



TERBIUM-147

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Tb-147
Atomic number (Z): 65
Mass number (A): 147
Neutron number (N): 82

RADIOACTIVE DECAY

Decay modes: β^+ , Electron capture
Half-life: 1.64 [h]
Decay constant: 1.1740×10^{-4} [1/s]
Daughters: Gd-147 (100.0%)
Radioactive daughters: Gd-147

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.28101 [MeV]
Mean photon energy: 2.18449 [MeV]
Air kerma rate constant, Γ_{10} : 6.629×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 7.690×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 4.502×10^{-14} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : $0.000 \times 10^{+00}$ [Gy $\cdot$ kg/Bq $\cdot$ s]

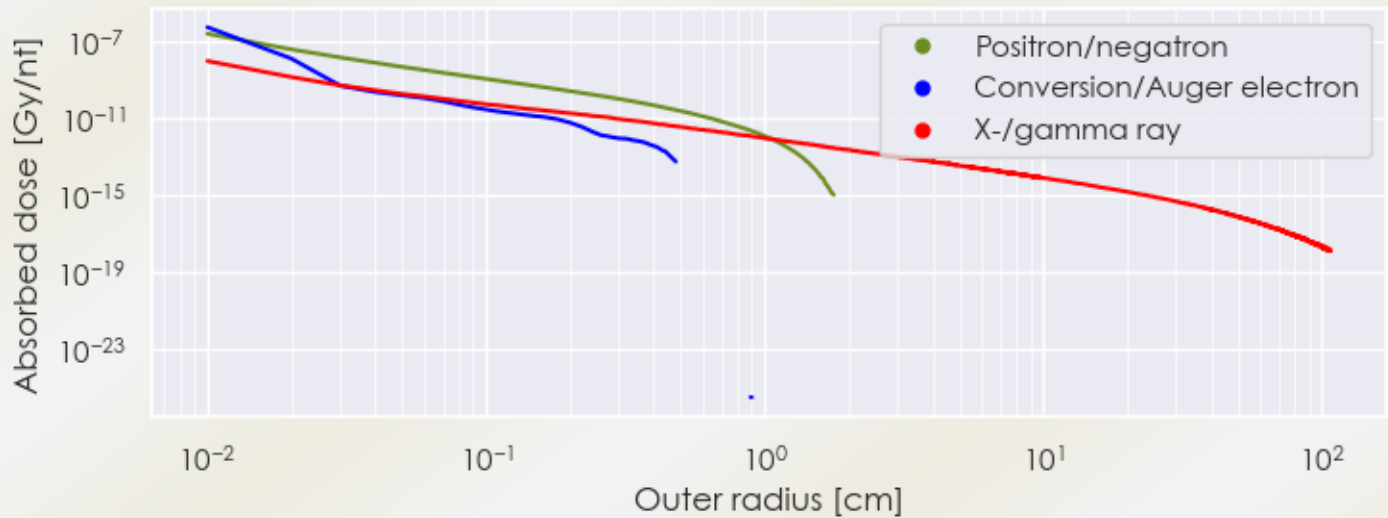
Equilibrium dose constant for betas/electrons, $\Delta_{\beta,\beta^+,e^-}$: 4.502e-14 [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 3.500e-13 [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

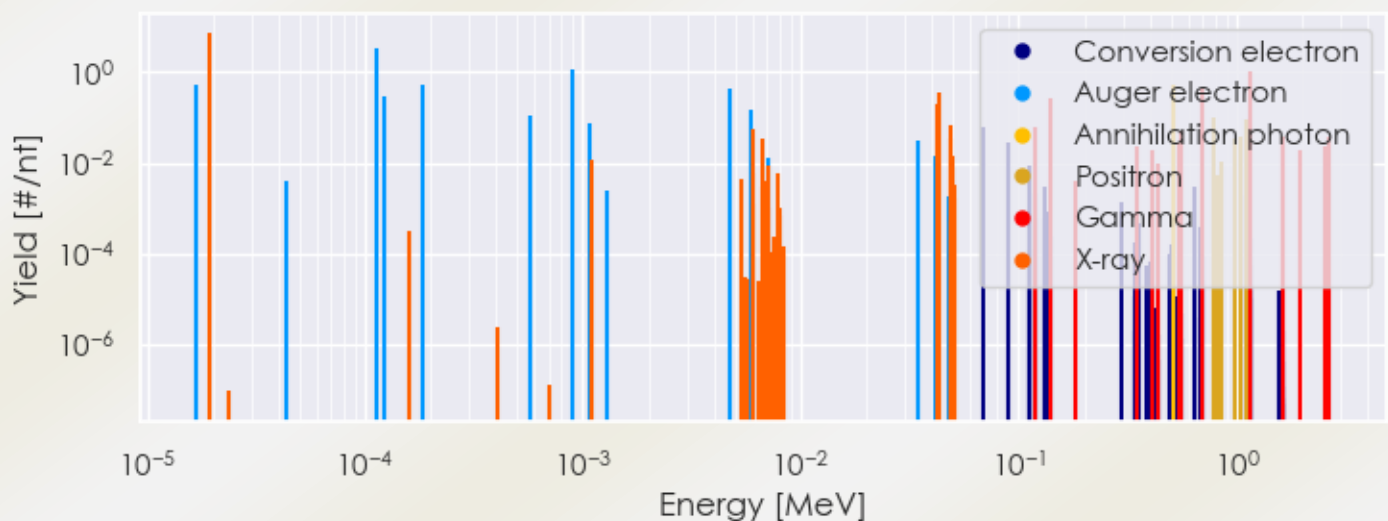
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Tb-147 DPK.csv

SUMMARY SPECTRA (PLOT)

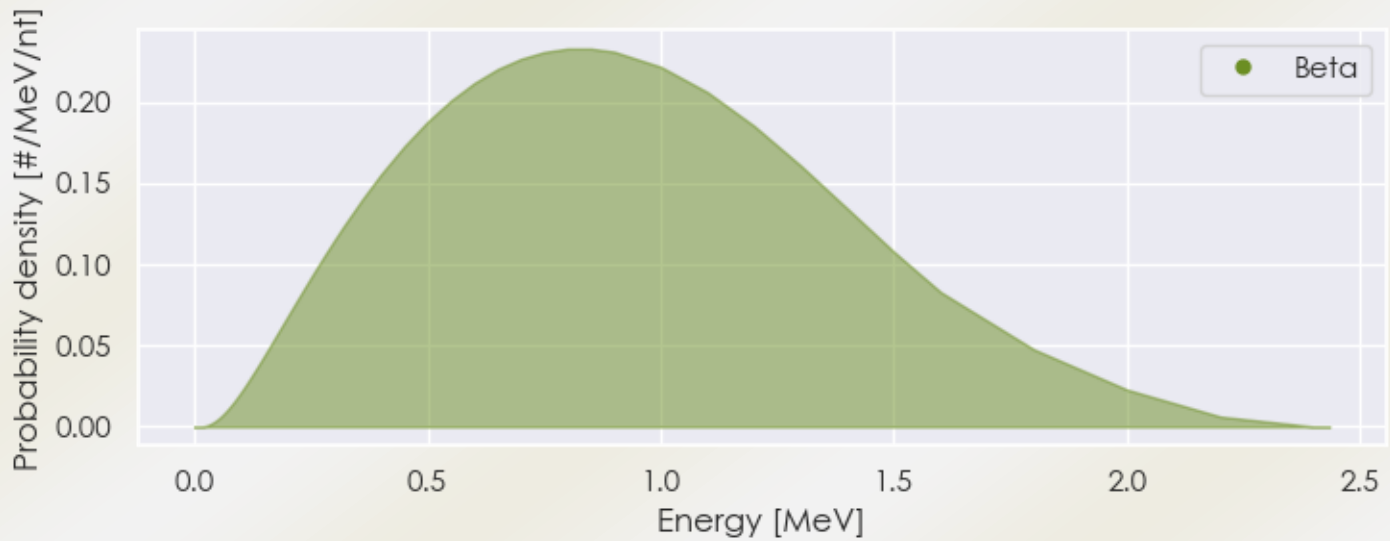
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Tb-147 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/Tb-147 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/Tb-147 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.94293e-05	7.585e+00	X-ray
1.09475e-03	1.156e-02	X-ray
6.04290e-03	5.329e-02	X-ray
6.71540e-03	3.436e-02	X-ray
4.23559e-02	1.899e-01	X-ray
4.30603e-02	3.415e-01	X-ray
4.86161e-02	3.470e-02	X-ray
4.87612e-02	6.711e-02	X-ray
5.00239e-02	1.480e-02	X-ray
1.19700e-01	6.100e-02	Gamma

1.39800e-01	2.746e-01	Gamma
3.47400e-01	2.400e-02	Gamma
4.07000e-01	1.900e-02	Gamma
4.34800e-01	1.000e-02	Gamma
5.11000e-01	5.483e-01	Annihilation photon
5.47200e-01	2.800e-02	Gamma
5.54700e-01	5.100e-02	Gamma
6.94400e-01	4.300e-01	Gamma
1.15220e+00	1.000e+00	Gamma
1.62790e+00	3.700e-02	Gamma
1.62810e+00	3.700e-02	Gamma
1.94830e+00	1.900e-02	Gamma
2.56190e+00	2.300e-02	Gamma
2.68140e+00	3.600e-02	Gamma
7.86025e-01	9.784e-02	Positron
8.52145e-01	1.098e-02	Positron
9.81809e-01	3.395e-02	Positron
1.03606e+00	3.594e-02	Positron
1.09960e+00	8.986e-02	Positron
1.68638e-05	5.097e-01	Auger electron
1.13381e-04	3.412e+00	Auger electron
1.23637e-04	2.806e-01	Auger electron
1.82282e-04	5.328e-01	Auger electron
5.72388e-04	1.072e-01	Auger electron
8.97929e-04	1.150e+00	Auger electron
1.07577e-03	7.806e-02	Auger electron
4.77150e-03	4.228e-01	Auger electron
5.92752e-03	1.483e-01	Auger electron
7.11820e-03	1.288e-02	Auger electron
3.47387e-02	2.962e-02	Auger electron
4.11460e-02	1.467e-02	Auger electron
6.93970e-02	6.389e-02	Conversion electron
8.94970e-02	2.756e-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