>2J</i> _f ^π :	21 ^{⟨+⟩}	25 ⁺	27 ⁺	27 ⁺	29 [−]	31 [−]	33 [−]	35 [−]	
2041.5(11)	25 ⁺		100								
2731.1(11)	27 ⁺			100							
2855.6(11)	27 ⁺			100							
3032.3(11)	29 [−]				63(6)	37					
3529.8(11)	31 [−]						100				
3826.1(12)	33 [−]							100			
4470.2(15)	35 [−]								100		
4544.4(18)	⟨37⟩ [−]										100

Energy levels and branching ratios [94Sc24].

²⁰⁴₈₃Bi

<i>E</i> [*]	<i>J</i> ^π	<i>T</i> _{1/2} or
[keV]		<i>Γ</i> _{cm}
0	6 ⁺	11.22(10) h
5.55(5)	5 ⁺	
15.08(7)	4 ⁺	
53.40(20)	7 ⁺	
78.25(7)	3 ⁺	
200.84(8)	⟨4⟩ ⁺	
215.27(8)	2 ⁺	
332.08(7)	3 ⁺	
805.5(3)	10 [−]	13.0(1) ms
816.0(3)	8 ⁺	
876.3(3)	⟨9 [−] ⟩	
895.72(8)	⟨1⟩ ⁺	

(continued)

 $^{204}_{83}\text{Bi}$

E^*	J^π	$T_{1/2}$ or Γ_{cm}
[keV]		
941.5(3)	9^+	3.96(8) ns
983.19(8)	$\langle 2^-, 3^- \rangle$	
1018.46(8)	$\langle 3^+ \rangle$	
1094.57(8)	2^-	
1099.28(8)	$1^-, 2^-$	
1255.32(8)	1^+	
1369.35(8)	$0^-, 1^-$	
1404.25(8)	$\langle 1 \rangle^-$	
1413.6(4)	11^-	
1454.6(11)	$\langle 12 \rangle^-$	
1478.37(8)	$\langle 1, 2 \rangle^+$	
1526.11(8)	$\langle 2 \rangle^-$	
1634.18(8)	1^-	
1639.7(4)	12	
1774.7(5)		
1789.4(5)		
1821.6(11)	$\langle 13 \rangle^-$	1.07(3) ms
1915.3(11)	$\langle 14^- \rangle$	
1968.2(11)		
2223.4(11)	$\langle 14 \rangle^-$	
2483.4(11)	$\langle 14 \rangle^-$	
2651.7(11)	$\langle 15^- \rangle$	
2684.5(12)	$\langle 15^- \rangle$	
2705.3(11)	$\langle 14^- \rangle$	
2819.9(11)		
2833.4(11)	$\langle 17^+ \rangle$	
2835.2(12)	$\langle 15^- \rangle$	
3387.5(12)	$\langle 18^+ \rangle$	
3516.0(12)	$\langle 16^- \rangle$	
3809.0(12)	$\langle 19^+ \rangle$	

Additional data on this isotope can be found in [90Br19].

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

Energy levels and branching ratios [94Sc24]. Part 2

 $^{204}_{83}\text{Bi}$

E^*	J^π	Branching ratios in percentage							
[keV]		$E^*_f:$ $J^\pi_f:$	0 6^+	5.55 5^+	15.08 4^+	53.40 7^+	78.25 3^+	200.84 $\langle 4 \rangle^+$	215.27 2^+
5.55(5)	5^+		100						
15.08(7)	4^+			100					
53.40(20)	7^+		100						
78.25(7)	3^+				100				

(continued)

 $^{204}_{83}\text{Bi}$

E^* [keV]	J^π	Branching ratios in percentage							
		$E_f^*:$ $J_f^\pi:$	0 6 ⁺	5.55 5 ⁺	15.08 4 ⁺	53.40 7 ⁺	78.25 3 ⁺	200.84 $\langle 4 \rangle^+$	215.27 2 ⁺
200.84(8)	$\langle 4 \rangle^+$						100		
215.27(8)	2 ⁺						100		
332.08(7)	3 ⁺				74(7)		10.2(6)	15.5(4)	
805.5(3)	10 ⁻					100			
816.0(3)	8 ⁺					100			
876.3(3)	$\langle 9^- \rangle$					100			
895.72(8)	$\langle 1 \rangle^+$						x		100
941.5(3)	9 ⁺					100			
983.19(8)	$\langle 2^-, 3^- \rangle$						77(5)		23(5)
1018.46(8)	$\langle 3^+ \rangle$				42(3)			58(2)	
1094.57(8)	2 ⁻						68(1)		
1099.28(8)	1 ⁻ , 2 ⁻								89(2)
1255.32(8)	1 ⁺						0.12(6)		100
1634.18(8)	1 ⁻								≈ 0.6

Energy levels and branching ratios [94Sc24]. Part 3

 $^{204}_{83}\text{Bi}$

E^* [keV]	J^π	Branching ratios in percentage										
		$E_f^*:$ $J_f^\pi:$	332.08 3 ⁺	805.5 10 ⁻	895.72 $\langle 1 \rangle^+$	983.19 $\langle 2^-, 3^- \rangle$	1018.46 $\langle 3^+ \rangle$	1094.57 2 ⁻	1099.28 1 ⁻ , 2 ⁻	1404.25 $\langle 1 \rangle^-$	1413.6 11 ⁻	1454.6 $\langle 12 \rangle^-$
1094.57(8)	2 ⁻		32(1)									
1099.28(8)	1 ⁻ , 2 ⁻				8.4(3)	2.11(6)		≈ 0.1				
1369.35(8)	0 ⁻ , 1 ⁻								100			
1404.25(8)	$\langle 1 \rangle^-$							14.5(13)	86(3)			
1413.6(4)	11 ⁻			100								
1454.6(11)	$\langle 12 \rangle^-$										100	
1478.37(8)	$\langle 1, 2 \rangle^+$				40(2)		60(3)					
1526.11(8)	$\langle 2 \rangle^-$	6.5(9)							93(7)			
1634.18(8)	1 ⁻							8.5(5)	84(4)	5.0(4)		
1639.7(4)	12										100	
1821.6(11)	$\langle 13 \rangle^-$											100

Energy levels and branching ratios [94Sc24]. Part 4

 $^{204}_{83}\text{Bi}$

E^* [keV]	J^π	Branching ratios in percentage										
		$E_f^*:$ $J_f^\pi:$	1526.11 $\langle 2 \rangle^-$	1639.7 12	1821.6 $\langle 13 \rangle^-$	1915.3 $\langle 14 \rangle^-$	2483.4 $\langle 14 \rangle^-$	2651.7 $\langle 15 \rangle^-$	2684.5 $\langle 15 \rangle^-$	2705.3 $\langle 14 \rangle^-$	2833.4 $\langle 17^+ \rangle$	3387.5 $\langle 18^+ \rangle$
1634.18(8)	1 ⁻		2.23(8)									
1774.7(5)				100								

(continued)

²⁰⁴Bi
83

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	1526.11 $\langle 2 \rangle^-$	1639.7 12	1821.6 $\langle 13 \rangle^-$	1915.3 $\langle 14 \rangle^-$	2483.4 $\langle 14 \rangle^-$	2651.7 $\langle 15 \rangle^-$	2684.5 $\langle 15 \rangle^-$	2705.3 $\langle 14 \rangle^-$	2833.4 $\langle 17^+ \rangle$	3387.5 $\langle 18^+ \rangle$
1789.4(5)				100								
1915.3(11)	$\langle 14 \rangle^-$				100							
1968.2(11)					100							
2223.4(11)	$\langle 14 \rangle^-$				100							
2483.4(11)	$\langle 14 \rangle^-$				100							
2651.7(11)	$\langle 15 \rangle^-$					100						
2684.5(12)	$\langle 15 \rangle^-$						100					
2705.3(11)	$\langle 14 \rangle^-$				100				x			
2819.9(11)					100							
2833.4(11)	$\langle 17^+ \rangle$					64		≈ 36				
2835.2(12)	$\langle 15 \rangle^-$						100					
3387.5(12)	$\langle 18^+ \rangle$										100	
3516.0(12)	$\langle 16 \rangle^-$									100		
3809.0(12)	$\langle 19^+ \rangle$											100

Energy levels and branching ratios [04Ko28, 93Ra10].

²⁰⁵Bi
83

E^*	$2J^\pi$	L	S_N	I_d	I_t	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]			(τ, d)	$rel.$	$rel.$	Γ_{cm}		$E_f^*:$ $2J_f^\pi:$	0 9 ⁻	796 11 ⁻	850 7 ⁻	872 5 ⁻	881 13 ⁻
0	9 ⁻	5	0.90	65	180	15.31(4) d	73Er08						
795.86(7)	11 ⁻								100				
849.83(5)	7 ⁻	3	0.17	101	114		73Er08		100				
872.38(5)	5 ⁻								100		≈0.065		
881.3(2)	13 ⁻								100	x			
1001.21(5)	7 ⁻	3	0.53	292	180		73Er08		92(5)		4.2(3)	3.5(3)	
1044.03(7)	⟨9 ⁻ ⟩			28	48		73Er08		76(4)	17(3)	8(2)		
1109.9(1)	13 ⁻								44(4)	56(3)			
1167.6(2)	15 ⁻												91(5)
1194.3(2)	⟨9 ⁻ , 11 ⁻ ⟩								44(8)	56(6)			
1239.0(2)	7 ⁻	3	0.13	77	42		73Er08		100				
1310.1(3)	⟨15 ⁻ , 13 ⁺ ⟩												100
1336.25(6)	5 ⁻								91(7)				
1343.9(2)	17 ⁻												5.8(1)
1436.9(3)	⟨13 ⁻ , 15 ⁻ ⟩												100
1472.20(9)	⟨1 ⁻ ⟩											100	
1486.64(6)	⟨3 ⁻ ⟩											83(4)	
1497.17(6)	1 ⁺					7.9(7) μs						62(4)	
1571.9(2)	17 ⁻												
1591.9(5)	⟨13 ⁺ ⟩	6	0.82	81	276		73Er08			100			
1701.0(4)	15 ⁻												
1709.18(6)	3 ⁺					105(10) ps						84(5)	

(continued)

²⁰⁵Bi
83

E^*	$2J^\pi$	L	S_N	I_d	I_t	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]			(τ, d)	<i>rel.</i>	<i>rel.</i>	Γ_{cm}		E^*_f : $2J^\pi_f$:	0 9 ⁻	796 11 ⁻	850 7 ⁻	872 5 ⁻	881 13 ⁻
1837.8(4)	15 ⁻												
1960(25)	$\langle 3, 1 \rangle^-$	1	0.09	40	6		73Er08						
1970.25(7)	$\langle 5 \rangle^+$										2.2(14)		
2041.0(2)	17 ⁺												
2064.6(2)	21 ⁺					100(6) ns							
2138.9(4)	25 ⁺					220(25) ns							
2140(25)	5 ⁻	3	0.06	36	9		73Er08						
2195.74(9)	X ⁽⁻⁾											47(4)	
2310(25)	$\langle 5^-, 7^- \rangle$	$\langle 3 \rangle$	≈ 0.06	32	9		73Er08						
2386.1(2)	$\langle 3^- \rangle$	1	0.10	48	<6		73Er08					100	
2424.33(8)	$\langle 3 \rangle^+$											85(5)	
2447.6(2)												100	
2573.9(1)	$\langle 5^-, 7 \rangle$								25(5)		45(5)	30(5)	
2579.39(9)											58(4)	18(3)	
2640(25)	$\langle 5, 7 \rangle^-$	3	0.06	36	12		73Er08						
2683.6(1)												67(6)	
2700(25)				12	18		73Er08						
2740(25)				21	24		73Er08						
2780.2(5)	27 ⁺												
2790(35)		1+3	≈ 0.04	57			73Er08						
2870(35)	$\langle 5, 7 \rangle^-$	3	0.19	105	24		73Er08						
2892.68(9)	$\langle 3^+, 5^+ \rangle$											11(3)	
2951.1(1)	$\langle 5, 7 \rangle^-$	3	0.07	32			73Er08				20(4)		
3010(35)	$\langle 5, 7 \rangle^-$	3	0.13	69	9		73Er08						
3060(35)	$\langle 5, 7 \rangle^-$	3	0.09	53	9		73Er08						
3170(35)	$\langle 1, 3 \rangle^-$	1	0.17	146			73Er08						
3197.6(5)	27 ⁺												
3200.9(5)	29 ⁺												
3220(35)	$\langle 1, 3 \rangle^-$	1	0.19	77			73Er08						
3300	$\langle 1^-, 3^- \rangle$	1	0.35	40			73Er08						
3360	$\langle 1^-, 3^- \rangle$		incl	89			73Er08						
3379.6(5)	29 ⁻					2.50(5) ns							
3390	$\langle 1^-, 3^- \rangle$		incl	77			73Er08						
3410	$\langle 1^-, 3^- \rangle$		incl	81			73Er08						
3895.8(5)	31 ⁻												
4019.3(5)	33 ⁻												
4171.7(6)	35 ⁻												
4181.4(5)	31 ⁺												
4650.3(6)	35 ⁽⁻⁾												
4695.3(6)	37 ⁻												
4934.1(6)	37 ⁽⁻⁾												
4957.9(5)	33 ⁺												
5163.8(5)	35 ⁺												
5392.9(6)													
5406.4(6)	39 ⁽⁻⁾												

(continued)

²⁰⁵Bi
83

E^*	$2J^\pi$	L	S_N	I_d	I_t	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]			(τ, d)	<i>rel.</i>	<i>rel.</i>	Γ_{cm}		E_f^* :	0	796	850	872	881
								$2J_f^\pi$:	9 ⁻	11 ⁻	7 ⁻	5 ⁻	13 ⁻
5484.7(6)	37 ⁺												
5571													
5875.7(6)													
5930.9(6)	$\langle 39^+ \rangle$												
5941.4(6)													
5948													
6452													
6718.7(8)													
			73Er08	73Er08	73Er08		Ref.						

Combined data from the (τ, d) and (α, t) reactions [73Er08] are given in [04Ko28] as S_N relative to S_N values for ²⁰⁹Bi using potential parametrization "B" in [73Er08].

Relative yield of deuterons (I_d) and tritons (I_t) from the (τ, d) and (α, t) reactions (in units number of tracks per mm) are taken from figures in [73Er08].

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

Energy levels and branching ratios [04Ko28, 93Ra10]. Part 2

²⁰⁵Bi
83

E^*	$2J^\pi$	Branching ratios in percentage											
[keV]		E_f^* :	1001	1109.95	1167.64	1239.02	1310.12	1336.25	1343.94	1472.20	1486.64	1497.17	
		$2J_f^\pi$:	7 ⁻	13 ⁻	15 ⁻	7 ⁻		5 ⁻	17 ⁻	$\langle 1 \rangle^-$	$\langle 3 \rangle^-$	1 ⁺	
1167.6(2)	15 ⁻			8.8(14)									
1336.25(6)	5 ⁻		9(3)										
1343.9(2)	17 ⁻				94								
1486.64(6)	$\langle 3 \rangle^-$							17(4)					
1497.17(6)	1 ⁺		9(4)							16(3)	≈ 13		
1571.9(2)	17 ⁻				85(1)				14.7(6)				
1701.0(4)	15 ⁻			60	≈ 40								
1709.18(6)	3 ⁺										0.79(10)	15.6(8)	
1837.8(4)	15 ⁻						100						
1970.25(7)	$\langle 5 \rangle^+$											18(2)	
2041.0(2)	17 ⁺				14.5(1)				67(3)				
2064.6(2)	21 ⁺								100				
2195.74(9)	X ^{$\langle - \rangle$}		22(11)					18(5)					
2579.39(9)			23(3)										
2951.1(1)	$\langle 5, 7 \rangle^-$		20(4)			20(8)							

Energy levels and branching ratios [04Ko28, 93Ra10]. Part 3

²⁰⁵Bi
83

E^*	$2J^\pi$	Branching ratios in percentage										
[keV]		E_f^* : $2J_f^\pi$:	1571.95 17 ⁻	1709.18 3 ⁺	1837.8 15 ⁻	1970.25 $\langle 5 \rangle^+$	2041.04 17 ⁺	2064.64 21 ⁺	2138.9 25 ⁺	2780.2 27 ⁺	3197.6 27 ⁺	3200.9 29 ⁺
1970.25(7)	$\langle 5 \rangle^+$			80(5)								
2041.0(2)	17 ⁺		15(2)		4.2(1)							
2064.6(2)	21 ⁺						≈ 0.17					
2138.9(4)	25 ⁺							100				
2195.74(9)	X $\langle - \rangle$					12(1)						
2424.33(8)	$\langle 3 \rangle^+$			9.7(11)		5.4(11)						
2683.6(1)						33(4)						
2780.2(5)	27 ⁺								100			
2892.68(9)	$\langle 3^+, 5^+ \rangle$			89(8)								
2951.1(1)	$\langle 5, 7 \rangle^-$			40(16)								
3197.6(5)	27 ⁺								49(10)	51(10)		
3200.9(5)	29 ⁺									100		
3379.6(5)	29 ⁻									94	6.3(20)	
4181.4(5)	31 ⁺											100

Energy levels and branching ratios [04Ko28, 93Ra10]. Part 4

²⁰⁵Bi
83

E^*	$2J^\pi$	Branching ratios in percentage										
[keV]		E_f^* : $2J_f^\pi$:	3379.6 29 ⁻	3895.8 31 ⁻	4019.3 33 ⁻	4171.7 35 ⁻	4181.4 31 ⁺	4650.3 35 $\langle - \rangle$	4695.3 37 ⁻	4934.1 37 $\langle - \rangle$	4957.9 33 ⁺	5163.8 35 ⁺
3895.8(5)	31 ⁻		100									
4019.3(5)	33 ⁻			100								
4171.7(6)	35 ⁻				100							
4650.3(6)	35 $\langle - \rangle$				100							
4695.3(6)	37 ⁻					100						
4934.1(6)	37 $\langle - \rangle$					100						
4957.9(5)	33 ⁺			89			≈ 11					
5163.8(5)	35 ⁺										100	
5392.9(6)												100
5406.4(6)	39 $\langle - \rangle$								100			
5484.7(6)	37 ⁺							51(13)	15(12)	≈ 10		24(12)
5571												100

Energy levels and branching ratios [04Ko28, 93Ra10]. Part 5

 $^{205}_{83}\text{Bi}$

E^* [keV]	$2J^\pi$	$E_f^*:$ $2J_f^\pi:$	5392.9	5406.4 $39^{(-)}$	5484.7 37^+	5875.7	5941.4
5484.7(6)	37^+			x			
5875.7(6)			100				
5930.9(6)	$\langle 39^+ \rangle$				100		
5941.4(6)					100		
5948					100		
6452							x
6718.7(8)						100	

Energy levels and branching ratios [99Br39].

 $^{206}_{83}\text{Bi}$

E^* [keV]	J^π	L (α, d)	I_d (α, d)	$T_{1/2}$ or Γ_{cm}	Ref.	$E_f^*:$ $J_f^\pi:$	Branching ratios in percentage				
							0.0 $6^{(+)}$	59.9 $\langle 4^+ \rangle$	70.7 $\langle 3^+ \rangle$	82.8 $\langle 5^+ \rangle$	141 $\langle 7^+ \rangle$
0.0	$6^{(+)}$			6.243(3) d	77Da05						
59.897(17)	$\langle 4^+ \rangle$			7.7(2) μs			100				
70.742(22)	$\langle 3^+ \rangle$							100			
82.819(19)	$\langle 5^+ \rangle$		20		77Da05		100				
141.2	$\langle 7^+ \rangle$		30		77Da05		100				
166(1)	$\langle 5^+ \rangle$		20		77Da05		39	61			
200.382(21)	$\langle 4^+ \rangle$							46(10)	12(2)	42(6)	
285											
352.692(23)	$\langle 3^+, 4^+ \rangle$							4.6(3)	90(3)		
409.17(3)	$\langle 2^+ \rangle$								100		
523.212(24)	$\langle 3^+ \rangle$							70(3)	12.62(6)		
733.91(3)	$\langle 3^+ \rangle$										
815.8	$\langle 8^+ \rangle$										100
878.10(3)	$\langle 2^+ \rangle$							4.03(16)	88(2)		
897.08(3)	$\langle 3^+ \rangle$							34(3)	53		
931.68(3)	$\langle 1^+ \rangle$								18.4(7)		
1044.8	$\langle 10^- \rangle$			0.89(1) ms							43
1067(2)			40		77Da05						
1077.87(3)	$\langle 2^+ \rangle$							6(1)	50(2)		
1080.9	$\langle 8^- \rangle$										100
1102.99(3)	$\langle 2^+ \rangle$							0.83(3)	94(2)		
1258.3	9										
1266.9	$\langle 9^+ \rangle$										
1389.42(3)	$\langle 1^+ \rangle$								1.1		
1523.65(6)	$\langle 1^+ \rangle$								7.8(5)		
1567.62(4)	$\langle 1^+ \rangle$								85(3)		
1600.15(4)	$\langle 1^+ \rangle$										
1639.4	$\langle 11^- \rangle$										
1789.3	$\langle 12^- \rangle$										

(continued)

²⁰⁶Bi
83

E^*	J^π	L	I_d	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		(α, d)	(α, d)	Γ_{cm}		E^*_f : J^π_f :	0.0 6 \langle^+	59.9 $\langle 4^+ \rangle$	70.7 $\langle 3^+ \rangle$	82.8 $\langle 5^+ \rangle$	141 $\langle 7^+ \rangle$
2055.7	$\langle 13^- \rangle$										
2499.5	$\langle 13^- \rangle$										
2542(5)	$\langle 9^- \rangle$	$\langle 9 \rangle$	60		91Ma16						
2603.7	$\langle 14^- \rangle$										
2838(6)			30		77Da05						
2860(6)	$\langle 10^- \rangle$	$\langle 11 \rangle$	30		91Ma16						
3147.2	$\langle 15^+ \rangle$			15.6(3) ns							
3170(6)	$\langle 8^- \rangle$	$\langle 7 \rangle$	100		91Ma16						
3568(7)	$\langle 11^+ \rangle$	$\langle 10 \rangle$	110		91Ma16						
3603.6	$\langle 16^+ \rangle$										
3632(7)	$\langle 12^+ \rangle$	$\langle 12 \rangle$	80		91Ma16						
3652.6	$\langle 16^+ \rangle$										
4023(8)			180		77Da05						
4076(8)			60		77Da05						
4305.3	$\langle 18^+ \rangle$										
4843(10)	$\langle 14^- \rangle$	$\langle 13 \rangle$	120		91Ma16						
5110(10)			40		77Da05						
		91Ma16			Ref.						

Additional data on this isotope can be found in [77Da05].

Relative yield of deuterons (I_d) from (α, d) reactions (in units number of counts in spectrograph) are taken from figure in [77Da05].

Energy levels and branching ratios [99Br39]. Part 2

²⁰⁶Bi
83

E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	200 $\langle 4^+ \rangle$	352.7 $\langle 3^+, 4^+ \rangle$	409.2 $\langle 2^+ \rangle$	523.2 $\langle 3^+ \rangle$	733.9 $\langle 3^+ \rangle$	815.8 $\langle 8^+ \rangle$	878.1 $\langle 2^+ \rangle$	897.1 $\langle 3^+ \rangle$	931.7 $\langle 1^+ \rangle$	1044.8 $\langle 10^- \rangle$
352.692(23)	$\langle 3^+, 4^+ \rangle$		4.9(7)									
523.212(24)	$\langle 3^+ \rangle$		4.8(3)	12.4(12)								
733.91(3)	$\langle 3^+ \rangle$		21(2)	44(3)	24(2)	10(4)						
878.10(3)	$\langle 2^+ \rangle$		5.68(23)		1.00(4)	1.52(6)	0.21(4)					
897.08(3)	$\langle 3^+ \rangle$			13(5)								
931.68(3)	$\langle 1^+ \rangle$				82(2)				x			
1044.8	$\langle 10^- \rangle$							57				
1077.87(3)	$\langle 2^+ \rangle$		0.33(5)		14	25(1)	0.9(3)			1.6(2)	1.8(5)	
1102.99(3)	$\langle 2^+ \rangle$		0.70(3)		0.58(4)	3.03(1)	0.50(5)		0.08(5)	x	0.29(3)	
1258.3	9							43				57
1266.9	$\langle 9^+ \rangle$							100				
1389.42(3)	$\langle 1^+ \rangle$				11.8(2)	0.06			40(1)		0.26(2)	
1523.65(6)	$\langle 1^+ \rangle$				39(2)				47(2)		6.0(8)	
1600.15(4)	$\langle 1^+ \rangle$				86(3)				12.3(21)			

(continued)

 $^{206}_{83}\text{Bi}$

E^*	J^π	Branching ratios in percentage										
		$E_f^*:$	200	352.7	409.2	523.2	733.9	815.8	878.1	897.1	931.7	1044.8
[keV]		$J_f^\pi:$	$\langle 4^+ \rangle$	$\langle 3^+, 4^+ \rangle$	$\langle 2^+ \rangle$	$\langle 3^+ \rangle$	$\langle 3^+ \rangle$	$\langle 8^+ \rangle$	$\langle 2^+ \rangle$	$\langle 3^+ \rangle$	$\langle 1^+ \rangle$	$\langle 10^- \rangle$
1639.4	$\langle 11^- \rangle$											100
1789.3	$\langle 12^- \rangle$											60

Energy levels and branching ratios [99Br39]. Part 3

 $^{206}_{83}\text{Bi}$

E^* [keV]	J^π	Branching ratios in percentage										
		$E_f^*:$ $J_f^\pi:$	1077.9 $\langle 2^+ \rangle$	1103.0 $\langle 2^+ \rangle$	1389.4 $\langle 1^+ \rangle$	1567.6 $\langle 1^+ \rangle$	1639.4 $\langle 11^- \rangle$	1789.3 $\langle 12^- \rangle$	2055.7 $\langle 13^- \rangle$	2603.7 $\langle 14^- \rangle$	3147.2 $\langle 15^+ \rangle$	3603.6 $\langle 16^+ \rangle$
1389.42(3)	$\langle 1^+ \rangle$		7.1(2)	40(1)								
1567.62(4)	$\langle 1^+ \rangle$				15(3)							
1600.15(4)	$\langle 1^+ \rangle$					1.7(1)						
1789.3	$\langle 12^- \rangle$						40					
2055.7	$\langle 13^- \rangle$							100				
2499.5	$\langle 13^- \rangle$							100				
2603.7	$\langle 14^- \rangle$								100			
3147.2	$\langle 15^+ \rangle$									100		
3603.6	$\langle 16^+ \rangle$										100	
3652.6	$\langle 16^+ \rangle$										100	
4305.3	$\langle 18^+ \rangle$											100

Energy levels and branching ratios [93Ma73].

 $^{207}_{83}\text{Bi}$

E^*	$2J^\pi$	L	S_N	I_d	I_t	S_N	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		(τ, d)	(τ, d)	<i>rel.</i>	<i>rel.</i>	(τ, d)	Γ_{cm}		$E^*_{\text{f}}:$ $2J^\pi_{\text{f}}:$	0	670	743	892	932
										9 ⁻	11 ⁻	7 ⁻	9 ⁻	13 ⁻
0	9 ⁻	5	0.90	28	147	0.80(15)	32.9(14) yr	73Er08						
669.63(4)	11 ⁻									100				
742.62(4)	7 ⁻	3	0.07	12	20	0.09(2)		73Er08		100				
892.32(4)	9 ⁻	>3	≈0.1	4	20	0.25(10)		73Er08		48(2)	39(5)	14(1)		
931.88(9)	13 ⁻									56(6)	44(6)			
992.27(4)	7 ⁻	3	0.82	162	206	0.79(5)		73Er08		97(1)		2.6(2)	0.22(2)	
1148.30(5)	⟨5⟩ ⁻				7	0.02(1)		71Gl04		37(1)		63(4)		
1211.5(6)	9 ⁻									100		x		
1240.6(1)	13 ⁻									21(13)	68(9)			11(3)
1335(5)														
1358.1(2)	15 ⁻													85(12)
1360.3(1)	⟨7⟩ ⁻									100				
1372.6(1)	⟨5⟩ ⁻									45(1)		50(1)		
1459(5)	X ^{⟨-⟩}													

(continued)

²⁰⁷Bi
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E^*	$2J^\pi$	L	S_N	I_d	I_t	S_N	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		(τ, d)	(τ, d)	$rel.$	$rel.$	(τ, d)	Γ_{cm}		$E_f^*:$ $2J_f^\pi:$	0 9 ⁻	670 11 ⁻	743 7 ⁻	892 9 ⁻	932 13 ⁻
1556(5)	X ⁽⁻⁾													
1588(5)														
1607.4(10)	13 ⁺	6	0.90	49	200	0.90(15)		73Er08			100			
1645.4(1)	15 ⁻										14(4)			78(8)
1667(5)	X ⁽⁻⁾													
1680.0(1)	$\langle 3 \rangle^-$													
1690.6(1)	$\langle 5 \rangle^-$											78(4)		
1748(5)														
1756(5)														
1762.8(1)	$\langle 5 \rangle^-$									32(5)		18(1)		
1770(5)	X ⁽⁻⁾													
1813(5)	X ⁽⁻⁾													
1861(5)														
1869(5)					7									
1902.0(1)	$\langle 1 \rangle^+$													
1942(5)	X ⁽⁻⁾													
1949(5)	$\langle 5 \rangle^-$	3	0.11	8	7			73Er08						
1976(5)														
1996(5)	X ⁽⁻⁾													
2044(5)														
2060.1(1)	$\langle 3 \rangle^+$						103(10) ps			5.7(4)		0.38(4)		
2081(5)	X ⁽⁻⁾													
2101.5(2)	21 ⁺						182(6) μs							
2111(5)	X ⁽⁻⁾													
2119.8(10)	3 ⁻	1	0.07	20				73Er08				100		
2174(5)														
2180.3(11)	$\langle 17 \rangle^-$													
2221(5)														
2231(5)														
2265(5)														
2335(5)				6										
2405.4(1)	$\langle 5 \rangle^+$											13(1)		
2546(5)		>3		12	27			73Er08						
2601.2(11)	25 ⁺													
2650(25)		>3		4	10			73Er08						
2699(5)				16										
2801(5)	5 ⁻ , 7 ⁻	3	0.4	81	47	0.48(5)		73Er08						
2931(5)		$\langle 3+1 \rangle$	0.09	20		0.42(4)		73Er08						
2949(5)	$\langle 5^-, 7^- \rangle$	$\langle 3 \rangle$	0.27	81	27			73Er08						
3030(15)	$\langle 1^-, 3^- \rangle$	$\langle 1 \rangle$	0.18	40		0.12(2)		73Er08						
3060(35)		$\langle 1 \rangle$	0.18	16				73Er08						
3134(5)	1 ⁻ , 3 ⁻	1	0.19	69	7	0.15(2)		73Er08						
3310(35)	1 ⁻ , 3 ⁻	1	0.6	20		0.45(2)		73Er08						
3345(5)	1 ⁻ , 3 ⁻	1	<0.6	166	7			73Er08						
3468(5)	$\langle 1^-, 3^- \rangle$	$\langle 1 \rangle$	0.19	77		0.27(2)		73Er08						

(continued)

²⁰⁷Bi
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E^*	$2J^\pi$	L	S_N	I_d	I_t	S_N	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		(τ, d)	(τ, d)	<i>rel.</i>	<i>rel.</i>	(τ, d)	Γ_{cm}		E_f^* :	0	670	743	892	932
									$2J_f^\pi$:	9 [−]	11 [−]	7 [−]	9 [−]	13 [−]
3500.5(15)	27 ⁺													
3530(5)	$\langle 1^-, 3^- \rangle$	$\langle 1 \rangle$	0.11	32				73Er08						
3887.3(18)	29 [−]						13(1) ns							
4559.8(20)														
			73Er08	73Er08		71Gl04		Ref.						
					73Er08			Ref.						

Additional data on this isotope can be found in [71Gl04].

Combined data from the (τ ,d) and (α ,t) reactions [73Er08] given in the first column [04Ko28] is the value S_N relative to S_N values for ²⁰⁹Bi using potential parametrization "B" in [73Er08].

Relative yield of deuterons (I_d) and tritons (I_t) from the (τ ,d) and (α ,t) reactions (in units number of tracks per mm) are taken from figures in [73Er08].

Data in the last column (from [71Gl04]) are given for the comparison.

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

Energy levels and branching ratios [93Ma73]. Part 2

²⁰⁷Bi
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E^*	$2J^\pi$	Branching ratios in percentage										
[keV]		E_f^* :	992.27	1148.30	1240.56	1358.13	1360.33	1372.57	1645.41	1680.01	1690.60	1762.76
		$2J_f^\pi$:	7 ⁻	$\langle 5 \rangle^-$	13 ⁻	15 ⁻	$\langle 7 \rangle^-$	$\langle 5 \rangle^-$	15 ⁻	$\langle 3 \rangle^-$	$\langle 5 \rangle^-$	$\langle 5 \rangle^-$
1148.30(5)	$\langle 5 \rangle^-$		0.36(4)									
1358.1(2)	15 ⁻				15(3)							
1372.6(1)	$\langle 5 \rangle^-$		0.6(4)	4.2(8)								
1645.4(1)	15 ⁻				8.4(16)	≤ 2.0						
1680.0(1)	$\langle 3 \rangle^-$			38(1)				62(4)				
1690.6(1)	$\langle 5 \rangle^-$		5.3(4)				16.4(11)					
1762.8(1)	$\langle 5 \rangle^-$		50(2)				x	<14				
1902.0(1)	$\langle 1 \rangle^+$									100		0.040
2060.1(1)	$\langle 3 \rangle^+$			73(1)				7.8(2)		0.19(4)	7.4(2)	4.09(8)
2101.5(2)	21 ⁺					43(5)			57(6)			
2180.3(11)	$\langle 17 \rangle^-$					100						

Energy levels and branching ratios [93Ma73]. Part 3

²⁰⁷Bi
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E^*	$2J^\pi$	Branching ratios in percentage						
[keV]		E_f^* :	1902.04	2060.13	2101.49	2601.2	3500.5	3887.3
		$2J_f^\pi$:	$\langle 1 \rangle^+$	$\langle 3 \rangle^+$	21 ⁺	25 ⁺	27 ⁺	29 ⁻
2060.1(1)	$\langle 3 \rangle^+$		1.94(14)					
2405.4(1)	$\langle 5 \rangle^+$		6.8(3)	80(2)				
2601.2(11)	25 ⁺				100			

(continued)

²⁰⁷Bi
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E^*	$2J^\pi$	Branching ratios in percentage						
[keV]		$E_f^*:$ $2J_f^\pi:$	1902.04 $\langle 1 \rangle^+$	2060.13 $\langle 3 \rangle^+$	2101.49 21^+	2601.2 25^+	3500.5 27^+	3887.3 29^-
3500.5(15)	27^+					100		
3887.3(18)	29^-						100	
4559.8(20)								100

Energy levels and branching ratios [86Ma17].

²⁰⁸Bi
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E^*	E^*	J^π	L	σ (α ,d)	L	S_N	L	S_N	L	S_N	L	ε	$T_{1/2}$ or	Ref.
[keV]	[keV]		(α ,d)	μ b/sr	(τ ,d)	(τ ,d)	(p,d)	(p,d)	(d,t)	(d,t)	(p,t)	(p,t)	Γ_{cm}	
0.0 ^a		$\langle 5 \rangle^+$	6	12.5	$\langle 5 \rangle$	5.5	1	1.05	1	1.07		1.0	368(4)·10 ³ yr	71Al05
63.3(1) ^a		$\langle 4 \rangle^+$	4	1.7	$\langle 5 \rangle$	4.1	1	0.87				1.0		84Sp04
510.6(1) ^b		$\langle 6 \rangle^+$					3	1.33				1.0	118(14) ps	73Cr05
601.8(1)		$\langle 4 \rangle^+$			$\langle 5,3 \rangle$		3	0.93					5(2) ps	71Al05
628.6(1)		$\langle 5 \rangle^+$		$\langle 1.9 \rangle$	$\langle 5 \rangle$	0.83	3	1.89						84Sp04
633.5(1)		$\langle 3 \rangle^+$		incl	$\langle 3 \rangle$	0.11		incl				1.3		71Al05
650.7(2)		$\langle 7 \rangle^+$		$\langle 4.8 \rangle$			3	1.52				incl		84Sp04
886.7(2)		$\langle 5 \rangle^+$		$\langle 2.3 \rangle$			1	1.02				1.0	0.18(+8-6) p	84Sp04
925.2(1)		$\langle 2 \rangle^+$					3	0.48				1.0		73Cr05
936.6(1)		$\langle 3 \rangle^+$	$\langle 4 \rangle$	$\langle 8.4 \rangle$	$\langle 3 \rangle$	3.4							>1.7 p	84Sp04
959.3(1)		$\langle 4 \rangle^+$					1	0.73				1.9		79Er11
1033.6(1)		$\langle 4 \rangle^+$	4	5.7	$\langle 3 \rangle$	3.9							0.7(+3-2) p	84Sp04
1069.5(1)		$\langle 3 \rangle^+$					1	0.60					0.4(+2-1) p	73Cr05
1094.5(2)		$\langle 6 \rangle^+$					1	1.19				1.1	0.13(+5-4) p	73Cr05
1384.3(6)		$\langle 3^+-5^+ \rangle$												
1435.7(3)														
1469.8(2)		$\langle 5^+ \rangle$		2.5										84Sp04
1529.8(1)		$\langle 3^+ \rangle$												
1534(2)			$\langle 3 \rangle$	2.4										84Sp04
1539.8(1)		$\langle 2^+ \rangle$											>1.2 p	
1563.7(2)		$\langle 4^+ \rangle$			$\langle 3 \rangle$	0.18								71Al05
1571.1(4)		$\langle 10 \rangle^-$		0.9			6	2.24				4.0	2.58(4) m	84Sp04
1605.2(5)		$\langle 4^+ \rangle$												
1625.5(6)		$\langle 7 \rangle^-$	5	12.2										84Sp04
1636.9(8)					$\langle 6 \rangle$	5.9								71Al05
1660(2)		$\langle 8 \rangle^-$					6	2.05						73Cr05
1666.2(4)														
1677.7(7)		$\langle 6 \rangle^-$	7	10.2	$\langle 6 \rangle$	5.6								84Sp04
1703.6(1)		$\langle 5 \rangle^-$					6	1.22						73Cr05
1716(2)		$\langle 6 \rangle^-, \langle 7 \rangle^-$		5.8	$\langle 6 \rangle$	2.1	6	2.56						84Sp04
1738.4(6)		$\langle 6^+ \rangle$												
1787(2)		9^-					6	1.95						73Cr05
1802.5(2)		$\langle 1^+ \rangle$												

(continued)

²⁰⁸Bi
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E^*	E^*	J^π	L	σ (α, d)	L	S_N	L	S_N	L	S_N	L	ϵ	$T_{1/2}$ or	Ref.
[keV]	[keV]		(α, d)	$\mu\text{b/sr}$	(τ, d)	(τ, d)	(p, d)	(p, d)	(d, t)	(d, t)	(p, t)	(p, t)	Γ_{cm}	
1805.0(4)				≈ 3	[3]	0.31								84Sp04
1837.1(2)		$\langle 5^+ \rangle$	$\langle 6 \rangle$	7.7										84Sp04
1844.2(4)		$\langle 4 \rangle^-$					6	0.92						73Cr05
1845.1(5)														
1870.9(4)		$\langle 3^+ \rangle$					1	≈ 0.02						73Cr05
1885(4)			$\langle 5 \rangle$	5.0	[3]	0.30								84Sp04
1920.5(1)		$\langle 3 \rangle^-$					6	0.70						73Cr05
1925.0(4)														
1938.0(5)														
2077.9(2)														
2126.8(3)		$\langle 2^+ \rangle$			[1]	0.08								71Al05
2137(7)														
2165(7)														
2250(5)			$\langle 5 \rangle$	3.6										84Sp04
2308.7(2)														
2339(3)		$\langle 7 \rangle^+$					3	1.49						73Cr05
2384.1(4)		$\langle 4 \rangle^+, \langle 5 \rangle^+$					3	1.89						73Cr05
2401.6(2)														
2408(3)		$\langle 6 \rangle^+$		13			3	1.29						84Sp04
2413(5)		9^-		incl								0.08*		
2427(3)		$\langle 11 \rangle^-$					6	2.50				7.6		73Cr05
2457.5(4)		$\langle 3 \rangle^+$			[3]	0.17	3	0.72						71Al05
2475(4)		9^-	9	58								0.82*		84Sp04
2501.4(3)		$\langle 2 \rangle^+$		5.8	[3]	0.11	3	0.46						84Sp04
2514(5)														
2560(5)				11										84Sp04
2609(6)														
2641(6)				20										84Sp04
2661(3)		$\langle 8 \rangle^+$					3	1.54				1.0		73Cr05
2688(5)														
2716(5)														
2720(3)			$\langle 5+7 \rangle$	30										84Sp04
2808(6)		$\langle 10^- \rangle$	11	43										84Sp04
2830(6)			$\langle 7 \rangle$	545										84Sp04
2850(7)														
2884.2(5)		$\langle 1 \rangle^+$												
2891(4)		$\langle 3 \rangle^+$		6.1	$\langle 3 \rangle$	3.4	3	0.35						71Al05
2893.9(5)		$\langle 2^- \rangle$					$\langle 6 \rangle$	0.23						73Cr05
2915(5)														
2945(5)		$\langle 2 \rangle^+$			$\langle 3 \rangle$	2.8								71Al05
3050(3)														
3070(5)		$\langle 1, 2 \rangle^+$			$\langle 1 \rangle$	0.19								71Al05
3079(3)														
3096(6)		$\langle 8^- \rangle$	7	114								0.09*		84Sp04
3115(3)		$X^{(+)}$					$\langle 1 \rangle$							73Cr05

(continued)

²⁰⁸Bi
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E^*	E^*	J^π	L	σ (α, d)	L	S_N	L	S_N	L	S_N	L	ε	$T_{1/2}$ or	Ref.
[keV]	[keV]		(α, d)	$\mu b/sr$	(τ, d)	(τ, d)	(p, d)	(p, d)	(d, t)	(d, t)	(p, t)	(p, t)	Γ_{cm}	
3142(3)		$X^{(+)}$					$\langle 1 \rangle$							73Cr05
3162(5)		X^-										0.26*		
3173(5)		$\langle 1, 2 \rangle^+$		11	$\langle 1 \rangle$	0.76								71Al05
3201		$\langle 12^+ \rangle$												03Fo03
3209.1														
3211(6)				6.3										84Sp04
3213(3)														
3216.0(2)														
3241(3)														
3260(5)		$\langle 1, 2 \rangle^+$		31	$\langle 1 \rangle$	0.48								71Al05
3261(10)														
3268.4(2)														
3271.0(3)														
3274(3)		X^+					$\langle 3+5 \rangle$	0.33						73Cr05
3288(5)		$\langle 1, 2 \rangle^+$			$\langle 1 \rangle$	1.68								71Al05
3303(7)				48										84Sp04
3310(10)		X^-										0.19*		
3319(3)														
3328(3)		$\langle 4^-, 5^- \rangle$		7.6			$\langle 0 \rangle$							84Sp04
3337(5)														
3348(3)		$\langle 4^-, 5^- \rangle$					$\langle 0 \rangle$							
3364(3)		X^+					$\langle 3+5 \rangle$	0.57						73Cr05
3383(7)				20										84Sp04
3389(3)														
3400		$\langle 13^+ \rangle$												
3410(5)		$\langle 1, 2 \rangle^+$			$\langle 1 \rangle$	0.44								71Al05
3414(3)		X^+					5	1.81						73Cr05
3420(10)														
3449		$\langle 13^+ \rangle$												03Fo03
3459(4)		X^-										0.08*		
3460(5)		$\langle 1, 2 \rangle^+$		60	$\langle 1 \rangle$	0.32								71Al05
3463(3)		X^+					5	1.28						73Cr05
3508(7)		$\langle 11^+ \rangle$	10	236										84Sp04
3523(3)		X^+					5	0.59						73Cr05
3530(7)		9^-										0.03*		
3540(3)		X^+		19		weak	5	0.30						71Al05
3564(3)		X^+					5	1.79						73Cr05
3572(5)		X^-										0.12*		
3609(7)		$\langle 12^+ \rangle$	$\langle 12 \rangle$	32										84Sp04
3610(3)		$\langle 1, 2 \rangle^+$			$\langle 1 \rangle$	0.60								71Al05
3640(7)														
3661(3)														
3687(3)														
3722(3)														
3741(3)														

(continued)

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E^*	E^*	J^π	L	σ (α, d)	L	S_N	L	S_N	L	S_N	L	ε	$T_{1/2}$ or	Ref.
[keV]	[keV]		(α, d)	$\mu b/sr$	(τ, d)	(τ, d)	(p, d)	(p, d)	(d, t)	(d, t)	(p, t)	(p, t)	Γ_{cm}	
3761(7)														
3766(3)														
3777(10)														
3799(8)				25										84Sp04
3861(5)				$\langle 7.4 \rangle$										84Sp04
3886(3)		$X^{(+)}$					$\langle 5 \rangle$							73Cr05
3912(7)				$\langle 4.4 \rangle$										84Sp04
3971(8)				74										84Sp04
4015(4)		X^+					3							73Cr05
4020(6)				$\langle 43 \rangle$										84Sp04
4053(8)				$\langle 54 \rangle$										84Sp04
4097(10)														
4147(5)														
4159		$\langle 13^+ \rangle$												03Fo03
4160(8)				$\langle 14 \rangle$										84Sp04
4184(4)														
4247(4)				$\langle 38 \rangle$										84Sp04
4288(9)				$\langle 52 \rangle$										84Sp04
4291		$\langle 13 \rangle$												03Fo03
4361(9)				$\langle 29 \rangle$										84Sp04
4403(9)				$\langle 29 \rangle$										84Sp04
4452(9)				55										84Sp04
4484		$\langle 14^+ \rangle$												03Fo03
4545(4)		$X^{(+)}$					$\langle 3 \rangle$							73Cr05
4558(4)		$X^{(+)}$					$\langle 1 \rangle$							73Cr05
4589(4)		$X^{(+)}$					$\langle 1 \rangle$							73Cr05
4619(4)		$X^{(+)}$					$\langle 3 \rangle$							73Cr05
4635		$\langle 15^+ \rangle$												03Fo03
4656(9)				24										84Sp04
4701				$\langle 21 \rangle$										84Sp04
4848(10)		$\langle 14^- \rangle$	$\langle 13 \rangle$	38										84Sp04
4889(10)				19										84Sp04
5012(10)				29										84Sp04
5071(10)				31										84Sp04
5463		$\langle 15^- \rangle$												03Fo03
5467(11)				17										84Sp04
5556(11)				42										84Sp04
5627		$\langle 16^- \rangle$												03Fo03
15165**	15165(6)	$\langle 0^+ \rangle$												
17780	17798(18)	3^-												
18386	18385(1)	5^-												
18685	18674(11)	4^-												
18872	18674(2)	5^-												
	18893	5^-												
19084	19102(18)	4^-												

(continued)

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E^*	E^*	J^π	L	σ (α, d)	L	S_N	L	S_N	L	S_N	L	ε	$T_{1/2}$ or	Ref.
[keV]	[keV]		(α, d)	$\mu b/sr$	(τ, d)	(τ, d)	(p, d)	(p, d)	(d, t)	(d, t)	(p, t)	(p, t)	Γ_{cm}	
19125	19142(17)	5 ⁻												
19160	19172(11)	6 ⁻												
19201	19221(20)	7 ⁻												
19214	19231(18)	3 ⁻												
19289	19301(4)	4 ⁻												
19344	19361(17)	5 ⁻												
19369	19381(12)	6 ⁻												
19394	19410(16)	2 ⁻												
19417	19430(13)	3 ⁻												
19460	19480(20)	5 ⁻												
19522	19540(18)	4 ⁻												
19644	19659(15)	6 ⁻												
19774	19779(5)	7 ⁺												
19862	19878(16)	3 ⁻												
20029	20018(11)	7 ⁺												
20138	20147(9)	2 ⁻												
20202	20217(15)	3 ⁻												
20291	20306(15)	2 ⁻												
20409	20416(7)	3 ⁻												
20456	20455(-1)	1 ⁻												
20547	20545(-2)	2 ⁻												
20647	20654(7)	5 ⁻												
20676	20674(-2)	1 ⁻												
20853	20873(20)	5 ⁻												
20942	20943(1)	$\langle 2^- \rangle$												
21037	21043(6)	3 ⁻												
21087	21092(5)	2 ⁻												
21110	21112(2)	1 ⁻												
21132	21142(10)	3 ⁻												
21174	21172(-2)	4 ⁻												
21250	21252(2)	2 ⁻												
21426		1 ⁻												
21476		1 ⁻												
			84Sp04	84Sp04		71Al05		73Cr05				79Er11		Ref.

Additional data on this isotope can be found in [04Ze02, 03Fo03, 00Ak01, 96Li37, 77Da05, 68Al11].

* Transition strength estimated as $N_f(2J_{f+1})/(2J_{c+1})(2J_{i+1})$ with N_f – normalization, J_c – core excitation [79Er11].

** Corresponds to the proton resonance at $E_o=11514$ keV, see data in vol. I/19A2 for other states;

S_N from the (p,d) reaction are given relative to lead and are compared with theories in [73Cr05]. 8 multiplets are marked a-h according to [71Al05].

There is the difference of E^* in two compilations: Nuclear Data Sheets [86Ma17] (in the first column) and vol. I/19A2 (E^* in the second column estimated from proton resonance positions E_o). The difference between them is given here instead of the experimental error in E^* .

Energy levels and branching ratios [86Ma17]. Part 2

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E^*	J^π	E^*_f : J^π_f :	0.0 $\langle 5 \rangle^+$	63.3 $\langle 4 \rangle^+$	511 $\langle 6 \rangle^+$	Branching ratios in percentage						936.6 $\langle 3 \rangle^+$
[keV]					602 $\langle 4 \rangle^+$	629 $\langle 5 \rangle^+$	633.5 $\langle 3 \rangle^+$	650.7 $\langle 7 \rangle^+$	886.7 $\langle 5 \rangle^+$	925.2 $\langle 2 \rangle^+$		
	$\langle 4 \rangle^+$	100										
	$\langle 6 \rangle^+$	97(7)		3.0(8)								
	$\langle 4 \rangle^+$	68(3)		32(3)								
	$\langle 5 \rangle^+$	<1.3	100		<3							
	$\langle 3 \rangle^+$	1.3(1)	99		x							
	$\langle 7 \rangle^+$	63(8)	<18		37(6)							
	$\langle 5 \rangle^+$	49(2)	49(2)		2.0(7)	<1	<1	<1	<1			
	$\langle 2 \rangle^+$	<0.11	23(1)	<0.11	<0.11	<0.11	77(2)	<0.2				
	$\langle 3 \rangle^+$	1.8(6)	97(3)	<0.1	<0.1	≤ 1.1	1.0(1)	<0.1				
	$\langle 4 \rangle^+$	23(3)	68(3)	<0.7	<0.3	2.6(3)	6.5(3)	<1				
	$\langle 4 \rangle^+$	71(2)	29(1)	<0.9	<0.2	≤ 4.0	≤ 1.1	<0.4	≤ 11			
	$\langle 3 \rangle^+$	2.1(2)	90(3)	<5.3	7.8(4)	≤ 3.4	≤ 3.2	<0.4		<0.6	<0.6	
	$\langle 6 \rangle^+$	100	<3.8	<3.8	<9.4	<3.8	<1.9	<1.9	<6	<7.5	<7.5	
	$\langle 3^+-5^+ \rangle$	20										
					40						60	
	$\langle 5^+ \rangle$	[3.8]	[3.8]	[42]	<2	[18(1)]	[23(2)]	≤ 3.2	[7(1)]	<2	[2.7]	
	$\langle 3^+ \rangle$	[11(1)]	[20(1)]	<0.4	[32(1)]	<0.8	<81	<0.8	<0.4	<4	[3.5]	
	$\langle 2^+ \rangle$	<0.2	≤ 8.2	<0.1	2.3(6)	<0.4	78(2)	<0.2	<0.1	4.5(2)	13.1(8)	
	$\langle 4^+ \rangle$	<1.0	<1.0	<0.5	≤ 10	44(3)	<1.0	<0.5	3.9(5)	<0.5	22(1)	
	$\langle 10 \rangle^-$							100				
	$\langle 4^+ \rangle$	6(3)			18(5)						24(2)	
	$\langle 7 \rangle^-$			100								
		100										
					[100]							
	$\langle 6 \rangle^-$		9(3)					58(11)	23(2)			
	$\langle 5 \rangle^-$	12(1)	40(2)	<0.4	18(1)	3.8(4)	<1.9	<0.4	1.5(8)	<0.4	<1.9	
	$\langle 6 \rangle^-, \langle 7 \rangle^-$			81(4)				19(2)				
	$\langle 1^+ \rangle$	<0.3	<0.8	<0.13	<0.13	<0.13	4.6(3)	<0.13	<0.13	≤ 13	10.0(5)	
							[100]					
	$\langle 5^+ \rangle$	<2.1	<3.1	[2.1]	[9.4]	<2.1	<2.1	<1.1	<1.1	<5.2	<2.1	
	$\langle 4 \rangle^-$		22(1)				3.9(7)	14(1)	1.4(3)		9.8(7)	
				30								
	$\langle 3 \rangle^-$	<1.0	15(1)	<0.5	30(1)	4.0(5)	4.5(5)	<0.5	≤ 99	x	40(2)	
		100										
		≤ 2.2	<0.3	<0.2	<0.4	<0.1	1.3(1)	<0.1	≤ 11	0.41(11)	0.51(11)	
	$\langle 2^+ \rangle$						8(1)			8(1)	65(2)	
		<1.3	<0.9	<0.9	<1.3	<0.5	<0.9	<0.5		<0.5	<8.2	
	$\langle 4 \rangle^+, \langle 5 \rangle^+$				55(3)	45(3)						
		<2	<2	<2	<1	<1	<1	<1	<1	≤ 69	<1	
	$\langle 3 \rangle^+$						61(4)			28(4)		
	$\langle 2 \rangle^+$						52(2)			48(2)		
											4.8(3)	
	$\langle 1 \rangle^+$									84(4)		

Energy levels and branching ratios [86Ma17]. Part 3

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E^*	J^π	E_f^* :	959.3	1033.6	1069.5	Branching ratios in percentage						
[keV]		J_f^π :	$\langle 4 \rangle^+$	$\langle 4 \rangle^+$	$\langle 3 \rangle^+$	1094.5	1384.3	1469.8	1529.8	1539.8	1563.7	1605.2
						$\langle 6 \rangle^+$		$\langle 5^+ \rangle$	$\langle 3^+ \rangle$	$\langle 2^+ \rangle$	$\langle 4^+ \rangle$	$\langle 4^+ \rangle$
	$\langle 3^+-5^+ \rangle$				80							
	$\langle 5^+ \rangle$			≤ 10	< 2	< 1.1						
	$\langle 3^+ \rangle$			[33(1)]	< 0.4	< 0.4						
	$\langle 2^+ \rangle$	< 0.2	< 0.2		1.7(1)	< 0.1						
	$\langle 4^+ \rangle$	< 4	30(1)		< 1.0	< 1.0						
	$\langle 4^+ \rangle$		7(3)		10(2)			34(11)				
	$\langle 6 \rangle^-$					9(3)						
	$\langle 5 \rangle^-$	≤ 11	11(1)		< 0.8	< 0.8		< 0.8	< 1.1	< 1.5	13(3)	
	$\langle 6^+ \rangle$							100				
	$\langle 1^+ \rangle$	< 0.5	< 0.13		< 0.13	< 0.3		< 0.13	≤ 1.3	85.4(20)	< 0.3	
	$\langle 5^+ \rangle$		[8.4]		< 2.1	[71(4)]		< 1.1	< 13	< 1.1	[9(2)]	
	$\langle 4 \rangle^-$	3.9(7)	2.8(7)									
					70							
	$\langle 3^+ \rangle$		31(6)								69(6)	
	$\langle 3 \rangle^-$	≤ 9	≤ 40		< 1.0	< 1.0		< 0.5	6.5(5)	< 0.5	< 2.4	
					100							
		< 0.1	0.81(11)		< 0.3	< 0.2		< 0.2	< 0.2	≤ 51	< 0.5	
	$\langle 2^+ \rangle$									5(1)		
		< 1.3	< 0.5		94(3)	< 0.5		< 2.2	< 0.5	< 0.5	≤ 13	
		< 1	≤ 53		< 0.7	< 0.7		< 1.4	[25(3)]		[69(3)]	
	$\langle 3 \rangle^+$				11(2)							
			0.19(9)				0.46(9)		9(3)		1.11(9)	0.56(9)
	$\langle 2^- \rangle$				24(2)					3.4(9)		
											54(3)	
	$\langle 1,2 \rangle^+$						0.1(1)			0.9(1)		
											33(2)	
									1(1)	6(1)	5(1)	10(1)

Energy levels and branching ratios [86Ma17]. Part 4

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E^*	J^π	E_f^* :	1625.5	1677.7	1703.6	Branching ratios in percentage						
[keV]		J_f^π :	$\langle 7 \rangle^-$	$\langle 6 \rangle^-$	$\langle 5 \rangle^-$	1716	1738.4	1802.5	1837.1	1870.9	1920.5	2077.9
							$\langle 6^+ \rangle$	$\langle 1^+ \rangle$	$\langle 5^+ \rangle$	$\langle 3^+ \rangle$	$\langle 3 \rangle^-$	
	$\langle 5^+ \rangle$				< 4.2							
	$\langle 4 \rangle^-$				42(8)							
	$\langle 3 \rangle^-$				< 1.5							
					< 0.1			97.0(22)	< 0.2		< 0.4	
	$\langle 2^+ \rangle$									14(1)		
					< 1.8			< 1.3	< 1.3		6.3(5)	< 1.3
					[5.8]			< 15	< 3.6		< 0.7	< 0.7
					9(2)	2.2(6)			1.0(2)	3.3(3)	5.9(2)	
	$\langle 2^- \rangle$							6.0(9)			55(2)	

(continued)

²⁰⁸Bi

E^*	J^π	E_f^*	1625.5	1677.7	1703.6	Branching ratios in percentage						
[keV]		J_f^π	$\langle 7 \rangle^-$	$\langle 6 \rangle^-$	$\langle 5 \rangle^-$	1716	1738.4	1802.5	1837.1	1870.9	1920.5	2077.9
							$\langle 6^+ \rangle$	$\langle 1^+ \rangle$	$\langle 5^+ \rangle$	$\langle 3^+ \rangle$	$\langle 3 \rangle^-$	
	$\langle 1,2 \rangle^+$			18(1)					11(1)			
					5.4(2)				0.7(1)			11.2(15)
				10(2)	14(4)	9.8(8)	5.3(8)		12.8(8)		6.7(8)	2.2(8)
							57(3)					
							10(1)	17(1)	8(1)		1	32(1)
		24(2)	5(1)				7(1)		14(1)			5(2)

Energy levels and branching ratios [86Ma17]. Part 5

²⁰⁸Bi

E^*	J^π	E_f^*	2126.8	2308.7	Branching ratios in percentage						
[keV]		J_f^π	$\langle 2^+ \rangle$		2384.1	2401.6	2457.5	2501.4	2720	2893.9	
							$\langle 3 \rangle^+$	$\langle 2 \rangle^+$		$\langle 2^- \rangle$	
			0.9(2)				62(2)				
	$\langle 1 \rangle^+$							16.0(14)			
	$\langle 2^- \rangle$		12.0(9)								
							9(2)		8(1)		
	$\langle 1,2 \rangle^+$		3.0(1)			2.2(1)	3.9(1)	72.6(17)			
						6(2)				1(1)	
									20(1)		
		2		31(6)							
					43(2)						

Energy levels and branching ratios [91Ma16].

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E^*	$2J^\pi$	L	β_L	$\sigma(\alpha, d)$	C^2S	L	C^2S	L	S_N	S_N	$g\Gamma_o^2/\Gamma$	$\sigma(d, d')$	$T_{1/2}$ or	Ref.
[keV]		(p, p')	(p, p')	$\mu\text{b/sr}$	(τ, d)	(α, t)	(α, t)	(d, t)	(d, t)	(t, α)	[eV]	$\mu\text{b/sr}$	Γ_{cm}	
0.0	9^-			12.3	1.00*	5	0.80			2.62		12·10 ³	Stable	85Ga01
896.29(5)	7^-	$\langle 2 \rangle$	0.013	21.1	1.38	3	0.76			0.12		1	9.7(11) ps	71Un01
1608.58(5)	13^+	3	0.027	31.4	0.85	6	0.74			0.5		13	0.27(18) ns	85Ga01
2442.86(5)	1^+									1.8			10(2) ns	
2492.82(6)	3^+	3	0.026			2	0.014			1.8		13	≈31 ps	85Ga01
2564.16(9)	$\langle 9 \rangle^+$	3	0.047									48	0.015(3) ps	71Un01
2583.07(9)	$\langle 7 \rangle^+$	3	0.041									42	0.29(8) ps	71Un01
2599.90(8)	11^+	3	0.074	≈6.1								121	0.043(12) ps	71Un01
2600.92(5)	13^+			incl	0.08	6	0.065						0.34(10) ps	85Ga01
2617.31(6)	5^+	3	0.035									34	>2 ps	71Un01
2741.05(5)	15^+	3	0.057					1	0.14	≤0.2		72	7.1(10) ps	80Cl05
2766.61(5)	$3^{(+)}$	[4]	0.013									3		71Un01

(continued)

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E^*	$2J^\pi$	L	β_L	σ (α, d)	C^2S	L	C^2S	L	S_N	S_N	$g\Gamma_o^2/\Gamma$	σ (d,d')	$T_{1/2}$ or	Ref.
[keV]		(p,p')	(p,p')	$\mu b/sr$	(τ, d)	(α, t)	(α, t)	(d,t)	(d,t)	(t, α)	[eV]	$\mu b/sr$	Γ_{cm}	
2826.19(11)	5^-			18	0.87	3	0.57			≤ 0.05		5	0.039(5) ps	85Ga01
2845.14(6)	1^+													00Ti04
2916.57(7)	$\langle 1^+ \rangle$			≈ 4.8										
2955.87(7)	$\langle 3^+ \rangle$	[4]	0.014							2.2		4		71Un01
2986.79(5)	19^+	5	0.021	26				1	0.98			10	18(1) ns	80Cl05
3038.87(10)	5^+	5	0.013	≈ 6.5								4		71Un01
3090.08(7)	$\langle 7^+ \rangle$	5	0.014									4		71Un01
3119.54(11)	3^-				0.98	1	0.44						0.021(14) ps	85Ga01
3132.96(9)	11^+	5	0.036	56								21		71Un01
3135.77(7)	$\langle 15^+ \rangle$		incl	incl										
3152.83(20)	$\langle 9^+ \rangle$	5	0.032	incl				1	0.61			16		80Cl05
3154.06(5)	17^+		incl	incl										
3159.28(8)	$3^{(+)}$													
3169.07(5)	$\langle 13^+ \rangle$	5	0.026									12		71Un01
3197.44(10)	$1,3,5^+$			19										71Le09
3211.84(5)	$\langle 17^+ \rangle$	5	0.020					1	0.48			6		80Cl05
3221.58(7)	$\langle 5^+ \rangle$													
3269.6(1)	$1,3,5^+$													
3311.15(6)	$\langle 7^+, 9^+ \rangle$	$\langle 3 \rangle$	0.009									4		71Un01
3354.7(4)	$\langle 3^+ \rangle$													
3362.01(11)	$7^+ - 11^+$													
3378.16(9)	$\langle 9^+ \rangle$											1		71Un01
3394.3(5)	$\langle 15^+ \rangle$													
3406.21(8)	13^+					6	0.03					2		85Ga01
3450.30(20)	$\langle 7^+ \rangle$													
3464.12(10)	$\langle 11^+ \rangle$	5	0.019									5		71Un01
3467.67(7)	$\langle 19^+ \rangle$		incl	79				3	0.27			incl		80Cl05
3486.92(7)	$19^{(+)}$			incl										
3489.85(17)														
3502.22(12)	$\langle 15^+ \rangle$													
3505.29(20)	$5^-, 7^-$					3	0.04							85Ga01
3541.61(18)														
3575.00(20)	$3^- - 7^+$	5	0.012	58										75Wa03
3578.99(11)	$17^+, 19^+$		incl											
3597.14(10)	19^+	5	0.020					1,3	0.2,1					80Cl05
3601.73(10)	$5^+ - 9^+$													
3633(4)	1^-				0.54	1	0.20							85Ga01
3685(3)	X^+	5	0.015											75Wa03
3692.16(10)	$\langle 11^- \rangle$									10.0				
3703.55(20)	$\langle 7^+ \rangle$	5	0.015											75Wa03
3717.64(10)														
3735(5)	X^+													
3752.2(3)														
3766.9(3)	$\langle 11^+ \rangle$													
3783.6(4)														

(continued)

²⁰⁹Bi
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E^*	$2J^\pi$	L	β_L	σ (α, d)	C^2S	L	C^2S	L	S_N	S_N	$g\Gamma_o^2/\Gamma$	σ (d, d')	$T_{1/2}$ or	Ref.
[keV]		(p, p')	(p, p')	$\mu b/sr$	(τ, d)	(α, t)	(α, t)	(d, t)	(d, t)	(t, α)	[eV]	$\mu b/sr$	Γ_{cm}	
3800.80(19)	$\langle 7^+, 9^+ \rangle$	$\langle 3 \rangle$	0.013	≈ 312										75Wa03
3812.25(16)	$23^{\langle + \rangle}$	[7]	0.03											75Wa03
3817.86(20)	$9^+ - 13^+$		incl					3	1.58					80Cl05
3839(4)	$11^+, 13^+$					6	0.03							85Ga01
3849.94(20)														
3884.3(5)														
3889.5(3)														
3905.9(3)														
3912(10)	$15^+ - 21^+$							1	0.71					80Cl05
3921.22(10)	$\langle 7^+, 9^+ \rangle$	$\langle 3 \rangle$	0.013											75Wa03
3936.74(10)	$\langle 13^- \rangle$		≈ 130			≥ 7								85Ga01
3950(5)	$X^{\langle + \rangle}$	$\langle 3 \rangle$	0.012	incl										75Wa03
3962.28(22)														
3980.04(10)	X^-	2	0.033								0.88(31)			75Wa03
4000.72(1)	$9^+ - 13^-$													
4002(10)	X^+							1	0.35	1.8				80Cl05
4009.3(4)														
4021(10)						≥ 7				2.4				85Ga01
4036.5(4)														
4046.54(20)														
4065(10)								1	0.92					80Cl05
4079(5)									incl					
4088.34(10)	$5^- - 13^-$	2	0.027								0.28(3)			75Wa03
4096.34(17)	$9^+ - 13^-$		incl											
4116(4)	$X^{\langle + \rangle}$	$\langle 7 \rangle$	0.022											75Wa03
4123(7)														
4134.0(20)				≈ 145										71Le09
4141.95(10)	$21^{\langle + \rangle}$													
4148.10(14)	$9^+, 11^-$										0.07(2)			
4158.80(19)	X^-	2	0.027								0.21(4)			75Wa03
4160.9(7)	$X^{\langle - \rangle}$													
4168(7)	$X^{\langle - \rangle}$					7	0.045							85Ga01
4176.15(10)	$7^+ - 11^+$	3	0.033								0.21(4)			75Wa03
4207.5(4)											0.25(3)			
4222.9(7)														
4223(7)	$15^+ - 21^+$							1	0.14					80Cl05
4233.75(20)	$\langle 13 \rangle^-$					7	0.06							85Ga01
4257(4)	$15^+ - 21^+$													
4262.9(2)								1	0.21					80Cl05
4286(3)		4	0.034											75Wa03
4297.73(17)														
4300.75(10)		≈ 7	≈ 0.03											75Wa03
4313(7)														
4326(3)														
4335.3(3)														

(continued)

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E^*	$2J^\pi$	L	β_L	$\sigma(\alpha, d)$	C^2S	L	C^2S	L	S_N	S_N	$g\Gamma_o^2/\Gamma$	$\sigma(d, d')$	$T_{1/2}$ or	Ref.
[keV]		(p, p')	(p, p')	$\mu\text{b/sr}$	(τ, d)	(α, t)	(α, t)	(d, t)	(d, t)	(t, α)	[eV]	$\mu\text{b/sr}$	Γ_{cm}	
4340.7(5)														
4349(7)	15^+-21^+							1	0.97					80Cl05
4361.89(21)	$\langle 11-15 \rangle^-$	4	0.032											75Wa03
4376.5(6)														
4381.32(21)														
4388.16(19)														
4397.85(20)														
4409.05(20)		≈ 8	≈ 0.04											75Wa03
4415	1^-													00Ti04
4417(10)	15^+-21^+							1	0.14					80Cl05
4421(10)	$\langle 1^- \rangle$					1	0.10							85Ga01
4441.7(10)	$\langle 7^- \rangle$	4	0.017			3	0.10							85Ga01
4471.0(3)	$\langle 9^+-13^- \rangle$													
4484.80(11)														
4506.85(20)														
4515.23(10)	$\langle 9^+-13^- \rangle$													
4522(10)														
4532(4)	$\langle 13^-, 15^- \rangle$	≈ 8	≈ 0.02			7	<0.02							85Ga01
4587.9(6)														
4602.6(13)														
4613(5)	$5^-, 7^-$					3	0.06							85Ga01
4646.1(3)														
4682.0(8)														
4700(25)														
4750.8(2)														
4755.8(2)	$\langle 7, 9, 11 \rangle$										2.7(7)			80Ch22
4762.3(3)														
4789.8(4)	$\langle 9^+-13^- \rangle$					6	0.04							85Ga01
4796.1(3)	$\langle 7, 9, 11 \rangle$										3.5(9)			80Ch22
4830.3(3)	$\langle 7, 9, 11 \rangle$										1.5(3)			80Ch22
4837.6(3)														
4853.5(2)														
4879.5(2)														
4886(25)	$13^-, 15^-$					7	0.02							85Ga01
4948.3(5)														
4967.6(15)														
4996.2(3)	$\langle 13^- \rangle$					7	0.03							85Ga01
5056.7(6)	$\langle 11^+ \rangle$							3	0.15					80Cl05
5087(25)	$5^-, 7^-$					3	0.07							85Ga01
5131(6)		≈ 7	≈ 0.02											75Wa03
5167.3(3)	$\langle 9^+-13^- \rangle$													
5182.7(7)	$5^-, 7^-$					3	0.07				0.9(3)			85Ga01
5235.1(3)	$\langle 7, 9, 11 \rangle$										1.4(3)			80Ch22
5256(10)	X^+							3	0.32					80Cl05
5277(25)	$13^-, 15^-$					7	0.04							85Ga01

(continued)

²⁰⁹Bi
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E^*	$2J^\pi$	L	β_L	σ (α, d)	C^2S	L	C^2S	L	S_N	S_N	$g\Gamma_o^2/\Gamma$	σ (d, d')	$T_{1/2}$ or	Ref.
[keV]		(p,p')	(p,p')	$\mu b/sr$	(τ, d)	(α, t)	(α, t)	(d,t)	(d,t)	(t, α)	[eV]	$\mu b/sr$	Γ_{cm}	
5281.9(11)	$\langle 7, 9, 11 \rangle$										5.5(11)			80Ch22
5293.4(6)	$\langle 7, 9, 11 \rangle$										2.2(6)			80Ch22
5312.6(13)	$\langle 7, 9, 11 \rangle$										3.0(9)			80Ch22
5333(5)														
5354.0(4)	$\langle 7, 9, 11 \rangle$										3.3(8)			80Ch22
5367(10)	X^+							3	0.41					80Cl05
5380(25)	$13^-, 15^-$				7	0.03								85Ga01
5404.5(6)	$\langle 11 \rangle^+$													
5411.2(6)											3.3(8)			80Ch22
5424.6(2)	$\langle 9^+ - 13^- \rangle$										1.7(5)			80Ch22
5440.2(10)											1.6(5)			80Ch22
5464.6(8)	11^+				6	0.06	3	0.83			1.4(4)			80Ch22
5484.4(5)	$\langle 7, 9, 11 \rangle$										4.0(8)			80Ch22
5498.0(10)	$\langle 7, 9, 11 \rangle$										4.8(9)			80Ch22
5510.53(24)	$\langle 9^+ - 13^- \rangle$										6.8(12)			80Ch22
5523.5(5)														
5538.4(7)											4.4(10)			80Ch22
5559.6(6)											2.6(8)			80Ch22
5570.6(7)					[6]	0.04					1.7(10)			85Ga01
5589.2(7)						incl					3.2(9)			80Ch22
5609.1(10)	11^-												0.48(10) fs	
5609.8(3)														
5652.6(8)	$\langle 11 \rangle^+$							3	0.43					80Cl05
5662(2)											1.6(4)			80Ch22
5693(25)	$\langle 3^+, 5^+ \rangle$				$\langle 2 \rangle$	0.15								85Ga01
5769(7)														
5795(7)														
5835(8)														
5925.1(17)	$\langle 11 \rangle^+$							3	0.28					80Cl05
6392(8)														
6556														
6911(4)											2.4(5)			80Ch22
6944.8(21)											2.1(6)			80Ch22
6983(4)											2.6(5)			80Ch22
7106(4)											1.0(3)			80Ch22
7168	$9^+, 11^+$												0.56(3) fs	
7171(4)											4.7(10)			80Ch22
7176.6(10)											24(5)			73Sw01
7202(5)											30(5)			73Sw01
7243.9(13)											3.7(8)			80Ch22
7264(4)											2.4(9)			80Ch22
7279														
7279+X														
7287(4)											2.6(7)			80Ch22
7360(4)											4.3(11)			80Ch22

(continued)

²⁰⁹Bi
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E^*	$2J^\pi$	L	β_L	σ (α, d)	C^2S	L	C^2S	S_N	S_N	$g\Gamma_o^2/\Gamma$	σ (d, d')	$T_{1/2}$ or	Ref.
[keV]		(p,p')	(p,p')	$\mu b/sr$	(τ, d)	(α, t)	(α, t)	(d, t)	(t, α)	[eV]	$\mu b/sr$	Γ_{cm}	
7416	9 ⁻									0.14(9)**		1.9(+23-7) fs	
7632												<0.9 fs	
9000													
10900(300)													
13450(10)													
18627(4)	9 ⁺												
19382(26)	$\langle 11^+ \rangle$												
20100(150)	$\langle 15^+ \rangle$												
20186(4)	5 ⁺												
20671(6)	$\langle 1^+ \rangle$												
21114(16)	7 ⁺												
21172(18)	3 ⁺												
≈ 22000													
				75Wa03	71Le09	80Gr09		85Ga01	80Cl05	72Ba81	80Ch22	71Un01	Ref.
											73Sw01		Ref.
											74Sw05		Ref.

Additional data on this isotope can be found in [04Br19, 00Ti04, 97DeZW, 96De48, 91Wo04, 84Ga16, 79Ze03, 77Co10, 74Cl06, 74Cl07, 74Sw05, 72Ba81, 72Wo21, 70El13, 70Br12, 69Br06].

Abundance: 100 %.

* Compilation [91Ma16] contains the comparison of data from 5 independent measurements of C^2S in the (τ, d) reaction [67Wi09, 67Wo03, 68Ba34, 68El01, 80Gr09]; normalized values from the last work are given here (see comments in [91Ma16]).

** Γ_o from [70Sc27].

Comparison of spectroscopic factors from different proton-transfer reactions ((τ, d), ($^7\text{Li}, ^6\text{He}$) etc.) can be found in [79Ze03].

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

Energy levels and branching ratios [91Ma16]. Part 2

²⁰⁹Bi
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E^*	$2J^\pi$	Branching ratios in percentage										
		E_f^* :	0.0	896	1608	2443	2493	2564	2583	2600	2601	2617
[keV]		$2J_f^\pi$:	9 ⁻	7 ⁻	13 ⁺	1 ⁺	3 ⁺	$\langle 9 \rangle^+$	$\langle 7 \rangle^+$	11 ⁺	13 ⁺	5 ⁺
896.29(5)	7 ⁻		100									
1608.58(5)	13 ⁺		100									
2442.86(5)	1 ⁺			100								
2492.82(6)	3 ⁺		100			x						
2564.16(9)	$\langle 9 \rangle^+$		100									
2583.07(9)	$\langle 7 \rangle^+$		30.6(10)	69.4(9)								
2599.90(8)	11 ⁺		100		<4.5							
2600.92(5)	13 ⁺		1.3(5)		99(14)							
2617.31(6)	5 ⁺		33.5(7)	63.3(13)			3.2(1)					
2741.05(5)	15 ⁺		55.4(3)		37.6(3)						7.0(1)	

(continued)

²⁰⁹Bi

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		E_f^* : $2J_f^\pi$:	0.0 9 ⁻	896 7 ⁻	1608 13 ⁺	2443 1 ⁺	2493 3 ⁺	2564 $\langle 9 \rangle^+$	2583 $\langle 7 \rangle^+$	2600 11 ⁺	2601 13 ⁺	2617 5 ⁺
2766.61(5)	3 ⁽⁺⁾		≈ 5			67.3(8)	22.5(3)					4.8(3)
2826.19(11)	5 ⁻		69.9(8)	30(3)								
2845.14(6)	1 ⁺					85(10)						
2955.87(7)	$\langle 3 \rangle^+$		<19			<3.0	84.3(13)					12.4(8)
2986.79(5)	19 ⁺										<0.8	
3038.87(10)	5 ⁺			77.6(12)								
3090.08(7)	$\langle 7 \rangle^+$		84.5(14)	15.5(10)								
3119.54(11)	3 ⁻			100								
3132.96(9)	11 ⁺		78(2)		22.0(16)							
3135.77(7)	$\langle 15 \rangle^+$				90.6(19)							
3152.83(20)	$\langle 9 \rangle^+$		100									
3169.07(5)	$\langle 13 \rangle^+$				100							
3311.15(6)	$\langle 7^+, 9^+ \rangle$		32.2(11)	68(2)								
3362.01(11)	7 ⁺ -11 ⁺			100								
3378.16(9)	$\langle 9^+ \rangle$		69(2)	31(2)								
3394.3(5)	$\langle 15^+ \rangle$			36.2(10)	64(4)							
3406.21(8)	13 ⁺				54(3)					26(3)		
3450.30(20)	$\langle 7^+ \rangle$			100								
3464.12(10)	$\langle 11^+ \rangle$		100									
3489.85(17)			26.6(12)	73(3)								
3505.29(20)	5 ⁻ , 7 ⁻			28(2)					72(18)			
3541.61(18)			16.1(15)	84(4)								
3575.00(20)	3 ⁻ -7 ⁺			37(3)								
3601.73(10)	5 ⁺ -9 ⁺		5.8(11)	94(3)								
3692.16(10)	$\langle 11^- \rangle$		100									
3703.55(20)	$\langle 7^+ \rangle$		45.1(8)	4(2)								
3717.64(10)			100									
3752.2(3)				100								
3766.9(3)	$\langle 11 \rangle^+$		100									
3783.6(4)				100								
3800.80(19)	$\langle 7^+, 9^+ \rangle$		41(3)	59(3)								
3817.86(20)	9 ⁺ -13 ⁺				52(5)			48(16)				
3849.94(20)			100									
3884.3(5)			100									
3889.5(3)			100									
3905.9(3)			16(3)	84(6)								
3921.22(10)	$\langle 7^+, 9^+ \rangle$		80(4)	20(4)								
3936.74(10)	$\langle 13^- \rangle$		100									
3962.28(22)			55(3)	45(3)								
3980.04(10)	X ⁻		100									
4000.72(1)	9 ⁺ -13 ⁻		36(3)		64(6)							
4009.3(4)			100									
4036.5(4)			100									
4046.54(20)			100									
4088.34(10)	5 ⁻ -13 ⁻		100									

(continued)

 ^{209}Bi

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		$E_f^*:$ $2J_f^\pi:$	0.0 9 ⁻	896 7 ⁻	1608 13 ⁺	2443 1 ⁺	2493 3 ⁺	2564 $\langle 9 \rangle^+$	2583 $\langle 7 \rangle^+$	2600 11 ⁺	2601 13 ⁺	2617 5 ⁺
4096.34(17)	9 ⁺ -13 ⁻		65(2)		35(4)							
4134.0(20)			100									
4148.10(14)	9 ⁺ , 11 ⁻		38(3)	10(3)	51(5)							
4158.80(19)	X ⁻		82(3)	18(3)								
4160.9(7)	X ⁽⁻⁾		100									
4176.15(10)	7 ⁺ -11 ⁺		100									
4207.5(4)			100									
4222.9(7)			100									
4233.75(20)	$\langle 13 \rangle^-$		100									
4262.9(2)			100									
4297.73(17)			44(3)	56(6)								
4300.75(10)			100									
4335.3(3)					100							
4340.7(5)			100									
4361.89(21)	$\langle 11-15 \rangle^-$				100							
4376.5(6)			100									
4381.32(21)				100								
4388.16(19)			18(2)	82(7)								
4397.85(20)			100									
4409.05(20)			100									
4441.7(10)	$\langle 7 \rangle^-$		100									
4471.0(3)	$\langle 9^+-13^- \rangle$		16(2)		84(5)							
4484.80(11)					100							
4506.85(20)			100									
4515.23(10)	$\langle 9^+-13^- \rangle$		16.7(11)		83(2)							
4587.9(6)			100									
4602.6(13)			100									
4646.1(3)			100									
4682.0(8)			38(8)	62(20)								
4750.8(2)			25.0(15)	75(5)								
4755.8(2)	$\langle 7, 9, 11 \rangle$		100									
4762.3(3)			31(3)	69(7)								
4789.8(4)	$\langle 9^+-13^- \rangle$		50(4)		50(10)							
4796.1(3)	$\langle 7, 9, 11 \rangle$		100									
4830.3(3)	$\langle 7, 9, 11 \rangle$		100									
4837.6(3)			59(4)	41(6)								
4853.5(2)			100									
4879.5(2)			21(2)	79(7)								
4948.3(5)			29(4)	71(6)								
4967.6(15)			100									
4996.2(3)	$\langle 13 \rangle^-$		100									
5056.7(6)	$\langle 11 \rangle^+$		100									
5167.3(3)	$\langle 9^+-13^- \rangle$		20.4(18)		80(6)							
5182.7(7)	5 ⁻ , 7 ⁻		100									
5235.1(3)	$\langle 7, 9, 11 \rangle$		100									

(continued)

 $^{209}_{83}\text{Bi}$

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		$E_f^*:$ $2J_f^\pi:$	0.0 9^-	896 7^-	1608 13^+	2443 1^+	2493 3^+	2564 $\langle 9 \rangle^+$	2583 $\langle 7 \rangle^+$	2600 11^+	2601 13^+	2617 5^+
5281.9(11)	$\langle 7,9,11 \rangle$		100									
5293.4(6)	$\langle 7,9,11 \rangle$		100									
5312.6(13)	$\langle 7,9,11 \rangle$		100									
5354.0(4)	$\langle 7,9,11 \rangle$		100									
5404.5(6)	$\langle 11 \rangle^+$		100									
5411.2(6)			100									
5424.6(2)	$\langle 9^+-13^- \rangle$		44(2)		56(7)							
5440.2(10)			100									
5464.6(8)	11^+		100									
5484.4(5)	$\langle 7,9,11 \rangle$		100									
5498.0(10)	$\langle 7,9,11 \rangle$		100									
5510.53(24)	$\langle 9^+-13^- \rangle$		41(3)		59(8)							
5523.5(5)			31(6)	69(8)								
5538.4(7)			37(8)	63(11)								
5559.6(6)			38(5)	62(5)								
5570.6(7)			100									
5589.2(7)			100									
5609.1(10)	11^-		100									
5609.8(3)				100								
5652.6(8)	$\langle 11 \rangle^+$		100									
5925.1(17)	$\langle 11 \rangle^+$		100									
6392(8)			100									
6556			100									
6911(4)			100									
6944.8(21)			100									
6983(4)			100									
7106(4)			100									
7168	$9^+, 11^+$		100									
7171(4)			100									
7176.6(10)			100									
7202(5)			100									
7243.9(13)			100									
7264(4)			100									
7279			100									
7287(4)			100									
7360(4)			100									
7416	9^-		100									
7632			100									

Energy levels and branching ratios [91Ma16]. Part 3

²⁰⁹Bi

E^* [keV]	$2J^\pi$	Branching ratios in percentage									
		E_f^* : $2J_f^\pi$:	2741 15 ⁺	2767 3 ⁽⁺⁾	2845 1 ⁺	2917 <1 ⁺ >	2956 <3> ⁺	2987 19 ⁺	3039 5 ⁺	3090 <7> ⁺	3135.77 <15> ⁺
2845.14(6)	1 ⁺			15(10)							
2916.57(7)	<1 ⁺ >			100							
2955.87(7)	<3> ⁺				3.3(3)						
2986.79(5)	19 ⁺		100								
3038.87(10)	5 ⁺			22.4(5)							
3135.77(7)	<15> ⁺		9.4(4)								
3154.06(5)	17 ⁺		93.8(11)					6.24(16)			
3159.28(8)	3 ⁽⁺⁾			24(1)	41(4)	35(3)					
3197.44(10)	1,3,5 ⁺				100						
3211.84(5)	<17> ⁺							100			
3221.58(7)	<5> ⁺			60(2)			31.3(14)			9.0(8)	
3269.6(1)	1,3,5 ⁺				100						
3354.7(4)	<3> ⁺			100							
3406.21(8)	13 ⁺										19(2)
3467.67(7)	<19> ⁺							80.0(14)			
3486.92(7)	19 ⁽⁺⁾							100			
3575.00(20)	3 ⁻ -7 ⁺			63(25)							
3578.99(11)	17 ⁺ ,19 ⁺							44(3)			
3597.14(10)	19 ⁺							84(3)			
3703.55(20)	<7> ⁺								51(14)		
3812.25(16)	23 ⁽⁺⁾							100			

Energy levels and branching ratios [91Ma16]. Part 4

²⁰⁹Bi

E^* [keV]	$2J^\pi$	Branching ratios in percentage					
		E_f^* : $2J_f^\pi$:	3154.06 17 ⁺	3211.84 <17> ⁺	3486.92 19 ⁽⁺⁾	3597.14 19 ⁺	7279+X
3467.67(7)	<19> ⁺		20(3)				
3502.22(12)	<15> ⁺			100			
3578.99(11)	17 ⁺ ,19 ⁺		56(2)				
3597.14(10)	19 ⁺		15.5(12)				
4141.95(10)	21 ⁽⁺⁾				53(2)	47(2)	
7279+X							x

Energy levels and branching ratios [03Br13].

²¹⁰Bi
83

E^*	J^π	L	σ (α, d)	S_N	$C^2 S'$	L	$(2J+1)S$	S_N	$C^2 S$	$T_{1/2}$ or	Ref.
[keV]		(α, d)	$\mu b/sr$	(d,p)	(d,p)	(d,p)	(d,p)	(α, τ)	(α, τ)	Γ_{cm}	
0.0 ^k	1 ⁻	$\langle 1 \rangle$	2.2	0.29	0.3*	4	2.9			5.012(5) d	72Cl05
46.539 ^k	0 ⁻	$\langle 1 \rangle$	3.4	0.11	0.1	4	1.0			<3 ns	72Cl05
271.3 ^k	9 ⁻	$\langle 9 \rangle$	85	1.95	1.9	4	18.5			304(6)·10 ⁴ yr	72Cl05
319.7 ^k	2 ⁻	$\langle 3 \rangle$	8.8	0.54	0.5	4	5.0			5.2(10) ps	72Cl05
347.9 ^k	3 ⁻	$\langle 3 \rangle$	3.4	0.81	0.7	4	7.4				72Cl05
433.5 ^k	7 ⁻	$\langle 7 \rangle$	47	2.7	2.6	4	27.5			57.5(10) ns	72Cl05
439.2 ^k	5 ⁻			incl	incl		incl			37.7(18) ns	72Cl05
502.8 ^k	4 ⁻	$\langle 5 \rangle$	14.8	1.06	0.9	4	10.0			<1.4 ns	72Cl05
550.0 ^k	6 ⁻	$\langle 5+7 \rangle$	25	1.34	1.3	4	11.8			<1.4 ns	72Cl05
563.1 ^l	$\langle 1^- \rangle$										
582.5 ^k	8 ⁻	$\langle 7 \rangle$	100	1.49	1.7	4	14.6			<1.7 ps	72Cl05
670.0 ^l	10 ⁻	11	38	1.84	2.1	6	28	2.1**		100(18) ps	72Cl05
915.9 ^m	8 ⁻	7	260	0.31		4	2.8				72Cl05
971.8 ^l	$\langle 2^- \rangle$			0.36		2	0.1				72Cl05
993.7 ⁿ	$\langle 3^+ \rangle$	$\langle 3 \rangle$	23	0.78	0.7	6	8	0.7**			72Cl05
1164.7 ^m	$\langle 1^- \rangle$										
1175.2 ^m	$\langle 2^- \rangle$							2.8	2.4*		
1184.1 ^l	$\langle 8^- \rangle$	$\langle 7-9 \rangle$	35	2.5	2.4	6	37				72Cl05
1197.3(5)											
1208.3 ^m	$\langle 6^- \rangle$	$\langle 6-9 \rangle$	117	0.70	0.7	4,2	0.8				72Cl05
1248.0 ^l	$\langle 4^- \rangle$	$\langle 5 \rangle$	24	0.05		4,2	0.5				72Ko03
1300.6 ^l	$\langle 7^- \rangle$										
1316(3)	$\langle 11^+ \rangle$	$\langle 10 \rangle$	318								81Da07
1335.6 ^l	$\langle 5^- \rangle$			2.3	2.6	6	47	3.25	2.6		72Cl05
1339.3 ^l	$\langle 6^- \rangle$										
1346.0(6)											
1373.91 ^l	$\langle 3^- \rangle$	$\langle \leq 9 \rangle$	$\langle 12 \rangle$								81Da07
1382.27 ^m	$\langle 7^- \rangle$			2.9	2.4	6	47	2.9	2.4		72Cl05
1389.95 ^m	$\langle 4^- \rangle$						incl				
1462.83 ^m	$\langle 5^- \rangle$			2.5	2.2			2.5	2.2		72Cl05
1469(3)	$\langle 12^+ \rangle$	$\langle 12 \rangle$	30	3.3	2.5			2.6	2.5		72Cl05
1475.93 ^m	$\langle 3^- \rangle$					6	58				
1478.78 ^l	$\langle 9^- \rangle$						incl				
1523.17 ⁿ	$\langle 4^+ \rangle$	$\langle 5,6 \rangle$	10	3.05	0.9	$\langle 6 \rangle$	26	1.2	0.9		72Cl05
1531.14(19) ^b	$\langle 2^+ \rangle$										
1584.9(5) ^c	$\langle 2^- \rangle$		8.8	0.12		2	1.2				72Cl05
1706.40 ⁿ	$\langle 5^+ \rangle$	$\langle 5 \rangle$	18.4	0.86	1.1	7	13	1.15	1.1		72Cl05
1753.5 ⁿ	$\langle 10^+ \rangle$		144	0.97	2.1	7	10	2.36	2.1		72Cl05
1776.25 ⁿ	$\langle 6^+ \rangle$			1.31	1.3	7	17	1.3	1.3		72Cl05
1793.25 ⁿ	$\langle 8^+ \rangle$										
1801	$\langle 11^+ \rangle$	$\langle 11,10 \rangle$	58	2.4	2.3	7	24	3.0	1.7		72Cl05
1812	$\langle 8^+ \rangle$			1.5	1.7	7	15				72Cl05
1836.98 ⁿ	$\langle 7^+ \rangle$		$\langle 28 \rangle$	2.4	1.5	7	19	1.6	1.5		72Cl05
1896.80(18) ^b	$\langle 3^+ \rangle$										
1897.04(23) ^c	$\langle 9^- \rangle$										

(continued)

²¹⁰Bi
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E^*	J^π	L	σ (α, d)	S_N	C^2S'	L	$(2J+1)S$	S_N	C^2S	$T_{1/2}$ or	Ref.
[keV]		(α, d)	$\mu\text{b/sr}$	(d,p)	(d,p)	(d,p)	(d,p)	(α, τ)	(α, τ)	Γ_{cm}	
1908(4)			$\langle 14 \rangle$								81Da07
1924.32(15) ^a	$\langle 2^- \rangle$			0.32	0.5	2	2.8				72Cl05
1980.21(11) ^a	$\langle 7^- \rangle$			2.1	2.2	2	17				72Cl05
1984.82(14) ^c	$\langle 3^- \rangle$						incl				
1987(4)		$\langle 12 \rangle$	65								81Da07
1990.00(17) ^a	$\langle 3^- \rangle$										
2005.79(14) ^c	$\langle 8^- \rangle$										
2006.20(11) ^b	$\langle 4^+ \rangle$										
2015.41(17) ^b	$\langle 6^+ \rangle$										
2026.58(16) ^f	$\langle 1^+ \rangle$										
2034.26(11) ^a	$\langle 5^- \rangle$		$\langle 13.4 \rangle$	0.76	1.1	2	8.1				72Cl05
2072.13 ⁿ	$\langle 9^+ \rangle$							2.3	1.9		72Cl05
2079.15(13) ^a	$\langle 4^- \rangle$			0.45	0.9	2	4.0				72Cl05
2099.17(11) ^c	$\langle 5^- \rangle$										
2100.2 ⁿ	$\langle 11^+ \rangle$		$\langle 44 \rangle$					1.37	2.3		72Cl05
2107.86(23) ^a	$\langle 6^- \rangle$			0.82	1.3	2	7.5				72Cl05
2135.05(11) ^c	$\langle 7^- \rangle$										
2138(3)	$\langle 5^- \rangle$			0.14		2	1.6				72Cl05
2143(4)		11,10	$\langle 107 \rangle$				incl				81Da07
2177.21(14) ^c	$\langle 4^- \rangle$		$\langle 20 \rangle$	0.29		2	3.11				72Cl05
2237.74(12) ^c	$\langle 6^- \rangle$		$\langle 14 \rangle$	0.41		2	3.8				72Cl05
2258.74(15) ^b	$\langle 7^+ \rangle$										
2280(5)		$\langle 7,9 \rangle$	$\langle 31 \rangle$	0.042		2	0.2				72Cl05
2314.05(21) ^g	$\langle 6^- \rangle$										
2464			18								81Da07
2525.12(14) ^d	$\langle 4^- \rangle$		<10	0.71	0.9	0	5.4				72Cl05
2543(5)			19								81Da07
2578.51(16) ^d	$\langle 5^- \rangle$	5	65	0.90	1.1	0	7.1				72Cl05
2610.05(17) ^g	$\langle 4^- \rangle$	$\langle 5 \rangle$	33	0.13		$\langle 2+4 \rangle$	0.9				72Cl05
2664(5)		$\langle 5 \rangle$	19								81Da07
2723.80(16) ^f	$\langle 8^+ \rangle$										
2733(5) ^{***}	$\langle 14^- \rangle$	$\langle 13 \rangle$	134	1.32	1.7	$\langle 2+4 \rangle$	2.8				72Cl05
2737.15(17) ^h	$\langle 8^- \rangle$										
2758.82(13) ^f	$\langle 6^+ \rangle$										
2764.7(3) ^f	$\langle 3^+ \rangle$					2	2.5				
2764.91(17) ^h	$\langle 3^- \rangle$		$\langle 32 \rangle$	0.46	0.7						72Cl05
2818.29(21) ^e	$\langle 1^- \rangle$			0.23	0.3	2+4	2.0				72Cl05
2818.86(19) ^h	$\langle 4^+ \rangle$										
2833(6)	$\langle 10,11 \rangle$		52								81Da07
2840.29(17) ^h	$\langle 6^- \rangle$			0.64	1.3	$\langle 2+4 \rangle$	2.5				72Cl05
2868(6)			20.5								81Da07
2909.95(13) ^f	$\langle 7^+ \rangle$										
2920.98(13) ^g	$\langle 5^- \rangle$		23	0.063		2	1.9				72Cl05
2966.16(17) ^h	$\langle 4^- \rangle$			0.32		$\langle 2+4 \rangle$	1.6				72Cl05
3004.44(12) ^h	$\langle 2^- \rangle$										

(continued)

²¹⁰Bi
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E^*	J^π	L	$\sigma(\alpha, d)$	S_N	C^2S'	L	$(2J+1)S$	S_N	C^2S	$T_{1/2}$ or	Ref.
[keV]		(α, d)	$\mu b/sr$	(d, p)	(d, p)	(d, p)	(d, p)	(α, τ)	(α, τ)	Γ_{cm}	
3010.6(3) ^g	$\langle 2^- \rangle$			0.45	0.5	$\langle 2+4 \rangle$	0.8				72Cl05
3039.65(17) ⁱ	$\langle 3^- \rangle$		32	0.34		$\langle 2+4 \rangle$	3.4				72Cl05
3069.37(12) ⁱ	$\langle 4^- \rangle$			0.90	0.9	$\langle 2+4 \rangle$	1.7				72Cl05
3108.8(2) ^h	$\langle 5^- \rangle$			0.96	1.3	2+4	2.3				72Cl05
3123(6)		$\langle 5 \rangle$	27								81Da07
3141.0(2) ⁱ	$\langle 6^- \rangle$			1.44	1.1	$\langle 2+4 \rangle$	9.0				72Cl05
3182.1(5)	$\langle 4^- \rangle$			0.69	0.9	2	4.5				72Cl05
3209.66(12) ⁱ	$\langle 5^- \rangle$		88	1.27	1.1	$\langle 2+4 \rangle$	3.5				72Cl05
3244.31(22) ^h	$\langle 7^- \rangle$	$\langle 10, 11 \rangle$	38	1.41	1.5	$\langle 2+4 \rangle$	3.4				72Cl05
3299											
3332(7)		$\langle 12 \rangle$	71								81Da07
3399											
3412(7)		$\langle 11, 12 \rangle$	73								81Da07
3443(7)			32								81Da07
3502(7)			66								81Da07
3538(7)			48								81Da07
4025			$\langle 50 \rangle$								81Da07
4188			$\langle 70 \rangle$								81Da07
			81Da07	72Cl05	03Br13			72Cl05	03Br13		Ref.

Additional data on this isotope can be found in [88La18, 77Da05, 71El01].

* This and all other values in this column are theoretical estimates given in [03Br13].

** The strength of the (α, τ) reaction have been normalized to these theoretical values [72Cl05].*** Considered and discussed in [88La18] as strongly populated in the (α, d) reaction13 main configuration marked here a-n (for example, k – main configuration $\pi 1h_{9/2})(\nu 2g_{9/2})$ assigned in [03Br13].

This and other nucleon configurations are discussed in [72Ko03, 72Cl05, 03Br13].

 $\sigma(\alpha, d)$ for $E=48$ MeV was measured at 10° [81Da07], see data for 20° therein.

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

Energy levels and branching ratios [03Br13]. Part 2

²¹⁰Bi
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E^*	J^π	Branching ratios in percentage										
		E_f^* :	0.0	46.5	271	320	348	433	439	502.8	550	563
[keV]		J_f^π :	1 ⁻	0 ⁻	9 ⁻	2 ⁻	3 ⁻	7 ⁻	5 ⁻	4 ⁻	6 ⁻	$\langle 1^- \rangle$
46.539 ^k	0 ⁻		100									
319.7 ^k	2 ⁻		100									
347.9 ^k	3 ⁻		99			1.3						
433.5 ^k	7 ⁻				100							
439.2 ^k	5 ⁻						100	x				
502.8 ^k	4 ⁻					12(3)	83(21)		6(3)			
550.0 ^k	6 ⁻							56(12)	44(10)			
563.1 ^l	$\langle 1^- \rangle$		69(15)	31(15)								

(continued)

 $^{210}_{83}\text{Bi}$

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	0.0 1 ⁻	46.5 0 ⁻	271 9 ⁻	320 2 ⁻	348 3 ⁻	433 7 ⁻	439 5 ⁻	502.8 4 ⁻	550 6 ⁻	563 <1 ⁻ >
582.5 ^k	8 ⁻				x			x				
670.0 ^l	10 ⁻				100							
915.9 ^m	8 ⁻				x			x				
971.8 ^l	<2 ⁻ >		48(9)				<12					52(13)
993.7 ⁿ	<3 ⁺ >					85(17)	15(4)			<1.7		
1164.7 ^m	<1 ⁻ >			x								x
1175.2 ^m	<2 ⁻ >	x				x	x					
1184.1 ^l	<8 ⁻ >							<52			[100]	
1208.3 ^m	<6 ⁻ >								[100]	<18		
1248.0 ^l	<4 ⁻ >						[100]					
1300.6 ^l	<7 ⁻ >										<30	
1335.6 ^l	<5 ⁻ >								x	x	x	
1339.3 ^l	<6 ⁻ >								x		x	
1373.91 ^l	<3 ⁻ >									<25		
1382.27 ^m	<7 ⁻ >										x	
1389.95 ^m	<4 ⁻ >								x	x		
1462.83 ^m	<5 ⁻ >									<17.5		
1475.93 ^m	<3 ⁻ >					x						x
1523.17 ⁿ	<4 ⁺ >						x			x		
1531.14(19) ^b	<2 ⁺ >	x				x						x
1584.9(5) ^c	<2 ⁻ >	52					48(3)					
1706.40 ⁿ	<5 ⁺ >								x	x	x	
1753.5 ⁿ	<10 ⁺ >				100							
1776.25 ⁿ	<6 ⁺ >							<1.1	75(16)		25(5)	
1793.25 ⁿ	<8 ⁺ >							[100]				
1836.98 ⁿ	<7 ⁺ >										[64(16)]	
1896.80(18) ^b	<3 ⁺ >					x						
1897.04(23) ^c	<9 ⁻ >				71(14)							
1924.32(15) ^a	<2 ⁻ >		15(2)			31(7)	17(7)					20(2)
1980.21(11) ^a	<7 ⁻ >							<81				
1984.82(14) ^c	<3 ⁻ >					<41				<36		
1990.00(17) ^a	<3 ⁻ >		[31(15)]									
2006.20(11) ^b	<4 ⁺ >						46(10)		5(2)	<9		
2015.41(17) ^b	<6 ⁺ >							24(8)	<16		76(18)	
2026.58(16) ^f	<1 ⁺ >		76(20)	24(8)								
2034.26(11) ^a	<5 ⁻ >						13(1)	<17	25(1)	<17	62(12)	
2072.13 ⁿ	<9 ⁺ >				[100]							
2079.15(13) ^a	<4 ⁻ >					x	x		[100]	<86		
2099.17(11) ^c	<5 ⁻ >							<8		56(11)		
2107.86(23) ^a	<6 ⁻ >							20(2)	39(10)		41(13)	
2135.05(11) ^c	<7 ⁻ >							x	x		x	
2177.21(14) ^c	<4 ⁻ >						x		73(6)	27(15)		
2237.74(12) ^c	<6 ⁻ >							[13(6)]	[31(9)]			
2258.74(15) ^b	<7 ⁺ >							x			x	
2314.05(21) ^g	<6 ⁻ >							67(17)	<67		33(11)	

(continued)

 $^{210}_{83}\text{Bi}$

E^* [keV]	J^π	Branching ratios in percentage										
		$E^*_f:$ $J^\pi_f:$	0.0 1 ⁻	46.5 0 ⁻	271 9 ⁻	320 2 ⁻	348 3 ⁻	433 7 ⁻	439 5 ⁻	502.8 4 ⁻	550 6 ⁻	563 <1 ⁻ >
2525.12(14) ^d	<4 ⁻ >						x		x	x		
2578.51(16) ^d	<5 ⁻ >								x	x	x	
2610.05(17) ^g	<4 ⁻ >								x			
2737.15(17) ^h	<8 ⁻ >				x							
2764.7(3) ^f	<3 ⁺ >						x			x		
2764.91(17) ^h	<3 ⁻ >						x		x	x		
2818.29(21) ^e	<1 ⁻ >			[100]								
2818.86(19) ^h	<4 ⁺ >								<57	[100]		
2840.29(17) ^h	<6 ⁻ >							x	x		x	x
2909.95(13) ^f	<7 ⁺ >										[24(9)]	
2966.16(17) ^h	<4 ⁻ >								x			
3039.65(17) ⁱ	<3 ⁻ >						x		x	x		
3108.8(2) ^h	<5 ⁻ >							x				
3141.0(2) ⁱ	<6 ⁻ >							x	x		x	
3182.1(5)	<4 ⁻ >						15(3)		41	44(15)		
3209.66(12) ⁱ	<5 ⁻ >					x	x					
3244.31(22) ^h	<7 ⁻ >							x	x		x	

Energy levels and branching ratios [03Br13]. Part 3

 $^{210}_{83}\text{Bi}$

E^* [keV]	J^π	Branching ratios in percentage										
		$E^*_f:$ $J^\pi_f:$	582.53 8 ⁻	670.0 10 ⁻	915.88 8 ⁻	971.85 <2 ⁻ >	993.69 <3 ⁺ >	1164.70 <1 ⁻ >	1175.24 <2 ⁻ >	1184.14 <8 ⁻ >	1208.33 <6 ⁻ >	1248.04 <4 ⁻ >
1184.1 ^l	<8 ⁻ >		<48									
1300.6 ^l	<7 ⁻ >		<13		100					x		
1339.3 ^l	<6 ⁻ >											x
1373.91 ^l	<3 ⁻ >				100							
1382.27 ^m	<7 ⁻ >	x		x								
1389.95 ^m	<4 ⁻ >								x			
1462.83 ^m	<5 ⁻ >										[100]	
1475.93 ^m	<3 ⁻ >							x				
1478.78 ^l	<9 ⁻ >	x	x									
1836.98 ⁿ	<7 ⁺ >										[36(17)]	
1896.80(18) ^b	<3 ⁺ >						x					
1980.21(11) ^a	<7 ⁻ >										[100]	
1990.00(17) ^a	<3 ⁻ >				[69(23)]							
2005.79(14) ^c	<8 ⁻ >	x										
2006.20(11) ^b	<4 ⁺ >						<90					<9
2026.58(16) ^f	<1 ⁺ >				<54		<30					
2079.15(13) ^a	<4 ⁻ >						<59					
2099.17(11) ^c	<5 ⁻ >										5(2)	
2100.2 ⁿ	<11 ⁺ >			100								

(continued)

 $^{210}_{83}\text{Bi}$

E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	582.53 8 ⁻	670.0 10 ⁻	915.88 8 ⁻	971.85 2 ⁻	993.69 3 ⁺	1164.70 1 ⁻	1175.24 2 ⁻	1184.14 8 ⁻	1208.33 6 ⁻	1248.04 4 ⁻
<hr/>												
2135.05(11) ^c	7 ⁻									x		
2177.21(14) ^c	4 ⁻										x	
2237.74(12) ^c	6 ⁻				[56(16)]							
2258.74(15) ^b	7 ⁺			x						x		
2525.12(14) ^d	4 ⁻					x						
2723.80(16) ^f	8 ⁺				[100]							
2737.15(17) ^h	8 ⁻	x										
2764.91(17) ^h	3 ⁻							x				
2909.95(13) ^f	7 ⁺				[45(12)]						<18	
3004.44(12) ^h	2 ⁻					10(3)		63(13)	<6			15(4)
3010.6(3) ^g	2 ⁻								x			
3039.65(17) ⁱ	3 ⁻							x				
3108.8(2) ^h	5 ⁻	x										

Energy levels and branching ratios [03Br13]. Part 4

 $^{210}_{83}\text{Bi}$

E^*	J^π	Branching ratios in percentage										
[keV]		E^*_f : J^π_f :	1300.63 $\langle 7^- \rangle$	1335.62 $\langle 5^- \rangle$	1339.35 $\langle 6^- \rangle$	1373.91 $\langle 3^- \rangle$	1382.27 $\langle 7^- \rangle$	1389.95 $\langle 4^- \rangle$	1462.83 $\langle 5^- \rangle$	1475.93 $\langle 3^- \rangle$	1523.17 $\langle 4^+ \rangle$	1584.9 $\langle 2^- \rangle$
1462.83 ^m	$\langle 5^- \rangle$	x										
1523.17 ⁿ	$\langle 4^+ \rangle$					x						
1897.04(23) ^c	$\langle 9^- \rangle$	29(9)										
1924.32(15) ^a	$\langle 2^- \rangle$											17(2)
1984.82(14) ^c	$\langle 3^- \rangle$					[100]						
2005.79(14) ^c	$\langle 8^- \rangle$	x					x					
2006.20(11) ^b	$\langle 4^+ \rangle$					9(3)						
2034.26(11) ^a	$\langle 5^- \rangle$							<68				
2099.17(11) ^c	$\langle 5^- \rangle$									<15	<3.9	
2135.05(11) ^c	$\langle 7^- \rangle$			x								
2237.74(12) ^c	$\langle 6^- \rangle$						<99					
2578.51(16) ^d	$\langle 5^- \rangle$								x			
2758.82(13) ^f	$\langle 6^+ \rangle$						[100]					
2818.29(21) ^e	$\langle 1^- \rangle$									<80		
2818.86(19) ^h	$\langle 4^+ \rangle$									<36		
2909.95(13) ^f	$\langle 7^+ \rangle$	[30(9)]										
2920.98(13) ^g	$\langle 5^- \rangle$			x				x			x	
2966.16(17) ^h	$\langle 4^- \rangle$							x	x			
3004.44(12) ^h	$\langle 2^- \rangle$							12(3)				
3039.65(17) ⁱ	$\langle 3^- \rangle$					x			x			
3069.37(12) ⁱ	$\langle 4^- \rangle$					x					x	
3209.66(12) ⁱ	$\langle 5^- \rangle$	x				x						
3244.31(22) ^h	$\langle 7^- \rangle$			<58								

Energy levels and branching ratios [03Br13]. Part 5

²¹⁰Bi
83

E^* [keV]	J^π	Branching ratios in percentage									
		E_f^* : J_f^π :	1706.40 $\langle 5^+ \rangle$	1776.25 $\langle 6^+ \rangle$	1793.25 $\langle 8^+ \rangle$	1836.98 $\langle 7^+ \rangle$	1896.80 $\langle 3^+ \rangle$	1924.32 $\langle 2^- \rangle$	1980.21 $\langle 7^- \rangle$	1984.82 $\langle 3^- \rangle$	1990.00 $\langle 3^- \rangle$
2006.20(11) ^b	$\langle 4^+ \rangle$		40(20)								
2079.15(13) ^a	$\langle 4^- \rangle$							x			
2099.17(11) ^c	$\langle 5^- \rangle$		39(11)								
2135.05(11) ^c	$\langle 7^- \rangle$								x		
2258.74(15) ^b	$\langle 7^+ \rangle$			x							
2610.05(17) ^g	$\langle 4^- \rangle$					[100]					
2723.80(16) ^f	$\langle 8^+ \rangle$										<84
2737.15(17) ^h	$\langle 8^- \rangle$				[100]	x					
2764.7(3) ^f	$\langle 3^+ \rangle$						x				
2764.91(17) ^h	$\langle 3^- \rangle$						x			x	
2818.86(19) ^h	$\langle 4^+ \rangle$									<57	
2840.29(17) ^h	$\langle 6^- \rangle$			x							
2909.95(13) ^f	$\langle 7^+ \rangle$				<35						
2966.16(17) ^h	$\langle 4^- \rangle$										x
3010.6(3) ^g	$\langle 2^- \rangle$							x		x	
3039.65(17) ⁱ	$\langle 3^- \rangle$								x		
3069.37(12) ⁱ	$\langle 4^- \rangle$	x									
3108.8(2) ^h	$\langle 5^- \rangle$			[40(20)]							
3141.0(2) ⁱ	$\langle 6^- \rangle$							[100]			
3209.66(12) ⁱ	$\langle 5^- \rangle$	x									
3244.31(22) ^h	$\langle 7^- \rangle$							31(12)			

Energy levels and branching ratios [03Br13]. Part 6

²¹⁰Bi
83

E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	2006.20 $\langle 4^+ \rangle$	2015.41 $\langle 6^+ \rangle$	2034.26 $\langle 5^- \rangle$	2072.13 $\langle 9^+ \rangle$	2079.15 $\langle 4^- \rangle$	2099.17 $\langle 5^- \rangle$	2135.05 $\langle 7^- \rangle$	2177.21 $\langle 4^- \rangle$	2237.74 $\langle 6^- \rangle$	2314.05 $\langle 6^- \rangle$
2099.17(11) ^c	$\langle 5^- \rangle$				<50							
2258.74(15) ^b	$\langle 7^+ \rangle$					x						
2525.12(14) ^d	$\langle 4^- \rangle$				x					x		
2578.51(16) ^d	$\langle 5^- \rangle$			x								
2610.05(17) ^g	$\langle 4^- \rangle$				<86							
2737.15(17) ^h	$\langle 8^- \rangle$								<35			
2764.7(3) ^f	$\langle 3^+ \rangle$		x									
2764.91(17) ^h	$\langle 3^- \rangle$		x									
2840.29(17) ^h	$\langle 6^- \rangle$								x			
2909.95(13) ^f	$\langle 7^+ \rangle$		<36									
2920.98(13) ^g	$\langle 5^- \rangle$				x				x			
2966.16(17) ^h	$\langle 4^- \rangle$						x			x		
3004.44(12) ^h	$\langle 2^- \rangle$									<34		
3039.65(17) ⁱ	$\langle 3^- \rangle$						x					
3108.8(2) ^h	$\langle 5^- \rangle$							[60(20)]			<99	

(continued)

 $^{210}_{83}\text{Bi}$

E^*	J^π	Branching ratios in percentage										
[keV]		E^*_f : J^π_f :	2006.20 $\langle 4^+ \rangle$	2015.41 $\langle 6^+ \rangle$	2034.26 $\langle 5^- \rangle$	2072.13 $\langle 9^+ \rangle$	2079.15 $\langle 4^- \rangle$	2099.17 $\langle 5^- \rangle$	2135.05 $\langle 7^- \rangle$	2177.21 $\langle 4^- \rangle$	2237.74 $\langle 6^- \rangle$	2314.05 $\langle 6^- \rangle$
3141.0(2) ⁱ	$\langle 6^- \rangle$										<87	
3209.66(12) ⁱ	$\langle 5^- \rangle$	x		x					x	x	x	
3244.31(22) ^h	$\langle 7^- \rangle$			69(23)								

Energy levels and branching ratios [03Br13]. Part 7

 $^{210}_{83}\text{Bi}$

E^* [keV]	J^π	Branching ratios in percentage					
		E_f^* : J_f^π :	2578.51 $\langle 5^- \rangle$	2723.80 $\langle 8^+ \rangle$	2758.82 $\langle 6^+ \rangle$	2818.29 $\langle 1^- \rangle$	3004.44 $\langle 2^- \rangle$
2764.91(17) ^h	$\langle 3^- \rangle$		x				
2920.98(13) ^g	$\langle 5^- \rangle$				x		
3004.44(12) ^h	$\langle 2^- \rangle$					<44	
3069.37(12) ⁱ	$\langle 4^- \rangle$		x				x

Energy levels and branching ratios [91Ar04, 04Br45].

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E^*	$2J^\pi$	L	σ (t,p)	R	ΣR	$(2J+1)S$	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		(t,p)	$\mu\text{b/sr}$			(d,p)	Γ_{cm}		E_f^* : $2J_f^\pi$:	0.0 9 ⁻	405 7 ⁻	766 $\langle 9,11 \rangle^-$	828 $\langle 13 \rangle^-$	1014
0.0	9 ⁻	0	61.0	0.96	0.96	≤ 4	2.14(2) m	76Fl12						
404.85(1)	7 ⁻	2	1.9	0.026		≤ 4	0.32(1) ns	76Fl12		100				
766.54(2)	9 ⁻ ,11 ⁻	2	11.8	0.146		9		78Ha31		94(3)	6.5(4)			
793(10)	X ⁻	2	12.6	0.149		≤ 4		76Fl12						
828.13(4)	$\langle 13 \rangle^-$	2	45.0	0.482		14		76Fl12		100		x		
831.95(1)	9 ⁻		incl			incl	<90 ps			66(1)	33(1)	1.4(1)		
951		$\langle 4 \rangle$	4.1	0.03				76Fl12		100	x			
987(10)		$\langle 4 \rangle$	4.4	0.04				76Fl12						
1014.4(1)	7 ⁻ -11 ⁻	$\langle 4 \rangle$	4.3	0.04				76Fl12		29(1)	71(11)			
1050(10)	X ^{$\langle - \rangle$}	$\langle 4 \rangle$	4.0	0.03				76Fl12						
1080.6(1)	X ⁻	2	11.0	0.13	0.9			76Fl12		1.6(1)	29(9)	69(9)		
1103.5(2)		$\langle 4 \rangle$						76Fl12		100				
1109.5(1)	9 ⁻	$\langle 4 \rangle$	24.0	0.19				76Fl12		18(1)	73(1)	5.5(8)		2.9(4)
1118(10)		$\langle 4 \rangle$	14.9	0.13		20		76Fl12						
1129.8(1)	$\langle 17 \rangle^-$					18		01La09					100	
1136(10)														
1149.7(1)	$\langle 15^- \rangle$												100	
1196.3(1)		$\langle 6 \rangle$	15.5	0.26				76Fl12		61(2)		39(15)		
1227.2(3)	$\langle 21^- \rangle$						70(5) ns	01La09						
1234.3(4)						25				100				

(continued)

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E^*	$2J^\pi$	L	σ (t,p)	R	ΣR	$(2J+1)S$	$T_{1/2}$ or	Ref.	Branching ratios in percentage						
[keV]		(t,p)	$\mu\text{b/sr}$			(d,p)	Γ_{cm}		E_{f}^* : $2J_{\text{f}}^\pi$:	0.0 9 ⁻	405 7 ⁻	766 $\langle 9,11 \rangle^-$	828 $\langle 13 \rangle^-$	1014	
1242(10)	$\langle 25^- \rangle$ 7-11	$\langle 4 \rangle$	34.0	0.28				76F112							
1257(10)						42	2.1us	01La09							
1270.7(1)						21				37(3)	32(2)	31(4)			
1304.4(6)															
1307(10)		$\langle 4 \rangle$	6.0	0.04				76F112							
1354(10)			7.9	0.07				76F112							
1369(10)		$\langle 6 \rangle$	8.5	0.14				76F112							
1389(10)															
1398(10)		$\langle 4 \rangle$	6.7	0.05	0.89	21		76F112							
1420(10)		$\langle 6 \rangle$	7.3	0.10				76F112							
1442(10)	$\langle 6 \rangle$	7.8	0.09				76F112								
1472(10)															
1489(10)	$\langle 6 \rangle$	4.7	0.06					76F112							
1553(10)	$\langle 8 \rangle$	1.6						76F112							
1579(10)	$\langle 6 \rangle$	5.7	0.09	0.76				76F112							
1589(10)			12.0					76F112							
1614(10)															
1630(10)	$\text{X}^{(+)}$	$\langle 3 \rangle$	7.5					76F112							
1666(10)			1.1					76F112							
1686(10)															
1713(10)															
1825(10)			1.1					76F112							
1872(10)			1.2					76F112							
1978(10)															
1992(10)															
2015(10)			4.5					76F112							
2050(10)	$\text{X}^{(+)}$	$\langle 3 \rangle$	3.3					76F112							
2059								04Br45							
2069(10)			3.5					76F112							
2102(10)			2.9					76F112							
2316								04Br45							
2409(15)															
2615(10)															
2782								04Br45							
3138								04Br45							
3602								04Br45							
4835	$\langle 41^+ \rangle$							04Br45							
4978								04Br45							
5257								04Br45							
5333								04Br45							
5445								01La09							
5944								01La09							

(continued)

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E^*	$2J^\pi$	L	σ (t,p)	R	ΣR	$(2J+1)S$	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		(t,p)	$\mu\text{b/sr}$			(d,p)	Γ_{cm}		E^*_f :	0.0	405	766	828	1014
									$2J^\pi_\text{f}$:	9 ⁻	7 ⁻	$\langle 9,11 \rangle^-$	$\langle 13 \rangle^-$	
6190			76F112	76F112		78Ha31		01La09						
								Ref.						

The result of the performed in [76F112] comparison of R - strength of the (t,p) reaction on ²⁰⁹Bi relative to the strength of the same reaction on ²¹⁰Pb is shown in the central part of Table. The weak coupling model is used for explaining the observed closeness of ΣR to the unity in the case of L=0,2,4,6 transfer.

Energy levels and branching ratios [91Ar04, 04Br45]. Part 2

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E^*	$2J^\pi$	Branching ratios in percentage		
[keV]		E_f^* :	1130	1150
		$2J_f^\pi$:	$\langle 17 \rangle^-$	$\langle 15^- \rangle$
1149.7(1)	$\langle 15^- \rangle$		x	
1227.2(3)	$\langle 21^- \rangle$		100	
1304.4(6)				100

Energy levels and branching ratios [92Ar05].

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E^*	J^π	$T_{1/2}$ or	Ref.	Branching ratios in percentage			
[keV]		Γ_{cm}		E_f^* :	0.0	115.183	238.632
				J_f^π :	1 $\langle^- \rangle$	2 $\langle^- \rangle$	$\langle 0^- \rangle$
0.0	1 $\langle^- \rangle$	60.55(6) m					
115.183(5)	2 $\langle^- \rangle$	8(4) ps			100		
196(16)							
213.1(2)	$\langle 3^- \rangle$		05Br03				
238.632(2)	$\langle 0^- \rangle$	1.0(2) ps			100	<0.02	
250	$\langle 8^-, 9^- \rangle$	25.0(2) m					
250.7(5)	$\langle 4^- \rangle$		05Br03				
338(16)							
415.272(11)	1 $\langle^- \rangle$	≤ 10 ps			4.2(7)	94(1)	1.5(2)
417.9(2)			05Br03				
494.5(3)			05Br03				
573(16)							
>1910	≥ 16	7.0(3) m	05Br03				

Energy levels and branching ratios [92Ak01].

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E^* [keV]	$2J^\pi$	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage		
				E_f^* : $2J_f^\pi$:	0.0 9 ⁻	258.5
0.0	9 ⁻	45.59(6) m				
257.9(2)	7 ⁻		97Ch19		x	
465(7)						
593.1(2)	$\langle 5-9 \rangle^-$		97Ch19		x	x
758.9	$\langle 5-13 \rangle^-$ 97Ch19		97Ch19 Ref.			

Energy levels and branching ratios [95El07].

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E^* [keV]	J^π	$T_{1/2}$ or Γ_{cm}	Branching ratios in percentage						
			E_f^* : J_f^π :	0.0 1 ⁻	53.2 $\langle 2 \rangle^-$	62.7 259 $\langle 2 \rangle^-$	295 1 ⁻	352 0 ⁻ , 1 ⁻	377
0.0	1 ⁻	19.9(4) m							
53.2275(21)	$\langle 2 \rangle^-$	≤ 0.10 ns		x					
62.7(1)									
103(6)									
258.87(3)	$\langle 2 \rangle^-$		87(2)	1.9(2)	11(1)				
295.224(2)	1 ⁻	≤ 0.05 ns	72(1)	28(1)					
351.932(2)	0 ⁻ , 1 ⁻	≤ 0.10 ns	100(1)	<0.05			x		
377.03(4)				26(4)	74(1)				
533.67(2)	$\langle 1^- \rangle$		19(1)	33(1)		48(1)	<1.5	x	
797.24(9)						x			
839.00(4)	1 ⁺		21.3(4)	39(3)		13(1)	2.5(4)	15(1)	8.0(3)
888.0(5)									x

Additional data on this isotope can be found in [91Be06, 90Di02].

Energy levels and branching ratios [95El07]. Part 2

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E^* [keV]	J^π	Branching ratios in percentage	
		E_f^* : J_f^π :	534 $\langle 1^- \rangle$
839.00(4)	1 ⁺		1.1(1)

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E^*	$2J^\pi$	$T_{1/2}$ or	Branching ratios in percentage			
[keV]		Γ_{cm}	E_{f}^* : $2J_{\text{f}}^\pi$:	0.0 $\langle 9^- \rangle$	746.6 $\langle 13^- \rangle$	1160.7 $\langle 17^- \rangle$
0.0	$\langle 9^- \rangle$	7.6(2) m				
746.6	$\langle 13^- \rangle$			x		
1160.7	$\langle 17^- \rangle$				x	
1347.5	$\langle 25^- \rangle$	36.4 s				x