

Tm-166 (7.70h) CB+	Tm-167 (9.25d) EC	Tm-168 (93.1d) ECB+B-	Tm-170 (128.6d) B-EC	Tm-171 (1.15m) B-	Tm-172 (63.6h) B-	Tm-173 (8.24h) B-	Tm-174 (5.4m) B-	
Er-165 (10.36h) C	Er-166 (STABLE)	Er-167 (STABLE)	Er-168 (STABLE)	Er-169 (STABLE)	Er-170 (STABLE)	Er-171 (7.516h) B-	Er-172 (49.3h) B-	Er-173 (1.434m) B-

THULIUM-170

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Tm-170
Atomic number (Z): 69
Mass number (A): 170
Neutron number (N): 101

RADIOACTIVE DECAY

Decay modes: β^- , Electron capture
Half-life: 128.6 [d]
Decay constant: 6.2384×10^{-8} [1/s]
Daughters: Yb-170 (99.9%), Er-170 (0.131%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.32799 [MeV]
Mean photon energy: 0.00414 [MeV]
Air kerma rate constant, Γ_{10} : 1.497×10^{-19} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 1.497×10^{-19} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 5.255×10^{-14} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy $\cdot$ kg/Bq $\cdot$ s]

Equilibrium dose constant for betas/electrons, $\Delta_{\beta, \beta+, e^-}$: 5.255e-14 [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 6.633e-16 [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

Dose point kernel source: **Graves, et al. Medical Physics. 2019 Nov.; 46(11):5284-5293.**

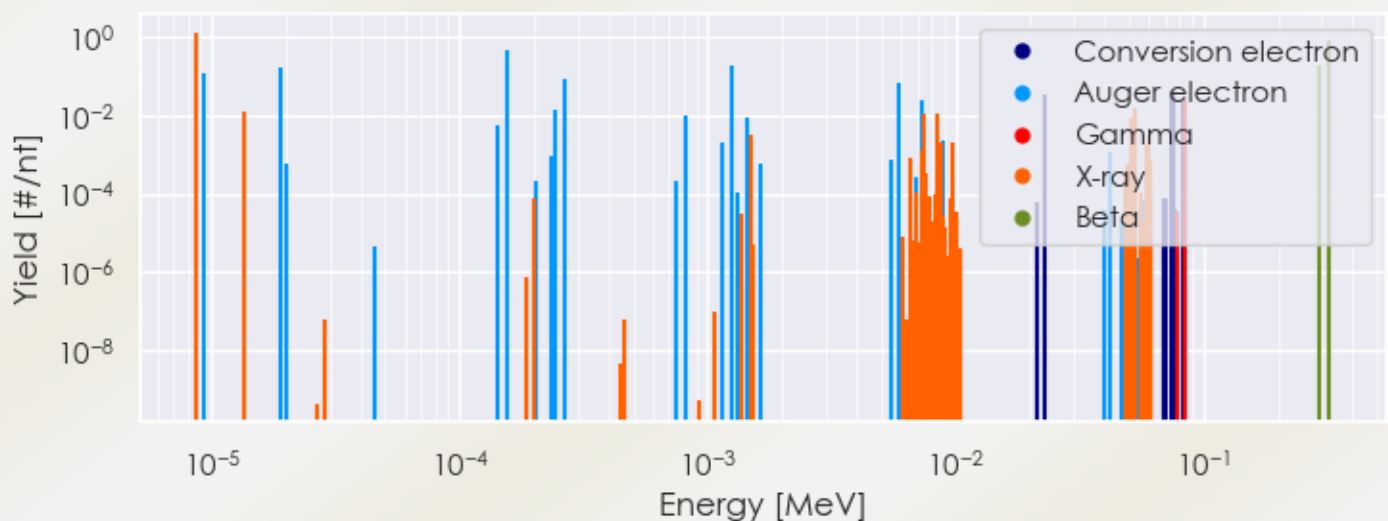
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Tm-170 DPK.csv

SUMMARY SPECTRA (PLOT)

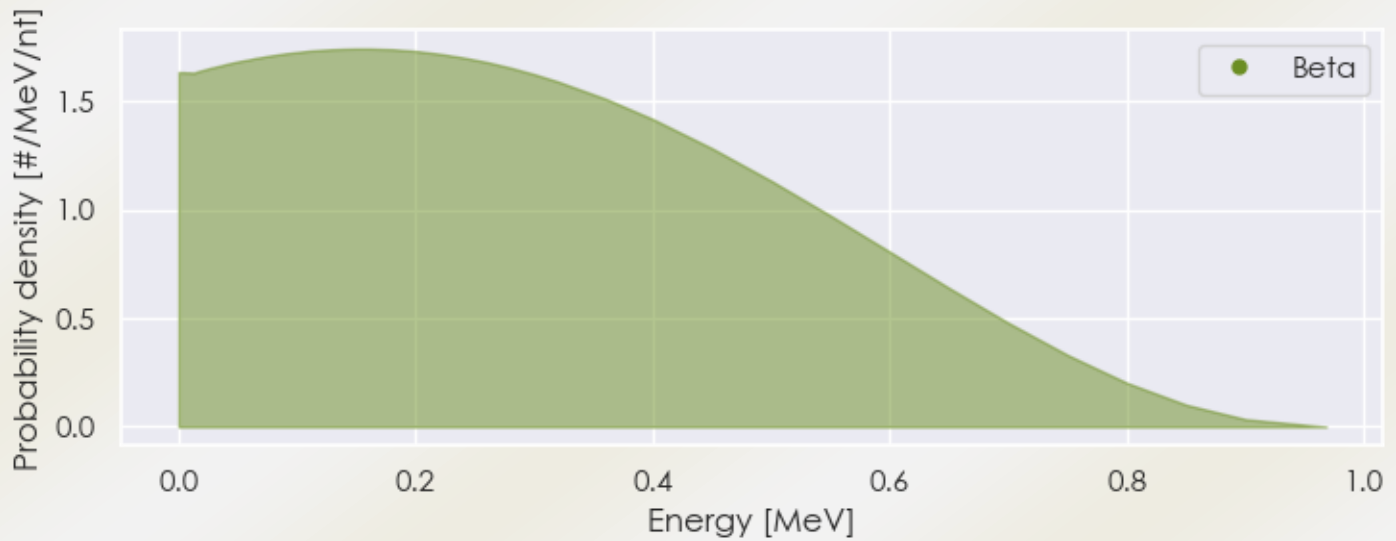
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Tm-170 Summary Spectrum.csv

BETA SPECTRA (PLOT)

Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated beta spectra file here: www.mirdsoft.org/products/MIRDspecs/Tm-170 Beta Spectrum.csv

TABULATED DATA

SUMMARY SPECTRA (TABLE)

Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**

Note: Radiations with yield < 0.01 are excluded from the table, but are available in the linked *.csv data.

Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Tm-170 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
8.69105e-06	1.361e+00	X-ray
1.35616e-05	1.257e-02	X-ray
7.40528e-03	1.170e-02	X-ray
8.41451e-03	1.123e-02	X-ray
5.25072e-02	1.654e-02	X-ray
8.42547e-02	2.471e-02	Gamma
2.90391e-01	1.829e-01	Beta
3.23057e-01	8.157e-01	Beta
9.31835e-06	1.182e-01	Auger electron
1.88608e-05	1.677e-01	Auger electron

1.54792e-04	4.932e-01	Auger electron
2.43224e-04	1.485e-02	Auger electron
2.64577e-04	8.663e-02	Auger electron
1.25895e-03	2.004e-01	Auger electron
5.84899e-03	6.656e-02	Auger electron
7.34024e-03	2.402e-02	Auger electron
2.28137e-02	3.433e-02	Conversion electron
7.42621e-02	4.547e-02	Conversion electron
7.53209e-02	4.530e-02	Conversion electron
8.23195e-02	2.332e-02	Conversion electron

USEFUL LINKS

Isotope decay characteristics are periodically updated as better measurements can be made - changes that may not be reflected on this page. Please see useful links:

National Nuclear Data Center (NNDC): <https://www.nndc.bnl.gov/nudat3/mird/>

International Atomic Energy Agency (IAEA) Livechart: <https://www-nds.iaea.org/relnsd/vcharthtml/VChartHTML.html>

REFERENCE LINKS

ICRP Report 107: <https://www.icrp.org/publication.asp?id=ICRP%20Publication%20107>

Graves et al. Dose Point Kernels: <https://doi.org/10.1002/mp.13789>

MIRD Decay Schemes 2nd Edition: https://sites.snmmi.org/SNMMI-MAIN/iCore/Store/StoreLayouts/Item_Detail.aspx?iProductCode=0-932004-80-6