				His	story								
		Type	on M.	Author	Citation	Literature Cutoff Date							
$Q(\beta^{-}) = -7559 I$ Identification: ¹⁸ reactions (19	6; S(n)=1 ⁸¹ Ta(²⁰ Ne 974Le02).	.042×10 ⁴ 3; S e,8n), mass sep	S(p)=618 paration (1	15; Q(α)=6307 5 20 1970Ta14); excitation fu	NDS 145, 1 (2017))17Wa10 unctions and cross bo	mbardments for several (HI,xn γ)							
	¹⁹³ Bi Levels												
Cross Reference (XREF) Flags													
A 197 At α decay (381 ms) B 197 At α decay (2.0 s) C 165 Ho(32 S,4n γ)													
E(level) [†]	$J^{\pi \ddagger}$	T _{1/2}	XREF		Com	nments							
0.0	(9/2-)	63.6 s <i>30</i>	A C	 [%]α=3.5 15; %ε+%β⁺=96.5 15 Q=-1.88 38; μ=3.734 95 (2016Ba42) δ<r<sup>2>²⁰⁹⁻¹⁹³ = -0.729 fm² 7 (stat) 51 (syst).</r<sup> J^π: From systematics for ground states for odd-A Bi, and for At parent and Tl daughter nuclei; from the hindrance factors for the 6960-keV α transition from the (9/2⁻) ¹⁹⁷At g.s. (HF=1.2) (see ¹⁹⁷At α-decay dataset below), and for the 5899-keV α decay to the 281-keV 9/2⁻ level in ¹⁸⁹Tl (HF 5); and from shell-model and TRS calculations (2004Ni06 - (³²S,4nγ)). T_{1/2}: Weighted average of 63 s 5 (1985Co06), 64 s 4 (1974Le02). Other: 62.2 s 36 (1972Ga27). %α: From 2005De01. Others: 3.5% 15 quoted in 1993An19 from 1990AnZR and 2≤I_α≤8% (1986Co12). %ε+%β⁺: T_{1/2}(β⁺)=55 s (1997Mo25, theory) suggests predominately ε+β⁺ decay. μ: from in-source laser spectroscopy (2016Ba42). Value is given as 3.734 μ_N 59 (stat) 74 (syst); listed combined uncertainties in quadrature. μ=4.1103 5 for ²⁰⁹Bi was used as reference value. O: from in-source laser spectroscopy (2016Ba42). O=-0.420 8 for ²⁰⁹Bi was used 									
2/8.44 ⁶ 18 305 ^c 6	//2 (1/2 ⁺)	3.20 s <i>14</i>	C BC	%α=84 16; %ε+%β ⁺ =16 16 μ=1.500 33 (2016Ba42) Additional information 1. δ <r<sup>2>²⁰⁹⁻¹⁹³ = -0.606 fm² 8 (stat) 42 (syst) (2016Ba42). δ<r<sup>2>^{m,g}=0.123 fm² 7 (stat) 9 (syst) (2016Ba42). E(level): From nubase2016 (2017Au03). J^π: This level decays by an E(α)=6475 keV 5 transition to the (1/2⁺) ¹⁸⁹Tl g.s. Values for the hindrance factor for this decay are HF=0.75 45 (1985Co06), and 0.9 2 (1986Co12), indicating that the initial and final states have the same configuration. T_{1/2}: Weighted average of 3.07 s 13 (2015He27), 3.5 s 2 (1974Le02, 1972Ga27), and From 1.4 s +38-6 (2005Uu02). Other: 3.15 s (1970Ta14), 1.9 s 4 (1985Co06). %α: Average from: a) comparison of intensity of ¹⁹³Bi (3.3 s) α peak with that of ¹⁹⁷At (2.0 s) parent peak, 90 +10-20 (1986Co12), and b) 75 25 (1985Co06). μ: from in-source laser spectroscopy (2016Ba42). Value is given as 1.500 μ_N 14 (stat) 30 (syst); compiler has combined uncertainties in quadrature. μ=4.1103 5 for ²⁰⁹Bi was used as reference value</r<sup></r<sup>									
464.66 [@] 18	9/2-		С										

¹⁹³Bi Levels (continued)

E(level) [†]	J#‡	T _{1/2}	XREF	Comments
505.1 [°] 3	$3/2^{+}$		С	
605.53 [#] 18	$13/2^{+}$	153 ns 10	C	%IT=100
000100 10	10/=	100 10 10	-	$T_{1/2}$: From 2004Ni06 (32 S.4ny).
619.60 [@] 15	$11/2^{-}$		C	-1/2 (2,,).
641.8.5	$(7/2^{-})$		c	
662.08^a 20	$9/2^{-}$		č	
734.2 ^c 3	$5/2^{+}$		C	
817.72 [@] 17	$13/2^{-}$		C	
915.30 ^{<i>a</i>} 17	$11/2^{-1}$		č	
928 93 [#] 21	$15/2^+$		c	
964.6.5	15/2		c	
1013.3 [°] 4	$(7/2^+)$		c	
1066.35 17	13/2-		C	
1117.06 22	$13/2^{+}$		С	
1169.67 [@] 18	$15/2^{-}$		С	
1203.5 ^c 4	$(9/2^+)$		С	
1228.13 [#] 21	$17/2^{+}$		с	
1249.06 ^{<i>a</i>} 21	$13/2^{-}$		C	
1257.88 21	$(11/2^{-})$		С	
1321.0 8			С	
1414.64 [@] 22	$17/2^{-}$		С	
1514.34 21	$(17/2^+)$		С	
1517.4 [°] 6	$(11/2^+)$		С	
1520.95 21	13/2-		С	
1535.73 21	$15/2^{+}$		C	
1555.30 [#] 25	$19/2^{+}$		С	
1562.41 ^{<i>a</i>} 21	$15/2^{-}$		С	
1609.9 4	$(15/2^{-})$		C	
1636.5 5	$(13/2^+)$		C	
1651.5 4	(15/2)		C	
1073.49 19	$\frac{17}{2}$		C	
1762 3 4	$(15/2^{-})$		c	
$1704.03^{@} 25$	$(10/2^{-})$		C	
1794.03 2J 1858 5 4	$(17/2^+)$		c	
1859.1 4	$15/2^{-}$		c	
1875 1# 3	$21/2^+$		C	
1910.06^{a} 23	$\frac{21}{2}$ $17/2^{-}$		c	
1950.09 24	$19/2^+$		č	
1979.8 5	,		С	
2045.8 4	$(19/2^{-})$		С	
2048.6 5	$(21/2^+)$		С	
2048.7 [@] 3	$21/2^{-}$		С	
2057.6 3	$21/2^+$		С	
2090.41 18	$17/2^{-}$		С	
2109.7 3	19/2+		С	
2128.8 4	$21/2^+$		C	
2139.6 6	$(17/2^{+})$		C	
2193.75° 21	19/2-		С	
2220.6 [#] 3	$23/2^+$		С	
2240.3 ^{<i>a</i>} 6	19/2-		С	

¹⁹³Bi Levels (continued)

E(level) [†]	Jπ‡	T _{1/2}	XREF	Comments
2253.6 <i>4</i> 2265.8 <i>5</i>	$25/2^+$		C C	
2321.7.4	$(21/2^+)$		c	
2336.9 ^{&} 3	(21/2)		C	
2349.6 6	$\frac{29}{2^+}$	85 µs 3	c	%IT=100
				T _{1/2} : measured by 2015He27 (32 S,4n γ) from (recoil)(455.4 γ)(t). Proposed configuration= $\pi i_{13/2}$ coupled to oblate 8 ⁺ state in 192 Pb with configuration= $\pi h_{0/2}^2$.
2356.3 4	$25/2^{-}$		С	72
2405.1 ^b 7	(29/2 ⁻)	3.02 µs 8	C	%IT=100 T _{1/2} : measured by 2015He27 (32 S,4n γ) from (recoil)(307.4 γ)(t).
2428.3 4	$23/2^{-}$		C	
2432.9 3	23/21		C	
$2462.9^{@}3$	23/2-		c	
$2483.9^{\&}$ 3	$23/2^{-}$		c	
2509.8 6	$\frac{23}{2^{+}}$		C	
2525.4 4	23/2-		С	
2535.8 [#] 4	$25/2^+$		C	
2547.3 5	(21/2) $23/2^{-}$		C	
$2587.2^{@}4$	$25/2^{-}$		c	
2591.5 4	$\frac{25}{2^+}$		C	
2669.4 ^{&} 4	25/2-		С	
2708.9 4	$(25/2^+)$		C	
2710.3 5	$27/2^{+}$		C	
$2721.7^{@}4$	27/2-		C	
2723.4 4	25/2-		C	
2756.0 [#] 4	27/2+		С	
2762.8 4	$25/2^+$		C	
2774.05	$(31/2^{-})$		C	
2832.3 5	(31/2) 29/2 ⁻		c	
2873.2 [#] 5	29/2+		С	
2893.0 4	$(25/2^+)$		C	
2921.9 ^{x} 5	27/2-		C	
2928.0° 5	$(29/2^{-})$		C	
2958.7.6	$\frac{23}{2^+}$		c	
2963.5 [#] 6	$31/2^+$		c	
2986.9 6	29/2+		С	
2996.1 7 3103.6 9	29/2+		C C	
3117.1 [#] 6	33/2+		C	
3118.47	$(23/2^{-})$		C	
5159.2° 8 3200 1 & 5	(33/2)		C	
32200.4 3	29/2		c	
3282.9 8	$(33/2^{-})$		C	

¹⁹³Bi Levels (continued)

E(level) [†]	J π ‡	XREF	Comments
3304.2 6	$33/2^{+}$	С	
3321.0 [#] 7	35/2+	C	
3349.2 8	$33/2^+$	c	
3448.6 ^b 8	$(35/2^{-})$	С	
3496.3 <mark>&</mark> 5	31/2-	с	
3560.9 [#] 7	37/2+	c	
3563.1 8	$(31/2^+)$	C	
3622.7 7		С	
3638.6 11	(0= (0-)	С	
3669.3 9	$(37/2^{-})$	С	
3709.90 8	$(37/2^{-})$	C	
3/49.19	a a /a	C	
3796.0°C 5	$\frac{33}{2^{-}}$	C	
3810.5 /	35/2 20/2+	C	
3837.4" /	39/2+	C	
3910 7 8	33/2	c	
3969.1 9	$37/2^{+}$	c	
3976.7 9	,	С	
4008.8 ^{&} 6	35/2-	С	
4028.7 ^b 9	$(39/2^{-})$	С	
4029.7 11		С	
4059.1 6	$(35/2^{-})$	С	
4137.3# 8	$41/2^{+}$	С	
4213.2 6	$(37/2^{-})$	C	
4240.7 ^{x} 8	$(37/2^{-})$	C	
4272.27	$(37/2^{+})$	C	
4284.0 9		c	
4345.1 8	$37/2^{-}$	c	
4467.7 [#] 8	$43/2^{+}$	С	
4544.1 9		c	
4574.5 9		С	
4586.7 9		С	
4824.4 [#] 9	$45/2^{+}$	С	
4898.1 10		C	
4901.2 <i>12</i> 5679.6 <i>14</i>		c	
x ^d	$(11/2^+)$	c	Additional information 2
$126.6\pm x^{d}$	$(11/2^{+})$ $(15/2^{+})$	c	
$120.0+x^{-4}$	$(10/2^+)$	C	
294.9+x 5	(19/2)	C C	
$304.4 + x^{-1} 0$	(23/2)	C	
$1047.0 \pm \frac{d}{2}$	$(21/2^+)$	C	
$104/.0+x^{4}$ 8	$(31/2^{+})$	C	
$13/8.7 + x^{a} 8$	$(35/2^+)$	C	
$1750.9 + x^{a} 9$	$(39/2^+)$	С	
$2162.7 + x^{a} 9$	$(43/2^+)$	С	
2613.1+x ^d 10	$(47/2^+)$	С	
3102.3+x ^d 11	$(51/2^+)$	С	
3630.1+x ^d 11	$(55/2^+)$	С	

¹⁹³Bi Levels (continued)

E(level) [†]	Jπ‡	XREF	
4196.1+x? ^d 12	(59/2+)	С	
4800.6+x? ^d 12	$(63/2^+)$	С	

[†] From least-squares adjustment to γ -ray energies.

[‡] From (³²S,4n γ), based on rotational structure and γ -ray multipolarities, and systematics of shell-model intruder states in odd-mass Bi and Tl nuclei.

Band(A): $\pi 13/2[606]$, $i_{13/2}$ orbital. A sharp band crossing is observed at $\hbar\omega \approx 0.2$ MeV, $J^{\pi} = 25/2^+$, interpreted as due to two $i_{13/2}$ neutrons.

[@] Band(B): $\pi 7/2[514], (h_{9/2}/f_{7/2}).$

& Band(C): 3-qp band based on 19/2⁻. Possible configuration= $\pi i_{13/2} \otimes \nu(i_{13/2}^{-1} p_{3/2}^{-1})$ mixed with $\pi i_{13/2} \otimes \nu(i_{13/2}^{-1} f_{5/2}^{-1})$.

^{*a*} Band(D): *π*9/2[505].

^b Band(E): 3-qp band based on (29/2⁻). Proposed configuration= $\pi h_{9/2} \otimes v i_{13/2}^{-2}$ 12+.

^c Band(F): Band based on $1/2^+$. This band is built on $1/2^+$ proton-intruder state of 2p-1h configuration.

^{*d*} Band(G): SD band built on $\pi 1/2[651], i_{11/2}$.

$\gamma(^{193}\text{Bi})$

E _i (level)	\mathbf{J}_i^{π}	E_{γ}^{\dagger}	I_{γ}^{\dagger}	E_f	\mathbf{J}_{f}^{π}	Mult. [‡]	α #	Comments
278.44	$7/2^{-}$	278.5.3	100	0.0	$(9/2^{-})$	D		
464.66	$9/2^{-}$	186.3 3	100 4	278.44	7/2-	D		
	- /	465.2 7	17 4	0.0	$(9/2^{-})$	D		
505.1	$3/2^{+}$	200.2 3	100	305	$(1/2^+)$	D		
605.53	13/2+	604.7 <i>3</i>	100	0.0	(9/2 ⁻)	[M2]	0.193	$\alpha(K)=0.1515$ 22; $\alpha(L)=0.0313$ 5; $\alpha(M)=0.00754$ 11
								$\alpha(N)=0.00194 3; \alpha(O)=0.000394 6;$
								$\alpha(P) = 4.62 \times 10^{-5} 7$
								B(M2)(W.u.)=0.063 5
619.60	11/2-	155.2 <i>3</i> 341.1 <i>4</i>	1.96 <i>14</i> 1.51 <i>20</i>	464.66 278.44	9/2 ⁻ 7/2 ⁻			
		619.7 <i>3</i>	100 8	0.0	(9/2-)	M1	0.0666	$\alpha(K)=0.0545 \ 8; \ \alpha(L)=0.00923 \ 13;$
								$\alpha(M)=0.00210$ 5 $\alpha(N)=0.000553$ 8; $\alpha(O)=0.0001131$ 16; $\alpha(P)=1.350\times10^{-5}$ 19
641.8	$(7/2^{-})$	363.4 4	100	278.44	$7/2^{-}$	D		
662.08	9/2-	383.8 <i>3</i>	100 5	278.44	$7/2^{-}$	D		
		661.6 4	44 7	0.0	$(9/2^{-})$	D+Q		
734.2	5/2+	229.3 3	100 5	505.1	3/2+	M1	0.974	α (K)=0.793 <i>12</i> ; α (L)=0.1377 <i>20</i> ; α (M)=0.0324 <i>5</i> α (N)=0.00828 <i>12</i> ; α (O)=0.001692 <i>25</i> ; α (P)=0.000201 <i>3</i>
		429.0 4	80 12	305	$(1/2^+)$			
817.72	$13/2^{-}$	198.2 <i>3</i>	7.7 5	619.60	$11/2^{-1}$	D		
	,	353.1 4	2.04 16	464.66	$9/2^{-}$			
		817.9 <i>3</i>	100 5	0.0	(9/2 ⁻)	E2	0.01043	α (K)=0.00808 <i>12</i> ; α (L)=0.001779 <i>25</i> ; α (M)=0.000430 <i>6</i>
								α (N)=0.0001097 16; α (O)=2.18×10 ⁻⁵ 3; α (P)=2.37×10 ⁻⁶ 4
915.30	11/2-	253.1 3	14.4 10	662.08	9/2-	M1	0.741	$\begin{array}{l} \alpha(\mathrm{K}) = 0.604 \; 9; \; \alpha(\mathrm{L}) = 0.1046 \; 15; \; \alpha(\mathrm{M}) = 0.0246 \; 4 \\ \alpha(\mathrm{N}) = 0.00629 \; 9; \; \alpha(\mathrm{O}) = 0.001285 \; 19; \\ \alpha(\mathrm{P}) = 0.0001530 \; 22 \end{array}$

$\gamma(^{193}\text{Bi})$ (continued)

E _i (level)	\mathbf{J}_i^π	E_{γ}^{\dagger}	I_{γ}^{\dagger}	E_f	\mathbf{J}_f^{π}	Mult. [‡]	α #	Comments
915.30	11/2-	450.6 3	20.5 13	464.66	9/2-	M1	0.1546	$\alpha(K)=0.1264 \ 18; \ \alpha(L)=0.0216 \ 3; \\ \alpha(M)=0.00507 \ 8 \\ \alpha(N)=0.001296 \ 19; \ \alpha(O)=0.000265 \ 4; \\ \alpha(P)=3.16\times10^{-5} \ 5 $
		636.7 <i>3</i> 915.5 <i>3</i>	36 <i>3</i> 100 <i>7</i>	278.44 0.0	7/2 ⁻ (9/2 ⁻)	Q M1+E2	0.016 8	α (K)=0.013 7; α (L)=0.0023 10; α (M)=0.00055 23 α (N)=0.00014 6; α (O)=2.9×10 ⁻⁵ 12; α (P)=3.3×10 ⁻⁶ 16
928.93	15/2+	323.4 3	100	605.53	13/2+	M1	0.378	$\alpha(K) = 0.308 5; \ \alpha(L) = 0.0532 8; \ \alpha(M) = 0.01249$ $I8$ $\alpha(K) = 0.00319 5; \ \alpha(O) = 0.000653 \ I0;$ $\alpha(P) = 7.78 \times 10^{-5} \ II$
964.6 1013.3	(7/2+)	459.5 <i>4</i> 278.9 <i>8</i> 508.2 <i>3</i>	100 5.1 20 100 6	505.1 734.2 505.1	3/2 ⁺ 5/2 ⁺ 3/2 ⁺	0		
1066.35	13/2-	446.8 <i>3</i>	25.0 19	619.60	11/2-	M1	0.1581	$\begin{array}{l} \alpha(\mathrm{K}) = 0.1292 \ 19; \ \alpha(\mathrm{L}) = 0.0221 \ 4; \\ \alpha(\mathrm{M}) = 0.00519 \ 8 \\ \alpha(\mathrm{N}) = 0.001326 \ 19; \ \alpha(\mathrm{O}) = 0.000271 \ 4; \\ \alpha(\mathrm{P}) = 3.23 \times 10^{-5} \ 5 \end{array}$
1117.06	13/2+	1066.6 <i>3</i> 188.3 <i>3</i> 200.4 5	100 <i>10</i> 13.3 <i>11</i> 5 2 <i>13</i>	0.0 928.93 817 72	$(9/2^{-})$ $15/2^{+}$ $12/2^{-}$	Q		
		497.5 <i>4</i>	5.5 15 17.1 <i>13</i>	619.60	13/2 11/2 ⁻	(E1)	0.01001	$\alpha(K)=0.00826 \ 12; \ \alpha(L)=0.001343 \ 19;$ $\alpha(M)=0.000313 \ 5$ $\alpha(N)=7.95\times10^{-5} \ 12; \ \alpha(O)=1.602\times10^{-5} \ 23;$ $\alpha(P)=1.83\times10^{-6} \ 3$
		511.3 3	100 9	605.53	13/2+	M1+E2	0.07 4	$\alpha(\mathbf{K}) = 1.65 \times 10^{-5} \text{ s}$ $\alpha(\mathbf{K}) = 0.06 \ 4; \ \alpha(\mathbf{L}) = 0.011 \ 5; \ \alpha(\mathbf{M}) = 0.0026 \ 10$ $\alpha(\mathbf{N}) = 0.0007 \ 3; \ \alpha(\mathbf{O}) = 0.00013 \ 6;$ $\alpha(\mathbf{P}) = 1 \ 5 \times 10^{-5} \ 8$
1169.67	15/2-	352.1 3	89 <i>3</i>	817.72	13/2-	M1	0.300	$\alpha(I) = 1.0 \times 10^{-5} = 0.0421 \ 6; \ \alpha(M) = 0.00990$ $I4$ $\alpha(N) = 0.00253 \ 4; \ \alpha(O) = 0.000517 \ 8;$ $\alpha(D) = 6.16 \times 10^{-5} \ 0.000517 \ 8;$
		550.0 <i>3</i>	100 4	619.60	11/2-	E2	0.0245	$\alpha(\mathbf{F}) = 0.10 \times 10^{-4} \text{ g}^{-6}$ $\alpha(\mathbf{K}) = 0.01762 \ 25; \ \alpha(\mathbf{L}) = 0.00522 \ 8;$ $\alpha(\mathbf{M}) = 0.001295 \ 19$ $\alpha(\mathbf{N}) = 0.000330 \ 5; \ \alpha(\mathbf{O}) = 6.45 \times 10^{-5} \ 9;$ $\alpha(\mathbf{P}) = 6.49 \times 10^{-6} \ 10$
1203.5	(9/2+)	190.1 <i>3</i> 469.3 <i>3</i>	29.5 <i>21</i> 100 <i>6</i>	1013.3 734.2	(7/2 ⁺) 5/2 ⁺			<i>u</i> (1)=0.49×10 10
1228.13	17/2+	299.2 3	100 3	928.93	15/2+	M1	0.467	$\alpha(K)=0.381 \ 6; \ \alpha(L)=0.0659 \ 10; \\ \alpha(M)=0.01547 \ 22 \\ \alpha(N)=0.00396 \ 6; \ \alpha(O)=0.000809 \ 12; \\ \alpha(P)=9 \ 63 \times 10^{-5} \ 14$
		622.4 <i>3</i>	46.9 <i>19</i>	605.53	13/2+	E2	0.0186	$\begin{array}{l} \alpha(\mathbf{K}) = 0.01373 \ 20; \ \alpha(\mathbf{L}) = 0.00365 \ 6; \\ \alpha(\mathbf{M}) = 0.000899 \ 13 \\ \alpha(\mathbf{N}) = 0.000229 \ 4; \ \alpha(\mathbf{O}) = 4.51 \times 10^{-5} \ 7; \\ \alpha(\mathbf{R}) = 4.55 \times 10^{-6} \ 7. \end{array}$
1249.06	13/2-	333.7 <i>3</i> 587.0 <i>3</i>	100 <i>5</i> 86 <i>5</i>	915.30 662.08	11/2 ⁻ 9/2 ⁻	D		$\alpha(P) = 4.03 \times 10^{-6} /$
1257.88	(11/2 ⁻)	784.5 <i>4</i> 638.1 <i>4</i> 793.1 <i>3</i>	40 <i>3</i> 16 <i>3</i> 33 <i>4</i>	464.66 619.60 464.66	9/2 ⁻ 11/2 ⁻ 9/2 ⁻	Q D+O		
1321.0		1258.1 <i>3</i> 356.4 <i>6</i>	100 <i>11</i> 100	0.0 964.6	(9/2-)	D		

$\gamma(^{193}\text{Bi})$ (continued)

E _i (level)	\mathbf{J}_i^π	E_{γ}^{\dagger}	I_{γ}^{\dagger}	E_f	\mathbf{J}_f^π	Mult. [‡]	α #	Comments
1414.64	17/2-	245.2 3	16.2 8	1169.67	15/2-	M1	0.808	$\alpha(K)=0.659 \ 10; \ \alpha(L)=0.1143 \ 17; \ \alpha(M)=0.0269 \ 4 \ \alpha(N)=0.00687 \ 10; \ \alpha(O)=0.001404 \ 21; \ \alpha(P)=0 \ 0001671 \ 24$
		597.0 <i>3</i>	100 4	817.72	13/2-	E2	0.0204	$\alpha(\mathbf{K}) = 0.000107124$ $\alpha(\mathbf{K}) = 0.0149321; \ \alpha(\mathbf{L}) = 0.004116;$ $\alpha(\mathbf{M}) = 0.00101415$ $\alpha(\mathbf{N}) = 0.0002594; \ \alpha(\mathbf{O}) = 5.07 \times 10^{-5}8;$ $\alpha(\mathbf{N}) = 5.10 \times 10^{-6}8$
1514.34	(17/2 ⁺)	585.3 <i>3</i>	100 4	928.93	15/2+	M1	0.0773	$\begin{array}{l} \alpha(\mathbf{r}) = 5.19 \times 10^{-5} & 3 \\ \alpha(\mathbf{K}) = 0.0633 \ 9; \ \alpha(\mathbf{L}) = 0.01074 \ 16; \\ \alpha(\mathbf{M}) = 0.00252 \ 4 \\ \alpha(\mathbf{N}) = 0.000644 \ 9; \ \alpha(\mathbf{O}) = 0.0001316 \ 19; \\ \alpha(\mathbf{P}) = 1 \ 570 \times 10^{-5} \ 22 \end{array}$
		908.7 <i>3</i>	86 5	605.53	13/2+	E2	0.00844	$\begin{array}{l} \alpha(\Gamma) = 1.570 \times 10^{-22} \\ \alpha(K) = 0.00663 \ 10; \ \alpha(L) = 0.001378 \ 20; \\ \alpha(M) = 0.000331 \ 5 \\ \alpha(N) = 8.45 \times 10^{-5} \ 12; \ \alpha(O) = 1.688 \times 10^{-5} \ 24; \\ (K) = 1.96 \times 10^{-6} \ 2 \\ \alpha(N) = 1.96 \times 10^{-6} \ 24; \\ \alpha(N) = 1.96 \times 10^{-6} \ 24$
15174	$(11/2^+)$	504 1 <i>4</i>	100	1013 3	$(7/2^{+})$			$\alpha(P) = 1.86 \times 10^{-6} 3$
1520.95	$\frac{11/2}{13/2^{-}}$	351.1 3	6.7 18	1169.67	$(7/2^{-})$ 15/2 ⁻	D		
		455.1 <mark>&</mark> 6	4.2 18	1066.35	$13/2^{-}$			
		605.2 4	36 <i>3</i>	915.30	$11/2^{-}$	D		
		901.7 3	100 6	619.60	11/2-	M1+E2	0.017 9	$\alpha(K)=0.014\ 7;\ \alpha(L)=0.0024\ 11;$ $\alpha(M)=0.00057\ 24$
1525 72	15/0+	460.5.2	07 (17	1066.25	12/0-	D		α (N)=0.00015 6; α (O)=3.0×10 ⁻⁵ 13; α (P)=3.5×10 ⁻⁶ 16
1555.75	15/2	409.5 5	27.0 <i>17</i> 69.3	817 72	13/2 $13/2^{-}$	D E1	0.00482	$\alpha(K) = 0.00400.6$; $\alpha(L) = 0.000630.9$;
		111.9 5	07.5	017.72	10/2	21	0.00102	$\alpha(M) = 0.0001461 21$
								$\alpha(N)=3.72\times10^{-5} 6; \alpha(O)=7.53\times10^{-6} 11; \alpha(P)=8.74\times10^{-7} 13$
		930.0 <i>3</i>	100 7	605.53	13/2+	M1	0.0232	$\alpha(K)=0.0190 \ 3; \ \alpha(L)=0.00318 \ 5; \ \alpha(M)=0.000744 \ 11$
								$\alpha(N)=0.000190 \ 3; \ \alpha(O)=3.89\times10^{-5} \ 6;$
1555.30	$19/2^{+}$	327.4 3	100.3	1228.13	$17/2^{+}$	M1	0.366	$\alpha(F) = 4.65 \times 10^{-17}$ $\alpha(K) = 0.298.5; \alpha(L) = 0.0514.8;$
	- 1							α(M)=0.01208 <i>18</i>
								α (N)=0.00309 5; α (O)=0.000631 9;
		626.2.3	52.0 20	928.93	$15/2^{+}$	E2	0.0183	$\alpha(P) = 7.52 \times 10^{-5} \ T1$ $\alpha(K) = 0.01357 \ 19: \ \alpha(L) = 0.00359 \ 5:$
				,,				$\alpha(M)=0.000883 \ I3$
								α (N)=0.000225 4; α (O)=4.43×10 ⁻⁵ 7;
1562.41	15/2-	313 3 3	26716	1249.06	13/2-	M1	0.412	$\alpha(P)=4.58\times10^{-6}$ 7 $\alpha(K)=0.336$ 5: $\alpha(L)=0.0580$ 9:
1502.41	15/2	515.5 5	20.7 10	1249.00	15/2	1011	0.412	$\alpha(M)=0.01363 \ 20$
								α (N)=0.00349 5; α (O)=0.000712 11;
		61722	100.5	015 20	11/2-	0		$\alpha(P) = 8.48 \times 10^{-3} \ 12$
1609.9	$(15/2^{-})$	352.3 3	100 5	1257.88	$(11/2^{-})$	Q		
1636.5	$(13/2^+)$	433.0 <i>3</i>	100	1203.5	$(9/2^+)$			
1651.5	$(15/2^{-})$	393.4 3	100	1257.88	$(11/2^{-})$	Q	4 10 7	· (IZ) 2.22 ((I.) 0.594 0· · (M) 0.1272
16/3.49	17/2	137.6 3	20.0 10	1535.73	15/2	MI	4.10 /	$\alpha(K)=3.33$ 6; $\alpha(L)=0.584$ 9; $\alpha(M)=0.1373$ 21
								α (N)=0.0351 6; α (O)=0.00718 11; α (P)=0.000854 14
		159.3 <i>3</i>	11.2 8	1514.34	$(17/2^+)$	D		· ·
		445.4 4	21.2 16	1228.13	$17/2^{+}$			

$\gamma(^{193}\text{Bi})$ (continued)

E _i (level)	\mathbf{J}_i^π	E_{γ}^{\dagger}	I_{γ}^{\dagger}	E_f	\mathbf{J}_f^{π}	Mult. [‡]	α #	Comments
1673.49	17/2+	504.0 3	76 4	1169.67	15/2-	E1	0.00975	$\alpha(K)=0.00804 \ 12; \ \alpha(L)=0.001306 \ 19; \alpha(M)=0.000304 \ 5 \alpha(N)=7.73\times10^{-5} \ 11; \ \alpha(O)=1.558\times10^{-5} \ 22; \alpha(P)=1.778\times10^{-6} \ 25$
		556.4 <i>3</i> 744.7 <i>4</i>	100 <i>4</i> 23.0 <i>18</i>	1117.06 928.93	13/2 ⁺ 15/2 ⁺	Q D		
		1067.8 <i>3</i>	86 6	605.53	13/2+	E2	0.00616	$\alpha(K)=0.00492 \ 7; \ \alpha(L)=0.000950 \ 14; \\ \alpha(M)=0.000226 \ 4 \\ \alpha(N)=5.78\times10^{-5} \ 8; \ \alpha(O)=1.161\times10^{-5} \ 17; \\ \alpha(P)=1.304\times10^{-6} \ 19$
1736.96	17/2-	567.0 <i>3</i>	92 8	1169.67	15/2-	M1	0.0841	$\alpha(K) = 1.504 \times 10^{-17} = 0.01168 \ 17;$ $\alpha(K) = 0.00688 \ 10; \ \alpha(L) = 0.01168 \ 17;$ $\alpha(M) = 0.000704 \ 4$ $\alpha(N) = 0.000700 \ 10; \ \alpha(O) = 0.0001432 \ 21;$ $\alpha(P) = 1.708 \times 10^{-5} \ 24$
		670.3 <i>3</i>	100 8	1066.35	13/2-	Q		
1762.3 1794.03	(15/2) 19/2 ⁻	379.4 <i>3</i>	61.8 22	605.53 1414.64	13/2 ⁺ 17/2 ⁻	M1	0.245	$\alpha(K)=0.200 \ 3; \ \alpha(L)=0.0344 \ 5;$ $\alpha(M)=0.00807 \ 12$ $\alpha(N)=0.00207 \ 3; \ \alpha(O)=0.000422 \ 6;$ $\alpha(D)=5.03\times10^{-5} \ 8$
		624.3 <i>3</i>	100 4	1169.67	15/2-	E2	0.0184	$\alpha(K) = 0.01365 \ 20; \ \alpha(L) = 0.00362 \ 5; \alpha(M) = 0.000891 \ 13 \alpha(N) = 0.000227 \ 4; \ \alpha(O) = 4.47 \times 10^{-5} \ 7; $
1858.5	(17/2+)	929.6 <i>3</i>	100	928.93	15/2+	(M1+E2)	0.016 8	$\begin{array}{l} \alpha(P)=4.62\times10^{-7} \\ \alpha(K)=0.013 \ 7; \ \alpha(L)=0.0022 \ 10; \\ \alpha(M)=0.00053 \ 22 \\ \alpha(N)=0.00014 \ 6; \ \alpha(O)=2.7\times10^{-5} \ 12; \end{array}$
1859.1	15/2-	793.5 4	100	1066.35	$13/2^{-}$	D		$\alpha(P)=3.2\times10^{-5}$ 15
1875.1	21/2+	319.8 3	100 4	1555.30	19/2+	M1	0.390	α (K)=0.318 5; α (L)=0.0548 8; α (M)=0.01288 19 α (N)=0.00329 5; α (O)=0.000673 10; α (P)=8.02×10 ⁻⁵ 12
		646.9 <i>3</i>	86 4	1228.13	17/2+	E2	0.01706	$\alpha(K) = 0.01272 \ 18; \ \alpha(L) = 0.00328 \ 5; \alpha(M) = 0.000805 \ 12 \alpha(N) = 0.000205 \ 3; \ \alpha(O) = 4.04 \times 10^{-5} \ 6;$
1910.06	17/2-	347.6 <i>4</i> 661.1 <i>4</i> 844 0 3	26 <i>4</i> 60 <i>6</i> 100 <i>1</i> 2	1562.41 1249.06 1066.35	15/2 ⁻ 13/2 ⁻ 13/2 ⁻			$\alpha(\mathbf{P})=4.21\times10^{-6}~6$
1950.09	19/2+	435.7 3	100 5	1514.34	$(17/2^+)$	M1	0.1691	$\alpha(K)=0.1382 \ 20; \ \alpha(L)=0.0237 \ 4; \\ \alpha(M)=0.00555 \ 8 \\ \alpha(N)=0.001419 \ 20; \ \alpha(O)=0.000290 \ 4; \\ \alpha(P)=3.46 \times 10^{-5} \ 5 $
1979 8		721.6 <i>3</i> 1021.2 <i>3</i> 913 <i>4 4</i>	51.2 25 46.3 25	1228.13 928.93 1066 35	17/2 ⁺ 15/2 ⁺ 13/2 ⁻	D		
2045.8	(19/2 ⁻)	394.0 <i>3</i> 436 3 <i>4</i>	100 6	1651.5 1609 9	$(15/2^{-})$ $(15/2^{-})$	Q		
2048.6	$(21/2^+)$	534.3 4	100	1514.34	$(17/2^+)$	Q		
2048.7	21/2-	255.1 <i>3</i> 634 1 3	12.4 6 100 4	1794.03 1414 64	19/2 ⁻ 17/2 ⁻	D E2	0.725 0.0178	$\alpha(K) = 0.01324.19; \alpha(L) = 0.00347.5;$
		05 7.1 5	100 7	1117.07			0.0170	$\begin{array}{l} \alpha(M) = 0.000852 \ 12 \\ \alpha(M) = 0.000852 \ 12 \\ \alpha(N) = 0.000217 \ 3; \ \alpha(O) = 4.28 \times 10^{-5} \ 6; \\ \alpha(P) = 4.43 \times 10^{-6} \ 7 \end{array}$

γ ⁽¹⁹³Bi) (continued)</sup>

E _i (level)	\mathbf{J}_i^{π}	E_{γ}^{\dagger}	I_{γ}^{\dagger}	E_f	\mathbf{J}_f^{π}	Mult. [‡]	a#	Comments
2057.6 2090.41	21/2 ⁺ 17/2 ⁻	502.5 <i>3</i> 543.2 <i>3</i> 232.1 <i>4</i> 328.2 <i>4</i> 352 <i>4 4</i>	100 5 36.6 22 4.2 9 13.6 22 16 1 49	1555.30 1514.34 1859.1 1762.3 1736.96	19/2 ⁺ (17/2 ⁺) 15/2 ⁻ (15/2 ⁻) 17/2 ⁻	D Q		
		528.2 <i>4</i> 569.4 <i>3</i> 862.4 <i>3</i>	10.1 <i>19</i> 14.5 <i>16</i> 94 6 49.4 <i>25</i>	1562.41 1520.95 1228.13	17/2 15/2 ⁻ 13/2 ⁻ 17/2 ⁺	D Q E1	0.00341	$\alpha(K)=0.00284 4; \alpha(L)=0.000441 7;$ $\alpha(M)=0.0001022 15$ $\alpha(N)=2.60\times10^{-5} 4; \alpha(O)=5.28\times10^{-6} 8;$
		920.9 3	100 6	1169.67	15/2-	M1	0.0238	$\alpha(\mathbf{F}) = 0.17 \times 10^{-5} \text{ g}$ $\alpha(\mathbf{K}) = 0.0195 3; \ \alpha(\mathbf{L}) = 0.00326 5;$ $\alpha(\mathbf{M}) = 0.000764 11$ $\alpha(\mathbf{N}) = 0.000195 3; \ \alpha(\mathbf{O}) = 3.99 \times 10^{-5} 6;$ $\alpha(\mathbf{P}) = 4.77 \times 10^{-6} 7$
		1023.6 <i>4</i> 1272 8 3	28.8 <i>19</i> 46 4 25	1066.35	$\frac{13}{2^{-}}$	0		
2109.7	19/2+	436.2 3	100 4	1673.49	17/2+	M1	0.1686	α (K)=0.1378 20; α (L)=0.0236 4; α (M)=0.00553 8 α (N)=0.001415 20; α (O)=0.000289 4; α (P)=3.45×10 ⁻⁵ 5
		695.1 <i>3</i> 881 3 <i>4</i>	17.0 <i>12</i> 16 9 <i>13</i>	1414.64 1228 13	$\frac{17}{2^{-}}$	D D		
2128.8	21/2+	455.4 3	100 5	1673.49	17/2+	E2	0.0386	$\alpha(\mathbf{K})=0.0261 \ 4; \ \alpha(\mathbf{L})=0.00937 \ 14; \\ \alpha(\mathbf{M})=0.00236 \ 4 \\ \alpha(\mathbf{N})=0.000601 \ 9; \ \alpha(\mathbf{O})=0.0001162 \ 17; \\ \alpha(\mathbf{P})=1.122 \times 10^{-5} \ 16 $
2139.6 2193.75	(17/2 ⁺) 19/2 ⁻	503.1 <i>4</i> 103.4 <i>3</i> 242.9 <i>4</i> 284.0 <i>3</i> 631.4 <i>3</i>	100 40.4 21 22.9 17 24.6 21 55 4	1636.5 2090.41 1950.09 1910.06 1562.41	(13/2 ⁺) 17/2 ⁻ 19/2 ⁺ 17/2 ⁻ 15/2 ⁻	D		
		679.2 <i>3</i>	100 5	1514.34	(17/2 ⁺)	E1	0.00536	$\alpha(K)=0.00444 \ 7; \ \alpha(L)=0.000703 \ 10; \\ \alpha(M)=0.0001633 \ 23 \\ \alpha(N)=4.15\times10^{-5} \ 6; \ \alpha(O)=8.40\times10^{-6} \ 12; \\ \alpha(P)=9 \ 73\times10^{-7} \ 14$
2220.6	23/2+	345.7 <i>3</i>	100 4	1875.1	21/2+	M1	0.315	$\alpha(\mathbf{K}) = 0.257 \ 4; \ \alpha(\mathbf{L}) = 0.0443 \ 7; \\ \alpha(\mathbf{M}) = 0.01041 \ 15 \\ \alpha(\mathbf{N}) = 0.00266 \ 4; \ \alpha(\mathbf{O}) = 0.000544 \ 8; \\ \alpha(\mathbf{D}) = 6 \ 48 \times 10^{-5} \ 10 $
		665.2 <i>3</i>	93 4	1555.30	19/2+	E2	0.01606	$\begin{array}{l} \alpha(\mathbf{X}) = 0.13 \times 10 & 10 \\ \alpha(\mathbf{K}) = 0.01204 & 17; \ \alpha(\mathbf{L}) = 0.00304 & 5; \\ \alpha(\mathbf{M}) = 0.000745 & 11 \\ \alpha(\mathbf{N}) = 0.000190 & 3; \ \alpha(\mathbf{O}) = 3.75 \times 10^{-5} & 6; \\ (\mathbf{D}) = 2.02 \times 10^{-5} & 6; \end{array}$
2240.3	19/2-	677.9 5	100	1562.41	15/2-	E2	0.01542	$\begin{array}{l} \alpha(\mathrm{P}) = 3.92 \times 10^{-6} & 6 \\ \alpha(\mathrm{K}) = 0.01161 \ 17; \ \alpha(\mathrm{L}) = 0.00289 \ 4; \\ \alpha(\mathrm{M}) = 0.000707 \ 10 \\ \alpha(\mathrm{N}) = 0.000180 \ 3; \ \alpha(\mathrm{O}) = 3.56 \times 10^{-5} \ 5; \end{array}$
2253.6		459.2 4	26.0 24	1794.03	19/2-			$\alpha(P)=3.73\times10^{-6}$ 6
2265.8	25/2+	839.2 <i>3</i> 137.1 <i>3</i>	100 5 100	1414.64 2128.8	17/2 ⁻ 21/2 ⁺	E2	1.84	$\alpha(K)=0.360\ 6;\ \alpha(L)=1.096\ 19;\ \alpha(M)=0.290$ 5 $\alpha(N)=0.0739\ 13;\ \alpha(O)=0.01367\ 24;$
2278.6	25/2+	149.8 <i>3</i>	100	2128.8	21/2+	E2	1.299 <i>21</i>	α (P)=0.001072 <i>19</i> α (K)=0.308 <i>5</i> ; α (L)=0.737 <i>13</i> ; α (M)=0.195

$\gamma(^{193}\text{Bi})$ (continued)

E _i (level)	\mathbf{J}_i^π	E_{γ}^{\dagger}	I_{γ}^{\dagger}	E_f	${ m J}_f^\pi$	Mult.‡	α #	Comments
2321.7	(21/2+)	371.7 4	66 7	1950.09	19/2+	M1	0.259	4 $\alpha(N)=0.0496 \ 9; \ \alpha(O)=0.00919 \ 16;$ $\alpha(P)=0.000727 \ 12$ $\alpha(K)=0.212 \ 3; \ \alpha(L)=0.0364 \ 6;$ $\alpha(M)=0.00854 \ 13$ $\alpha(N)=0.00218 \ 4; \ \alpha(O)=0.000446 \ 7;$
		807.3 4	100 9	1514.34	(17/2+)	(E2)	0.01071	$\alpha(P)=5.32\times10^{-5} 8$ $\alpha(K)=0.00829 \ 12; \ \alpha(L)=0.00184 \ 3; \alpha(M)=0.000445 \ 7$ $\alpha(N)=0.0001134 \ 16; \ \alpha(O)=2.26\times10^{-5} \ 4; $
2336.9	21/2-	143.0 <i>3</i>	100	2193.75	19/2-	M1	3.67	$\alpha(P)=2.44\times10^{-6} 4$ $\alpha(K)=2.99 5; \ \alpha(L)=0.523 8; \ \alpha(M)=0.1230$ 19 $\alpha(N)=0.0315 5; \ \alpha(O)=0.00643 \ 10;$ $\alpha(N)=0.00755 \ 12$
2349.6	29/2+	84.0 6	100	2265.8	25/2+	E2	14.3 6	$\alpha(L) = 0.60705 12$ $\alpha(L) = 10.64; \alpha(M) = 2.83 11$ $\alpha(N) = 0.723; \alpha(O) = 0.1325; \alpha(P) = 0.01014$
2356.3	25/2-	307.4 3	100	2048.7	21/2-	E2	0.1122	$\begin{array}{l} \alpha(K) = 0.0013770 \\ \alpha(K) = 0.0624 \ 9; \ \alpha(L) = 0.0372 \ 6; \\ \alpha(M) = 0.00960 \ 14 \\ \alpha(N) = 0.00244 \ 4; \ \alpha(O) = 0.000464 \ 7; \\ \alpha(P) = 4 \ 10 \times 10^{-5} \ 6 \end{array}$
2405.1	(29/2 ⁻)	48.8 6	100	2356.3	25/2-	[E2]	196 <i>13</i>	$\alpha(L) = 146 \ 10; \ \alpha(M) = 38.5 \ 25 \ \alpha(N) = 9.8 \ 7; \ \alpha(O) = 1.79 \ 12; \ \alpha(P) = 0.134 \ 9 \ B(E_2)(W,u) = 0.052 \ 5$
2428.3	$23/2^{-}$	634.3 <i>3</i>	100	1794.03	19/2-	Q		
2432.9	23/2+	212.3 <i>4</i> 375.4 <i>3</i> 557.5 <i>4</i> 654 1 <i>4</i>	20.1 22 100 5 38 4	2220.6 2057.6 1875.1 1704.03	$23/2^+$ $21/2^+$ $21/2^+$ $10/2^-$	D		
2462.9	23/2-	414.3 3	40.6 18	2048.7	21/2	M1	0.194	α (K)=0.1581 23; α (L)=0.0271 4; α (M)=0.00636 9 α (N)=0.001626 23; α (O)=0.000332 5; α (P)=3.96×10 ⁻⁵ 6
		668.9 <i>3</i>	100 4	1794.03	19/2-	E2	0.01587	$\alpha(K) = 0.0101 17; \ \alpha(L) = 0.00299 5; \alpha(M) = 0.000733 11 \alpha(N) = 0.000187 3; \ \alpha(O) = 3.69 \times 10^{-5} 6; 0.000187 4; \ \alpha(O) = 0.000187 5; \ \alpha(O) = 0.0001$
2483.9	23/2-	146.8 <i>3</i> 435.6 <i>3</i>	100 <i>4</i> 32.6 <i>23</i> 45 8 <i>23</i>	2336.9 2048.7	21/2 ⁻ 21/2 ⁻	D D		$\alpha(\mathbf{P})=3.86\times10^{-6}~6$
2509.8	23/2+	381.0 <i>4</i>	45.8 25 100	2128.8	19/2 21/2 ⁺	Q M1	0.242	α (K)=0.198 3; α (L)=0.0340 5; α (M)=0.00798 12 α (N)=0.00204 3; α (O)=0.000417 6; α (N)=4.07×10 ⁻⁵ 8
2525.4	23/2-	731.4 3	100	1794.03	19/2-	E2	0.01313	$\alpha(\mathbf{r}) = 4.97 \times 10^{-6} \text{ s}$ $\alpha(\mathbf{K}) = 0.01001 \ 14; \ \alpha(\mathbf{L}) = 0.00236 \ 4;$ $\alpha(\mathbf{M}) = 0.000575 \ 8$ $\alpha(\mathbf{N}) = 0.0001467 \ 21; \ \alpha(\mathbf{O}) = 2.91 \times 10^{-5} \ 4;$ $\alpha(\mathbf{P}) = 3.09 \times 10^{-6} \ 5$
2535.8	25/2+	315.2 <i>3</i> 660.7 <i>3</i>	85 <i>3</i> 100 <i>4</i>	2220.6 1875.1	23/2 ⁺ 21/2 ⁺	D E2	0.01630	$\alpha(K) = 0.01220 \ 18; \ \alpha(L) = 0.00310 \ 5; \alpha(M) = 0.000759 \ 11 \alpha(N) = 0.000194 \ 3; \ \alpha(O) = 3.82 \times 10^{-5} \ 6;$
2547.3	(21/2 ⁻)	501.5 3	100	2045.8	(19/2-)	M1	0.1163	α (P)=3.99×10 ⁻⁶ 6 α (K)=0.0951 14; α (L)=0.01621 23;

γ ⁽¹⁹³Bi) (continued)</sup>

E _i (level)	\mathbf{J}_i^π	E_{γ}^{\dagger}	I_{γ}^{\dagger}	E_f	\mathbf{J}_f^{π}	Mult. [‡]	α #	Comments
								α (M)=0.00380 6 α (N)=0.000972 14; α (O)=0.000199 3; α (P)=2.37×10 ⁻⁵ 4
2578.0	$\frac{23}{2^{-}}$	784.0 <i>3</i>	100	1794.03 2462 9	$\frac{19}{2^{-}}$	Q		
2367.2	23/2	538.4 3	100 7	2048.7	21/2-	E2	0.0258	$\begin{aligned} &\alpha(\mathbf{K}) = 0.0184 \ 3; \ \alpha(\mathbf{L}) = 0.00556 \ 8; \\ &\alpha(\mathbf{M}) = 0.001382 \ 20 \\ &\alpha(\mathbf{N}) = 0.000352 \ 5; \ \alpha(\mathbf{O}) = 6.88 \times 10^{-5} \ 10; \\ &\alpha(\mathbf{P}) = 6.89 \times 10^{-6} \ 10 \end{aligned}$
2591.5	25/2+	371.0 <i>3</i> 716.3 <i>3</i>	30.0 <i>19</i> 100 <i>4</i>	2220.6 1875.1	23/2 ⁺ 21/2 ⁺	E2	0.01372	$\alpha(K)=0.01042$ 15; $\alpha(L)=0.00249$ 4; $\alpha(M)=0.000608$ 9 $\alpha(N)=0.0001551$ 22; $\alpha(O)=3.07\times10^{-5}$ 5; $\alpha(D)=2.25\times10^{-6}$ 5
2669.4	25/2-	185.5 <i>3</i>	100	2483.9	23/2-	D		$\alpha(P)=3.25\times10^{-6}$ 5
2708.9	(25/2+)	276.0 <i>3</i> 488.3 <i>4</i> 651.5 <i>5</i>	100 7 85 7 38 8	2432.9 2220.6 2057.6	23/2 ⁺ 23/2 ⁺ 21/2 ⁺	D+Q		
2710.3	27/2+	619.9 [@] 4	100 [@]	2090.41	17/2-	D		
2718.0 2721.7	$\frac{27}{2^{-}}$	452.2 3 134.7 3	100 100 <i>4</i>	2265.8 2587.2	$25/2^{+}$ $25/2^{-}$	D D		
0700 4	25/2-	365.1 4	33 4	2356.3	25/2-	D		
2723.4	25/2	295.1 0 674.6 <i>3</i>	8.3 22 100 5	2428.3 2048.7	$\frac{23}{2}$ $\frac{21}{2^{-}}$	Q		
2756.0	27/2+	164.5 <i>3</i> 220.4 <i>3</i>	11.3 7 100 5	2591.5 2535.8	25/2 ⁺ 25/2 ⁺	M1	1.087	$\alpha(K)=0.886 \ 13; \ \alpha(L)=0.1539 \ 23; \ \alpha(M)=0.0362 \ 6 \ \alpha(N)=0.00180 \ 2;$
								$\alpha(R) = 0.00925 \ 14, \ \alpha(C) = 0.00189 \ 5, \ \alpha(P) = 0.000225 \ 4$
2762.8	25/2+	535.2 <i>3</i> 542.2 <i>4</i> 887.7 <i>3</i>	37.9 <i>17</i> 30 6 100 7	2220.6 2220.6 1875.1	23/2 ⁺ 23/2 ⁺ 21/2 ⁺	Q D Q		
2774.8 2804.1	$(31/2^{-})$	726.0 <i>4</i> 398.8 <i>3</i>	100 100	2048.7 2405.1	$21/2^{-}$ (29/2 ⁻)	M1	0.214	$\alpha(K)=0.1751\ 25;\ \alpha(L)=0.0300\ 5;$
								α (M)=0.00705 <i>10</i> α (N)=0.00180 <i>3</i> ; α (O)=0.000369 <i>6</i> ; α (P)=4 39×10 ⁻⁵ 7
2832.3	29/2-	476.0 <i>3</i>	100	2356.3	25/2-	Q		
2873.2 2893.0	29/2 ⁺ (25/2 ⁺)	117.1 <i>3</i> 357.0 <i>4</i>	100 40 <i>4</i>	2756.0 2535.8	27/2 ⁺ 25/2 ⁺	D (M1)	0.289	$\alpha(K)=0.236 \ 4; \ \alpha(L)=0.0406 \ 6; \ \alpha(M)=0.00953 \ 14 \ \alpha(N)=0.00244 \ 4; \ \alpha(O)=0.000498 \ 8; \ \alpha(D)=5 \ 0.00244 \ 0.000498 \ 8; \ \alpha(D)=5 \ 0.000498 \$
		672.5 3	100 6	2220.6	23/2+	D		$u(\mathbf{r}) = 5.95 \times 10^{-5}$ 9
2921.9	27/2-	252.5 3	100 5	2669.4	25/2-	M1	0.745	$\begin{array}{l} \alpha(\text{K}) = 0.608 \ 9; \ \alpha(\text{L}) = 0.1053 \ 16; \\ \alpha(\text{M}) = 0.0247 \ 4 \\ \alpha(\text{N}) = 0.00633 \ 10; \ \alpha(\text{O}) = 0.001294 \ 19; \\ \alpha(\text{P}) = 0.0001540 \ 23 \end{array}$
2928 0	(29/2-)	334.7 ^{&} 4 438.1 5 206 3 3	6.5 <i>10</i> 6.7 <i>14</i> 100	2587.2 2483.9 2721 7	25/2 ⁻ 23/2 ⁻ 27/2 ⁻			• •
2926.0	$(25/2)^{(+)}$	736.1 3	100	2220.6	23/2+	(D)		
2958.7	31/2+	609.1 <i>3</i>	100	2349.6	29/2+	M1	0.0696	α (K)=0.0570 8; α (L)=0.00966 14; α (M)=0.00226 4

$\gamma(^{193}\text{Bi})$ (continued)

E _i (level)	\mathbf{J}_i^{π}	E_{γ}^{\dagger}	I_{γ}^{\dagger}	E_f	\mathbf{J}_f^{π}	Mult. [‡]	α #	Comments
20(2.5	21/2+	00.0.6	40.5	0072.0	20/2+			α (N)=0.000579 9; α (O)=0.0001184 17; α (P)=1.413×10 ⁻⁵ 20
2963.5	31/21	90.0 8 614.0 <i>3</i>	48 5 100 7	2873.2 2349.6	29/2* 29/2*	M1	0.0682	$\alpha(K)=0.0558 \ 8; \ \alpha(L)=0.00946 \ 14; \ \alpha(M)=0.00222 \ 4 \ \alpha(N)=0.000567 \ 8; \ \alpha(O)=0.0001159 \ 17;$
2986.9	29/2+	268.9 <i>3</i>	67 4	2718.0	27/2+	M1	0.627	α (P)=1.383×10 ⁻⁵ 20 α (K)=0.511 8; α (L)=0.0884 13; α (M)=0.0208 3
		0						α (N)=0.00532 8; α (O)=0.001086 16; α (P)=0.0001293 19
		721.1 & 4	100 8	2265.8	25/2+	(E2)	0.01353	$\begin{array}{l} \alpha(\mathrm{K}) = 0.01029 \ 15; \ \alpha(\mathrm{L}) = 0.00245 \ 4; \\ \alpha(\mathrm{M}) = 0.000597 \ 9 \\ \alpha(\mathrm{N}) = 0.0001524 \ 22; \ \alpha(\mathrm{O}) = 3.02 \times 10^{-5} \ 5; \end{array}$
2996.1	29/2+	278.1 4	100	2718.0	27/2+	M1	0.571	α (P)=3.20×10 ⁻⁶ 5 α (K)=0.466 7; α (L)=0.0806 <i>12</i> ; α (M)=0.0189
								α (N)=0.00484 7; α (O)=0.000990 15; α (P)=0.0001178 18
3103.6 3117.1	33/2+	754.0 6 153.6 <i>3</i> 158.5 <i>4</i>	100 100 <i>4</i> 8.6 <i>14</i>	2349.6 2963.5 2958.7	29/2 ⁺ 31/2 ⁺ 31/2 ⁺	D		
3118.4	$(23/2^{-})$	571.1 4	100	2547.3	$(21/2^{-})$	D		
3159.2	(33/2 ⁻)	355.3 3	100 4	2804.1	(31/2 ⁻)	M1	0.293	$\alpha(K)=0.239$ 4; $\alpha(L)=0.0411$ 6; $\alpha(M)=0.00966$ 14
								α (N)=0.00247 4; α (O)=0.000505 8; α (P)=6.01×10 ⁻⁵ 9
3200.4	29/2-	753.9 <i>4</i> 278.6 <i>4</i>	40 5 100 5	2405.1 2921.9	(29/2 ⁻) 27/2 ⁻	M1	0.568	α (K)=0.463 7; α (L)=0.0802 <i>12</i> ; α (M)=0.0188
								α (N)=0.00482 7; α (O)=0.000985 15; α (P)=0.0001173 17
		530.9 4	18.3 15	2669.4	$25/2^{-}$	Q		
3220.5		388.2 ^{&} 6	100	2832.3	29/2-			
3282.9	(33/2 ⁻)	478.5 3	100 5	2804.1	(31/2 ⁻)	D	0.1317	$\alpha(K)=0.1077 \ 16; \ \alpha(L)=0.0184 \ 3; \ \alpha(M)=0.00431 \ 6 \ \alpha(N)=0.001103 \ 16; \ \alpha(O)=0.000225 \ 4; \ \alpha(P)=2 \ 69\times 10^{-5} \ 4$
		879.0 6	29 4	2405.1	$(29/2^{-})$			
3304.2	$33/2^{+}$	345.4 <i>3</i>	25.0 23	2958.7	31/2+	D		
		954.7 3	100 14	2349.6	29/2+	E2	0.00766	α (K)=0.00605 9; α (L)=0.001227 18; α (M)=0.000294 5
								α (N)=7.50×10 ⁻⁵ 11; α (O)=1.502×10 ⁻⁵ 21; α (P)=1.664×10 ⁻⁶ 24
3321.0	35/2+	203.9 3	100	3117.1	33/2+	M1	1.351	α (K)=1.100 <i>16</i> ; α (L)=0.191 <i>3</i> ; α (M)=0.0450 <i>7</i> α (N)=0.01151 <i>17</i> ; α (O)=0.00235 <i>4</i> ; α (P)=0.000280 <i>4</i>
3349.2	$33/2^{+}$	390.5 4	100	2958.7	$31/2^{+}$	D		
3448.6	(35/2 ⁻)	289.5 3	100 5	3159.2	(33/2 ⁻)	M1	0.512	α (K)=0.417 6; α (L)=0.0721 11; α (M)=0.01694 25 α (N)=0.00433 7; α (O)=0.000886 13;
								α(P)=0.0001055 <i>15</i>
2406.2	21/2-	644.1 5	18 5	2804.1	$(31/2^{-})$	N/1	0.482	
3496.3	51/2	295.13	100 5	3200.4	29/2	MI	0.483	$\alpha(\mathbf{K}) = 0.394 \ 0; \ \alpha(\mathbf{L}) = 0.0680 \ 10; \ \alpha(\mathbf{M}) = 0.01598 \ 23$

$\gamma(^{193}\text{Bi})$ (continued)

E _i (level)	\mathbf{J}_i^{π}	E_{γ}^{\dagger}	I_{γ}^{\dagger}	E_f	\mathbf{J}_{f}^{π}	Mult. [‡]	α #	Comments
3496.3	31/2-	574.3 3	45 3	2921.9	27/2-	E2	0.0222	$\alpha(N)=0.00409 \ 6; \ \alpha(O)=0.000835 \ 12; \\ \alpha(P)=9.95\times10^{-5} \ 15 \\ \alpha(K)=0.01614 \ 23; \ \alpha(L)=0.00459 \ 7; \\ \alpha(M)=0.001137 \ 16 \\ \alpha(N)=0.000290 \ 4; \ \alpha(O)=5.68\times10^{-5} \ 8; \\ \alpha(D)=5.77\times10^{-6} \ 0 $
3560.9	37/2+	239.8 3	100 4	3321.0	35/2+	M1	0.860	$\alpha(P)=5.7/\times10^{-6} \text{ g}$ $\alpha(K)=0.701 \text{ 11; } \alpha(L)=0.1216 \text{ 18;}$ $\alpha(M)=0.0286 \text{ 5}$ $\alpha(N)=0.00731 \text{ 11; } \alpha(O)=0.001494 \text{ 22;}$ $\alpha(P)=0.000178 \text{ 3}$
		443.8 5	18.7 20	3117.1	33/2+			
3563.1	$(31/2^+)$	567.5 ^{&} 3	100 6	2996.1	29/2+			
2622.7		576.2 4	73 6	2986.9	$29/2^+$	D		
3622.7		535 0 6	100	2958.7	31/2			
3669.3	$(37/2^{-})$	386.4 4	100	3282.9	$(33/2^{-})$	0		
3709.9	$(37/2^{-})$	261.3 3	100 7	3448.6	$(35/2^{-})$	Ď		
		550.6 4	64 10	3159.2	$(33/2^{-})$	Q		
3749.1	22/2-	466.2 4	100	3282.9	$(33/2^{-})$	1.01	0.460	
3796.0	33/2	298.8 4	100 7	3490.3	31/2	MI	0.469	$\begin{array}{l} \alpha(\mathbf{K}) = 0.383 \ 6; \ \alpha(\mathbf{L}) = 0.0661 \ 10; \\ \alpha(\mathbf{M}) = 0.01553 \ 23 \\ \alpha(\mathbf{N}) = 0.00397 \ 6; \ \alpha(\mathbf{O}) = 0.000812 \ 12; \\ \alpha(\mathbf{P}) = 9.67 \times 10^{-5} \ 14 \end{array}$
		595.9 3	66 4	3200.4	29/2-			
3816.5	35/2-	512.3 3	100	3304.2	33/2+	E1	0.00942	$\alpha(K)=0.00778 \ 11; \ \alpha(L)=0.001261 \ 18;$ $\alpha(M)=0.000294 \ 5$ $\alpha(N)=7.47\times10^{-5} \ 11; \ \alpha(O)=1.504\times10^{-5} \ 22;$ $\alpha(D)=1.718\times10^{-6} \ 25$
3837.4	39/2+	276.5 3	100 4	3560.9	37/2+	M1	0.580	$\alpha(P) = 1.718 \times 10^{-6} 2.5$ $\alpha(K) = 0.473 7; \alpha(L) = 0.0819 12; \alpha(M) = 0.0192$ 3
								α (N)=0.00492 7; α (O)=0.001005 15; α (P)=0.0001197 18
3886.2	35/2+	516.4 <i>4</i> 582.1 <i>4</i> 927.9 <i>5</i>	28 4 100 10 20 5	3321.0 3304.2 2958.7	35/2 ⁺ 33/2 ⁺ 31/2 ⁺	Q D		
3910.7		606.5 4	100	3304.2	$33/2^+$			
3969.1	37/2+	619.9 [@] 4	100 [@]	3349.2	33/2+	E2	0.0187	α (K)=0.01384 20; α (L)=0.00369 6; α (M)=0.000909 13
								α (N)=0.000232 4; α (O)=4.56×10 ⁻⁵ 7; α (P)=4.70×10 ⁻⁶ 7
3976.7	25/2-	627.5 5	100	3349.2	$33/2^+$	D		
4008.8	35/2	212.7 3	61 5 100 6	3/96.0	$\frac{33}{2}$	D		
4028.7	(39/2 ⁻)	312.7 5 318.8 3 580.2 4	100 8 100 8 52 8	3709.9 3448.6	$(37/2^{-})$ $(35/2^{-})$			
4029.7		725.5 <mark>&</mark> 9	100	3304.2	$33/2^{+}$			
4059.1	$(35/2^{-})$	263.1 3	100	3796.0	33/2-	D		
4137.3	$41/2^{+}$	299.8 3	100 6	3837.4	$39/2^+$	D		
1213.2	$(37/2^{-})$	5/6.67	35 6 100	3360.9 4008 9	31/2 ⁺ 35/2 ⁻	D		
4240.7	$(37/2^{-})$	231.9 5	100	4008.8	$35/2^{-}$	D		
4272.2	$(37/2^+)$	386.5 5	64 15	3886.2	$35/2^+$			
	/	967.7 4	100 15	3304.2	33/2+			
4284.0 4292.3		661.3 <i>5</i> 454.9 <i>4</i>	100 100	3622.7 3837.4	39/2+			

E _i (level)	\mathbf{J}_i^{π}	E_{γ}^{\dagger}	I_{γ}^{\dagger}	E_f	\mathbf{J}_f^π	Mult.‡
4345.1	37/2-	528.6 <i>3</i>	100	3816.5	35/2-	D
4467.7	$43/2^{+}$	330.3 4	100 10	4137.3	$41/2^{+}$	D
		630.4 5	46 8	3837.4	$39/2^{+}$	
4544.1		271.9 6	100	4272.2	$(37/2^+)$	
4574.5		229.4 4	100	4345.1	$37/2^{-}$	
4586.7		294.4 <i>3</i>	100	4292.3		
4824.4	$45/2^{+}$	356.7 4	100	4467.7	$43/2^{+}$	D
4898.1	,	323.6 4	100	4574.5		
4961.2		677.2 8	100	4284.0		
5679.6		718.4 7	100	4961.2		
126.6+x	$(15/2^+)$	126.6 4	100	х	$(11/2^+)$	
294.9+x	$(19/2^+)$	168.3 <i>3</i>	100	126.6+x	$(15/2^+)$	
504.4+x	$(23/2^+)$	209.5 <i>3</i>	100	294.9+x	$(19/2^+)$	
755.3+x	$(27/2^+)$	250.9 <i>3</i>	100	504.4+x	$(23/2^+)$	
1047.0+x	$(31/2^+)$	291.7 <i>3</i>	100	755.3+x	$(27/2^+)$	
1378.7+x	$(35/2^+)$	331.7 <i>3</i>	100	1047.0+x	$(31/2^+)$	
1750.9+x	$(39/2^+)$	372.2 <i>3</i>	100	1378.7+x	$(35/2^+)$	
2162.7+x	$(43/2^+)$	411.8 <i>3</i>	100	1750.9+x	$(39/2^+)$	
2613.1+x	$(47/2^+)$	450.4 4	100	2162.7+x	$(43/2^+)$	
3102.3+x	$(51/2^+)$	489.2 <i>4</i>	100	2613.1+x	$(47/2^+)$	
3630.1+x	$(55/2^+)$	527.8 <i>3</i>	100	3102.3+x	$(51/2^+)$	
4196.1+x?	$(59/2^+)$	566.0 <mark>&</mark> 4	100	3630.1+x	$(55/2^+)$	
4800.6+x?	$(63/2^+)$	604.5 <mark>&</mark> 3	100	4196.1+x?	$(59/2^+)$	

[†] From $({}^{32}S,4n\gamma) - 2015He27$.

[±] Multipolarities from $({}^{32}S,4n\gamma) - 2015He27$, based on γ -ray angular distribution (DCO ratio) and linear polarization # Additional information 3.
@ Multiply placed with intensity suitably divided.
& Placement of transition in the level scheme is uncertain.

$\gamma(^{193}\text{Bi})$ (continued)



 $^{193}_{83}{\rm Bi}_{110}$

Level Scheme (continued)

Intensities: Relative photon branching from each level @ Multiply placed: intensity suitably divided

 $--- \rightarrow \gamma$ Decay (Uncertain)

Legend



Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level @ Multiply placed: intensity suitably divided

 $--- \rightarrow \gamma$ Decay (Uncertain)



¹⁹³₈₃Bi₁₁₀

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level @ Multiply placed: intensity suitably divided

 $--- \rightarrow \gamma$ Decay (Uncertain)



Level Scheme (continued)



Level Scheme (continued)



Level Scheme (continued)





 $^{193}_{83}{\rm Bi}_{110}$

Level Scheme (continued)



¹⁹³₈₃Bi₁₁₀



¹⁹³₈₃Bi₁₁₀

Band(G): SD band built on π1/2[651],i _{11/2}					
<u>(63/2</u> ⁺)		4800.6+x			
	604				
<u>(59/2+)</u>	-	<u>4196.1+x</u>			
	566				
(55/2+)	+	3630.1+x			
(51/0+)	528				
(51/2+)	1	3102.3+x			
(47/2+)	489	2613.1+x			
	450				
(43/2+)	+	2162.7+x			
(39/2+)	412	1750.9+x			
(35/2+)	372	1378.7+x			
(31/2+)	332	1047.0+x			
(27/2+)	292	755.3+x			
(23/2+)	251	504.4+x			
(19/2+)	210	294.9+x			
$\frac{(15/2^+)}{(11/2^+)}$	168	126.6+x			
(11/2)	147	<u> </u>			

Band(F): Band based on 1/2+



 $^{193}_{83}{\rm Bi}_{110}$