^{169}Er β^- decay (9.39 d) 1968Ca06,1970Sh09,2021Ta24

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 209,1 (2026)	1-Oct-2025

Parent: ^{169}Er: E=0.0; $J^\pi=1/2^-$; $T_{1/2}$=9.39 d *2*; Q(β^-)=353.5 *8*; %β^- decay=100

^{169}Er-J^π,$T_{1/2}$: from ^{169}Er Adopted Levels.

^{169}Er-Q(β^-): from 2021Wa16.

1968Ca06: ^{169}Er was produced by neutron irradiation of 95% enriched ^{168}Er in the Swedish reactor. Purified placing in the isotope separator. Measured electron spectrum with the iron-core 50 cm radius double-focusing spectrometer.

1970Sh09: ^{169}Er produced by neutron irradiation of 95% enriched ^{168}Er at the DR3 reactor at Riso; measured Eγ, Iγ; deduced Iβ.

2021Ta24: ^{169}Er was produced by neutron irradiation of enriched $^{168}Er_2O_3$ target material and was chemically separated from the dissolved target; activity of reference sample was determined by triple-to-double coincidence ratio using liquid scintillation counting; Iγ measurements were carried out at Institute of Radiation Physics (IRA), Lausanne, Switzerland using one n-type high-purity germanium (HPGe) cylindrical detector, and at Paul Scherrer Institute (Ψ), Villigen-Ψ, Switzerland using one planar HPGe detector.

Others: 1948Ke11, 1951Ke44, 1956Bi30, 1956Ha72, 1959Ch31, 1963Mc13, 1965Du02, 1967Ma42, 1971MaXG.

Except for the ce and Iβ data reported here, transition data were obtained with ^{169}Yb sources (see ^{169}Yb ε decay (32.016 d) for details and additional data), except where otherwise noted.

For K-shell auto-ionization probability data, see 1968Er02, 1971Ca44, and 1974Ja31.

For internal bremsstrahlung data, see 1976Pr06.

Measured X-ray intensities (2021Ta24)

Energy	Intensity (per 100 decay)	
49.7	2.91×10^{-3}	*6*
50.7	5.39×10^{-3}	*10*
57.3	1.74×10^{-3}	*3*
59.0	4.85×10^{-4}	*9*

^{169}Tm Levels

E(level)†	J^π‡	$T_{1/2}$‡	Comments
0.0	$1/2^+$	stable	
8.41017 *15*	$3/2^+$	4.09 ns *6*	$T_{1/2}$: other: 4.36 ns *17* (1963Mc13 – β^- decay).
118.18945 *11*	$5/2^+$	62.4 ps *28*	

† From recoil-corrected Eγ.

‡ From Adopted Levels.

β^- radiations

β^- feedings are from intensity imbalance at each level; g.s. feeding is from 100% less total Iβ to 8.4+118.2 levels.

1965Du02 report Eβ=344 keV *3* for β group to the g.s. and 8.4 levels combined.

Additional information 1.

E(decay)	E(level)	Iβ^-†	Log *ft*	Comments
(235.3 *13*)	118.18945	0.00498 *8*	9.59^{1u} *1*	av Eβ=74.00 *26* Iβ^-: other: 0.0048 *10* (1970Sh09).

Continued on next page (footnotes at end of table)

^{169}Er β^- decay (9.39 d) 1968Ca06,1970Sh09,2021Ta24 (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(345.1 *13*)	8.41017	45 *5*	6.57 *5*	av Eβ=98.01 *25*
(353.5 *16*)	0.0	55 *5*	6.52 *4*	av Eβ=100.69 *26*

[†] Absolute intensity per 100 decays.

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$\gamma(^{169}Tm)$

Iγ normalization: from I(γ+ce)/ΣIβ measurements.

E_γ[†]	I_γ[&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	α[@]	$I_{(\gamma+ce)}$[&]	Comments
8.41017 *15*	0.172 *20*	8.41017	3/2+	0.0	1/2+	M1+E2	0.0323 *10*	260 *7*	45[#] *5*	ce(M)/(γ+ce)=0.789 *13* ce(N)/(γ+ce)=0.182 *6*; ce(O)/(γ+ce)=0.0241 *8*; ce(P)/(γ+ce)=0.000909 *27* α(M)=206 *6* α(N)=47.6 *12*; α(O)=6.29 *15*; α(P)=0.2375 *33* %Iγ=0.172 *20* I_γ: Deduced from I(γ+ce) and α. Mult.,δ: from M1:M2:M3 in 1968Ca06. δ from subshell ratio data of 1968Ca06 and using the BrIccMixing code (v2.3b). M1:M2:M3:M4:M5:N1:N2:N3:(N4+N5):O1:(O2+O3)= 100:36.8 *14*:38.0 *14*:0.9 *2*:1.0 *2*:22.1 *6*:6.4 *3*:7.6 *2*:0.20 *2*: 3.7 *1*:2.08 *6* (1968Ca06); M1:M2:M3:(M4+M5)=100:31 *3*:34 *3*: ≈1.2, N1:N2:N3=100:25 *3*:41 *5*, M/N=4.2 *5*, N/O=6.4 *10* (1971MaXG). Other: (α(M)exp + α(N)exp)=106 *6* (from βce coin (1959Ch31)); value is inconsistent with adopted multipolarity.
109.77924 *4*	0.00136 *2*	118.18945	5/2+	8.41017	3/2+	M1+E2	−0.153 *11*	2.369 *33*		%Iγ=0.00136 *2* α(K)=1.966 *28*; α(L)=0.314 *5*; α(M)=0.0704 *11* α(N)=0.01645 *26*; α(O)=0.002336 *35*; α(P)=0.0001203 *17* I_γ: rounded value of 0.001362 *18* (2021Ta24).
118.18940 *14*	0.000151 *2*	118.18945	5/2+	0.0	1/2+	E2		1.642 *23*		%Iγ=0.000151 *2* α(K)=0.701 *10*; α(L)=0.721 *10*; α(M)=0.1759 *25* α(N)=0.0400 *6*; α(O)=0.00469 *7*; α(P)=2.95×10^{-5} *4* I_γ: rounded value of 0.0001511 *24* (2021Ta24).

[†] From Adopted Gammas.
[‡] From Adopted Gammas, except as noted.
[#] From Ice(8.4γ)/ΣIβ=45 *5* (Ice≈I(γ+ce)) (1965Du02). Other value for this ratio: 42 *1%* (1959Ch31).
[@] Additional information 2.
[&] Absolute intensity per 100 decays.

$^{169}_{69}Tm_{100}$-3

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Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays