^{124}Sn(^{17}N,5nγ) 2015Ni05

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan	NDS 152, 331 (2018)	1-Apr-2018

2015Ni05: E(^{17}N)=5.2 MeV/nucleon produced in the ^{9}Be(^{18}O,^{17}N)^{10}B reaction with E(^{18}O)=9.3 MeV/nucleon. ^{17}N beam passed through the secondary-beam line consisting of dipole, quadrupole, and sextupole magnets. Measured Eγ, Iγ, $\gamma\gamma$, γ(t) using 12 HPGe detectors, eight of them with BGO Compton-suppression shields and beam-γ coincidences using a parallel plate avalanche counter placed upstream from the target.

^{136}La Levels

2015Ni05 present their level energies relative to that of the 114-ms isomer (setting its excitation energy equal to zero). For aid in comparison between different datasets and the Adopted Levels, evaluator has adjust the excitation energy of the isomer to that given in the Adopted Levels, x+230.

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$	Comments
259.3	(7$^-$)	114 ms *5*	E(level),T$_{1/2}$: from the Adopted Levels.
289.52 *15*	(7$^+$)		
539.82 *6*	(8$^-$)		
1124.72[&] *12*	(9$^+$)[#]		
1280.93[&] *14*	(10$^+$)[#]		
1687.71[&] *17*	(11$^+$)[#]		
2113.03[&] *18*	(12$^+$)[#]		
2371.5[&] *3*	(13$^+$)[#]		
2520.5[b] *4*	(14$^+$)	187 ns *27*	%IT=100 T$_{1/2}$: from $\gamma\gamma$(t) with one γ above the isomer and the other below. Analysis included the sum of the time spectra of 16 combinations of prompt (413γ, 484γ, 597γ and 618γ) and delayed (407γ, 425γ, 585γ, and 684γ) transitions (2015Ni05).
2580.0[a] *4*	(12$^-$)		
2790.8[a] *3*	(13$^-$)		
3070.5[a] *4*	(14$^-$)		
3117.2[b] *4*	(15$^+$)[@]		
3406.4[a] *5*	(15$^-$)		
3734.9[b] *4*	(16$^+$)[@]		
4147.5[b] *5*	(17$^+$)[@]		
4294.6? *5*			E(level): reverse ordering of 559.8γ and 337.2γ is possible which would instead result in a level at 4072 keV (2015Ni05).
4631.7[b] *5*	(18$^+$)[@]		
4869.9[b] *5*	(19$^+$)[@]		
4938.1 *5*			
5029.1 *5*			
5200.4? *5*			
5468.1 *5*			

[†] From a least-squares fit to Eγ, by evaluator, except where noted.

[‡] From 2015Ni05 based in part on previous J^{π} assignments and also systematics, comparison to cranked Nilsson-Strutinsky calculations and band assignments. Specific arguments provided as comments.

[#] Based on systematics of $\pi h_{11/2}\otimes\nu h^{-1}_{11/2}$ bands in ^{130,132,134}La.

[@] From band assignment, band based on 2261-keV (14$^+$) level.

[&] Band(A): $\pi h_{11/2}\otimes\nu h^{-1}_{11/2}$ band.

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^{124}Sn(^{17}N,5nγ) 2015Ni05 (continued)

^{136}La Levels (continued)

[a] Band(B): Negative parity side band.
[b] Band(C): $\pi(d_{5/2}g_{7/2})^1 \otimes \nu(s_{1/2}d_{3/2}d_{5/2}g_{7/2})^1 h_{11/2}^{-2}$ band.

$\gamma(^{136}La)$

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	α[b]	Comments
148.6[@] *5*	4 *1*	2520.5	(14$^+$)	2371.5	(13$^+$)	0.354 *6*	$I_{(\gamma+ce)}$: 5 *2*.
156.21[@] *8*	48 *4*	1280.93	(10$^+$)	1124.72	(9$^+$)		$I_{(\gamma+ce)}$: 59 *5*.
210.8[@] *3*	5 *4*	2790.8	(13$^-$)	2580.0	(12$^-$)		$I_{(\gamma+ce)}$: 6 *4*.
238.2[@] *1*	2.1 *8*	4869.9	(19$^+$)	4631.7	(18$^+$)		$I_{(\gamma+ce)}$: 2.1 *8*.
258.5[@] *3*	7 *2*	2371.5	(13$^+$)	2113.03	(12$^+$)		$I_{(\gamma+ce)}$: 7 *2*.
279.7[@] *2*	7 *3*	3070.5	(14$^-$)	2790.8	(13$^-$)		$I_{(\gamma+ce)}$: 8 *3*.
280.52[@] *6*	100	539.82	(8$^-$)	259.3	(7$^-$)		$I_{(\gamma+ce)}$: 100.
306.2[@] *2*	2.3 *8*	4938.1		4631.7	(18$^+$)		$I_{(\gamma+ce)}$: 2.2 *8*.
330.5[@][c] *1*	4 *1*	5200.4?		4869.9	(19$^+$)		$I_{(\gamma+ce)}$: 4 *1*.
335.9[@] *3*	9 *3*	3406.4	(15$^-$)	3070.5	(14$^-$)		$I_{(\gamma+ce)}$: 9 *3*.
337.2[#@] *2*	4 *1*	4631.7	(18$^+$)	4294.6?			$I_{(\gamma+ce)}$: 4 *1*.
397.5[@] *2*	4 *2*	5029.1		4631.7	(18$^+$)		$I_{(\gamma+ce)}$: 4 *1*.
406.9[@] *1*	57 *9*	1687.71	(11$^+$)	1280.93	(10$^+$)		$I_{(\gamma+ce)}$: 55 *9*.
407.8[a] *4*	14 *3*	2520.5	(14$^+$)	2113.03	(12$^+$)	0.0184	$I_{(\gamma+ce)}$: 13 *3*.
412.8[@] *4*	3 *1*	4147.5	(17$^+$)	3734.9	(16$^+$)		$I_{(\gamma+ce)}$: 3 *1*.
425.45[@] *9*	30 *5*	2113.03	(12$^+$)	1687.71	(11$^+$)		$I_{(\gamma+ce)}$: 29 *5*.
439.0[@] *1*	2.4 *9*	5468.1		5029.1			$I_{(\gamma+ce)}$: 2.3 *9*.
484.3[@] *2*	5 *2*	4631.7	(18$^+$)	4147.5	(17$^+$)		$I_{(\gamma+ce)}$: 5 *2*.
529.7[@] *3*	2.2 *9*	5468.1		4938.1			$I_{(\gamma+ce)}$: 2.1 *9*.
559.8[#@] *2*	4 *1*	4294.6?		3734.9	(16$^+$)		$I_{(\gamma+ce)}$: 4 *1*.
584.9[&] *1*	61 *8*	1124.72	(9$^+$)	539.82	(8$^-$)		$I_{(\gamma+ce)}$: 58 *8*.
597.0[@] *4*	16 *3*	3117.2	(15$^+$)	2520.5	(14$^+$)		$I_{(\gamma+ce)}$: 15 *3*.
617.8[@] *1*	7 *2*	3734.9	(16$^+$)	3117.2	(15$^+$)		$I_{(\gamma+ce)}$: 7 *2*.
677.8[&] *3*	4 *3*	2790.8	(13$^-$)	2113.03	(12$^+$)		$I_{(\gamma+ce)}$: 4 *3*.
683.5[a] *3*	14 *3*	2371.5	(13$^+$)	1687.71	(11$^+$)		$I_{(\gamma+ce)}$: 13 *3*.
722.2[a] *4*	1.9 *9*	4869.9	(19$^+$)	4147.5	(17$^+$)		$I_{(\gamma+ce)}$: 1.8 *9*.
831.6[a] *2*	4.0 *9*	2113.03	(12$^+$)	1280.93	(10$^+$)		$I_{(\gamma+ce)}$: 3.7 *8*.
835.2[a] *1*	9 *2*	1124.72	(9$^+$)	289.52	(7$^+$)		$I_{(\gamma+ce)}$: 9 *2*.
892[‡][c]		2580.0	(12$^-$)	1687.71	(11$^+$)		
896.5[a] *3*	1.8 *5*	4631.7	(18$^+$)	3734.9	(16$^+$)		$I_{(\gamma+ce)}$: 1.7 *5*.
1030[‡][c]		4147.5	(17$^+$)	3117.2	(15$^+$)		
1214.2[a] *3*	6 *2*	3734.9	(16$^+$)	2520.5	(14$^+$)		$I_{(\gamma+ce)}$: 6 *2*.

[†] Relative photon intensities normalized to the 280.5γ are from email reply of authors of 2015Ni05 to XUNDL compiler on July 16, 2015. In 2015Ni05, authors report total transition intensities (normalized to to 100 for the 280.52-keV transition), incorporating calculated internal conversion intensities using the coefficients in 1968Ha52. These values are included in the comments and their assumptions of multipolarities (also provided via email to XUNDL compiler) are indicated by the footnotes.
[‡] Observed in total projection spectrum but coincidence relation could not be confirmed due to low statistics. Placement by 2015Ni05 is taken from 2005Bh06.
[#] Reverse ordering of the 337.2γ-559.8γ cascade is possible which would instead result in a level at x+4042.8 keV *4*.
[@] 2015Ni05 assumed M1 multipolarity for this transition.

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^{124}Sn(^{17}N,5nγ) 2015Ni05 (continued)

γ(^{136}La) (continued)

& 2015Ni05 assumed E1 multipolarity for this transition.
[a] 2015Ni05 assumed E2 multipolarity for this transition.
[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.

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Level Scheme

Intensities: Relative $I_{(\gamma+ce)}$

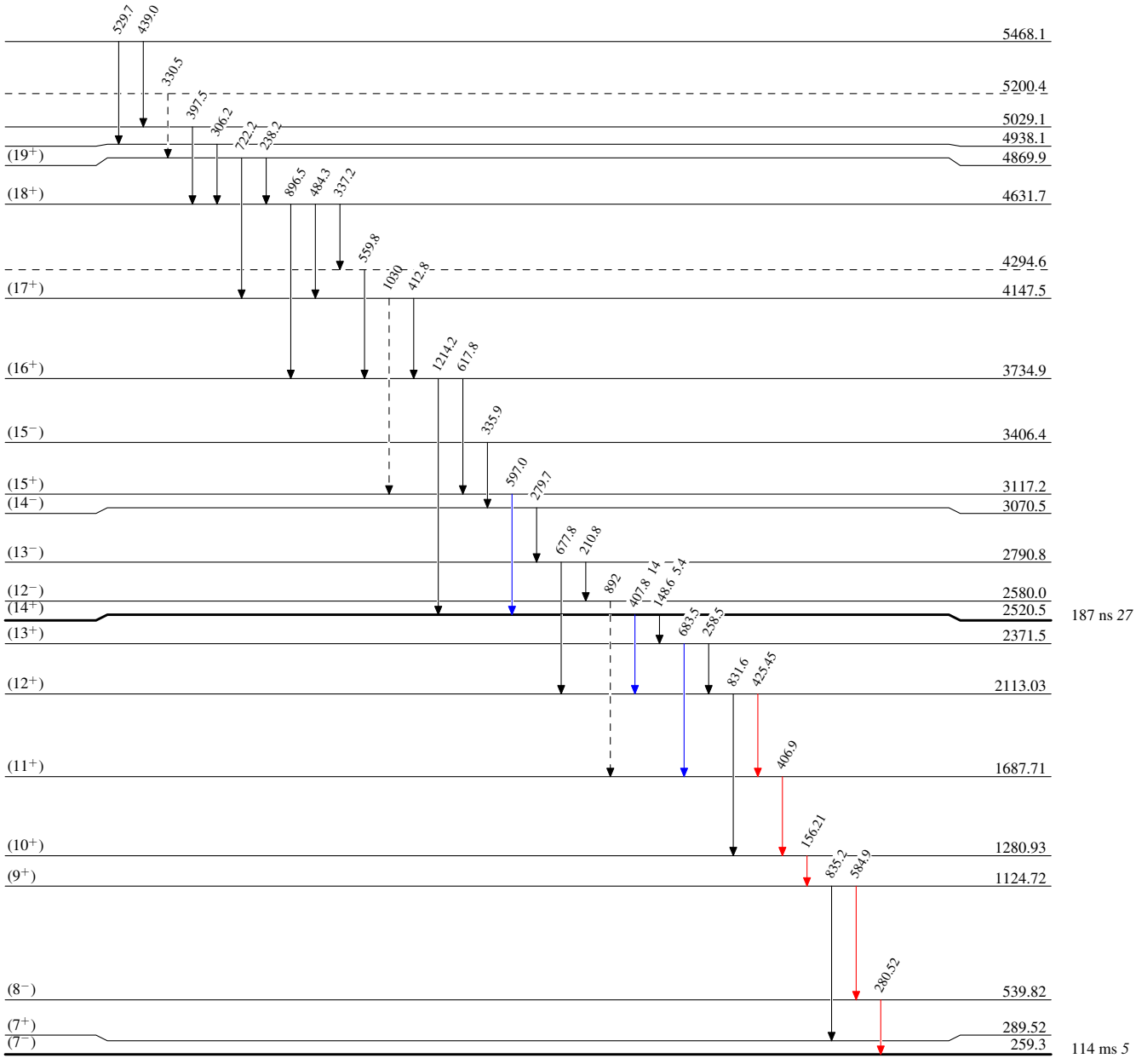
Legend

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

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

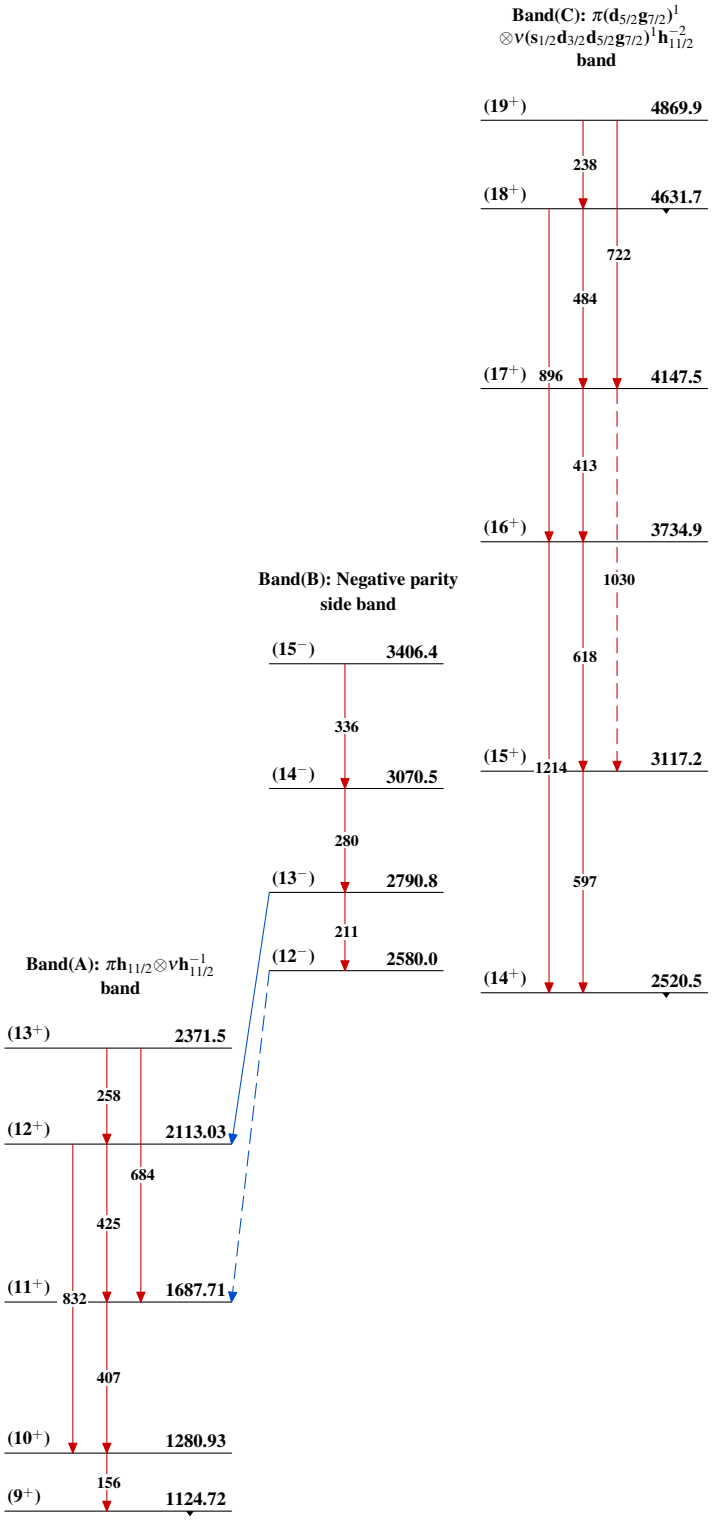
$I_\gamma > 10\% \times I_\gamma^{max}$

γ Decay (Uncertain)



$^{136}_{57}La_{79}$

^{124}Sn(^{17}N,5nγ) 2015Ni05



$^{136}_{57}La_{79}$