$^{182}W(^{16}O,6n\gamma)$, $Gd(^{40}Ar,xn\gamma)$ 1991La07,1979Ro06

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 113, 1871 (2012)	15-Jun-2012

Others: 1982AlZY, 1983St15, 1983St16, 1984Ma37, 1985Ma34, 1985St16, 1986PeZY.
1979Ro06: $^{156}Gd(^{40}Ar,4n\gamma)$, $E(^{40}Ar)$=190 MeV; Gd targets enriched to 93.58% in ^{156}Gd; measured Eγ, Iγ (Ge(Li), FWHM=2.7 keV at 1332 keV), $\gamma\gamma$, Xγ coin (4 dimensional (energy-time)); used $^{182}W(^{16}O,6n\gamma)$, E=132 MeV, to confirm assignments to ^{192}Pb. Used beam pulsing to look for lifetimes≥160 ns.
1983St15, 1983St16: $^{156}Gd(^{40}Ar,4n\gamma)$, $E(^{40}Ar)$=185 MeV; Gd targets enriched to 94% in ^{156}Gd; measured γ(t) and differential perturbed angular distributions; deduced $T_{1/2}$ (1983St15) and g (1983St15, 1983St16) for (12^+) isomer and $T_{1/2}$ (1983St16) for 10^+ isomer.
1985St16: $^{156}Gd(^{40}Ar,4n\gamma)$, $E(^{40}Ar)$=185 MeV; $^{160}Gd(^{36}Ar,4n\gamma)$, $E(^{36}Ar)$=175 MeV; measured γ(t); deduced $T_{1/2}$ for 10^+ and 12^+ isomers.
1991La07: $^{182}W(^{16}O,6n\gamma)$, E=109 MeV; both thick and thin >90% ^{182}W targets; measured Ice (Si(Li) detector), Eγ, Iγ, ce-γ coin, $\gamma\gamma$ coin, $\gamma\gamma$(t), beam-γ(t); deduced conversion coefficients, $T_{1/2}$ for 10^+ and (10^-,11^-) isomers.

The level scheme and all data are from 1991La07, unless noted to the contrary.

^{192}Pb Levels

E(level)†	J$^\pi$‡	$T_{1/2}$	Comments
0.0#	0^+		
853.9# *2*	2^+		
1355.7# *3*	4^+		
1860.0 *4*	5^-		
1921.1# *4*	6^+		
2303.8# *5*	(8^+)		
2323.3& *5*	7^-		a significant intensity imbalance (viz., 54 *12*) exists at this level.
2507.4& *6*	(8^-)		
2514.4& *5*	9^-		
2520.6@ *6*	8^+		
2581.1@ *6*	10^+	93 ns *11*	%IT=100 $T_{1/2}$: weighted average of 100 ns *15* from γ(t) (1983St16) and 85 ns *15* from $\gamma\gamma$(t) (1991La07). Much lower than adopted value.
2625.1@ *12*	12^+	1.10 μs *5*	%IT=100 g=−0.173 *2* (1983St15) g-factor: from TDPAD. $T_{1/2}$: from γ(t) (1985St16). Others: 1.07 μs *10* (1983St15), 0.88 μs *20* (1979Ro06).
2743.6 *6*	(10^-,11^-)	95 ns *15*	%IT=100 $T_{1/2}$: from beam-γ(t) (1991La07); inconsistent with adopted value.

† From least-squares fit to Eγ.
‡ Authors' values (1991La07), based on coincidence data, γ-ray multipolarities, and systematics of even-mass Pb nuclei. See ^{192}Pb Adopted Levels for evaluator's assignments.
# Band(A): π=+,α=0 low-J yrast states. J=2,4,6 states probably have significant admixture of deformed two quasiproton intruder configurations (1991La07).
@ Band(B): Configuration=$(\nu\ i_{13/2})^{-2}$ (1991La07).
& Band(C): π=−, 2-quasineutron states. $((\nu\ i_{13/2})(\nu\ p_{3/2}$ or $f_{5/2}$ or $f_{7/2}))$ states (1991La07).

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γ(^{192}Pb)

E_γ†	I_γ†	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	δ	α#	Comments
(7.0)		2514.4	9⁻	2507.4	(8⁻)				Ti(7.0)≤53 from intensity balance at the 2507 level. E_γ: from level energy difference.
44.0 *10*		2625.1	12⁺	2581.1	10⁺	(E2)		3.0×10^2 *4*	Mult.: 1991La07 report that the 44-keV transition is a fully converted E2 transition, but present no experimental data.
60.6 *6*	≤0.69	2581.1	10⁺	2520.6	8⁺	(E2)		63 *4*	I_γ: I(γ+ce)≤41 *4* from I(γ+ce) balance at 2521 level, so Iγ≤0.63 *6* if mult is E2. I_γ: Ti(61γ)/Ti(854γ)≤0.34 in (^{40}Ar,4nγ) (1979Ro06), from intensity balance at 2521 level.
66.7 *6*		2581.1	10⁺	2514.4	9⁻	E1		0.272 *8*	I(γ+ce)≤121 from I(γ+ce) balance at 2514 level. Mult.: (L1+L2)/L3=3.0 *5* (1991La07). Also, 1979Ro06 report that E1 is the only mult compatible with their observed photon intensities.
162.5 *3*	47 *5*	2743.6	(10⁻,11⁻)	2581.1	10⁺	E1		0.1304	α(K)exp=0.074 *6* (1991La07); α(L)exp=0.020 *4* (1991La07)
184.1 *4*	24 *4*	2507.4	(8⁻)	2323.3	7⁻	M1+E2	0.89 *15*	1.17 *10*	α(K)exp=0.84 *9* (1991La07) α(L1)exp+α(L2)exp=0.112 *19* (1991La07). δ: from α(K)exp.
191.0 *3*	35 *4*	2514.4	9⁻	2323.3	7⁻	E2		0.503	α(K)exp=0.162 *20* (1991La07); α(L)exp=0.30 *5* (1991La07) I_γ: Ti(191γ)/Ti(854γ)=0.50 *15* in (^{40}Ar,4nγ) (1979Ro06).
210.6 *4*	10.3 *15*	2514.4	9⁻	2303.8	(8⁺)	E1+M2	0.28 *4*	0.45 *11*	α(K)exp=0.34 *7* (1991La07) δ: from α(K)exp.
277.3 *6*	2.3 *5*	2581.1	10⁺	2303.8	(8⁺)	E2		0.1466 *23*	α(K)exp=0.055 *9* (1991La07) An uncertainty in α(K)exp of 0.092, given in 1991La07, is presumed to be a misprint of 0.009.
382.8 *4*	16.8 *20*	2303.8	(8⁺)	1921.1	6⁺	E2		0.0579	α(K)exp=0.0643 *10* (1991La07)
402.2 *5*	9.4 *10*	2323.3	7⁻	1921.1	6⁺	(E1)		0.01523	α(K)exp=0.0253 *10* (1991La07)
439.7 *3*	7.9 *10*	2743.6	(10⁻,11⁻)	2303.8	(8⁺)	(E3)		0.1489	α(K)exp=0.08 *5* (1991La07); α(L3)exp=0.048 *12* (1991La07) α(L1)exp+α(L2)exp=0.114 *15* (1991La07). Mult.: α(K)exp favors E3, but α(K)exp, α(L1)exp+α(L2)exp and α(L3)exp are mutually inconsistent. Note that B(E3)(W.u.) for this transition exceeds RUL.

Continued on next page (footnotes at end of table)

^{182}W(^{16}O,6nγ), Gd(^{40}Ar,xnγ) 1991La07,1979Ro06 (continued)

γ(^{192}Pb) (continued)

E_γ †	I_γ †	E_i(level)	J^π_i	E_f	J^π_f	Mult. ‡	α #	Comments
463.3 *3*	41 *3*	2323.3	7⁻	1860.0	5⁻	E2	0.0354	α(K)exp=0.037 *6* (1991La07) α(L1)exp+α(L2)exp=0.0085 *17* (1991La07). I_γ: Ti(463γ)/Ti(854γ)=0.45 *15* in (^{40}Ar,4nγ) (1979Ro06).
501.8 *2*	98 *6*	1355.7	4⁺	853.9	2⁺	E2	0.0291	α(K)exp=0.0318 *22* (1991La07) α(L1)exp+α(L2)exp=0.0052 *15* (1991La07). I_γ: Ti(502γ)/Ti(854γ)=0.90 *20* in (^{40}Ar,4nγ) (1979Ro06).
504.3 *3*	43 *3*	1860.0	5⁻	1355.7	4⁺	E1		α(K)exp=0.0080 *20* (1991La07) α(L1)exp+α(L2)exp=0.004 *3* (1991La07). I_γ: Ti(504γ)/Ti(854γ)=0.50 *20* in (^{40}Ar,4nγ) (1979Ro06).
565.4 *3*	64 *8*	1921.1	6⁺	1355.7	4⁺	E2	0.0220	α(K)exp=0.021 *2* (1991La07) α(L1)exp+α(L2)exp=0.0051 *10* (1991La07). I_γ: Ti(565γ)/Ti(854γ)=0.50 *10* in (^{40}Ar,4nγ) (1979Ro06).
599.5 *4*	40 *4*	2520.6	8⁺	1921.1	6⁺	E2	0.0193	α(K)exp=0.0167 *18* (1991La07); α(L3)exp=0.0010 *8* (1991La07) α(L1)exp+α(L2)exp=0.0016 *8* (1991La07). I_γ: Ti(600γ)/Ti(854γ)=0.34 *10* in (^{40}Ar,4nγ) (1979Ro06).
853.9 *2*	100	853.9	2⁺	0.0	0⁺	E2		α(K)exp=0.0094 *7* (1991La07) α(L1)exp+α(L2)exp=0.0021 *4* (1991La07).

† From (^{16}O,6nγ) at E=109 MeV (1991La07); Iγ is relative to I(854γ)=100. 1979Ro06 (in fig. 6) indicate I(γ+ce) for ^{156}Gd(^{40}Ar,4nγ), E(^{40}Ar)=190 MeV; this information is given in comments on the relevant gammas.

‡ From measured conversion electron data of 1991La07, unless noted otherwise.

\# 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.

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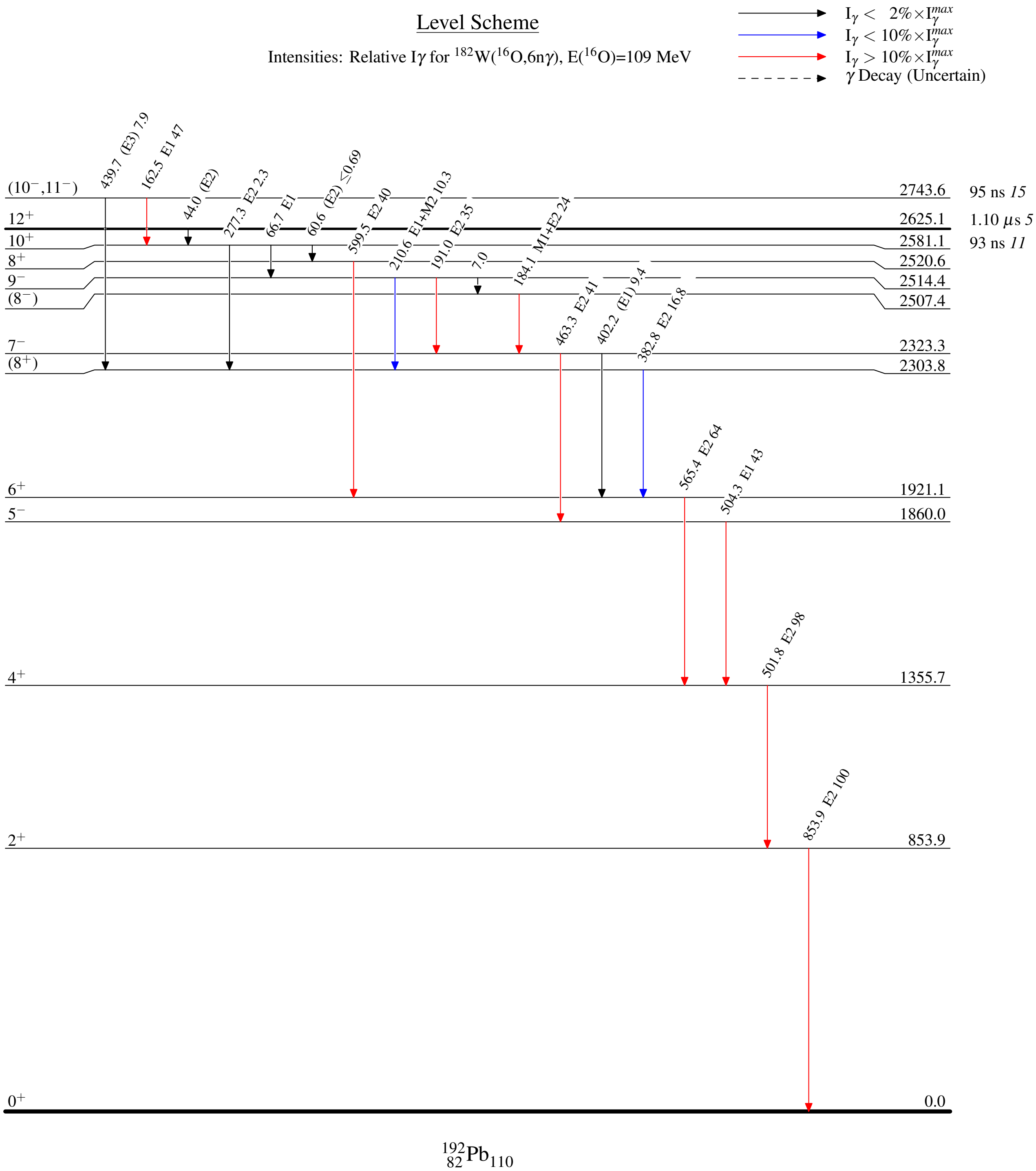
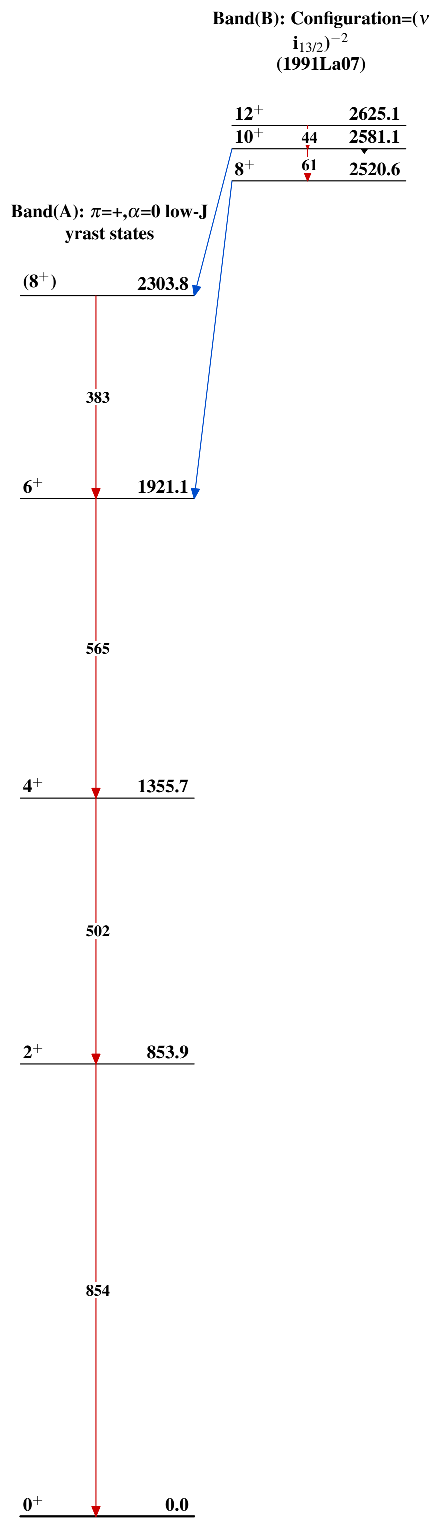
Level Scheme

Intensities: Relative Iγ for $^{182}W(^{16}O,6n\gamma)$, E(^{16}O)=109 MeV

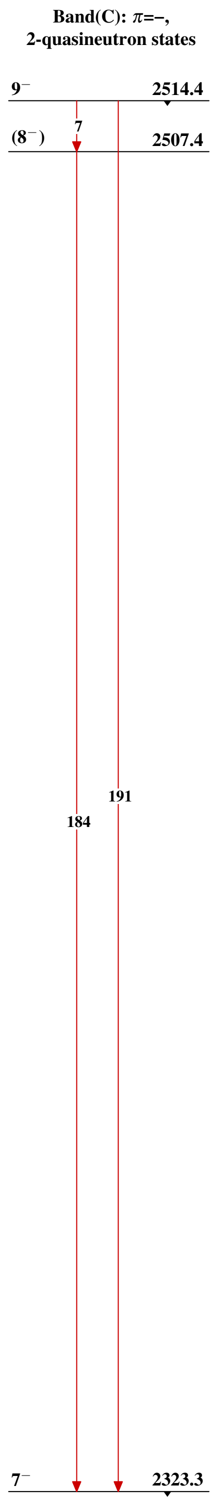


$^{182}W(^{16}O,6n\gamma)$, $Gd(^{40}Ar,xn\gamma)$ 1991La07,1979Ro06



$^{192}_{82}Pb_{110}$

$^{182}W(^{16}O,6n\gamma)$, $Gd(^{40}Ar,xn\gamma)$ 1991La07,1979Ro06 (continued)



$^{192}_{82}Pb_{110}$