Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 185, 2 (2022)	23-Aug-2022

Q(β^-)=6.45×10^3 *20*; S(n)=5.58×10^3 *20*; S(p)=9.96×10^3 *20*; Q(α)=−2.59×10^3 *20* 2021Wa16
S(2n)=9680 *200*, S(2p)=22880 *200*, Q(β^-n)=2110 *200* (2021Wa16).

^{149}La isotope produced through mass separation of fission fragments from ^{235}U(n,F) E(n)=thermal (1979En02,1986ReZU,2002Sy01,2004Sy01). See also 2017Wu04, with isotope production in ^{9}Be(^{238}U,F) reaction, followed by half-life measurement of ^{149}La decay.

Additional information 1.

Mass measurement using Penning-trap method: 2003SaZU.

Theoretical studies: consult the NSR database at www.nndc.bnl.gov/nsr/ for one references dealing with radioactive decay, listed under 'document record' which can be accessed through web retrieval of the ENSDF database at www.nndc.bnl.gov/ensdf/.

^{149}La Levels

Cross Reference (XREF) Flags

A ^{149}Ba β^- decay (352 ms)
B ^{248}Cm SF decay

E(level)†	J$^\pi$‡	T$_{1/2}$	XREF	Comments
0.0	(3/2)	1.091 s *34*	AB	%β^-=100; %β^-n=1.41 *34* XREF: B(?). J$^\pi$: from 2002Sy01, 2004Sy01 and 2007Ur03, based on suggested β feeding to 3/2, 5/2 levels in ^{149}Ce. T$_{1/2}$: weighted average of 1.11 s *4* (2017Wu04, implants-β correlated decay curve); 1.066 s *34* (1993Ru01, neutron decay curve); 1.10 s *3* (1986ReZU, neutron decay curve, earlier value of 1.04 s *4* in 1986Wa17); and 1.2 s *4* (1979En02, β timing). Other: 1.2 s (1987MaZY, γ timing). %β^-n: unweighted average of 1.74 *13* (1993Ru01) and 1.07 *13* (1986ReZU, earlier value was 1.17 *12* in 1986Wa17). Other: 1.46 *29* (2002Pf04 compilation).
0+x#	(7/2$^-$)		B	E(level): x<35 keV if 3/2 for g.s. and <20 keV if J=5/2 for g.s., estimated by 2007Ur03 from non-observation of a γ ray of this energy or enhanced intensity of x rays. J$^\pi$: probable 7/2 member of configuration=π3/2[541].
45.97 *8*	(1/2,3/2,5/2)		A	J$^\pi$: 46.0γ M1+E2 to (3/2).
81.5+x# *3*	(11/2$^-$)		B	
83.00 *10*			A	
164.50 *18*			A	
226.03 *8*			A	
280.8+x# *5*	(15/2$^-$)		B	
286.30 *17*			A	
357.32 *15*			A	
505.7 *3*			A	
516.53 *22*			A	
598.3+x# *6*	(19/2$^-$)		B	
843.6 *5*			A	
893.9 *3*			A	
1016.5+x# *6*	(23/2$^-$)		B	
1510.3+x# *7*	(27/2$^-$)		B	
2051.1+x# *8*	(31/2$^-$)		B	
2606.7+x# *8*	(35/2$^-$)		B	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{149}La Levels (continued)

† From a least-squares fit to Eγ values, assuming an uncertainty of 0.3 keV if not available.
‡ ΔJ=2 high-spin band based on (7/2⁻) in ^{248}Cm SF decay, also supported by a cascade of quadrupole transitions (most likely E2) from γγ(θ) data.
# Band(A): Probable π3/2[541],α=−1/2.

γ(^{149}La)

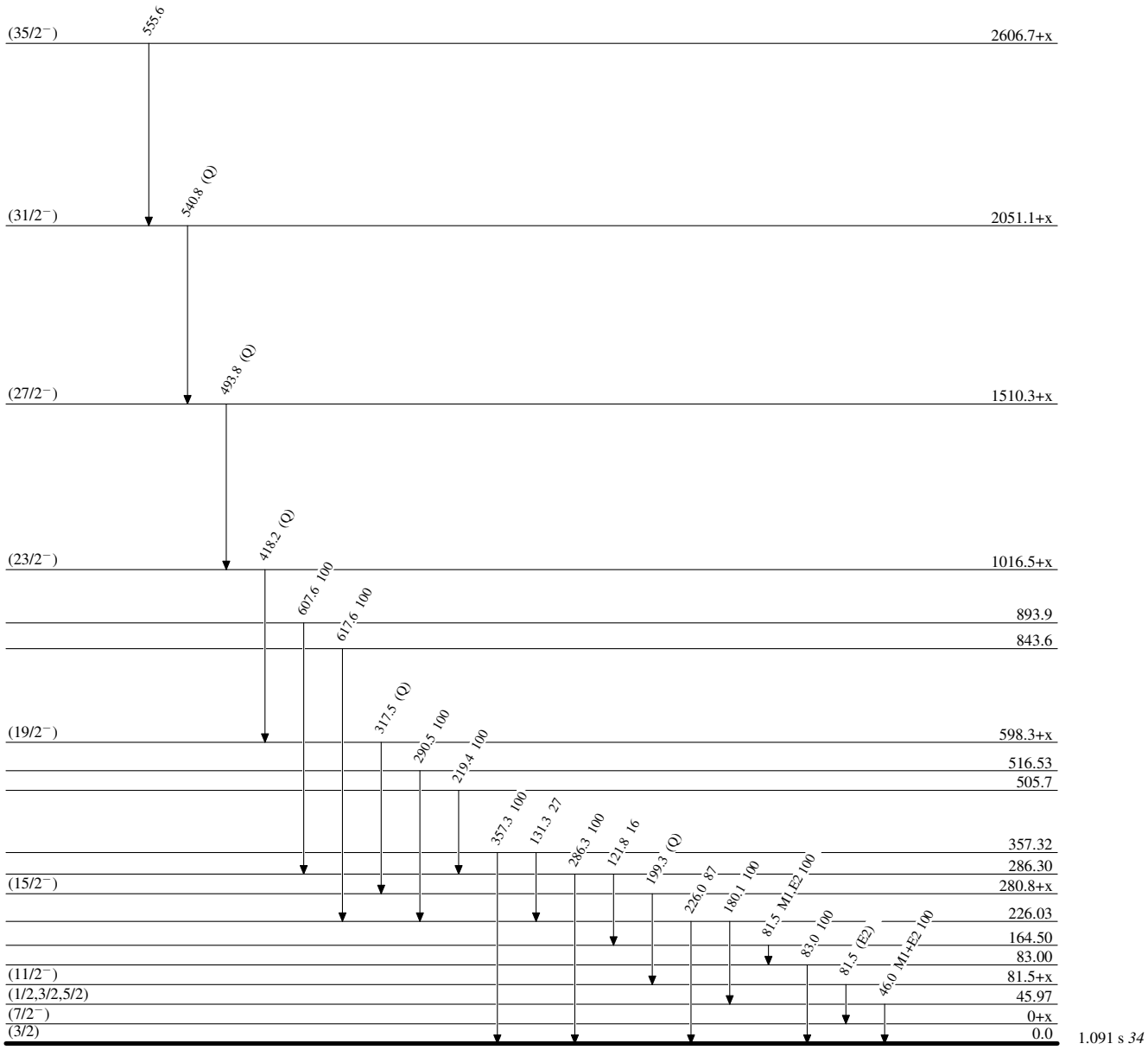
E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.	α@	Comments
45.97	(1/2,3/2,5/2)	46.0 *1*	100	0.0	(3/2)	M1+E2‡	23 *13*	
81.5+x	(11/2⁻)	81.5		0+x	(7/2⁻)	(E2)	4.15 *6*	Mult.: from ce data in ^{248}Cm SF decay.
83.00		83.0 *1*	100	0.0	(3/2)			
164.50		81.5 *2*	100	83.00		M1,E2‡	3.0 *11*	
226.03		180.1 *1*	100 *5*	45.97	(1/2,3/2,5/2)			
		226.0 *1*	87 *6*	0.0	(3/2)			
280.8+x	(15/2⁻)	199.3		81.5+x	(11/2⁻)	(Q)#		
286.30		121.8 *2*	16 *4*	164.50				
		286.3 *2*	100 *24*	0.0	(3/2)			
357.32		131.3 *2*	27 *5*	226.03				
		357.3 *2*	100 *16*	0.0	(3/2)			
505.7		219.4 *2*	100	286.30				
516.53		290.5 *2*	100	226.03				
598.3+x	(19/2⁻)	317.5		280.8+x	(15/2⁻)	(Q)#		
843.6		617.6 *5*	100	226.03				
893.9		607.6 *2*	100	286.30				
1016.5+x	(23/2⁻)	418.2		598.3+x	(19/2⁻)	(Q)#		
1510.3+x	(27/2⁻)	493.8		1016.5+x	(23/2⁻)	(Q)#		
2051.1+x	(31/2⁻)	540.8		1510.3+x	(27/2⁻)	(Q)#		
2606.7+x	(35/2⁻)	555.6		2051.1+x	(31/2⁻)			

† From β⁻ decay or ^{248}Cm SF decay.
‡ From conversion coefficients deduced based on I(γ+ce) intensity balance in ^{149}Ba β⁻ decay (2004Sy01).
# From γγ(θ) in ^{248}Cm SF decay. Mult=(Q) corresponds to ΔJ=2 transition, most likely E2.
@ 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.

Adopted Levels, Gammas

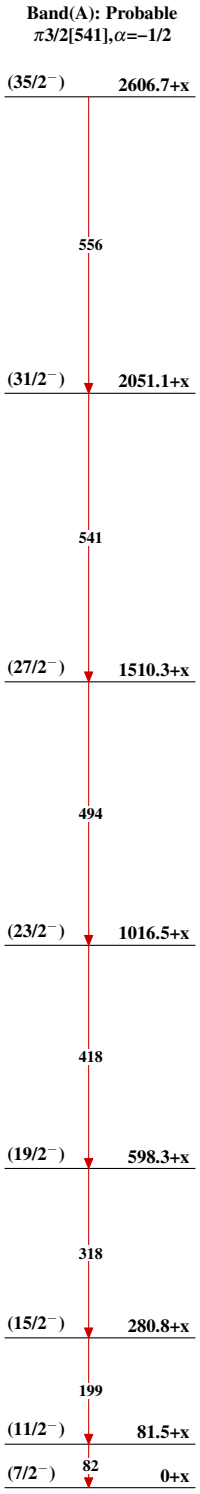
Level Scheme

Intensities: Relative photon branching from each level



$^{149}_{57}La_{92}$

Adopted Levels, Gammas



$^{149}_{57}La_{92}$