^{206}Pb(^{16}O,4nγ),^{209}Bi(^{14}N,5nγ) 1982Ch29,1985Bo32

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	10-Jun-2021

1982Ch29: ^{206}Pb(^{16}O,4nγ) E=92 MeV. Measured Eγ, Iγ, $\alpha\gamma$ coin.
1985Bo32: ^{209}Bi(^{14}N,5nγ) E=91 MeV. Measured ce, (α)ce coin, K/L ratios.

^{218}Th Levels

E(level)	J$^\pi$‡	$T_{1/2}$	Comments
0.0#	0^+		
689.6# *6*	2^+		
1080.1?† *12*			
1194.2# *9*	4^+		
1563.9# *11*	6^+		
1765.8# *12*	8^+	1.2 ns *2*	$T_{1/2}$: 1.3 ns *4* (690ce(t)); 1.3 ns *3* (504ce(t)); 1.0 ns *2* (370ce(t)); 1.3 ns *1* (202ce(t)) (1985Bo32).
2104.0# *14*	10^+	0.25 ns *15*	$T_{1/2}$: 338ce(t) (1985Bo32).
2277.3?† *15*			
2691.8?† *18*			

† Tentative level added by evaluator, based on level scheme proposed in 2020Od01.
‡ From E2 cascade in g.s. yrast cascade. The assignments are the same in Adopted Levels.
# Band(A): Yrast band.

γ(^{218}Th)

E$_\gamma$†	I$_\gamma$‡	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.#	α[b]	Comments
x146.9@ *10*	4 *2*							This γ ray may correspond to 146.7 *5* γ from 3306.7, (16^+) level in 2020Od01, however, expected 473.7γ from a 3160.0, (15^-) level in 2020Od01 not reported by 1982Ch29 and/or 1985Bo32.
173.3@ac *6*	44 *4*	2277.3?		2104.0	10^+			This γ ray is considered by evaluator as corresponding to 173.1 *4* γ from 2272.6, (11^-) level in 2020Od01.
201.9 *6*	37 *4*	1765.8	8^+	1563.9	6^+	E2	0.636 *12*	K/L=0.45 (1985Bo32) α(K)=0.1558 *24*; α(L)=0.352 *7* I(ce)=300 *26* (1985Bo32).
338.2 *6*	57 *8*	2104.0	10^+	1765.8	8^+	E2	0.1183 *18*	K/L=1.0 *3* (1985Bo32) α(K)=0.0575 *9*; α(L)=0.0448 *7* I(ce)=150 *30* (1985Bo32).
x355.0&						D	0.28 *25*	K/L=7 *3* (1985Bo32) K/L(theory)=5.45 *12* for E1, 5.33 *12* for M1, and 1.39 *3* for E2. I(ce)=26 *21* (1985Bo32). I$_\gamma$: I(γ+ce)(355γ)/I(γ+ce)(689.6γ)<1.0 (1985Bo32). As stated by 2020Od01, no γ ray near this energy was observed.
369.7 *6*	80 *9*	1563.9	6^+	1194.2	4^+	E2	0.0921	K/L=1.5 (1985Bo32) α(K)=0.0483 *7*; α(L)=0.0324 *5* I(ce)=81 *26* (1985Bo32).

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γ(^{218}Th) (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [#]	α [b]	Comments
390.5 [@ac] *10*	19 *6*	1080.1?		689.6	2^+			This γ ray is considered by evaluator as corresponding to 388.9 *6* γ from 1078.0, (3^-) level in 2020Od01.
414.5 [@ac] *10*	25 *8*	2691.8?		2277.3?				This γ ray is considered by evaluator as corresponding to 413.7 *4* γ from 2686.3, (13^-) level in 2020Od01.
504.6 *6*	98 *15*	1194.2	4^+	689.6	2^+	E2	0.0418	K/L=2.5 *5* (1985Bo32) α(K)=0.0265 *4*; α(L)=0.01134 *17* I(ce)=21 *5* (1985Bo32).
689.6 *6*	100 *17*	689.6	2^+	0.0	0^+	E2	0.0209	K/L=4 *1* (1985Bo32) α(K)=0.01484 *21*; α(L)=0.00453 *7* I(ce)=16 *5* (1985Bo32). Mult.: E2 or M2 from measured K/L ratio; M2 is highly unlikely as there is no evidence for long lifetime of 689.6 level.

[†] Average of values from 1982Ch29 (γ data) and 1985Bo32 (ce data), unless otherwise stated.
[‡] From 1982Ch29. Conversion electron intensities are available from 1985Bo32.
[#] From K/L measurements by 1985Bo32. The K/L values listed here have been read (by evaluator) from Fig. 4 of 1985Bo32.
[@] Observed only by 1982Ch29.
[&] Observed only by 1985Bo32.
[a] Tentative placement by evaluator, based on level scheme proposed in 2020Od01.
[b] 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.
[c] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

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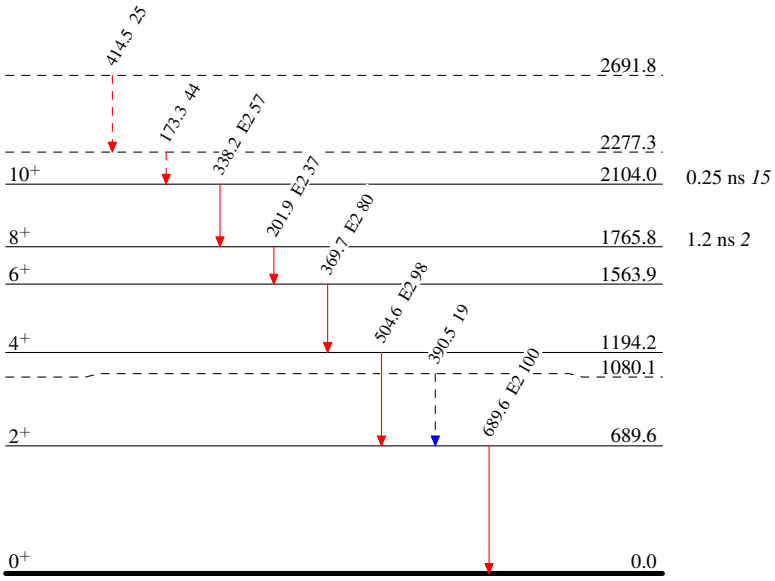
Level Scheme

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)



$^{218}_{90}Th_{128}$

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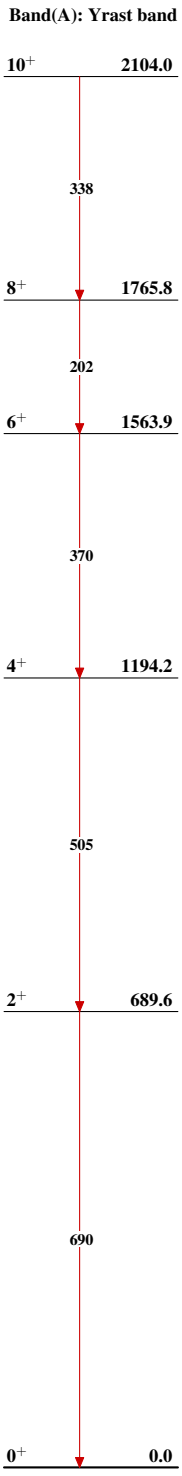

$^{218}_{90}Th_{128}$