^{208}Pb(^{48}Ca,Xγ),^{238}U(^{48}Ca,Xγ) 2016Is03

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 174, 1 (2021)	15-Apr-2021

Also includes ^{238}U(^{64}Ni,Fγ) in 2016Is03.

2016Is03: Three experiments were performed with beams provided from the ATLAS linear accelerator at ANL and target thickness of ≈50 mg/cm^2. In the first and second, E=330 MeV ^{48}Ca beam was used and targets were ^{208}Pb and ^{238}U, respectively; in the third, E=430 MeV ^{64}Ni beam was produced on a ^{238}U target. γ rays were detected with the Gammasphere array consisting of 101 Compton suppressed HPGe detectors. Measured Eγ, Iγ, γγ-coin, γγγ-coin, γγ(t). Deduced levels, J, π, $T_{1/2}$, band structures, γ-ray transition strengths, branching ratios. Comparisons with shell-model calculations.

All data are from 2016Is03.

^{123}Sn Levels

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	$T_{1/2}$#
0.0	11/2$^-$	2262.72 *19*	19/2$^-$	4378.8@ *4*	(35/2$^+$)	4 ns *1*
1107.04 *9*	15/2$^-$	2395.31 *18*	21/2$^+$	4744.1& *5*	(35/2$^-$)	
1217.08 *9*	13/2$^-$	2542.30 *18*	23/2$^-$	5479.0& *6*	(39/2$^-$)	
1926.09 *12*	(15/2$^+$)	2712.47& *21*	27/2$^-$	5644.9 *5*	(39/2$^+$)	
1944.90 *12*	19/2$^+$	3293.1@ *3*	(27/2$^+$)	6231.3 *5*	(39/2$^+$)	
2098.99 *18*	19/2$^-$	3756.0& *4*	(31/2$^-$)	7160.0 *5*	(43/2$^+$)	
2152.66@ *19*	23/2$^+$	4117.0@ *3*	(31/2$^+$)			

† From a least-squares fit to γ-ray energies.

‡ Proposed by 2016Is03, based on observed linking transitions, de-excitation paths, band assignments, and systematics of level energies over the entire Sn isotopic chain. When considered in Adopted Levels, those firm assignments here will be placed inside parenthesis by the evaluator if there is no other experimental evidence.

From decay curves obtained as time distribution between transitions feeding the isomer and those associated directly with the decay (2016Is03).

@ Band(A): Positive-parity yrast states.

& Band(B): Negative-parity yrast states.

γ(^{123}Sn)

Eγ	Iγ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
(18.7)	0.02†	1944.90	19/2$^+$	1926.09	(15/2$^+$)	[E2]	Eγ: From differences of level energies (2016Is03). Iγ: Calculated from summed intensities of 709 and 819 keV γ-rays with electron-conversion coefficient for an E2 transition (2016Is03).
147.0 *2*	47† *5*	2542.30	23/2$^-$	2395.31	21/2$^+$		
170.2 *1*	68† *6*	2712.47	27/2$^-$	2542.30	23/2$^-$		
207.6 *2*	75† *7*	2152.66	23/2$^+$	1944.90	19/2$^+$	[E2]	
242.6 *2*	22† *2*	2395.31	21/2$^+$	2152.66	23/2$^+$		
261.8 *2*	44‡ *5*	4378.8	(35/2$^+$)	4117.0	(31/2$^+$)	[E2]	
279.6 *2*	16† *2*	2542.30	23/2$^-$	2262.72	19/2$^-$		
296.1 *5*	2.0† *8*	2395.31	21/2$^+$	2098.99	19/2$^-$		
361.6 *5*	9‡ *4*	4117.0	(31/2$^+$)	3756.0	(31/2$^-$)		
443.4 *2*	5† *1*	2542.30	23/2$^-$	2098.99	19/2$^-$		
450.5 *2*	25† *2*	2395.31	21/2$^+$	1944.90	19/2$^+$		

Continued on next page (footnotes at end of table)

^{208}Pb(^{48}Ca,Xγ),^{238}U(^{48}Ca,Xγ) 2016Is03 (continued)

γ(^{123}Sn) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
(559.5)	47†	2712.47	27/2$^-$	2152.66	23/2$^+$		I_γ: deduced by 2016Is03 from B(E2) value for 170 keV isomeric transition in the 27/2$^-$ decay study in 1994Ma48.
709.0 *1*	15† *2*	1926.09	(15/2$^+$)	1217.08	13/2$^-$		
728.0 *2*	6† *1*	1944.90	19/2$^+$	1217.08	13/2$^-$	[E3]	
734.9 *4*	20‡ *2*	5479.0	(39/2$^-$)	4744.1	(35/2$^-$)		
819.1 *2*	12† *2*	1926.09	(15/2$^+$)	1107.04	15/2$^-$		
823.8 *2*	90‡ *8*	4117.0	(31/2$^+$)	3293.1	(27/2$^+$)		
837.8 *1*	67† *5*	1944.90	19/2$^+$	1107.04	15/2$^-$	[M2]	
928.7 *3*	5‡ *1*	7160.0	(43/2$^+$)	6231.3	(39/2$^+$)		
988.1 *3*	75‡ *7*	4744.1	(35/2$^-$)	3756.0	(31/2$^-$)		
992.0 *2*	5† *1*	2098.99	19/2$^-$	1107.04	15/2$^-$		
1043.8 *3*	81‡ *7*	3756.0	(31/2$^-$)	2712.47	27/2$^-$		
1107.0 *1*	100†	1107.04	15/2$^-$	0.0	11/2$^-$		
1140.3 *2*	100‡	3293.1	(27/2$^+$)	2152.66	23/2$^+$		
1155.7 *2*	16† *2*	2262.72	19/2$^-$	1107.04	15/2$^-$		
1217.1 *1*	21† *2*	1217.08	13/2$^-$	0.0	11/2$^-$		
1266.1 *3*	16‡ *2*	5644.9	(39/2$^+$)	4378.8	(35/2$^+$)		
1515.0 *3*	6‡ *1*	7160.0	(43/2$^+$)	5644.9	(39/2$^+$)		
1852.6 *3*	8‡ *2*	6231.3	(39/2$^+$)	4378.8	(35/2$^+$)		

† Intensities of delayed transitions normalized to 100 for the 1107 γ transition.
‡ Intensities of prompt transitions normalized to 100 for the 1140 γ transition.

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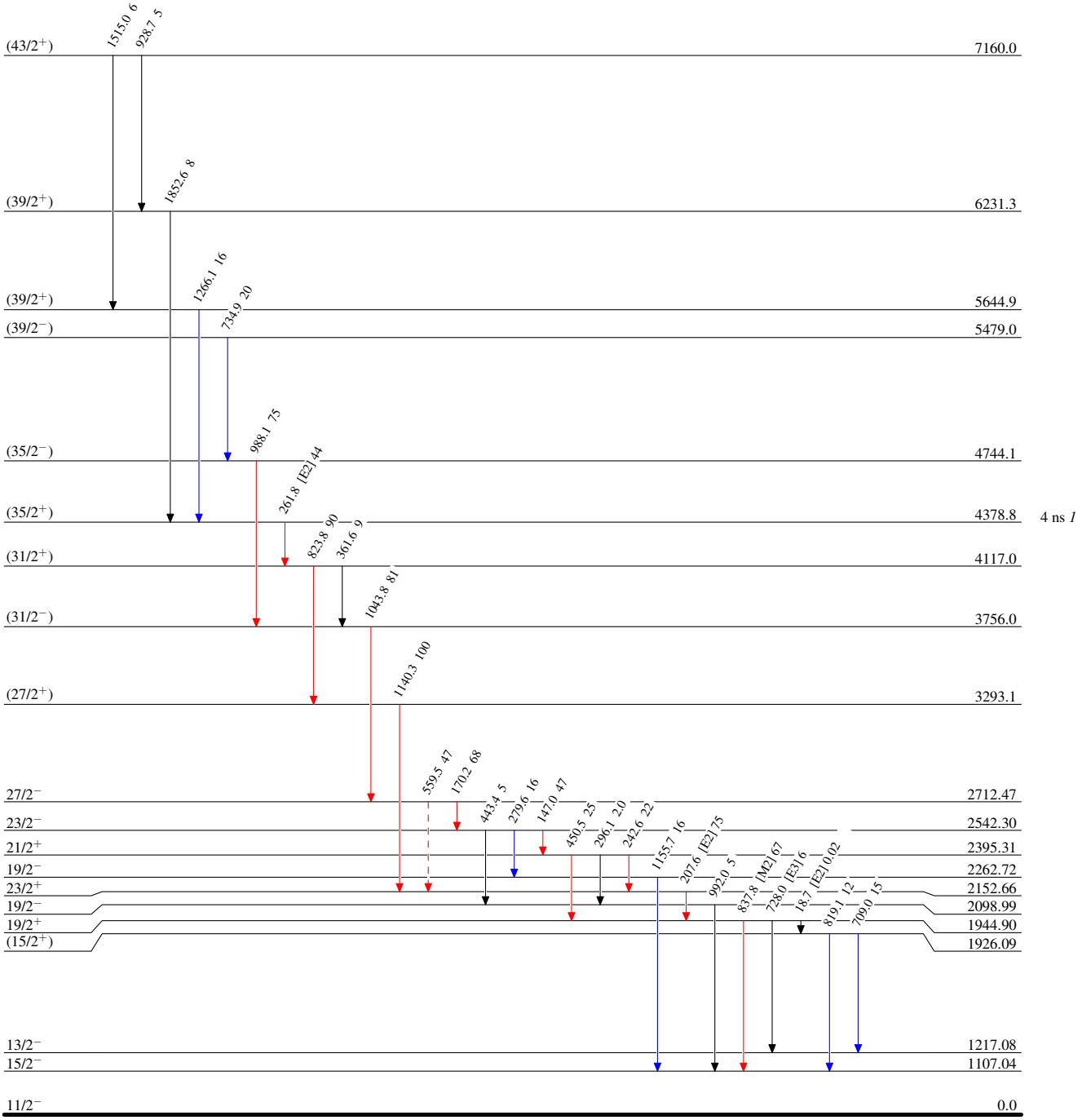
Level Scheme

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)

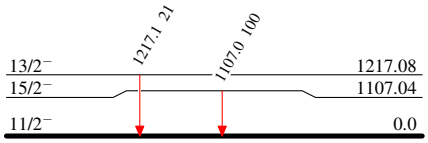


$^{123}_{50}Sn_{73}$

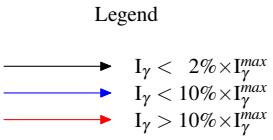
^{208}Pb(^{48}Ca,Xγ),^{238}U(^{48}Ca,Xγ) 2016Is03

Level Scheme (continued)

Intensities: Relative I_γ



$^{123}_{50}Sn_{73}$



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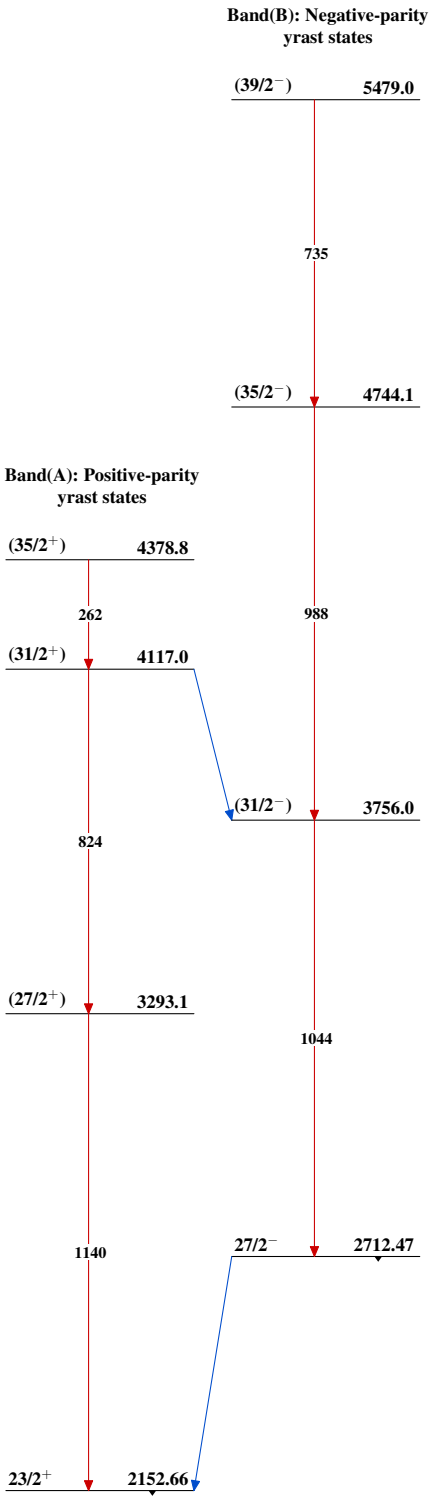

$^{123}_{50}Sn_{73}$