^{170}Tm β^- decay 1990Ke01,1988KuZM,1979Bu21

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(β^-)=968.1 *8*; %β^- decay=99.869 *10*

^{170}Tm-%β^- decay: from %β^-=(100 − %ε) with %ε=0.131 *10*; see ^{170}Tm ε decay.

Others: 1995Vi11, 1994Dh01, 1993Ma52, 1993Sa44, 1992BeYY, 1987GeZU, 1986Ve01, 1986Ve05, 1985Me18, 1985Ve01, 1982Bo26, 1981Gu06, 1979Ke04, 1976Tu01, 1973Kh04, 1973Pl08, 1972Gr05, 1972Gu03, 1971Ma43, 1970Mo07, 1969An24, 1969Da03, 1969Ha20, 1969Ne02, 1969Va17, 1968An19, 1968Ni06, 1968Na08, 1968Ra30, 1967Am02, 1967An02, 1967Ba27, 1967Gr11, 1966Fu03, 1966Ra04, 1965Me08, 1965Ro17, 1965Ru03, 1963Fo02, 1962El03, 1960Ma04, 1956De57, 1952Mc05, 1952Gr18.

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

^{170}Yb Levels

E(level)[†]	J^π[‡]	$T_{1/2}$
0.0	0^+	
84.25476 *8*	2^+	1.605[#] ns *13*

[†] From measured Eγ.

[‡] From Adopted Levels.

[#] From $\beta\gamma$(t). Weighted average of 1.60 ns *2* (1972Gr05), 1.62 ns *2* (1972Gu03), 1.58 ns *3* (1967Ba27). Others: 1.56 ns *8* (1966Fu03), 1.60 ns *5* (1966Ra04), 1.64 ns *5* (1965Me08), 1.56 ns *5* (1965Ro17), 1.47 ns *4* (1963Fo02), 1.61 ns *6* (1962El03), 1.62 ns *7* (1961Go24), 1.57 ns *5* (1952Gr18).

β^- radiations

β^- spectrum shape: 1969Va17, 1968An19, 1967An02, 1967Gr11. Shape is non-allowed for both branches (1969Va17).

883β^-84$\gamma(\theta)$: A_2=−0.179 *18* at 1.5 min_ec^2 after correction for time dependent attenuation (1976Tu01). Others: 1973Kh04, 1971Ma43, 1969Da03, 1968Ra30, 1967Am02, 1965Ru03.

Inner bremsstrahlung: 1981Gu06, 1994Dh01.

β^- decay nuclear matrix element parameters: see, e.g., 1985Ve01, 1982Bo26, 1973Kh04, 1971Ma43, 1968Ra30, 1968An19, 1967An02, 1965Ru03.

Total K- and L-shell ionization probabilities: 1995Vi11, 1992BeYY.

E(decay)[†]	E(level)	Iβ^-[‡]	Log *ft*	Comments
(883.8 *8*)	84.25476	18.1 *5*	9.439 *13*	av Eβ=290.51 *31* Iβ^-: from I(84γ)=2.48% 6 and α(84)=6.28 *9*. E(decay): other: 883 *1* (1969Va17). Total K- and L-shell ionization probabilities: K-shell, 0.0072% 5 (1995Vi11), 0.0068% 21 (1992BeYY); L-shell, 0.078% 14 (1995Vi11).
(968.1 *8*)	0.0	81.9 *5*	8.925 *4*	av Eβ=323.17 *32* Iβ^-: from Iβ(84 level)=18.1 *5* and Iε=0.131 *10*. E(decay): others: 968 (1969Va17), 965 *4* (1967An02), 967 *3* (1967Gr11).

[†] others: 1969Va17, 1969An24, 1967An02, 1967Gr11.

[‡] Absolute intensity per 100 decays.

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$\gamma(^{170}Yb)$

Iγ normalization: from Iγ(84γ)=2.48% *6*, see comment on Iγ(84γ) .
Relative Yb x-ray intensity data: 1986Ve01, 1985Me18, 1970Mo07, 1969Ha20 [I(K x ray Yb):I(K x ray Er):I(79γ Er):I(84γ Yb)], 1986Ve01, 1986Ve05 [K x ray and/or L x ray intensity ratios].
Absolute Yb x-ray intensity data: Kα x ray, 2.54% 5 (1990Ke01); Kα x ray, 0.67% 2 (1990Ke01); Kα x ray, 1.73% 5 (1988KuZM).
Transverse polarization of ce(L)(84 keV): K_L=0.34 *14* (1968Na08).
L1 fluorescence yield of Yb=0.131 *13* (1993Ma52).
Conversion electron Mossbauer spectroscopy (84γ): 1993Sa44.

E_γ	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[#]	Comments
84.25474 *8*	100	84.25476	2+	0.0	0+	E2[†]	6.28	α(K)=1.407 *20*; α(L)=3.72 *6*; α(M)=0.919 *13*; α(N+..)=0.233 *4* α(N)=0.209 *3*; α(O)=0.0239 *4*; α(P)=6.36×10^{-5} *9* E_γ: recommended value from evaluation by 2000He14. Others: 84.25523 *8* (1979Ke04), 84.2551 *3* (1979He19) (relative to different standard). Iγ(84γ)=2.48% 6 (weighted average of 2.37 *4* (1990Ke01), 2.56 *4* (1988KuZM; presumably supersedes 2.56 *7* at 95% confidence level from 1987GeZU) and 2.54 *6* (1973Pl08), based on measured source activity and Iγ). Ice_{LMN}=11.5% 6 (1990Ke01). See comment on mult(84γ) for summary of ce data.

[†] From the following conversion coefficient values and ratios. α(K)exp: 1.43 *4* (1990Ke01), 1.41 *3* (1986Ve01), 1.39 *3* (1985Me18), 1.46 *7* (1973Pl08), 1.41 *5* (1971Ca08), 1.37 *4* (1970Mo07), 1.41 *4* (1969Ne02), 1.48 *5* (1966Di02), from I(K x ray)/I(84γ) adjusted by evaluator assuming ω_k(Yb)=0.950; numerous less precise data also exist. α_{LMN}=4.87 *24* (1990Ke01). α(K)exp/α(L)exp:0.356 *9* (1968Ni06), 0.369 *5* (1960Ma04). α(L1)exp/α(L2)exp: 0.0798 *4* (1979Bu21). α(L1)exp/α(L3)exp: 0.082 *3* (1966Ka13), 0.0796 *18* (1967Ge07), 0.0810 *12* (1966Er03). α(L2)exp/α(L3)exp: 1.012 *3* (1979Bu21), 0.985 *9* (1966Ka13), 0.994 *10* (1967Ge07), 0.996 *14* (1966Er03). α(L3)exp/α(M3)exp: 3.91 *4* (1968Ni06). α(M)exp/α(N+...)exp: 3.77 *9* (1968Ni06). α(exp): 8.1 *2* (1973Pl08).
[‡] For absolute intensity per 100 decays, multiply by 0.0248 *6*.
[#] 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