^{254}No IT decay (184 μs):lbnl 2010Cl01

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 156, 1 (2019)	31-Jan-2019

Parent: ^{254}No: E=2929.7 *21*; J^π=(16$^+$); $T_{1/2}$=184 μs *3*; %IT decay=100.0

2010Cl01: ^{208}Pb(^{48}Ca,2nγ),E=221 MeV. The ^{48}Ca beam obtained from the 88-Inch Cyclotron of LBNL. Target=isotopically enriched ^{208}Pb, two ≈0.4 μg/cm^2 thick foils on a 35 μg/cm^2 carbon backing. The evaporated residues were separated using BGS and passed through multiwire proportional counter (MWPC) before being implanted in a 1 mm thick 16 by 16 double-sided silicon strip detector (DSSD) with an active area of 5 by 5 cm. A single, four-fold segmented HPGe Clover detector mounted behind the DSSD was used for γ detection. Measured Eγ, Iγ, ce, (recoils)γ-coin, (recoils)(ce)-coin, γ(ce)(t), γ(ce)(ce)(t), Eα, Iα, half-life of isomer.

^{254}No Levels

E(level)[†]	J^π[‡]	$T_{1/2}$	Comments
0[#]	0$^+$	51.2 s *4*	$T_{1/2}$: from Adopted Levels.
44[#] *1*	2$^+$		
146[#] *1*	4$^+$		
305[#] *2*	6$^+$		
519[#] *2*	8$^+$		
988.0[@] *13*	(3$^+$)		Configuration=π1/2[521]⊗π7/2[514],K^π=3$^+$.
1034.0[@] *17*	(4$^+$)		
1091.9[@] *15*	(5$^+$)		
1162.2[@] *16*	(6$^+$)		
1244.5[@] *16*	(7$^+$)		
1296.7[&] *17*	(8$^-$)	265 ms *3*	E(level): 1297 keV *2* (2010Cl01). $T_{1/2}$: from Adopted Levels. 2010Cl01 measured 263 ms *2* from recoil-ce(t). Proposed configurations=π9/2[624]⊗π7/2[514], K^π=8$^-$ (2010He10,2006Ta19,2006He19); ν7/2[613]⊗ν9/2[734], K^π=8$^-$ (2010Cl01). However, 2010He10 and 2006He19 suggested that long half-life of this isomer may be due to contribution from 2-neutron configurations of ν7/2[624]⊗ν9/2[734] and ν7/2[613]⊗ν9/2[734], K^π=8$^-$.
1408.1[&] *17*	(9$^-$)		
1531.3[&] *18*	(10$^-$)		
2013.2[a] *18*	(10$^+$)		
2146.6[a] *18*	(11$^+$)		
2291.6[a] *21*	(12$^+$)		
2448.5[a] *21*	(13$^+$)		
2617.2[a] *21*	(14$^+$)		
2796.4[a] *21*	(15$^+$)		
2929.7 *21*	(16$^+$)	184 μs *3*	E(level): 2928 keV *3* (2010Cl01). $T_{1/2}$: from Adopted Levels. 2010Cl01 measured 184 μs *2* from recoil-ce(t) and recoil-ce-ce(t). π7/2[514]⊗π9/2[624]⊗ν7/2[613]⊗ν9/2[734], K$^\pi$=16$^+$ configuration is suggested by 2010Cl01.

[†] From least-squares fit to Eγ values, assuming 1 keV uncertainty for Eγ when not stated.

[‡] From 2010Cl01. Authors suggested that the assignments should be treated as tentative since no experimental data were obtained for determining multipolarities of the transitions.

[#] Band(A): g.s. band, K^π=0$^+$.

[@] Band(B): π1/2[521]⊗π7/2[514],K^π=3$^+$.

[&] Band(C): Band based on K^π=8$^-$ isomer.

[a] Band(D): ν9/2[734]⊗ν11/2[725],K^π=10$^+$.

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γ(^{254}No)

Intensity of x rays relative to 100 for 605.2γ (2010Cl01)

x-ray	Energy (keV)	I(x ray)
Kα$_2$	121.1 *3*	62 *4*
Kα$_1$	127.5 *3*	95 *6*
Kβ$_3$+Kβ$_1$	143 *1*	36 *5*
Kβ$_2$	148 *1*	11 *3*

E$_\gamma$[†]	I$_\gamma$[†]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.	α[a]	I$_{(\gamma+ce)}$[‡]	Comments
(44[@])		44	2$^+$	0	0$^+$				
(45[@])		1034.0	(4$^+$)	988.0	(3$^+$)				
52		1296.7	(8$^-$)	1244.5	(7$^+$)				
(58[@])		1091.9	(5$^+$)	1034.0	(4$^+$)				
70		1162.2	(6$^+$)	1091.9	(5$^+$)				
82		1244.5	(7$^+$)	1162.2	(6$^+$)				
102		146	4$^+$	44	2$^+$				
104		1091.9	(5$^+$)	988.0	(3$^+$)				
111.4 *3*	9 *2*	1408.1	(9$^-$)	1296.7	(8$^-$)	[M1]	9.51 *16*	95 *21*	I(γ+ce)=93 *21* (2010Cl01).
123[&] *1*		1531.3	(10$^-$)	1408.1	(9$^-$)				Expected line overlaps K-x rays.
128[&]		1162.2	(6$^+$)	1034.0	(4$^+$)				Expected line overlaps K-x rays.
133.4[b#] *4*	24[b#] *3*	2146.6	(11$^+$)	2013.2	(10$^+$)	[M1]	5.66 *10*	160 *17*	I(γ+ce)=158 *17* (2010Cl01).
133.4[b#] *4*	24[b#] *3*	2929.7	(16$^+$)	2796.4	(15$^+$)	[M1]	5.66 *10*	160 *17*	
145 *1*	20 *6*	2291.6	(12$^+$)	2146.6	(11$^+$)	[M1]	4.45 *11*	109 *32*	I(γ+ce)=104 *32* (2010Cl01).
152		1244.5	(7$^+$)	1091.9	(5$^+$)				
156.9 *3*	6 *1*	2448.5	(13$^+$)	2291.6	(12$^+$)	[M1]	15.23 *23*	97 *17*	I(γ+ce)=99 *17* (2010Cl01).
159		305	6$^+$	146	4$^+$				
168.9 *3*	6 *1*	2617.2	(14$^+$)	2448.5	(13$^+$)	[M1]	12.39 *19*	80 *14*	I(γ+ce)=85 *14* (2010Cl01).
179.4 *3*	8 *1*	2796.4	(15$^+$)	2617.2	(14$^+$)	[M1]	10.45 *16*	92 *13*	I(γ+ce)=90 *13* (2010Cl01).
214		519	8$^+$	305	6$^+$				
312.4 *4*	7 *2*	2929.7	(16$^+$)	2617.2	(14$^+$)	[E2]	0.318 *5*	9.2 *26*	I(γ+ce)=9 *2* (2010Cl01).
325.5 *5*	5 *2*	2617.2	(14$^+$)	2291.6	(12$^+$)	[E2]	0.280 *5*	6.4 *26*	I(γ+ce)=7 *2* (2010Cl01).
347.5 *5*	8 *2*	2796.4	(15$^+$)	2448.5	(13$^+$)	[E2]	0.229 *4*	9.8 *25*	I(γ+ce)=9 *2* (2010Cl01).
481.8 *5*	7 *2*	2013.2	(10$^+$)	1531.3	(10$^-$)	[E1]	0.0199 *3*	7 *2*	I(γ+ce)=7 *2* (2010Cl01).
605.2 *4*	100 *8*	2013.2	(10$^+$)	1408.1	(9$^-$)	[E1]	0.0131 *2*	101 *8*	I(γ+ce)=100 *8* (2010Cl01).
778		1296.7	(8$^-$)	519	8$^+$				
786		1091.9	(5$^+$)	305	6$^+$				
842		988.0	(3$^+$)	146	4$^+$				
857		1162.2	(6$^+$)	305	6$^+$				
888		1034.0	(4$^+$)	146	4$^+$				
940		1244.5	(7$^+$)	305	6$^+$				
944		988.0	(3$^+$)	44	2$^+$				

[†] From 2010Cl01.
[‡] Deduced by evaluator. Values from 2010Cl01 are given under comments.
[#] Doublet, but the intensity is not divided. Seven 133γ-133γ coincidences were observed.
[@] Not seen experimentally, due to large conversion coefficient.
[&] Not seen experimentally since it overlaps with No K x rays.
[a] 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.
[b] Multiply placed with undivided intensity.

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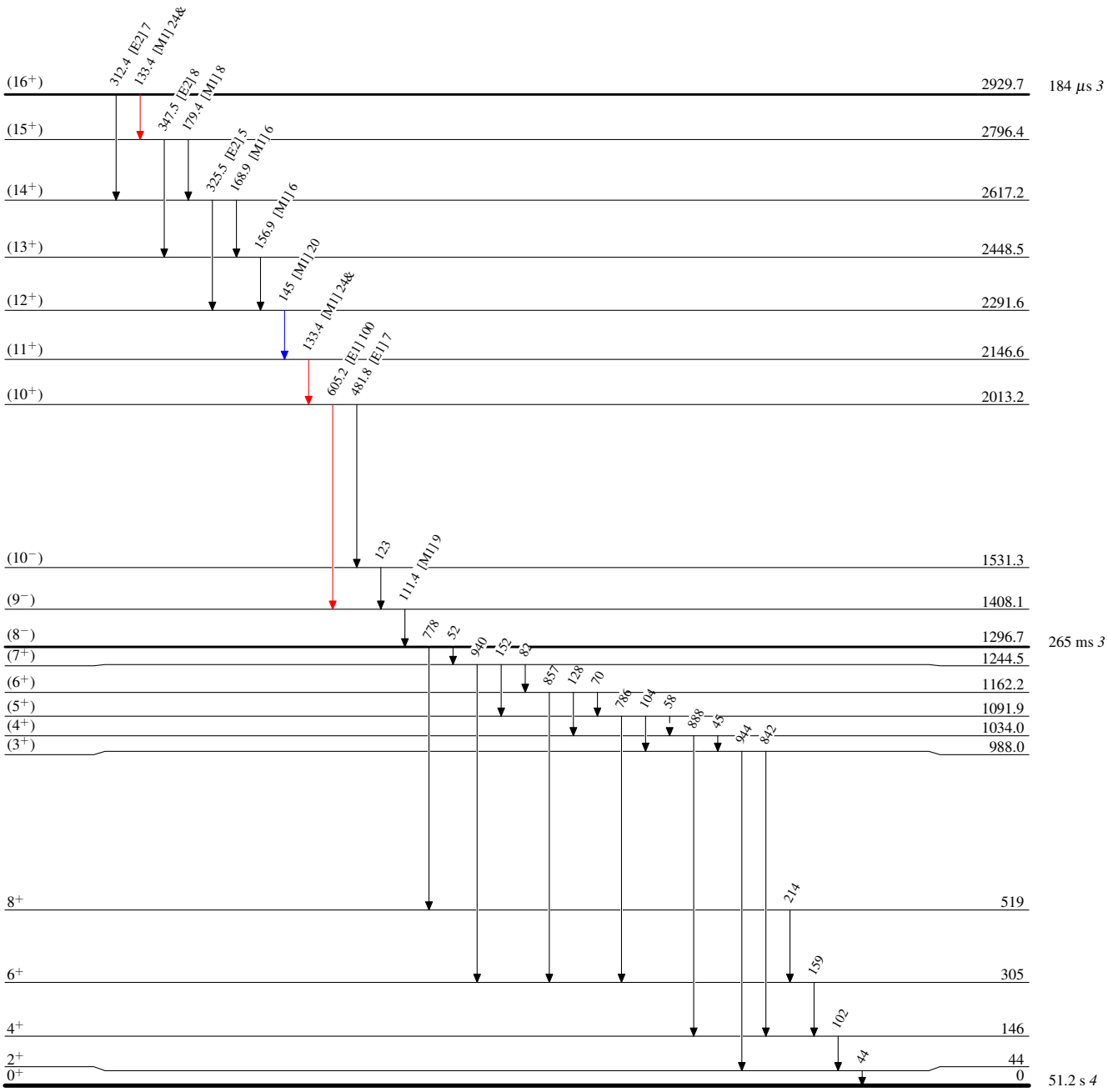
Decay Scheme

Intensities: Relative I_γ
& Multiply placed: undivided intensity given
%IT=100.0

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)



$^{254}_{102}No_{152}$

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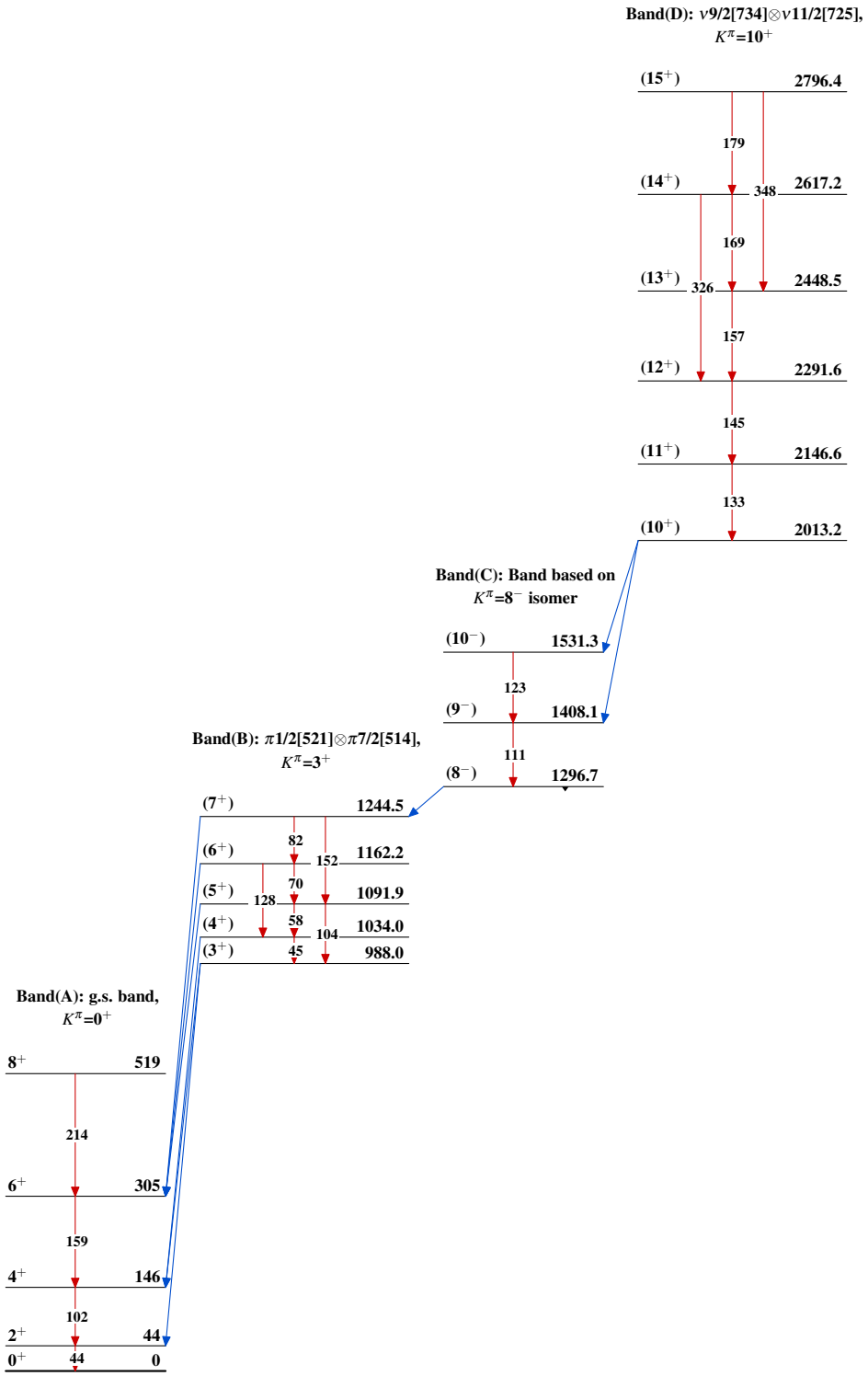

$^{254}_{102}No_{152}$