^{180}W(^{16}O,5nγ) 1999La06

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

1999La06: ^{180}W(^{16}O,5n), E=107 MeV, 95% enriched 150 μg/cm^2 target. Magnetic separator for reaction products, Si(Li) detector, intrinsic Ge detectors. Measured Eγ, Iγ, I(ce), $\gamma\gamma$, ce-γ coincidences. Deduced $T_{1/2}$, J^π, α(K,L,M). Also includes ^{176}Hf(^{20}Ne,5nγ), E=90 to 150 MeV, and tried ^{165}Ho(^{31}P,5nγ), ^{182}W(^{16}O,7nγ), E=132 MeV, in 1999La06.

^{191}Pb Levels

E(level)[†]	J^π[‡]	$T_{1/2}$[@]	Comments
55[&] *12*	13/2$^+$	2.18 min *8*	Additional information 1. E(level): from Adopted Levels. Authors of 1999La06 quote a calculated value of 148 keV, without any details. $T_{1/2}$: from Adopted Levels.
873.70[&] *5*	17/2$^+$[#]		
948.50[a] *9*	15/2$^+$		
1356.55[&] *7*	21/2$^+$[#]		
1425.05[a] *9*	19/2$^+$[#]		
1695.82 *10*	21/2$^-$		
1918.83[&] *11*	25/2$^+$[#]		
2137.82[a] *12*	23/2$^+$[#]		
2161.9 *6*	(25/2$^+$)		This level is not seen by 1999La06, who adopt it for their level scheme from 1998Fo02, along with the deexciting γ rays.
2272.72 *11*	(25/2$^-$)		
2346.7 *6*	(27/2$^+$)		
2473.12 *15*	(29/2$^-$)	15 ns *4*	
2495.9 *6*	(27/2$^-$,29/2$^-$)	17 ns *4*	
2550.53[&] *19*	29/2$^+$[#]		
2657.38[&] *24*	33/2$^+$[#]	0.15 μs *+10–5*	Configuration: ν $(i_{13/2})^{-3}$. $T_{1/2}$: From text in 1999La06. Also ≥0.1 μs in Fig. 3 (1999La06).

[†] From least-squares adjustment to the γ-ray energies. For total uncertainty, propagate 12 keV in quadrature, except for the isomeric state at 55 keV.
[‡] As in Fig. 3 of 1999La06, based on the multipolarities of the connecting transitions (from internal conversion coefficient measurements), band structures, and assumed orbital configurations.
[#] J^π values inferred from assumed stretched E2 character for the intraband transitions.
[@] From measurements reported in 1999La06 using a pulsed ^{16}O beam (2 ns bursts every 200 ns), except where noted.
[&] Band(A): 13/2$^+$ band.
[a] Band(B): 15/2$^+$ band.

γ(^{191}Pb)

Eγ	Iγ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[&]	Comments
(24.3)		2161.9	(25/2$^+$)	2137.82	23/2$^+$			This transition is adopted by authors of 1999La06 from (^{24}Mg,6nγ) (1998Fo02).
106.85[#] *15*	5.7 *14*	2657.38	33/2$^+$	2550.53	29/2$^+$	E2	4.77 *7*	α(K)=0.512 *7*; α(L)=3.17 *5*; α(M)=0.838 *13* α(N)=0.2114 *33*; α(O)=0.0377 *6*; α(P)=0.001504 *23* α(L1+L2)exp/α(L3)exp=1.15 *20*. B(E2) value of 48 e^{2}fm^4 *2* (1999La06).

Continued on next page (footnotes at end of table)

^{180}W(^{16}O,5nγ) 1999La06 (continued)

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

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[&]	Comments
149.20 *5*	63 *6*	2495.9	(27/2$^-$,29/2$^-$)	2346.7	(27/2$^+$)	E1	0.1613 *23*	α(K)exp=0.15 *3* α(K)=0.1300 *18*; α(L)=0.02401 *34*; α(M)=0.00564 *8* α(N)=0.001415 *20*; α(O)=0.000270 *4*; α(P)=2.244×10^{-5} *31* B(E1) value of 7.5×10^{-6} e^{2}fm^4 (1999La06).
184.80 *15*	51 *8*	2346.7	(27/2$^+$)	2161.9	(25/2$^+$)	M1	1.634 *23*	α(K)=1.334 *19*; α(L)=0.2297 *33*; α(M)=0.0538 *8* α(N)=0.01369 *19*; α(O)=0.00273 *4*; α(P)=0.000292 *4* α(K)exp<1.51 *18*, α(L1+L2)exp<0.32 *6*, α(M)exp>0.080 *22* (mixed with the 270.80 keV transition K line), α(K)/α(L)exp=5.9 *14*, α(L)/α(M)exp>3.5 *9*.
200.40 *10*	50 *4*	2473.12	(29/2$^-$)	2272.72	(25/2$^-$)	E2	0.425 *6*	α(K)exp=0.163 *23* α(K)=0.1676 *24*; α(L)=0.1920 *27*; α(M)=0.0502 *7* α(N)=0.01266 *18*; α(O)=0.002290 *32*; α(P)=0.0001151 *16* α(L1+L2)exp=0.16 *3*, α(L3)exp=0.076 *24*, α(M)exp=0.08 *3*.
219.25 *15*	19 *3*	2137.82	23/2$^+$	1918.83	25/2$^+$	M1	1.013 *14*	α(K)exp=0.73 *21* α(L12)exp=0.08 *3* α(K)=0.827 *12*; α(L)=0.1421 *20*; α(M)=0.0333 *5* α(N)=0.00846 *12*; α(O)=0.001687 *24*; α(P)=0.0001803 *25*
243.0 *6*		2161.9	(25/2$^+$)	1918.83	25/2$^+$			This transition is adopted by authors of 1999La06 from ^{173}Yb(^{24}Mg,6nγ) (1998Fo02).
270.80 *10*	19 *3*	1695.82	21/2$^-$	1425.05	19/2$^+$	(E1)	0.0375 *5*	α(K)exp=0.039 *4* α(K)=0.0307 *4*; α(L)=0.00525 *7*; α(M)=0.001226 *17* α(N)=0.000309 *4*; α(O)=5.98×10^{-5} *8*; α(P)=5.47×10^{-6} *8*
339.25 *10*	29 *4*	1695.82	21/2$^-$	1356.55	21/2$^+$	(E1)	0.02227 *31*	α(K)exp=0.025 *4* α(K)=0.01828 *26*; α(L)=0.00305 *4*; α(M)=0.000712 *10* α(N)=0.0001794 *25*; α(O)=3.50×10^{-5} *5*; α(P)=3.29×10^{-6} *5*
[x]402.40 *15*	11 *4*					(M1)	0.1926 *27*	α(K)=0.1577 *22*; α(L)=0.0267 *4*; α(M)=0.00625 *9* α(N)=0.001588 *22*; α(O)=0.000317 *4*; α(P)=3.39×10^{-5} *5*
476.55[@] *10*	16.0 *17*	1425.05	19/2$^+$	948.50	15/2$^+$	E2	0.0330 *5*	α(K)exp=0.026 *3*

Continued on next page (footnotes at end of table)

^{180}W(^{16}O,5nγ) 1999La06 (continued)

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

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[&]	Comments
								α(K)=0.02300 *32*; α(L)=0.00755 *11*; α(M)=0.001882 *26* α(N)=0.000476 *7*; α(O)=8.98×10^{-5} *13*; α(P)=6.86×10^{-6} *10*
482.85[#] *5*	79 *5*	1356.55	21/2$^+$	873.70	17/2$^+$	E2	0.0320 *4*	α(K)exp=0.0223 *17* α(L)exp=0.011 *3* α(K)=0.02237 *31*; α(L)=0.00724 *10*; α(M)=0.001804 *25* α(N)=0.000457 *6*; α(O)=8.61×10^{-5} *12*; α(P)=6.62×10^{-6} *9*
551.30 *15*	11.1 *20*	1425.05	19/2$^+$	873.70	17/2$^+$	(M1)	0.0834 *12*	α(K)=0.0684 *10*; α(L)=0.01149 *16*; α(M)=0.00269 *4* α(N)=0.000682 *10*; α(O)=0.0001361 *19*; α(P)=1.459×10^{-5} *20*
562.40[#] *10*	42 *4*	1918.83	25/2$^+$	1356.55	21/2$^+$	E2	0.02228 *31*	α(K)exp=0.013 *5* α(K)=0.01626 *23*; α(L)=0.00456 *6*; α(M)=0.001123 *16* α(N)=0.000284 *4*; α(O)=5.41×10^{-5} *8*; α(P)=4.43×10^{-6} *6*
576.90 *5*	64 *6*	2272.72	(25/2$^-$)	1695.82	21/2$^-$	(E2)	0.02102 *29*	α(K)exp=0.011 *4* α(K)=0.01543 *22*; α(L)=0.00423 *6*; α(M)=0.001041 *15* α(N)=0.000264 *4*; α(O)=5.02×10^{-5} *7*; α(P)=4.15×10^{-6} *6*
631.70[#] *15*	6.9 *12*	2550.53	29/2$^+$	1918.83	25/2$^+$	(E2)	0.01716 *24*	α(K)=0.01284 *18*; α(L)=0.00327 *5*; α(M)=0.000800 *11* α(N)=0.0002027 *28*; α(O)=3.88×10^{-5} *5*; α(P)=3.31×10^{-6} *5*
712.60[@] *20*	20 *6*	2137.82	23/2$^+$	1425.05	19/2$^+$	(E2)	0.01323 *19*	α(K)=0.01012 *14*; α(L)=0.002364 *33*; α(M)=0.000574 *8* α(N)=0.0001453 *20*; α(O)=2.80×10^{-5} *4*; α(P)=2.484×10^{-6} *35*
781.10 *15*	9.2 *19*	2137.82	23/2$^+$	1356.55	21/2$^+$	(M1)	0.0336 *5*	α(K)=0.0276 *4*; α(L)=0.00459 *6*; α(M)=0.001071 *15* α(N)=0.000272 *4*; α(O)=5.43×10^{-5} *8*; α(P)=5.83×10^{-6} *8*
818.70[#] *5*	100 *4*	873.70	17/2$^+$	55	13/2$^+$	(E2)	0.00992 *14*	α(K)=0.00774 *11*; α(L)=0.001660 *23*; α(M)=0.000399 *6* α(N)=0.0001012 *14*; α(O)=1.962×10^{-5} *27*; α(P)=1.810×10^{-6} *25*
893.50 *10*	24 *3*	948.50	15/2$^+$	55	13/2$^+$	(M1)	0.02375 *33*	α(K)=0.01953 *27*; α(L)=0.00323 *5*; α(M)=0.000754 *11* α(N)=0.0001915 *27*; α(O)=3.82×10^{-5} *5*; α(P)=4.11×10^{-6} *6*

[†] In 1999La06, Iγ reported with restect to the Iγ(818.7)=1000 *38*. The evaluator scales all down by a factor, i.e. Iγ(818.7)=100 *4*.
[‡] Proposed by authors of 1999La06, on the basis of measured conversion electron data, listed in the comments column when available.
[#] Transition connecting levels in the 13/2$^+$ band.
[@] Transition connecting levels in the 15/2$^+$ band.

Continued on next page (footnotes at end of table)

^{180}W(^{16}O,5nγ) 1999La06 (continued)

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

& Additional information 2.
x γ ray not placed in level scheme.

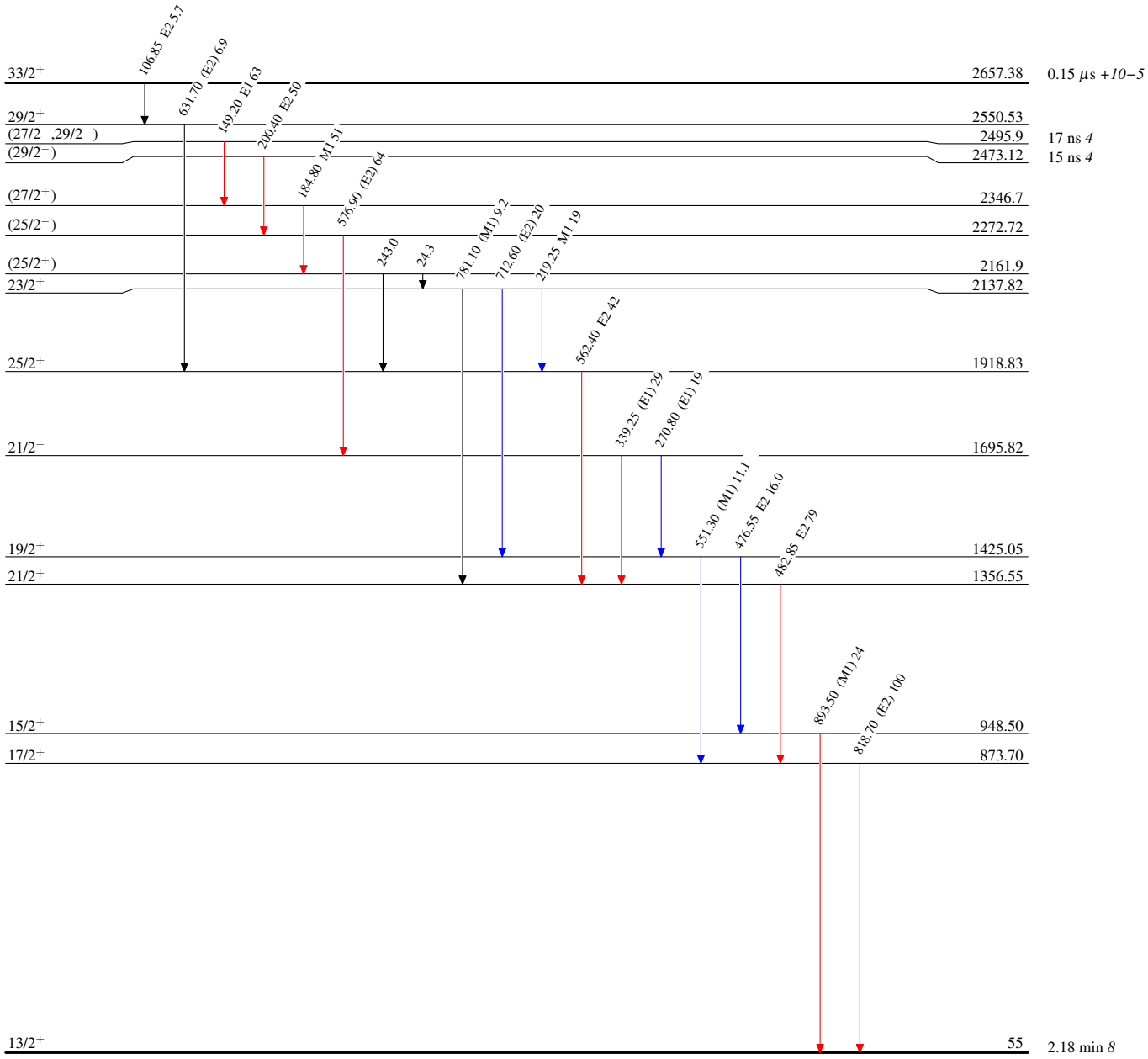
$^{180}W(^{16}O,5n\gamma)$ **1999La06**

Level Scheme

Intensities: Relative I_γ

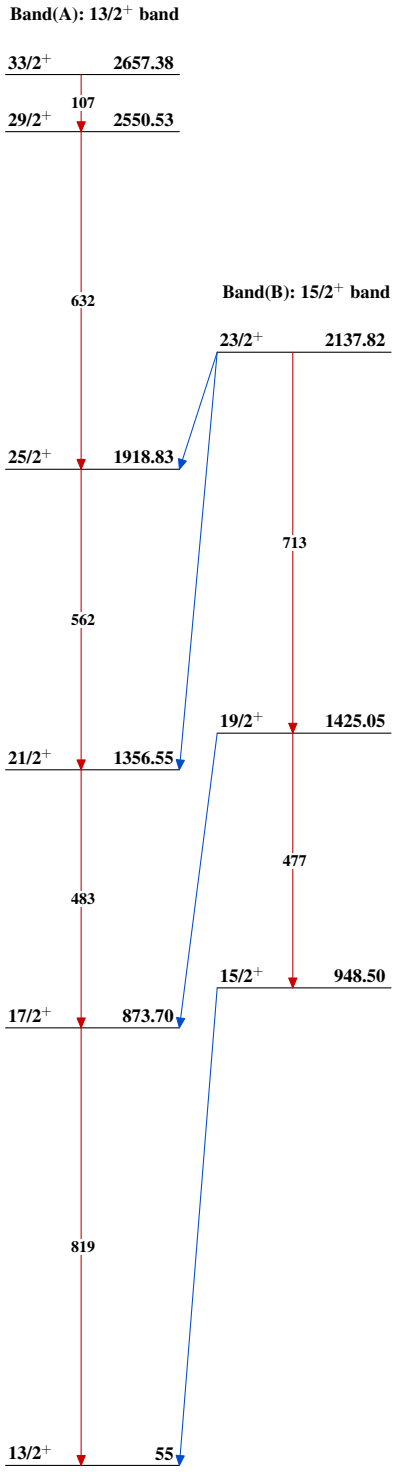
Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)



$^{191}_{82}Pb_{109}$

$^{180}W(^{16}O,5n\gamma)$ 1999La06



$^{191}_{82}Pb_{109}$