^{190}Os(α,3nγ) 1977Sa01

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 195,368 (2024)	1-Dec-2023

Others: 1975Pi02, 1976Pi03, 1976Kh02, 1978Ti02.

1977Sa01: 95% enriched ^{190}Os target. Projectile: α, E=31-46 MeV. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma\gamma$(t), α,$\gamma(\theta)$ at five angles in the range 90°−140°, γ-ray excitation functions; detector: Ge(Li).

^{191}Pt Levels

The level scheme has been constructed based on $\gamma\gamma$-coin measurements. Spin assignments are primarily from α,$\gamma(\theta)$ and γ-ray excitation functions. Level energies and γ-transition branching ratios of even-parity states are interpreted in terms of one quasiparticle coupled to a triaxial rotor. See also 1975Pi02 and 1976Kh02 for theoretical calculations. The odd-parity band has been interpreted as a three-quasineutron decoupled band related to the odd-parity band found in the adjacent even Pt isotopes. This band has also been observed in ^{191}Hg.

E(level)†	J$^\pi$&	T$_{1/2}$	Comments
0.0	3/2$^-$		
9.554‡ *16*	5/2$^-$		Additional information 1.
100.65 *10*	9/2$^-$	>1 μs	T$_{1/2}$: from 1976Pi03, $\gamma\gamma$(t).
148.9# *4*	13/2$^+$	104 μs *4*	T$_{1/2}$: from Adopted Levels.
173.1 *4*	11/2$^+$		
470.9# *4*	17/2$^+$		
529.0 *4*	15/2$^+$		
599.1 *4*	15/2$^+$		
918.9 *4*	(17/2$^+$)		
950.9# *4*	21/2$^+$		
989.2 *4*	19/2$^+$		
1158.3 *4*	19/2$^+$		
1302.5 *4*	19/2$^+$		
1381.3@ *4*	21/2$^{(-)}$		
1471.3 *4*			
1545.6@ *4*	25/2$^{(-)}$	1.07 ns *6*	T$_{1/2}$: from 1978Ti02 (direct measurement of conversion electrons relative to cyclotron beam bursts). Other value: 1.5 ns *4* (1977Sa01).
1550.2# *4*	25/2$^+$		
1590.5 *4*			
1862.6@ *4*	(27/2$^-$)		
1924.9 *5*			
1939.0 *5*			
2125.0@ *4*	29/2$^{(-)}$		
2233.2# *5*	29/2$^+$		
2385.0?			
2581.1@ *5*	(33/2$^-$)		
2940.4# *6*	(33/2$^+$)		

† From least-squares fit to Eγ using adopted ΔEγ and fixing the three first excited levels energies on the adopted values; the obtained chi-square suggests uncertainties overestimated by a factor ≈2.

‡ From Adopted Levels.

Favored decoupled band.

@ i13/2 semidecoupled band.

& As given in Fig. 4 (1977Sa01), except where otherwise noted.

^{190}Os(α,3nγ) 1977Sa01 (continued)

$\gamma(^{191}Pt)$

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[#]	Comments
(9.6)		9.554	5/2$^-$	0.0	3/2$^-$			E_γ: From level energy difference.
(24.3)		173.1	11/2$^+$	148.9	13/2$^+$			
48.2 *3*		148.9	13/2$^+$	100.65	9/2$^-$	M2	462 *15*	α(L)=345 *11*; α(M)=91 *3*; α(N+..)=26.9 *9* α(N)=22.8 *8*; α(O)=3.94 *13*; α(P)=0.206 *7* Observed only in the delayed spectrum. Mult.: from α(total) exp=600 *80* (1976Pi03).
91.1 *1*	292 *20*	100.65	9/2$^-$	9.554	5/2$^-$			A_2=0.00 *5*; A_4=0.00 *7*
[x]144.3 *3*	12 *2*							A_2=+0.18 *14* E_γ: A comparable 144.2γ placed from 1302 keV adopted level.
[x]151.1 *5*	8 *2*							E_γ: A comparable 151.1γ placed from 1309 keV adopted level.
164.3 *1*	312 *22*	1545.6	25/2$^{(-)}$	1381.3	21/2$^{(-)}$	Q		A_2=+0.25 *7*; A_4=−0.16 *7*
168.8 *1*	85 *9*	1471.3		1302.5	19/2$^+$	D(+Q)		A_2=0.00 *16*; A_4=−0.09 *17*
207.8 *6*	20 *6*	1158.3	19/2$^+$	950.9	21/2$^+$			
209.2 *2*	39 *5*	1590.5		1381.3	21/2$^{(-)}$	D(+Q)		A_2=−0.25 *7*; A_4=−0.06 *8*
223.0 *1*	287 *20*	1381.3	21/2$^{(-)}$	1158.3	19/2$^+$	D(+Q)		A_2=−0.21 *7*; A_4=+0.02 *7*
259.8[@] *3*	15 *3*	2385.0?		2125.0	29/2$^{(-)}$			
262.5 *2*	30 *5*	2125.0	29/2$^{(-)}$	1862.6	(27/2$^-$)	D(+Q)		A_2=−0.13 *9*
[x]271.7 *2*	54 *7*					Q		A_2=+0.28 *8*; A_4=−0.15 *9*
[x]288.8 *4*	11 *2*							
[x]310.5 *2*	60 *7*					D(+Q)		A_2=−0.25 *7*; A_4=+0.03 *8*
[x]313.0 *3*	18 *3*							
317.1 *2*	139 *13*	1862.6	(27/2$^-$)	1545.6	25/2$^{(-)}$	D(+Q)		A_2=−0.22 *13*
319.8 *2*	48 *6*	918.9	(17/2$^+$)	599.1	15/2$^+$			
322.0 *1*	1000	470.9	17/2$^+$	148.9	13/2$^+$	Q		A_2=+0.21 *6*; A_4=−0.11 *7*
[x]341.7 *4*	38 *5*							
351.6 *3*	21 *4*	1302.5	19/2$^+$	950.9	21/2$^+$			
355.9 *1*	185 *15*	529.0	15/2$^+$	173.1	11/2$^+$	Q		A_2=+0.23 *7*; A_4=−0.11 *8*
380.2 *1*	156 *14*	529.0	15/2$^+$	148.9	13/2$^+$	D(+Q)		A_2=−0.81 *7*; A_4=+0.15 *8*
383.7 *3*	17 *3*	1302.5	19/2$^+$	918.9	(17/2$^+$)	D(+Q)		A_2=−1.3 *4*
390.0 *2*	66 *8*	918.9	(17/2$^+$)	529.0	15/2$^+$	D(+Q)		A_2=−0.17 *7*; A_4=+0.08 *8*
392.0 *2*	156 *14*	1381.3	21/2$^{(-)}$	989.2	19/2$^+$	D(+Q)		A_2=−0.19 *6*; A_4=+0.06 *7*
393.4 *3*	37 *6*	1939.0		1545.6	25/2$^{(-)}$	(Q)		A_2=+0.45 *17*
[x]403.8 *4*	13 *2*							
[x]413.2 *4*	20 *4*					D(+Q)		A_2=−0.42 *22*; A_4=−0.04 *24*
[x]423.5 *3*	38 *6*							
430.4 *2*	181 *16*	1381.3	21/2$^{(-)}$	950.9	21/2$^+$	D(+Q)		A_2=+0.33 *6*; A_4=+0.01 *6* $\gamma(\theta)$ data is consistent with a ΔJ=0 transition.
447.8 *3*	36 *6*	918.9	(17/2$^+$)	470.9	17/2$^+$			
450.2 *2*	199 *18*	599.1	15/2$^+$	148.9	13/2$^+$	D(+Q)		A_2=−0.85 *8*; A_4=+0.20 *9*
453.6 *3*	35 *6*	1924.9		1471.3		(Q)		A_2=+0.20 *15*; A_4=−0.17 *17*
456.1 *3*	20 *4*	2581.1	(33/2$^-$)	2125.0	29/2$^{(-)}$	(Q)		A_2=+0.34 *12*
460.2 *1*	186 *17*	989.2	19/2$^+$	529.0	15/2$^+$	Q		A_2=+0.28 *8*; A_4=−0.06 *9*
480.0 *1*	478 *38*	950.9	21/2$^+$	470.9	17/2$^+$	Q		A_2=+0.26 *7*; A_4=−0.11 *7*
[x]482.5 *4*	17 *3*					D(+Q)		A_2=−0.86 *23*
518.4 *2*	95 *11*	989.2	19/2$^+$	470.9	17/2$^+$	D(+Q)		A_2=−0.85 *12*; A_4=+0.14 *14*
[x]525.9 *3*	37 *7*							A_2=+0.05 *12* assigned to 996.4 keV level decay in ^{189}Os(α,2n).
[x]527.3 *3*	47 *8*					(Q)		A_2=+0.27 *11*
[x]542.7 *4*	28 *6*					D(+Q)		A_2=−0.24 *11*

Continued on next page (footnotes at end of table)

^{190}Os(α,3nγ) 1977Sa01 (continued)

$\gamma(^{191}Pt)$ (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	Comments
559.3 *3*	119 *20*	1158.3	19/2$^+$	599.1	15/2$^+$	(Q)	A_2=+0.41 *23*
579.4 *2*	110 *18*	2125.0	29/2$^{(-)}$	1545.6	25/2$^{(-)}$	Q	A_2=+0.30 *8*; A_4=−0.09 *8*
[x]591.1 *3*	59 *11*						Placed from 1581 level in author's table. However, their level scheme shows no such level.
599.3 *2*	180 *26*	1550.2	25/2$^+$	950.9	21/2$^+$		
[x]605.7 *3*	39 *7*						
[x]612.8 *4*	18 *4*						
[x]673.1 *4*	17 *4*					D(+Q)	A_2=−0.77 *33*; A_4=+0.19 *36*
683.0 *2*	129 *23*	2233.2	29/2$^+$	1550.2	25/2$^+$	(Q)	A_2=+0.19 *9*; A_4=−0.08 *10*
687.3 *2*	180 *27*	1158.3	19/2$^+$	470.9	17/2$^+$	D(+Q)	A_2=−0.79 *8*; A_4=+0.25 *10*
703.3 *4*	22 *4*	1302.5	19/2$^+$	599.1	15/2$^+$		
707.2 *3*	38 *7*	2940.4	(33/2$^+$)	2233.2	29/2$^+$	(Q)	A_2=+0.35 *14*
[x]709.4 *3*	42 *7*					(Q)	A_2=+0.40 *13*
831.6 *3*	54 *8*	1302.5	19/2$^+$	470.9	17/2$^+$	D(+Q)	A_2=−1.14 *19*; A_4=+0.05 *21*
[x]838.6 *4*	23 *5*						

[†] From 1977Sa01. Relative photon intensity at θ=125°, E=37 MeV.

[‡] From $\alpha,\gamma(\theta)$, except for 48.2γ (method given in comment) (1977Sa01). 1977Sa01 report the multiporarities as E2, E1 or M1, and M1/E2, evaluator lists as D and Q.

[#] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

[@] Placement of transition in the level scheme is uncertain.

[x] γ ray not placed in level scheme.

^{190}**Os(α,3nγ)** **1977Sa01**

Level Scheme

Intensities: Relative I_γ

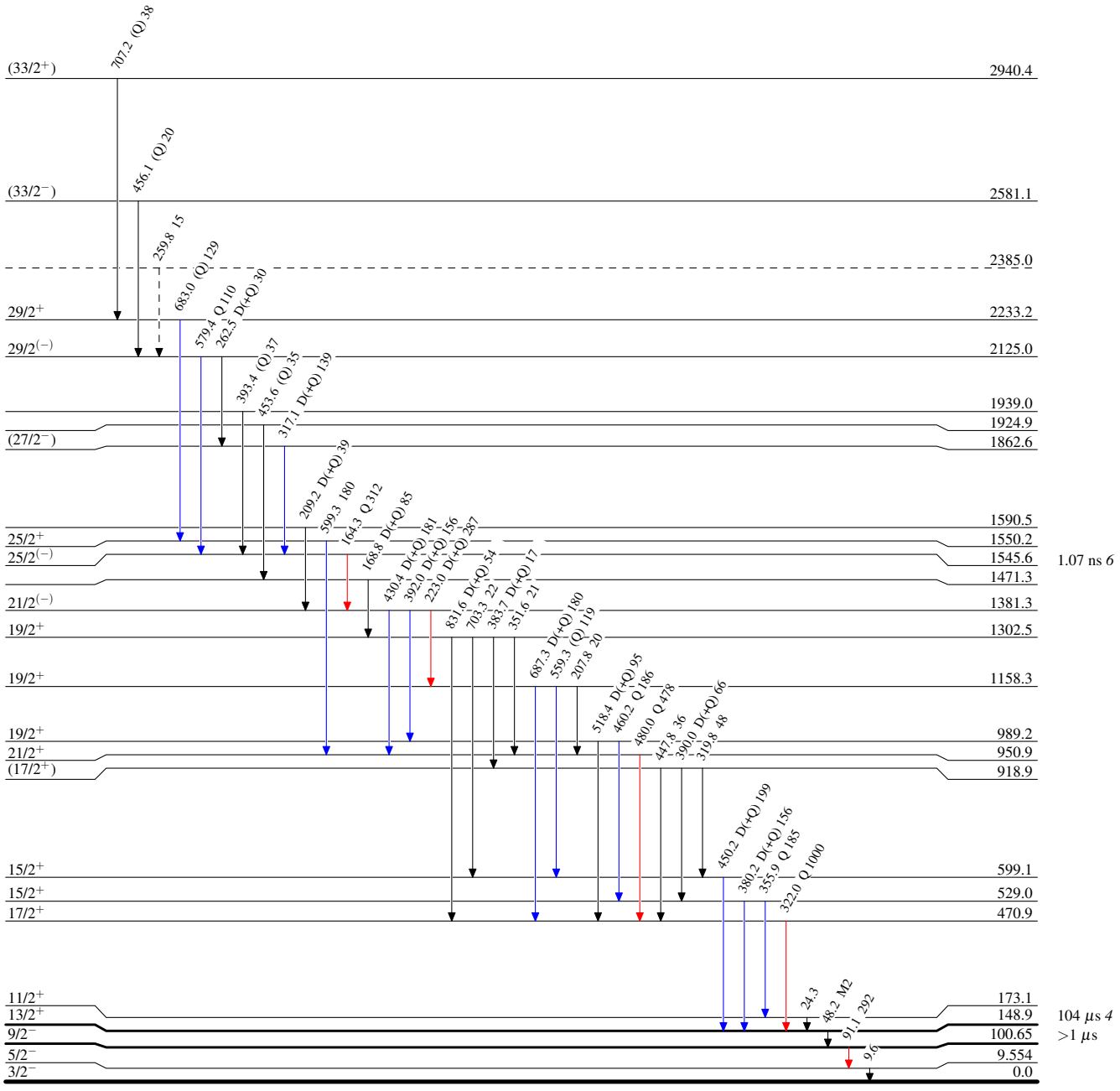
Legend

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

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

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

γ Decay (Uncertain)



$^{191}_{78}Pt_{113}$