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^-)=−9800 *SY*; S(n)=10334 *30*; S(p)=3040 *90*; Q(α)=2076 *29* 2021Wa16
ΔQ(β^-)=200 (syst,2021Wa16).
Q(ε)=7900 *30*, Q(εp)=6829 *29*, S(2n)=23280 *50*, S(2p)=4124 *29* (2021Wa16).
^{149}Er produced and identified by 1982No07, 1984To07, 1987Br14 and 1989Fi01.
From gross theory of β decay (1973Ta30), for ^{153}Yb %ε+%$\beta^+\approx$50, %α is expected to be ≈50. But no α decay of 4.2-s ^{153}Yb has been reported (1978AfZZ,1989Ko02). Theoretical partial $T_{1/2}(^{153}\text{Yb}\ \alpha\ \text{decay})=10\times10^{7.5}$ s (2019Mo01) predicts negligible %α.
Theoretical studies: consult the NSR database at www.nndc.bnl.gov/nsr/ for three references for structure and one for radioactive decay listed under 'document records' which can be accessed through web retrieval of the ENSDF database at www.nndc.bnl.gov/ensdf/.
Additional information 1.

^{149}Er Levels

Cross Reference (XREF) Flags

A ^{149}Tm ε decay (0.9 s)
B ^{149}Er IT decay (9.6 s)
C ^{92}Mo(^{60}Ni,2pnγ)

E(level)†	J$^\pi$‡	$T_{1/2}$&	XREF	Comments
0.0	(1/2$^+$)	4 s *2*	ABC	%ε+%β^+=100; %εp=7 *2* (1989Fi01) J$^\pi$: probable $s_{1/2}$ neutron state and systematics. $T_{1/2}$: from 1989Fi01, γ-decay curves.
111.19 *10*	(3/2$^+$)		ABC	J$^\pi$: 111.2γ M1 to (1/2$^+$) and 630.5γ M4 from (11/2$^-$); probable $d_{3/2}$ neutron state.
741.69 *23*	(11/2$^-$)	9.6 s *6*	ABC	%ε+%β^+=96.5 *7*; %IT=3.5 *7*; %εp=0.18 *7* (1989Fi01) $T_{1/2}$: unweighted average of 8.9 s *2* from 1989Fi01 in IT decay, 10.8 s *6* (1984ScZT) and 9 s *1* (1984To07) from ^{149m}Er ε decay. J$^\pi$: probable $h_{11/2}$ neutron state and systematics.
907.37 *18*	(5/2$^+$)		A	J$^\pi$: probable $d_{5/2}$ neutron state.
1066.17 *21*	(7/2$^-$)		A	J$^\pi$: probable $f_{7/2}$ neutron state.
1482.9 *4*	(9/2$^-$,11/2$^-$)		A	J$^\pi$: probable ε feeding from (11/2$^-$); 416.7γ to (7/2$^-$).
2311.5 *3*	(15/2$^-$)@		C	
2478.8 *3*	(15/2$^+$)#		C	
2542.1 *3*	(15/2$^+$)#		C	
2611.0 *3*	(19/2$^+$)#	0.61 μs *8*	C	
2611.1+x	(21/2$^+$)#		C	Additional information 2. E(level): x<60 (1987Br14).
2683.7+x?			C	
2864.10+x? *15*			C	
3187.80+x *10*	(23/2$^-$)@		C	
3242.9+x *4*	(27/2$^-$)@	4.8 μs *2*	C	

† From a least-squares fit to γ-ray energies.
‡ Low spins (≤11/2) are from 1987To12 in ^{149}Tm ε decay and high spins (≥11/2) are from probable shell model configurations

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{149}Er Levels (continued)

and analogy to ^{147}Dy (1987Br14) in (^{60}Ni,2pnγ).

[#] Member of configuration=$\pi h^4_{11/2}\otimes\nu s^{-1}_{1/2}$ and configuration=$\pi h^4_{11/2}\otimes\nu d^{-1}_{3/2}$ (1987Br14).

[@] Member of configuration=$\pi h^4_{11/2}\otimes\nu h^{-1}_{11/2}$ (1987Br14).

[&] From $\gamma\gamma$(t) in (^{60}Ni,2pnγ) (1987Br14), unless otherwise noted.

$\gamma(^{149}Er)$

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[#]	α[&]	Comments
111.19	(3/2$^+$)	111.2 *1*	100	0.0	(1/2$^+$)	M1[@]	2.100 *30*	E_γ: weighted average of 111.3 *1* (1987To02) from ^{149}Tm ε decay, 111.0 *1* (1985To11) and 111.3 *3* (1989Fi01) from IT decay.
741.69	(11/2$^-$)	630.5 *2*	100	111.19	(3/2$^+$)	M4[@]	0.320 *4*	B(M4)(W.u.)=1.67 *+37−35* E_γ: from IT decay.
907.37	(5/2$^+$)	796.2[‡] *2*	≈100[‡]	111.19	(3/2$^+$)			
		907.3[‡] *3*	≈48[‡]	0.0	(1/2$^+$)			
1066.17	(7/2$^-$)	158.8[‡] *1*	100	907.37	(5/2$^+$)	[E1]	0.0953 *13*	
1482.9	(9/2$^-$,11/2$^-$)	416.7[‡] *3*	100	1066.17	(7/2$^-$)			
2311.5	(15/2$^-$)	1569.8 *2*	100	741.69	(11/2$^-$)			
2478.8	(15/2$^+$)	167.3 *1*	100 *3*	2311.5	(15/2$^-$)	E1	0.0830 *12*	
		1737.0 *3*	6 *1*	741.69	(11/2$^-$)			
2542.1	(15/2$^+$)	63.3 *2*	41 *2*	2478.8	(15/2$^+$)	M1	10.62 *18*	
		230.6 *1*	100 *3*	2311.5	(15/2$^-$)			
2611.0	(19/2$^+$)	68.9 *1*	57 *3*	2542.1	(15/2$^+$)	E2	12.77 *19*	B(E2)(W.u.)=0.73 *+11−9*
		132.3 *1*	100 *5*	2478.8	(15/2$^+$)	E2	1.051 *15*	B(E2)(W.u.)=0.049 *+8−6*
2683.7+x?		72.4[a] *4*	100	2611.1+x	(21/2$^+$)			
2864.10+x?		179.9[a] *2*	100 *6*	2683.7+x?				
		253.0[a] *3*	45 *6*	2611.1+x	(21/2$^+$)			
3187.80+x	(23/2$^-$)	323.7 *1*	11.1 *5*	2864.10+x?				
		576.7 *1*	100 *3*	2611.1+x	(21/2$^+$)			
3242.9+x	(27/2$^-$)	55.1 *3*	100	3187.80+x	(23/2$^-$)	E2	31.5 *10*	B(E2)(W.u.)=0.152 *9*

[†] From (^{60}Ni,2pnγ), unless otherwise noted.

[‡] From ^{149}Tm ε decay.

[#] From ce data in (^{60}Ni,2pnγ), unless otherwise noted.

[@] From ce data in IT decay.

[&] 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.

[a] Placement of transition in the level scheme is uncertain.

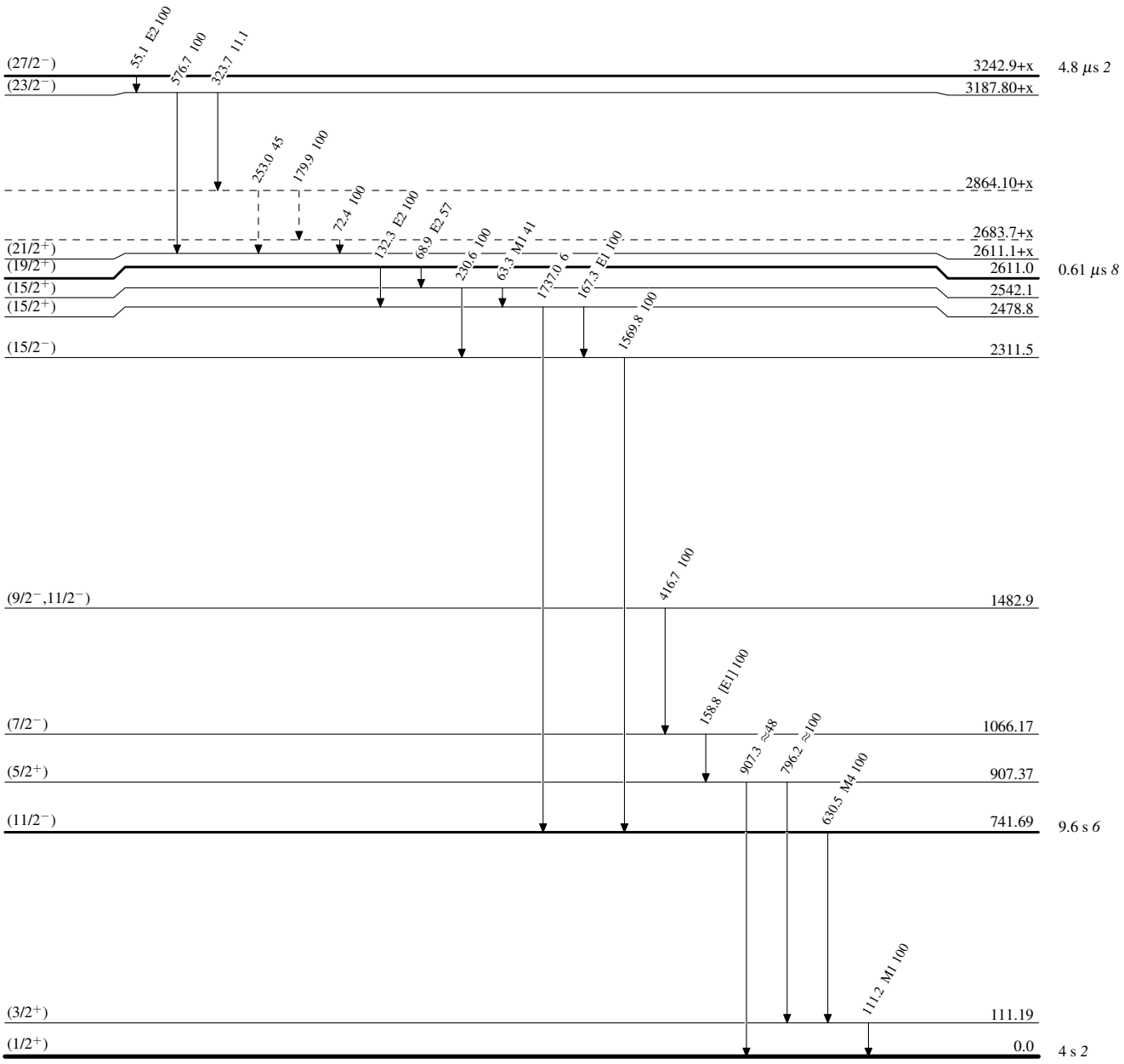
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{149}_{68}Er_{81}$