Coulomb excitation 1997Br18,1983Jh01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	T. D. Johnson, Balraj Singh	NDS 142, 1 (2017)	15-Apr-2017

1997Br18: E(α)=15 MeV; 81.14% enriched ^{189}Os of thickness 20 mg/cm^2; gammas measured with germanium detectors at 125° and 235° with another monitor detector at 30°. Levels, J^{π}'s and B(E2) values determined by normalizing to the neighboring 2^+ to 0^+ transitions intensities of ^{188}Os and ^{192}Os.

1983Jh01: E(^{16}O)=56 MeV, gammas measured in coincidence with backscattered ^{16}O ions. Eγ values measured at 0° subtending large solid angle.

1967Hr01: measured B(E2) for 219 and 233 levels.

1963Mc18, 1961Re02: measured ce, deduced B(E2) for low-lying levels.

^{189}Os Levels

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$[@]	Comments
0.0	3/2$^-$		
30.9 *4*	9/2$^-$		
36.3 *5*	1/2$^-$		
69.6 *4*	5/2$^-$	1.5 ns *3*	B(E2)↑=1.2 *2* B(E2)↑: From 1961Re02. Other: 0.63 (1963Mc18). E(level): No γ transitions measured from this level. Only conversion electrons measured.
95.3 *3*	3/2$^-$	0.10 ns *2*	B(E2)↑=0.200 *18* (1997Br18) B(E2)↑: other: 0.20 (1963Mc18).
216.5 *4*	7/2$^-$	0.41 ns *2*	B(E2)↑=0.292 *12* (1997Br18)
219.4 *3*	7/2$^-$	0.260 ns *11*	B(E2)↑=0.526 *20* (1997Br18) B(E2)↑: others: 0.67 *10* (1967Hr01) assuming B(E2,0$^+$ to 2$^+$)=2.30 for ^{190}Os (1989Ra16 evaluation); 1.10 (1963Mc18) including contribution from 216 level.
233.7 *3*	5/2$^-$	0.27 ns *+7−4*	B(E2)↑=0.111 *5* (1997Br18) B(E2)↑: other: 0.07 2 (1967Hr01) assuming B(E2,0$^+$ to 2$^+$)=2.30 for ^{190}Os (1989Ra16).
276.0 *4*	5/2$^-$	0.16 ns *4*	B(E2)↑=0.017 *3* (1997Br18)
350.1 *5*	(9/2$^-$)[#]		
365.9 *4*	5/2$^-$,7/2$^-$		
499.9 *5*	1/2$^-$,3/2$^-$[#]		
532.2 *5*			
557.7 *4*	3/2$^-$[#]		
594.9 *5*	(11/2$^-$)[#]		
630.6 *4*	(9/2$^-$)[#]		
634.2 *5*			
667.4 *5*			
735.5 *5*	1/2$^-$,3/2$^-$[#]		
794.4 *5*			
817.0 *10*	5/2$^-$,7/2$^-$[#]		

[†] Deduced from a least-square fit to γ-energies, 0.5 keV precision assumed for those γ-energies from only 1997Br18.

[‡] From 1997Br18, except as noted.

[#] From Adopted Levels.

[@] From B(E2) and adopted branchings.

Coulomb excitation 1997Br18,1983Jh01 (continued)

$\gamma(^{189}Os)$

E_γ[†]	I_γ[#@]	E_i(level)	J_i^π	E_f	J_f^π	Comments
59.1[‡]		95.3	3/2$^-$	36.3	1/2$^-$	
95.3[‡]		95.3	3/2$^-$	0.0	3/2$^-$	
124.2[‡]		219.4	7/2$^-$	95.3	3/2$^-$	
138.6 *5*	10	233.7	5/2$^-$	95.3	3/2$^-$	
146.7[d#] *5*	68	216.5	7/2$^-$	69.6	5/2$^-$	
146.7[d#f] *4*		365.9	5/2$^-$,7/2$^-$	219.4	7/2$^-$	
149.5 *5*	109	219.4	7/2$^-$	69.6	5/2$^-$	
163.8[ef] *5*	30[e&]	233.7	5/2$^-$	69.6	5/2$^-$	
163.8[e] *5*	[e&]	794.4		630.6	(9/2$^-$)	
185.5 *5*	160	216.5	7/2$^-$	30.9	9/2$^-$	
188.6 *5*	87	219.4	7/2$^-$	30.9	9/2$^-$	
197.2 *5*	114	233.7	5/2$^-$	36.3	1/2$^-$	
216.5 *5*	581	216.5	7/2$^-$	0.0	3/2$^-$	
219.2 *5*	1318	219.4	7/2$^-$	0.0	3/2$^-$	
233.5 *5*	166	233.7	5/2$^-$	0.0	3/2$^-$	
245.0[e] *5*	≈23[ea]	276.0	5/2$^-$	30.9	9/2$^-$	
245.0[e] *5*	≈18[ea]	594.9	(11/2$^-$)	350.1	(9/2$^-$)	
270.6 *5*	6	365.9	5/2$^-$,7/2$^-$	95.3	3/2$^-$	
276.1 *5*	2	276.0	5/2$^-$	0.0	3/2$^-$	
280.8 *5*	≈35[b]	350.1	(9/2$^-$)	69.6	5/2$^-$	
280.8[f] *5*	≈18[b]	630.6	(9/2$^-$)	350.1	(9/2$^-$)	
296.5 *5*	20	365.9	5/2$^-$,7/2$^-$	69.6	5/2$^-$	
323.6 *5*	13	557.7	3/2$^-$	233.7	5/2$^-$	
[x]360.4[#] *5*	3					
[x]362.8[#] *5*	5					
365[‡] *1*		365.9	5/2$^-$,7/2$^-$	0.0	3/2$^-$	E_γ: As this has a lower precision than other measured γ transitions in 1997Br18, evaluators used 1 keV as the uncertainty in generating the level energies in the least squared fit calculation.
375.3 *5*	21	594.9	(11/2$^-$)	219.4	7/2$^-$	
378.3 *5*	14	594.9	(11/2$^-$)	216.5	7/2$^-$	
397.2 *5*	31	630.6	(9/2$^-$)	233.7	5/2$^-$	
[x]403.6[#] *5*	10					
410.9 *5*	27	630.6	(9/2$^-$)	219.4	7/2$^-$	
[x]416[#f] *1*						
428.5 *5*	12	794.4		365.9	5/2$^-$,7/2$^-$	
462.4 *5*	43	557.7	3/2$^-$	95.3	3/2$^-$	E_γ: Not in adopted gammas. In 1983Jh01, it is mentioned that a γ with this energy could be depopulating the 557.7 keV but this is not confirmed in (n,γ).
[x]470.0[#] *5*	32					
[x]481.0[#] *5*	7					
[x]496.0[#] *5*	6					
499.9 *5*	7	499.9	1/2$^-$,3/2$^-$	0.0	3/2$^-$	
532.2 *5*	24	532.2		0.0	3/2$^-$	
[x]550.7[#] *5*	9					
558.2[c] *5*	36[c]	557.7	3/2$^-$	0.0	3/2$^-$	E_γ: Not in adopted gammas. This was observed in 1983Jh01, but was not confirmed in (n,γ).
[x]565.7[#] *5*	3					
575[f] *1*	2	794.4		219.4	7/2$^-$	
[x]585.3[#] *5*	12					

Continued on next page (footnotes at end of table)

Coulomb excitation 1997Br18,1983Jh01 (continued)

$\gamma(^{189}Os)$ (continued)

E_γ[†]	I_γ[#@]	E_i(level)	J_i^π	E_f	J_f^π	E_γ[†]	I_γ[#@]	E_i(level)	J_i^π	E_f	J_f^π
597.9[f] *5*	7	667.4		69.6	$5/2^-$	667.4 *5*	49	667.4		0.0	$3/2^-$
[x]603.3[#] *5*	7					735.5 *5*	32	735.5	$1/2^-,3/2^-$	0.0	$3/2^-$
[x]628.0[#] *5*	5					817 *1*	7	817.0	$5/2^-,7/2^-$	0.0	$3/2^-$
634.2 *5*	7	634.2		0.0	$3/2^-$						

[†] Except as otherwise noted, Eγ are the values from 1983Jh01 as those from 1997Br18 agree very closely up to their highest level of 365 keV. but provide no uncertainties.
[‡] From 1997Br18, intensity not given.
[#] From 1983Jh01.
[@] Intensity for 146.7γ was divided using adopted γ branchings. Note that the deduced value is Iγ=115 for the 146.7γ from the 216 level, which is inconsistent with the experimental value from 1983Jh01.
[&] Divided using adopted γ branchings and mixing ratios. From adopted branchings Iγ(tot)=34 in 1983Jh01.
[a] Divided using adopted γ branchings, Iγ(tot)=41 (1983Jh01).
[b] Divided assuming intensity is balanced through the 350 level, Iγ(tot)=53 in 1983Jh01.
[c] Mixed with ^{190}Os γ (1983Jh01).
[d] Multiply placed.
[e] Multiply placed with intensity suitably divided.
[f] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

Coulomb excitation 1997Br18,1983Jh01

Level Scheme

Intensities: Relative I_γ

@ Multiply placed: intensity suitably divided

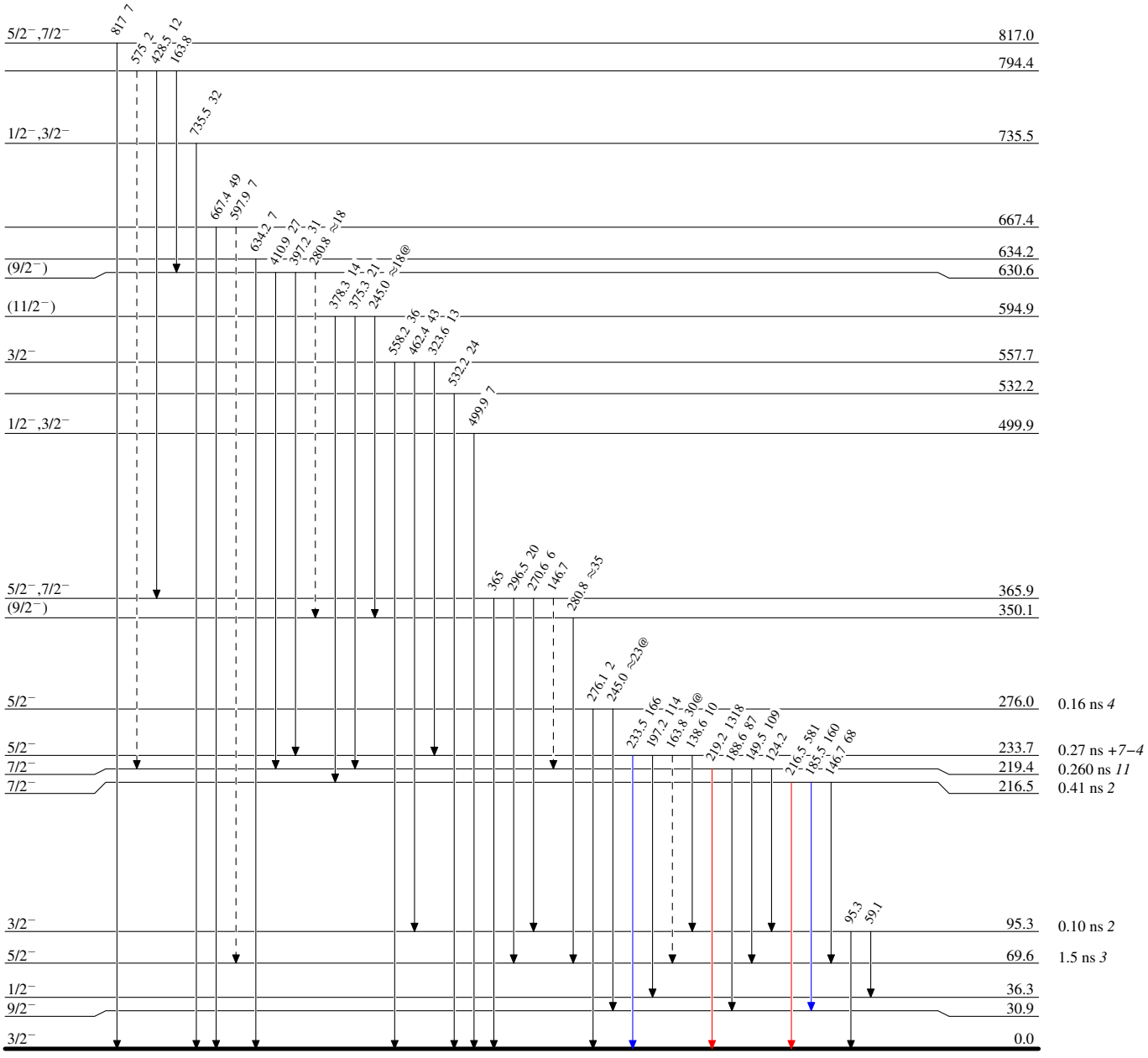
Legend

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

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

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

γ Decay (Uncertain)



$^{189}_{76}Os_{113}$