^{192}Os(α,2nγ) 1976Hj01,1974Ya03,2006Le06

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 177, 1 (2021)	3-Sep-2021

1976Hj01: E=23, 27 MeV α beams were produced from the Rossendorf cyclotron U-120. Target was 98% enriched ^{192}Os. γ rays were detected with Ge(Li) detectors and charged particles were detected with a cooled Si(Li) detector. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma\gamma$(t), $\alpha\gamma$(t), $\gamma(\theta)$, E(ce), I(ce). Deduced levels, $T_{1/2}$, J, π, γ-ray conversion coefficients, multipolarities, mixing ratios. Comparisons with theoretical calculations.

1974Ya03: E=24 MeV α beam was produced from the Purdue FN tandem. Target was 98% enriched ^{192}Os. γ rays were detected with Ge(Li) detectors. Measured Eγ, Iγ, $\gamma\gamma$-coin. Deduced levels. See also 1975Pi02 and 1974YaZU from the same laboratory.

2006Le06: E=27 MeV α beam was produced from the Kiev cyclotron U-120. Target was ≈60 metallic powder of 99% enriched ^{192}Os on a thick bismuth backing. γ rays were detected with two HPGe detectors. Measured Eγ, Iγ, $\gamma(\theta)$, $\gamma(\theta$,H,t). Deduced g factors using integral perturbed angular distribution technique.

Additional information 1.

Other: 1965La02.

^{194}Pt Levels

E(level)†	J$^\pi$‡	$T_{1/2}$	Comments
0.0	0^+		
328.40 *8*	2^+		
621.90 *8*	2^+		
811.13 *13*	4^+		
922.6 *1*	3^+		
1229.3 *2*	4^+		
1373.6 *2*	(5^-)		
1411.7 *2*	6^+		
1422.0 *2*	$(3,4)^+$		
1432.9 *2*	3^-		
1484.9 *2*	(7^-)	3.45 ns *12*	g=+0.26 *8* (2006Le06) $T_{1/2}$: from the Adopted Levels. g: from IPAD method (2006Le06) from analysis of 111.4, 482.8, 328.5 and 607.6 gamma rays.
1498.6 *2*	(5^+)		J$^\pi$: A_2 for 576γ consistent with stretched E2 to 3^+.
1592.6 *3*	(5^+)		J$^\pi$: A_2 for 670γ consistent with stretched E2 to 3^+.
1783.4 *2*	(6^-)		J$^\pi$: from $\gamma(\theta)$ and multipolarity of 409.8γ.
1984.3 *3*	$(6,7,8^+)$		
1991.6? *3*	(7^-)		
1999.7 *3*	(8^-)		
2047.4 *2*	(9^-)		
2099.4 *2*	$(8)^+$		
2309.5 *3*	(11^-)		
2438.3 *2*	(10^+)		$T_{1/2}$: 6.4 ns half-life assigned to this level (1976Hj01) is instead associated (by 2006Le06) with a 12^+ level, 12.7 keV above the 2438 level. This interpretation is based on systematics and agreement of measured g factor with calculated values for 10^+ and 12^+.
2451.0? *12*	(12^+)	5 ns *1*	g=−0.17 *7* (2006Le06) E(level): level proposed by 2006Le06 from systematics of B(E2) values in the neighboring nuclides. $T_{1/2}$: from (338.8γ,391.0γ,687.7γ)(t) (1976Hj01). See also $T_{1/2}$ comment for 2438.3 level. g: IPAD method (2006Le06) from analysis of 338.8, 600.5 and 687.7 gamma rays. Configuration=$\nu i^{-2}_{13/2}$.
2700.0 *3*	(11^-)		
2842.0 *12*	(14^+)		E(level),J$^\pi$: energy revised upwards by 12.7 keV and spin higher by 2 units according to the proposed level scheme of 2006Le06 with the introduction of a new 12^+ level at 2451 keV.

Continued on next page (footnotes at end of table)

^{192}Os(α,2nγ) 1976Hj01,1974Ya03,2006Le06 (continued)

^{194}Pt Levels (continued)

† From a least-squares fit to γ-ray energies.
‡ From Adopted Levels, unless otherwise stated.

$\gamma(^{194}Pt)$

A_2 values are from 1976Hj01. Values of logarithmic derivatives of A_2 in $\gamma(\theta)$ are available from 2006Le06 for the following transitions: 111.4, 328.4, 338.8, 391.0, 482.8, 562.6, 600.5, 607.6 and 687.7. These values are in general agreement with corresponding values from 1976Hj01.

E_γ †	I_γ ‡	E_i(level)	J_i^π	E_f	J_f^π	Mult.#	δ#	Comments
(12.7 *12*)		2451.0?	(12^+)	2438.3	(10^+)			
111.4 *2*	5 *1*	1484.9	(7^-)	1373.6	(5^-)			A_2=+0.23 *4* I_γ: others: 4.5 *9* (1974Ya03), 195.6 (2006Le06).
144.5 *2*	0.7 *2*	1373.6	(5^-)	1229.3	4^+			A_2=−0.05 *10* I_γ: also from 1974Ya03.
262.1 *2*	1.3 *4*	2309.5	(11^-)	2047.4	(9^-)			A_2=+0.34 *8* I_γ: other: 0.7 *1* (1974Ya03).
x268.3@ *2*	0.9 *1*							
293.55 *7*	16 *1*	621.90	2^+	328.40	2^+			A_2=−0.02 *2* I_γ: other: 21.0 *13* (1974Ya03).
300.74 *8*	11.7 *8*	922.6	3^+	621.90	2^+			A_2=+0.10 *2* I_γ: from 1974Ya03. Others: 9.3 *14* (27 MeV) and 14.0 *7* (23 MeV) from 1976Hj01.
x304.6 *3*	0.9 *3*							I_γ: other: 0.7 *2* (1974Ya03).
328.5 *1*	100	328.40	2^+	0.0	0^+			A_2=+0.19 *2*
338.8 *2*	6.4 *10*	2438.3	(10^+)	2099.4	$(8)^+$			A_2=+0.21 *4* I_γ: other: 1.9 *6* (1974Ya03), 3.8 *4* (2006Le06).
391.0a *2*	4.0a *12*	2438.3	(10^+)	2047.4	(9^-)			A_2=−0.01 *5* I_γ: 6.4 *10* for doublet. Separate intensities from $\gamma\gamma$ (1976Hj01). Other: 1.7 *2* (1974Ya03), 2.9 *2* for doublet (2006Le06). A_2 for the doublet.
391.0a *2*	2.0a *6*	2842.0	(14^+)	2451.0?	(12^+)			
409.8 *1*	4.5 *7*	1783.4	(6^-)	1373.6	(5^-)	M1+E2	+0.4 *1*	α(K)exp=0.11 *5*; A_2=+0.39 *4* (1976Hj01) I_γ: other: 4.3 *4* (1974Ya03).
x416.9@ *3*	2.0 *3*							
418.2 *3*	0.7 *2*	1229.3	4^+	811.13	4^+			A_2=+0.24 *15* I_γ: others: 0.8 *4* (1974Ya03); 1.2 *4* (1976Hj01) for E(α)=27 MeV.
x455.6 *2*	1.3 *4*							I_γ: other: 1.4 *2* (1974Ya03).
482.75 *12*	77 *4*	811.13	4^+	328.40	2^+			A_2=+0.26 *3* I_γ: other: 63.7 *35* (1974Ya03), 71.7 *4* (2006Le06).
499.4 *2*	3.2 *5*	1422.0	$(3,4)^+$	922.6	3^+			A_2=−0.09 *4* I_γ: other: 2.2 *4* (1974Ya03).
506.7& *2*	3.6& *5*	1991.6?	(7^-)	1484.9	(7^-)	M1,E2		A_2=+0.6 *3*; α(K)exp=0.038 *15* (1976Hj01) 1975Pi02 assign this γ from a 2507 level, instead.
514.8& *2*	8.0& *12*	1999.7	(8^-)	1484.9	(7^-)	M1+E2	+0.5 *1*	A_2=+0.46 *6*; α(K)exp=0.055 *15* (1976Hj01)

Continued on next page (footnotes at end of table)

^{192}Os(α,2nγ) 1976Hj01,1974Ya03,2006Le06 (continued)

$\gamma(^{194}Pt)$ (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Comments
[x]523.4[&b] 3	0.7[&] 2					
562.5[a] 1	58[a] 19	1373.6	(5$^-$)	811.13	4$^+$	A_2=−0.07 3 I_γ: 78 4 for doublet. Separate intensities from $\gamma\gamma$ data (1976Hj01). Other: 52.4 31 (1974Ya03), 49.7 5 (2006Le06)for doublet. A_2 for the doublet.
562.5[a] 1	20[a] 7	2047.4	(9$^-$)	1484.9	(7$^-$)	
[x]570.5[&] 3	0.8[&] 3					
572.6[&] 3	1.9[&] 6	1984.3	(6,7,8$^+$)	1411.7	6$^+$	
576.0 2	3.9 6	1498.6	(5$^+$)	922.6	3$^+$	A_2=+0.33 5 I_γ: other: 4.1 4 (1974Ya03).
594.3 3	1.6 6	922.6	3$^+$	328.40	2$^+$	I_γ: from 1974Ya03. Other: ≈2.0 (1976Hj01) for E(α)=27 MeV.
600.5 1	20 1	1411.7	6$^+$	811.13	4$^+$	A_2=+0.32 3 I_γ: other: 11.0 9 (1974Ya03), 15.8 2 (2006Le06).
607.5 2	5 1	1229.3	4$^+$	621.90	2$^+$	A_2=+0.24 5 I_γ: other: 4.5 7 (1974Ya03), 6.7 7 (2006Le06); 1.2 4 (1976Hj01) for E(α)=27 MeV.
[x]610.0 3	1.8 3					I_γ: other: 1.7 5 (1974Ya03).
617.8[&] 3	0.6[&] 2	1991.6?	(7$^-$)	1373.6	(5$^-$)	
621.8[a] 1	3.0[a] 10	621.90	2$^+$	0.0	0$^+$	A_2=+0.13 5 Iγ(doublet)=5.0 8. Separate intensities from $\gamma\gamma$ data (1976Hj01) Other: 4.3 4 for a doublet (1974Ya03). A_2 for doublet.
621.8[a] 1	2.0[a] 10	1432.9	3$^-$	811.13	4$^+$	
652.6 2	3.8 6	2700.0	(11$^-$)	2047.4	(9$^-$)	A_2=+0.16 5 I_γ: other: 1.3 3 (1974Ya03).
670.0 3	3.0 9	1592.6	(5$^+$)	922.6	3$^+$	A_2=+0.16 5 I_γ: other: 1.6 3 (1974Ya03).
687.7 1	10.8 6	2099.4	(8)$^+$	1411.7	6$^+$	A_2=+0.31 4 I_γ: other: 4.1 6 (1974Ya03), 6.8 2 (2006Le06).
811.0[@] 5	0.4 2	1432.9	3$^-$	621.90	2$^+$	
900.9[@] 6	0.4 2	1229.3	4$^+$	328.40	2$^+$	
1104.0[@] 3	3.2 5	1432.9	3$^-$	328.40	2$^+$	

[†] Weighted average of 1976Hj01 and 1974Ya03. 1976Hj01 quote uncertainty=0.1 to 0.3 keV. The evaluators have assigned 0.1 to γ data of Iγ>10, 0.2 to γ rays of Iγ=3 to 10 and 0.3 to γ rays of Iγ<3.

[‡] From 1976Hj01 for E=27 MeV, unless otherwise stated. 1976Hj01 provide Iγ data for E=23 MeV also. Uncertainties are taken by evaluators as 5% for Iγ>10, 15% for Iγ=3 to 10, and 30% for Iγ<3, based on authors′ statement that the uncertainties are of the order of 5 to 30% depending on line strength.

[#] From α(K)exp and $\gamma(\theta)$ (1976Hj01). ce data normalized to those for 328γ and 483γ, treated as E2 transitions.

[@] Reported by 1974Ya03 only. Iγ is at 24 MeV. For levels below ≈1500 keV, Iγ data reported by 1974Ya03 at 24 MeV are not too different from those given by 1976Hj01 at 27 MeV.

[&] γ reported by 1976Hj01 only.

[a] Multiply placed with intensity suitably divided.

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

[x] γ ray not placed in level scheme.

^{192}Os(α,2nγ) **1976Hj01,1974Ya03,2006Le06**

Level Scheme

Intensities: Relative I_γ

@ Multiply placed: intensity suitably divided

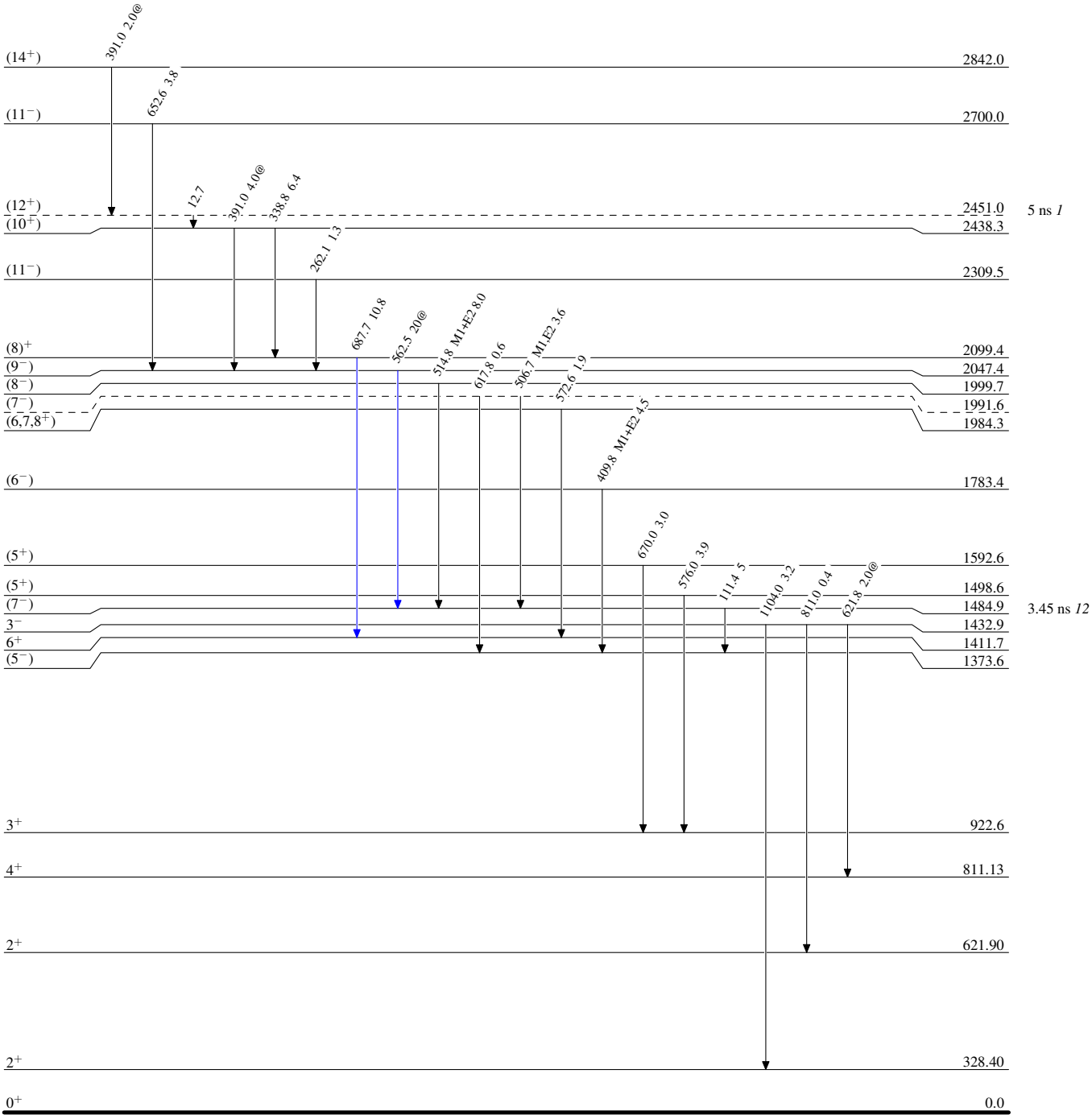
Legend

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

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

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

γ Decay (Uncertain)



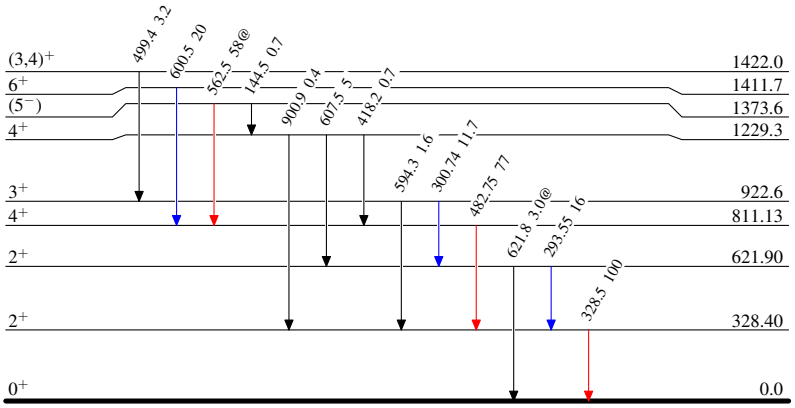
$^{194}_{78}Pt_{116}$

^{192}Os(α,2nγ) 1976Hj01,1974Ya03,2006Le06

Level Scheme (continued)

Intensities: Relative I_γ
@ Multiply placed: intensity suitably divided

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$



$^{194}_{78}Pt_{116}$