

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	C. M. Baglin ¹ , E. A. Mccutchan ² , S. Basunia ¹		NDS 153, 1 (2018)	1-Oct-2018

Q(β^-)=-10570 SY; S(n)=11275 27; S(p)=2806 15; Q(α)=5536.9 27 [2017Wa10](#)
 $\Delta Q(\beta^-)$ =90 (syst) ([2017Wa10](#)).
 S(2n)=20074 14; S(2p)=3611 17; Q(ϵp)=3703 18 ([2017Wa10](#)).

¹⁷⁰Os Levels

Cross Reference (XREF) Flags

- A ¹⁷⁰Ir ϵ decay (0.87 s)
- B ¹⁷⁰Ir ϵ decay (811 ms)
- C ¹⁷⁴Pt α decay
- D ¹⁴⁴Sm(²⁹Si,3n γ),

E(level) [†]	J π [‡]	T _{1/2}	XREF	Comments
0.0 [@]	0 ⁺	7.37 s 18	A CD	$\% \epsilon + \% \beta^+ = 90.5$ 10; $\% \alpha = 9.5$ 10 $\% \alpha$: weighted average of 12 1 (1982En03), 8.6 6 (1996Pa01), and 10 3 (2004GoZZ). The unweighted average of these data is 10.2 10. others: $\% \alpha = 3$ estimated by 1978Sc26 based on comparison of measured α intensities and calculated excitation function for reaction producing ¹⁷⁰ Os; 5 1 (1995Hi02 , assuming 162 γ and 216 γ In ¹⁷⁰ Re are M1) or 9 2 (1995Hi02 , neglecting internal conversion of 162 γ and 216 γ). calculated values: 2017Ph01 , 2017Zh03 , 2016Sa16 , 2016Su09 , 2015Ab11 , 2014Gi01 . T _{1/2} : 7.37 s 18 from weighted average of 7.2 s 2 (2004GoZZ , 5410 α (t); units misprinted As ms instead of s), 9 s 1 (1996Pa01), 7.9 s 3 (1995Hi02 , 5403 α (t)), 9.3 s 16 (1995Hi02 , 162 γ (t)), 8.5 s 5 (1995Hi02 , 216 γ (t)), 6.9 s 8 (1984Sc06), 7.1 s 2 (1982En03), 7.1 s 5 (1972To06); the unweighted average of these data is 7.9 s 3. Other: 4.0 s 2 (1978Sc26).
286.70 [@] 14	2 ⁺		CD	J π : stretched E2 287 γ to 0 ⁺ .
749.90 [@] 20	4 ⁺		D	J π : stretched E2 463 γ to 2 ⁺ .
1325.42 [@] 24	6 ⁺		D	J π : stretched Q In-band 576 γ to 4 ⁺ .
1696.9 ^{&} 3	5 ⁽⁻⁾		D	J π : D 947 γ to 4 ⁺ ; D+Q 372 γ to 6 ⁺ .
1945.8 [@] 4	8 ⁺		D	J π : stretched Q In-band γ to 6 ⁺ .
2084.4 ^{&} 4	7 ⁽⁻⁾		D	J π : stretched Q 388 γ to 5 ⁽⁻⁾ .
2502.6 ^{&} 5	9 ⁽⁻⁾		D	J π : stretched Q 418 γ to 7 ⁽⁻⁾ .
2545.2 [@] 5	10 ⁺		D	J π : stretched Q In-band γ to 8 ⁺ .
2610.5 5			D	
2667.4 6			D	
2831.6 ^{&} 6	11 ⁽⁻⁾		D	J π : stretched Q 329 γ to 9 ⁽⁻⁾ .
2841.1 [#] 6	(10 ⁺)		D	
2958.8 [#] 6	(12 ⁺)		D	
3053.6? 7			D	
3130.4 6	12 ⁽⁺⁾		D	J π : stretched Q 585 γ to 10 ⁺ .
3265.6 [#] 7	(14 ⁺)		D	
3280.1 ^{&} 7	13 ⁽⁻⁾		D	J π : stretched Q 388 γ to 11 ⁽⁻⁾ .
3707.0? 7			D	
3742.9 [#] 7	(16 ⁺)		D	
3860.8 ^{&} 7	(15 ⁻)		D	
4349.0 [#] 8	(18 ⁺)		D	

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Adopted Levels, Gammas (continued)

^{170}Os Levels (continued)

<u>E(level)[†]</u>	<u>J^π[‡]</u>	<u>XREF</u>	<u>E(level)[†]</u>	<u>J^π[‡]</u>	<u>XREF</u>
4513.2 ^{&} 8	(17 ⁻)	D	5720.4 ^a 13	(21 ⁻)	D
5055.8 [#] 9	(20 ⁺)	D	5847.8 [#] 13	(22 ⁺)	D
5139.4 ^a 8	(19 ⁻)	D	6398.5 ^a 9	(23 ⁻)	D
			6706.8 [#] 15	(24 ⁺)	D

[†] From least-squares fit to E_γ.

[‡] From ($^{29}\text{Si},3n\gamma$), based on γ multiplicities, γ branching, and band structure deduced from band crossing frequencies, alignments and alignment gains, except as noted.

[#] Band(A): (ν $i_{13/2}^2$), $\alpha=0$ band (1988Dr06). 2-quasiparticle AB band; becomes yrast At J=12.

[@] Band(B): $K^\pi=0^+$, $\alpha=0$ g.s. band (1988Dr06). Definite J^π is assigned to J≤10 members based on J^π=0⁺ for the g.s. and E2 multiplicity for 287 γ connecting J=2 and 0 band members.

[&] Band(C): AE, $\alpha=1$ band (1988Dr06). 2-quasiparticle $\pi=-$ band. A is (ν $i_{13/2}$) orbital; E represents the mixed $f_{7/2}$ and $h_{9/2}$ pseudo-spin partner orbitals. Small alignment gain At low frequencies may be associated with an octupole contribution.

^a Band(D): ABCE, $\alpha=1$ band (1988Dr06). 4-quasiparticle $\pi=-$ band. A is (ν $i_{13/2}$) orbital; E represents the mixed $f_{7/2}$ and $h_{9/2}$ pseudo-spin partner orbitals.

$\gamma(^{170}\text{Os})$

<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_γ[†]</u>	<u>I_γ[†]</u>	<u>E_f</u>	<u>J_f^π</u>	<u>Mult.[‡]</u>	<u>α[@]</u>	<u>Comments</u>
286.70	2 ⁺	286.70 14	100	0.0	0 ⁺	E2 [#]	0.1047	
749.90	4 ⁺	463.20 14	100	286.70	2 ⁺	E2 [#]	0.0276	
1325.42	6 ⁺	575.50 14	100	749.90	4 ⁺	(E2)	0.01625	
1696.9	5 ⁽⁻⁾	371.5 3	28.1 20	1325.42	6 ⁺	D+Q		
		947.1 3	100 4	749.90	4 ⁺	D		
1945.8	8 ⁺	620.4 3	100	1325.42	6 ⁺	(E2)	0.01367	
2084.4	7 ⁽⁻⁾	387.6 3	100 8	1696.9	5 ⁽⁻⁾	(E2)	0.0440	
		758.9 3	57.7 23	1325.42	6 ⁺	D		
2502.6	9 ⁽⁻⁾	418.2 3	100	2084.4	7 ⁽⁻⁾	(E2)	0.0359	
2545.2	10 ⁺	599.4 3	100	1945.8	8 ⁺	(E2)	0.01479	
2610.5		526.1 3	100	2084.4	7 ⁽⁻⁾			
2667.4		164.8 3	100	2502.6	9 ⁽⁻⁾			
2831.6	11 ⁽⁻⁾	329.0 3	100	2502.6	9 ⁽⁻⁾	(E2)	0.0697	
2841.1	(10 ⁺)	295.9 3	100 8	2545.2	10 ⁺	(M1)	0.268	Mult.: $\gamma(\theta)$ consistent with Q, $\Delta J=2$ or D+Q, $\Delta J=0$; intensity balance arguments In ($^{29}\text{Si},3n\gamma$) favor M1.
2958.8	(12 ⁺)	896.6 ^{&} 3		1945.8	8 ⁺			
		117.7 3	11.4 12	2841.1	(10 ⁺)	[E2]	2.28	Mult.: $\gamma(\theta)$ suggests dipole transition, but intensity balance suggests E2 In ($^{29}\text{Si},3n\gamma$) (1988Dr06); level scheme requires the latter.
		413.6 3	100 3	2545.2	10 ⁺	(Q)		
3053.6?		386.2 3	100	2667.4				
3130.4	12 ⁽⁺⁾	585.2 3	100	2545.2	10 ⁺	Q		
3265.6	(14 ⁺)	306.8 3	100	2958.8	(12 ⁺)	(E2)	0.0855	
3280.1	13 ⁽⁻⁾	448.5 3	100	2831.6	11 ⁽⁻⁾	(E2)	0.0300	
3707.0?		576.6 3	100	3130.4	12 ⁽⁺⁾			
3742.9	(16 ⁺)	477.3 3	100	3265.6	(14 ⁺)	(E2)	0.0256	
3860.8	(15 ⁻)	580.7 3	100	3280.1	13 ⁽⁻⁾			
4349.0	(18 ⁺)	606.1 3	100	3742.9	(16 ⁺)	(E2)	0.01441	

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Adopted Levels, Gammas (continued) $\gamma(^{170}\text{Os})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ^\dagger	I_γ^\dagger	E_f	J_f^π	Mult. [‡]	$\alpha^\@$
4513.2	(17 ⁻)	652.4 3	100	3860.8	(15 ⁻)	(E2)	0.01220
5055.8	(20 ⁺)	706.8 3	100	4349.0	(18 ⁺)	(E2)	0.01022
5139.4	(19 ⁻)	626.2 3	100	4513.2	(17 ⁻)	(Q)	
5720.4	(21 ⁻)	581 1	100	5139.4	(19 ⁻)		
5847.8	(22 ⁺)	792 1	100	5055.8	(20 ⁺)		
6398.5	(23 ⁻)	678.1 3	100	5720.4	(21 ⁻)		
6706.8	(24 ⁺)	859 1	100	5847.8	(22 ⁺)		

[†] From ($^{29}\text{Si},3n\gamma$).

[‡] Based on $\gamma(\theta)$ In ($^{29}\text{Si},3n\gamma$), except As noted, assigning $\Delta\pi=(\text{No})$ to intraband transitions.

[#] 287 γ and 463 γ are Q from $\gamma(\theta)$; in ($^{29}\text{Si},3n\gamma$) intensity balance at 287 level precludes M2 for either or both of these transitions.

[@] 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.

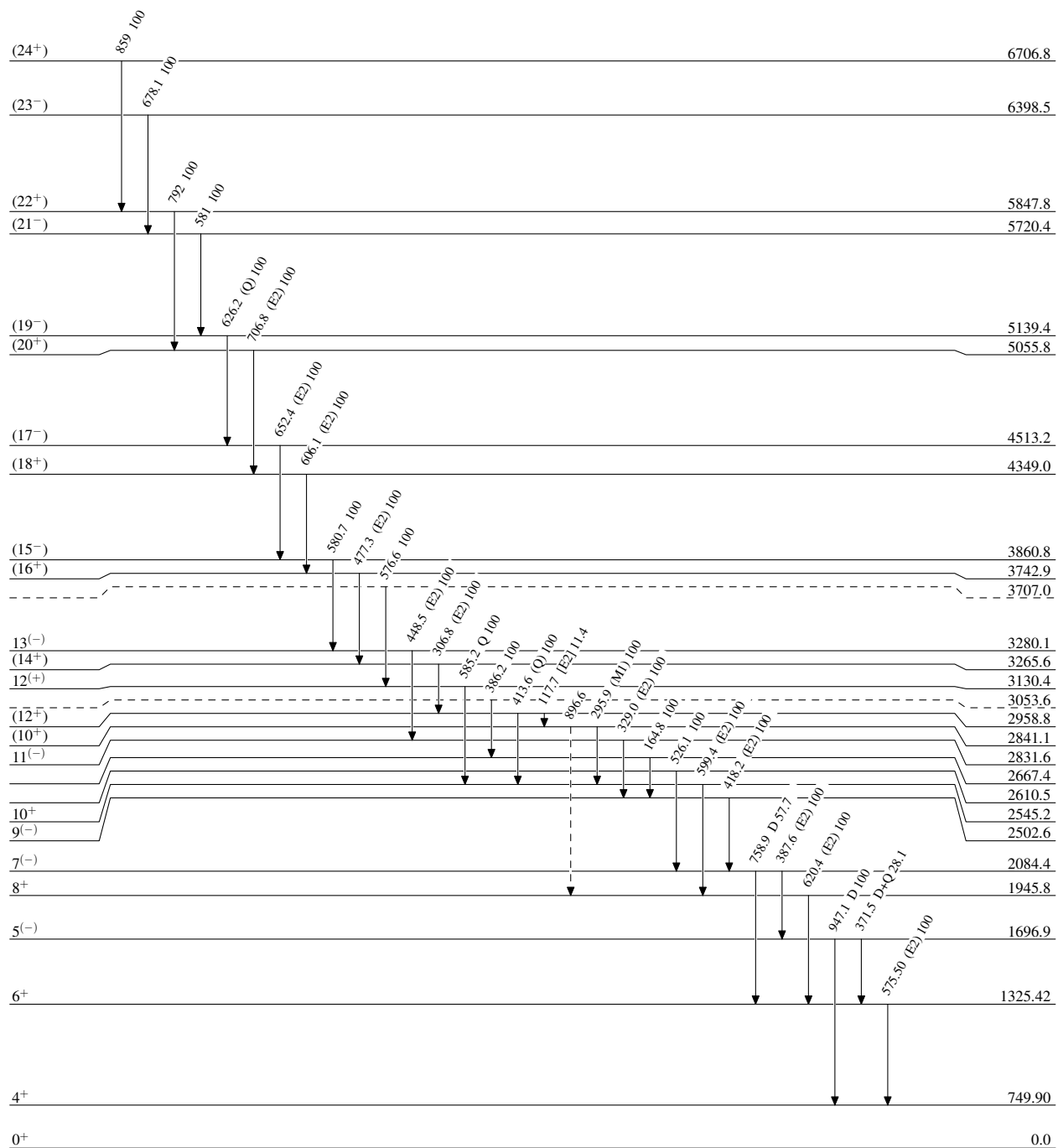
[&] Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

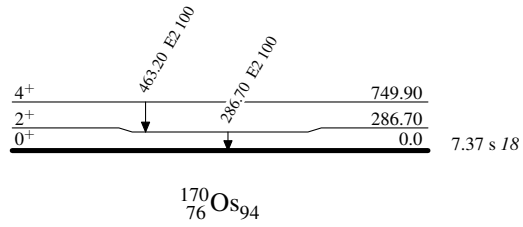
-----▶ γ Decay (Uncertain)

7.37 s 18

 $^{170}_{76}\text{Os}_{94}$

Adopted Levels, Gammas**Level Scheme (continued)**

Intensities: Relative photon branching from each level



Adopted Levels, Gammas