^{170}Tm ε decay 1990EgZY,1986Ve01,1985Me18

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. M. Baglin[1], E. A. Mccutchan[2], S. Basunia[1]	NDS 153, 1 (2018)	1-Oct-2018

Parent: ^{170}Tm: E=0.0; $J^\pi=1^-$; $T_{1/2}$=128.6 d *3*; Q(ε)=312.8 *18*; %ε decay=0.131 *10*

^{170}Tm-%ε decay: based on I(K x ray Er), assuming ω_K=0.947, I(ε)=0.0297% 19 to 79 level (see comment on branch to 79 level), and α(K)(79γ), α(79γ), εK(g.s.) and εK(79 level) from theory. I(K x ray Er) data are discrepant (see general comment on these data); the average from 1970Mo07, 1985Me18, 1986Ve01, 1988KuZM and 1990EgZY is 0.102% 8, and the evaluator adopts this in preference to the mass spectrometric determination of 1968CrZY (0.144% 3) for which the measurement details are not known.

Additional information 1.

Others: 1988KuZM, 1969Ha20, 1969Ne02, 1968CrZY.

^{170}Tm sources typically are produced by ^{169}Tm(n,γ).

See also ^{170}Tm β^- decay.

^{170}Er Levels

E(level)†	J^π‡
0.0	0^+
78.7 *5*	2^+

† From measured Eγ.

‡ From Adopted Levels.

ε radiations

E(decay)	E(level)	Iε†	Log *ft*	Comments
(234.1 *19*)	78.7	0.029 *3*	10.21 *6*	εK=0.7594 *9*; εL=0.1828 *7*; εM+=0.05773 *25* Iε: from I(79γ)/I(84γ Yb)=0.00140 *7*, I(84γ)=2.48% 6 and α(79γ)=7.55.
(312.8 *18*)	0.0	0.102 *8*	9.97 *5*	εK=0.7840 *5*; εL=0.1648 *3*; εM+=0.05116 *11* Iε: from I(K x ray Er) corrected for contributions from ε+β^+ branch to 79 level and internal conversion of 79 transition, assuming εK=0.784.

† Absolute intensity per 100 decays.

γ(^{170}Er)

Iγ normalization: from branching and I(79γ)=0.00347% *19* (the latter from I(79γ)/I(84γ Yb)=0.00140 *7* and adopted I(84γ)=2.48% 6).

I(K x ray Er) data: 0.089% 5 (1990EgZY); I(K x ray Er)/I(84γ Yb)=0.0344 *14* (1970Mo07), 0.0362 *7* (1985Me18), 0.0470 *9* (1986Ve01) which, combined with adopted I(84γ)=2.48% 6, gives I(K x ray Er)=0.085% 3, 0.090% 2, 0.119% 2, respectively; $I(K_{\alpha 1}$ x ray)=0.061% 2 (1988KuZM) [so I(K x ray)=0.122% 4 if $I(K\alpha_1$ x ray)/I(K x ray)=0.509]. Others: 1969Ha20, 1969Ne02. Source of discrepancy between data is unclear.

E_γ	I_γ†‡	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α#	Comments
78.7 *5*	0.140 *7*	78.7	2^+	0.0	0^+	E2	7.45 *22*	α(K)=1.74 *3*; α(L)=4.38 *15*; α(M)=1.07 *4*; α(N+..)=0.269 *9* α(N)=0.241 *9*; α(O)=0.0280 *10*; α(P)=7.67×10^{-5} *15* E_γ: from 1969Ha20. I_γ: from weighted average of Iγ(79)/Iγ(84, Yb)=0.00122 *24* (1970Mo07), 0.00150 *20* (1985Me18), 0.00140 *8* (1986Ve01).

Continued on next page (footnotes at end of table)

^{170}Tm ε decay 1990EgZY,1986Ve01,1985Me18 (continued)

γ(^{170}Er) (continued)

E_γ	E_i(level)	Comments
		Other: 1969Ha20. Mult.: from Adopted Gammas.

† Iγ relative to I(84γ, Yb)=100.
‡ For absolute intensity per 100 decays, multiply by 0.0248 *19*.
# 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.

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Decay Scheme

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