^{196}Pt(^{10}B,5nγ) 1985Pi05

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 187,355 (2023)	20-Sep-2022

E(^{10}B)=57-72 MeV; Target: ^{196}Pt, enriched >95% and 3.6 mg/cm^2 thick; Detectors: two Ge(Li) and one planar Ge(intrinsic); Measured: excitation functions, $\gamma(\theta)$,DCO, $\gamma\gamma$, γ(t) − pulsed beam with 10 ns on and 2 μs off periods. Deduced: level scheme, J^π, $T_{1/2}$.

Others: 1974GiZX, 1973GiZW.

^{201}Bi Levels

E(level)†	J^π‡	$T_{1/2}$#	Comments
0@	9/2$^-$	103 min *3*	J^π,$T_{1/2}$: From Adopted Levels.
964.2& *5*	11/2$^-$		
967.39& *25*	13/2$^-$		
1379.2a *3*	15/2$^-$		
1474.5a *4*	17/2$^-$		
1719.1 *7*	(13/2$^-$)		
1746.4b *4*	17/2$^+$	5.1 ns *13*	$T_{1/2}$: From 185.8γ-271.91γ(Δt) and the centroid shift analysis in 1985Pi05.
1932.2c *5*	21/2$^+$	<40 ns	E(level): The absence of prompt component in the time spectrum produced by gating on the 185.8γ, shown in figure 4(c) in 1985Pi05, suggests that 185.8γ directly depopulates an isomeric state. $T_{1/2}$: Estimated value from 185.8γ(t) in 1985Pi05.
1932.2+xd	(25/2$^+$)	118 ns *28*	Additional information 1. E(level): X is expected to be less than 80 keV (1985Pi05), otherwise a γ-ray transition would be observed. The assignment is consistent with the energy difference between the J^π=7$^-$ and 9$^-$ states in ^{200}Pb, as well as with the systematics in neighboring ^{203}Bi and ^{205}Bi isotopes. $T_{1/2}$: From $\gamma\gamma$(Δt) using time-difference spectra between 617.3γ with 967.4γ, 411.9γ, 271.9γ and 185.8γ (1985Pi05).
1971.2+xd *4*	27/2$^+$	105 ns *75*	$T_{1/2}$: From $\gamma\gamma$(Δt) using time-difference spectra between 679.8γ with 967.4γ, 411.9γ, 271.9γ and 185.8γ.
2299.0+x *3*	27/2$^+$		
2549.40+x *19*	27/2$^+$		
2589.6+x *3*			
2651.0+x *3*	29/2$^+$		
2668.21+x *22*	(29/2$^+$)		
2739.91+xe *25*	29/2$^-$	124 ns *4*	$T_{1/2}$: From 617.3γ(t) in 1985Pi05.
2994.6+x *8*			
3011.4+x *5*			
3238.8+x *4*	31/2$^-$		
3422.8+x *9*			
3526.4+x *4*	33/2$^-$		
3592.2+x? *10*			
3638.3+x *5*	(33/2$^-$)		
3706.6+x *5*			
3810.7+x *4*	33/2$^-$		
3922.8+x *6*	35/2$^-$		
4075.2+x? *7*			
4484.4+x *9*	(35/2$^-$)		
5282.2+x *10*	(37/2$^-$)		

† From a least-squares fit to Eγ. X is expected to be less than 80 keV, otherwise a γ-ray transition would be observed. The assignment is based on similarities with the J^π=7$^-$ and 9$^-$ states in ^{200}Pb, as well as with the systematics in neighboring ^{203}Bi

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^{196}Pt(^{10}B,5nγ) 1985Pi05 (continued)

^{201}Bi Levels (continued)

and ^{205}Bi isotopes.

‡ From 1985Pi05, unless otherwise stated.

An isomer with $T_{1/2}$=14 ns *3* was found above the 3526.4+X keV level in 1985Pi05. Note, that an isomer with $T_{1/2}\approx$10 ns was also reported in ^{203}Tl(α,6nγ) (1982Br21) at or above the 3810+X level.

@ Configuration=$\pi\ h^{+1}_{9/2}$.

& Configuration=$\pi\ (h^{+1}_{9/2})\otimes 2^+$.

a Configuration=$\pi\ (h^{+1}_{9/2})\otimes 4^+$.

b Admixture of configuration= $\pi\ (h^{+1}_{9/2})\ \nu\ (f^{-1}_{5/2},i^{-1}_{13/2})_{5-}$ and configuration=$\pi\ (h^{+1}_{9/2})\ \nu\ (p^{-1}_{3/2},i^{-1}_{13/2})_{5-}$.

c Admixture of configuration= $\pi\ (h^{+1}_{9/2})\ \nu\ (f^{-1}_{5/2},i^{-1}_{13/2})_{7-}$ and configuration=$\pi\ (h^{+1}_{9/2})\ \nu\ (p^{-1}_{3/2},i^{-1}_{13/2})_{7-}$.

d Configuration=$\pi\ (h^{+1}_{9/2})\ \nu\ (f^{-1}_{5/2},i^{-1}_{13/2})_{9-}$.

e Configuration=$\pi\ (h^{+1}_{9/2})\ \nu\ (i^{-2}_{13/2})_{12+}$.

γ(^{201}Bi)

E_γ †	I_γ ‡	E_i(level)	J^π_i	E_f	J^π_f	Mult.#	δ†	Comments
(39.0 *4*)		1971.2+x	27/2$^+$	1932.2+x	(25/2$^+$)			E_γ: From level energy difference. The transition was not observed directly and the existence is based on the $\gamma\gamma$-coincidence relationships.
(71.7 *3*)		2739.91+x	29/2$^-$	2668.21+x	(29/2$^+$)			E_γ: From level energy difference. The transition was not observed directly and the existence is based on the observed delayed component for 118.8γ and 736.0γ.
(<80)		1932.2+x	(25/2$^+$)	1932.2	21/2$^+$			
88.88 *12*	7.8 *23*	2739.91+x	29/2$^-$	2651.0+x	29/2$^+$			
95.26 *15*	4.7 *12*	1474.5	17/2$^-$	1379.2	15/2$^-$	M1(+E2)		Mult.: A_2=−0.04 *18*, A_4=−0.09 *28*; DCO=0.65 *36*.
118.81 *15*	1.61 *9*	2668.21+x	(29/2$^+$)	2549.40+x	27/2$^+$	M1(+E2)		Mult.: A_2=−0.08 *12*, A_4=0.05 *19*.
150.5 *6*	0.92 *6*	2739.91+x	29/2$^-$	2589.6+x		D		Mult.: A_2=−0.18 *14*, A_4=−0.18 *22*.
152.4 *4*	1.46 *15*	4075.2+x?		3922.8+x	35/2$^-$	D		Mult.: A_2=−0.23 *9*, A_4=−0.07 *15*.
169.4 *4*	0.61 *7*	3592.2+x?		3422.8+x		M1(+E2)		Mult.: A_2=−0.68 *21*, A_4=−0.02 *33*.
180.0 *5*	1.43 *8*	3706.6+x		3526.4+x	33/2$^-$	D		Mult.: A_2=−0.13 *11*, A_4=0.35 *18*.
185.77 *20*	51.3 *5*	1932.2	21/2$^+$	1746.4	17/2$^+$	(E2)		Mult.: A_2=+0.157 *10*, A_4=−0.017 *17*; DCO=0.95 *6*.
190.49 *25*	8.41 *10*	2739.91+x	29/2$^-$	2549.40+x	27/2$^+$	(E1)		Mult.: A_2=−0.128 *24*, A_4=−0.029 *40*.
x192.5 *7*	3.7 *7*							
x197.2 *4*	2.77 *10*							A_2=−0.05 *8*, A_4=−0.05 *13*.
250.2 *4*	1.41 *8*	2549.40+x	27/2$^+$	2299.0+x	27/2$^+$	M1+E2	>1.2	Mult.: A_2=−0.24 *11*, A_4=0.03 *18*.
x258.4 *4*	2.33 *8*							A_2=−0.36 *7*, A_4=0.04 *11*.
271.91 *20*	90.0 *9*	1746.4	17/2$^+$	1474.5	17/2$^-$	(E1)		Mult.: A_2=+0.189 *6*, A_4=−0.012 *9*; DCO=0.922 *44*; consistent with ΔJ=0 transition.
284.19 *25*	10.01 *22*	3810.7+x	33/2$^-$	3526.4+x	33/2$^-$	M1(+E2)	≤0.58	Mult.: A_2=+0.238 *42*, A_4=−0.098 *70*; DCO=0.67 *27*.
287.3 *4*	6.4 *9*	3526.4+x	33/2$^-$	3238.8+x	31/2$^-$			
366.6 *4*	4.6 *8*	2299.0+x	27/2$^+$	1932.2+x	(25/2$^+$)	(M1)		Mult.: DCO=0.58 *21*.
x382.2 *4*	3.6 *23*							
396.4 *4*	5.18 *8*	3922.8+x	35/2$^-$	3526.4+x	33/2$^-$	M1+E2	−0.24 *11*	Mult.: A_2=−0.325 *32*, A_4=−0.010 *53*.
411.86 *20*	80.7 *22*	1379.2	15/2$^-$	967.39	13/2$^-$	M1+E2	−0.023 *17*	Mult.: A_2=−0.128 *4*, A_4=−0.010 *6*; DCO=1.41 *8*.

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^{196}Pt(^{10}B,5nγ) 1985Pi05 (continued)

$\gamma(^{201}Bi)$ (continued)

E_γ †	I_γ ‡	E_i(level)	J_i^π	E_f	J_f^π	Mult.#	δ †	Comments
414.9 *5*	2.88 *14*	1379.2	15/2$^-$	964.2	11/2$^-$	[E2]		Mult.: A_2=+0.07 *6*, A_4=0.00 *9*, but values are inconsistent with the expected Mult=E2 assignment.
421.8 *5*	4.3 *7*	3011.4+x		2589.6+x				
428.2 *4*	3.1 *7*	3422.8+x		2994.6+x				
440.9 *4*	5.11 *12*	2739.91+x	29/2$^-$	2299.0+x	27/2$^+$	(E1)		Mult.: A_2=−0.17 *5*, A_4=0.12 *8*.
462.2 *8*	2.6 *7*	3011.4+x		2549.40+x	27/2$^+$			
468.0 *4*	1.4 *7*	3706.6+x		3238.8+x	31/2$^-$			
498.95 *25*	23.66 *24*	3238.8+x	31/2$^-$	2739.91+x	29/2$^-$	M1+E2	−0.33 *11*	Mult.: A_2=−0.390 *13*, A_4=0.032 *22*; DCO=1.14 *22*.
x552.5 *4*	1.16 *12*							A_2=−0.70 *22*, A_4=−0.40 *34*.
572.4 *4*	1.96 *17*	3810.7+x	33/2$^-$	3238.8+x	31/2$^-$	M1+E2	−0.41 *11*	Mult.: A_2=−0.67 *17*, A_4=−0.23 *27*.
617.27 *25*	32.3 *3*	2549.40+x	27/2$^+$	1932.2+x	(25/2$^+$)	M1+E2	+0.046 *28*	Mult.: A_2=−0.087 *15*, A_4=−0.015 *23*; DCO=1.02 *10*.
657.4 *3*	3.9 *7*	2589.6+x		1932.2+x	(25/2$^+$)			
679.8 *3*	14.41 *15*	2651.0+x	29/2$^+$	1971.2+x	27/2$^+$	M1+E2	−0.15 *12*	Mult.: A_2=−0.312 *15*, A_4=0.020 *25*; DCO=1.42 *31*. Value may be obscured by unresolved transition.
736.0 *4*	3.10 *16*	2668.21+x	(29/2$^+$)	1932.2+x	(25/2$^+$)	E2		Mult.: A_2=+0.20 *11*, A_4=−0.06 *17*.
754.9 *4*	2.60 *12*	1719.1	(13/2$^-$)	964.2	11/2$^-$	M1(+E2)		Mult.: A_2=−0.02 *9*, A_4=0.60 *15*.
786.3 *3*	25.04 *35*	3526.4+x	33/2$^-$	2739.91+x	29/2$^-$	(E2)		E_γ: This γ ray shows delayed component with $T_{1/2}$=14 ns *3*. Mult.: A_2=+0.113 *14*, A_4=0.031 *23*.
797.8 *4*	2.26 *11*	5282.2+x	(37/2$^-$)	4484.4+x	(35/2$^-$)			A_2=+0.63 *10*, A_4=−0.07 *16*.
x844.1 *8*	3.59 *10*							A_2=+0.05 *6*, A_4=−0.03 *10*.
846.1 *7*	4.4 *10*	4484.4+x	(35/2$^-$)	3638.3+x	(33/2$^-$)			A_2=+0.134 *53*, A_4=0.086 *90* Value may be obscured by unresolved transition.
963.9 *8*	12.52 *22*	964.2	11/2$^-$	0	9/2$^-$	M1(+E2)	−0.04 *7*	Mult.: A_2=−0.152 *35*, A_4=−0.023 *57*. Value may be obscured by unresolved transition.
967.42 *25*	100.0 *5*	967.39	13/2$^-$	0	9/2$^-$	E2		Mult.: A_2=+0.152 *11*, A_4=−0.025 *18*.
987.3 *4*	9.97 *14*	3638.3+x	(33/2$^-$)	2651.0+x	29/2$^+$			A_2=+0.231 *27*, A_4=−0.056 *46*; DCO=0.75 *40*.
1062.4 *8*	4.34 *15*	2994.6+x		1932.2+x	(25/2$^+$)			Mult.: A_2=+0.16 *8*, A_4=−0.01 *11*.
x1358.7 *5*	3.26 *11*							A_2=+0.23 *7*, A_4=−0.18 *12*.

† From 1985Pi05.
‡ From E(^{10}B)=67 MeV in 1985Pi05.
# Based on $\gamma(\theta)$ and DCO, unless otherwise stated. DCO values were obtained by gating on stretched E2 transitions.
x γ ray not placed in level scheme.

^{196}Pt(^{10}B,5nγ) 1985Pi05

Level Scheme

Intensities: Relative I_γ

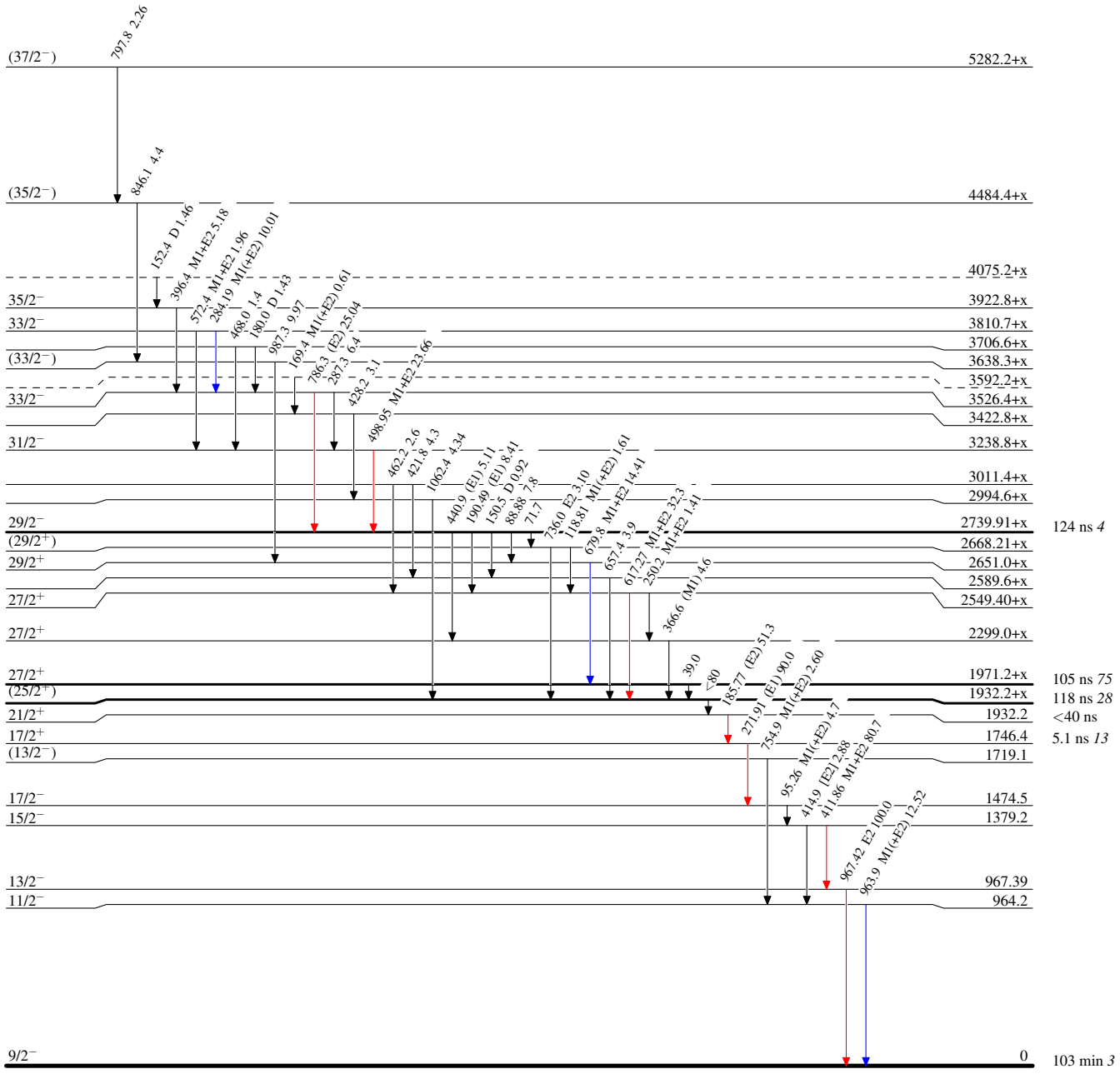
Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$

γ Decay (Uncertain)



$^{201}_{83}Bi_{118}$