^{155}Tm ε decay (45 s) 1991To08

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 160, 1 (2019)	21-Oct-2019

Parent: ^{155}Tm: E=41 *6*; $J^\pi=1/2^+$; $T_{1/2}$=45 s *3*; Q(ε)=5583 *12*; %ε+%$β^+$ decay>98.0

Additional information 1.

1991To08: sources with mass 155 were produced in the ^{95}Mo+^{64}Zn reaction, followed by mass separation and transport to detection systems. Si particle ΔE-E telescope, plastic scintillator, HPGe and Ge detectors. Measured Eα, Eγ, Iγ, γγ, γX, αγ, γ(t).

^{155}Er Levels

E(level)†	J^π‡
0.0	7/2⁻
88.08 *8*	5/2⁻,7/2⁻,9/2⁻
151.63 *8*	⁻
323.17 *15*	5/2⁻,7/2⁻,9/2⁻
398.63 *22*	
467.00 *16*	⁻
584.47 *18*	
595.1 *4*	

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

γ(^{155}Er)

The ce-related data are from 1977Ag01 (whose study included gammas from the decay of both ^{155}Tm activities). For a discussion of this information, see the ^{155}Tm ε decay (21.6 s) data set.

E_γ#	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.†‡	δ†&	α@	Comments
63.5 *1*	1.5 *5*	151.63	⁻	88.08	5/2⁻,7/2⁻,9/2⁻	M1(+E2)	<0.13	10.59 *17*	α(K)=8.75 *14*; α(L)=1.43 *10*; α(M)=0.320 *23* α(N)=0.074 *6*; α(O)=0.0106 *6*; α(P)=0.000546 *9* δ: computed by the evaluator from α(M)exp=0.24 *11* (1977Ag01).
88.1 *1*	10.0 *7*	88.08	5/2⁻,7/2⁻,9/2⁻	0.0	7/2⁻	M1(+E2)	<0.4	4.14 *8*	α(K)=3.29 *15*; α(L)=0.66 *15*; α(M)=0.15 *4* α(N)=0.035 *8*; α(O)=0.0047 *9*; α(P)=0.000202 *11* δ: computed by the evaluator from α(L)exp=0.5 *3* (1977Ag01).
151.6 *1*	2.2 *5*	151.63	⁻	0.0	7/2⁻	E2		0.649	α(K)=0.360 *5*; α(L)=0.222 *4*; α(M)=0.0534 *8* α(N)=0.01212 *18*; α(O)=0.001461 *21*; α(P)=1.587×10^{-5} *23* Mult.: the reported α(K)exp

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^{155}Tm ε decay (45 s) 1991To08 (continued)

$\gamma(^{155}Er)$ (continued)

E_γ[#]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†‡]	δ[†&]	α[@]	Comments
									value (0.15 *5*, 1977Ag01) is smaller than that for either an E2 (α(K)=0.360) or an M1 (α(K)=0.731) transition, suggesting that it might be E1 (for which α(K)=0.090). The placement in the level scheme, however, indicates that there should be no parity change between the two levels involved.
171.5 *2*	1.6 *6*	323.17	5/2$^-$,7/2$^-$,9/2$^-$	151.63	$^-$	E2(+M1)	>4	0.429 *9*	α(K)=0.261 *9*; α(L)=0.1292 *25*; α(M)=0.0309 *7* α(N)=0.00703 *14*; α(O)=0.000859 *16*; α(P)=1.21×10^{-5} *7* δ: computed by the evaluator from α(K)exp=0.18 *9* (1977Ag01).
247.0 *2*	2.8 *5*	398.63		151.63	$^-$	E2(+M1)		0.1265	α(K)=0.0879 *13*; α(L)=0.0297 *5*; α(M)=0.00702 *10* α(N)=0.001602 *23*; α(O)=0.000202 *3*; α(P)=4.35×10^{-6} *7* α: value for a pure E2 transition.
315.2 *2*	1.0 *5*	467.00	$^-$	151.63	$^-$	E2(+M1)		0.0595	α(K)=0.0440 *7*; α(L)=0.01194 *17*; α(M)=0.00279 *4* α(N)=0.000638 *9*; α(O)=8.25×10^{-5} *12*; α(P)=2.29×10^{-6} *4* α: value for a pure E2 transition.
323.2 *2*	6.5 *7*	323.17	5/2$^-$,7/2$^-$,9/2$^-$	0.0	7/2$^-$	M1+E2		0.082 *27*	α(K)=0.067 *26*; α(L)=0.0122 *13*; α(M)=0.00277 *23* α(N)=0.00064 *6*; α(O)=8.8×10^{-5} *13*; α(P)=3.9×10^{-6} *18* α: value calculated for δ=1.
379.1 *2*	≈1	467.00	$^-$	88.08	5/2$^-$,7/2$^-$,9/2$^-$	M1(+E2)		0.0716	α(K)=0.0604 *9*; α(L)=0.00881 *13*; α(M)=0.00195 *3* α(N)=0.000454 *7*; α(O)=6.59×10^{-5} *10*; α(P)=3.67×10^{-6} *6* α: value for a pure M1 transition.
432.7 *2*	1.0 *2*	584.47		151.63	$^-$				
496.7 *3*	0.8 *5*	584.47		88.08	5/2$^-$,7/2$^-$,9/2$^-$				
507.0 *4*	≈4	595.1		88.08	5/2$^-$,7/2$^-$,9/2$^-$				

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^{155}Tm ε decay (45 s) 1991To08 (continued)

γ(^{155}Er) (continued)

† Same as in Adopted Levels, Gammas dataset.
‡ The listed assignments are derived from a comparison of the α(K)exp data of 1977Ag01 with the theoretical values, normalized to α(K)(202γ from the ^{155}Ho ε decay)=0.28.
# A number of gammas from the ^{155}Tm decay are reported by 1977Ag01 that are not placed in their ^{155}Er level scheme (see the ^{155}Tm ε decay (21.6 2) data set for a listing). Since the sources used by these authors contained both activities, some of these gammas may in fact be associated with this (the 45-s) ^{155}Tm activity.
@ Additional information 2.
& Additional information 3.

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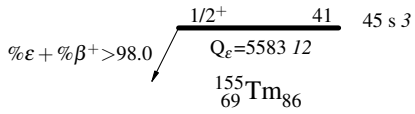
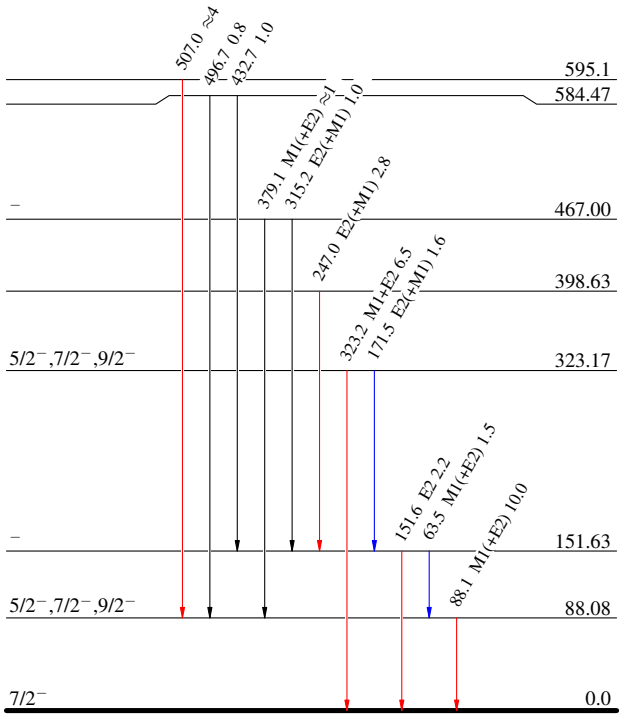
Decay Scheme

Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$





$^{155}_{68}Er_{87}$