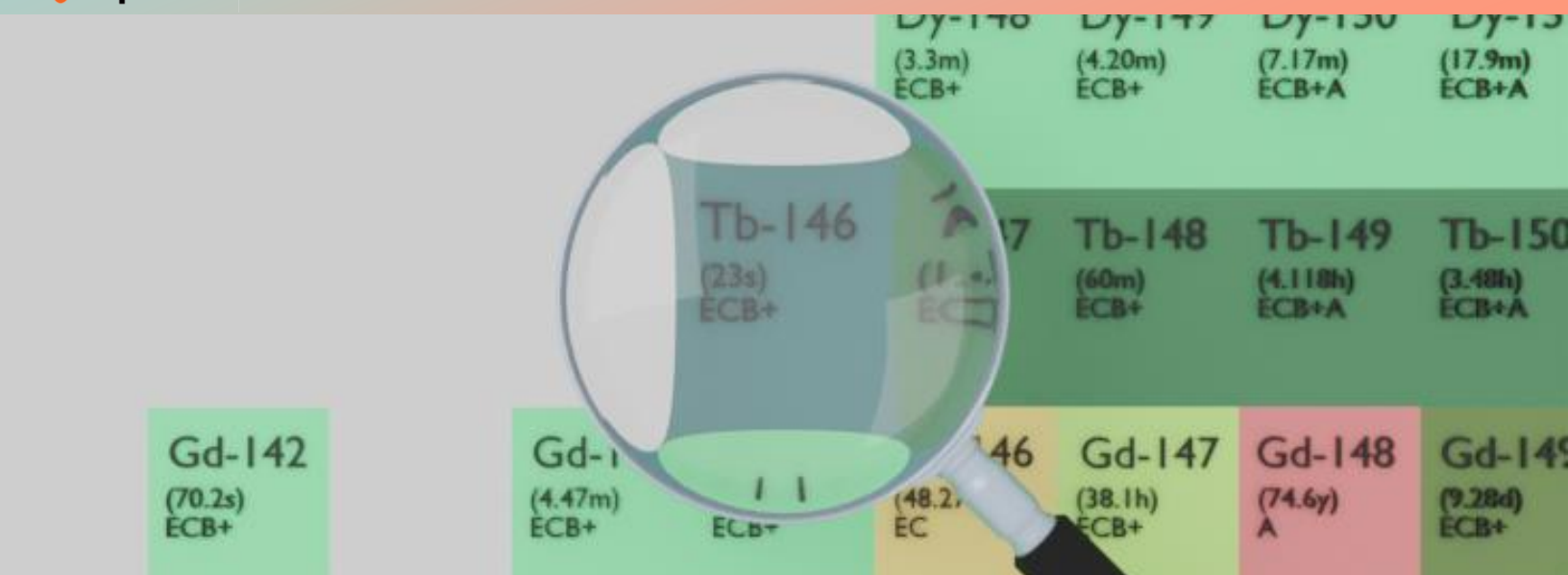




TERBIUM-146

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Tb-146
Atomic number (Z): 65
Mass number (A): 146
Neutron number (N): 81

RADIOACTIVE DECAY

Decay modes: β^+ , Electron capture
Half-life: 23.0 [s]
Decay constant: $3.0137\text{e-}02$ [1/s]
Daughters: Gd-146 (100.0%)
Radioactive daughters: Gd-146

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 1.46436 [MeV]
Mean photon energy: 3.62561 [MeV]
Air kerma rate constant, Γ_{10} : $9.320\text{e-}17$ [$\text{Gy} \cdot \text{m}^2/\text{Bq} \cdot \text{s}$]
Air kerma coefficient, K_{air} : $1.214\text{e-}16$ [$\text{Gy} \cdot \text{m}^2/\text{Bq} \cdot \text{s}$]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : $2.346\text{e-}13$ [$\text{Gy} \cdot \text{kg}/\text{Bq} \cdot \text{s}$]
Equilibrium dose constant for alphas, Δ_{α} : $0.000\text{e+}00$ [$\text{Gy} \cdot \text{kg}/\text{Bq} \cdot \text{s}$]

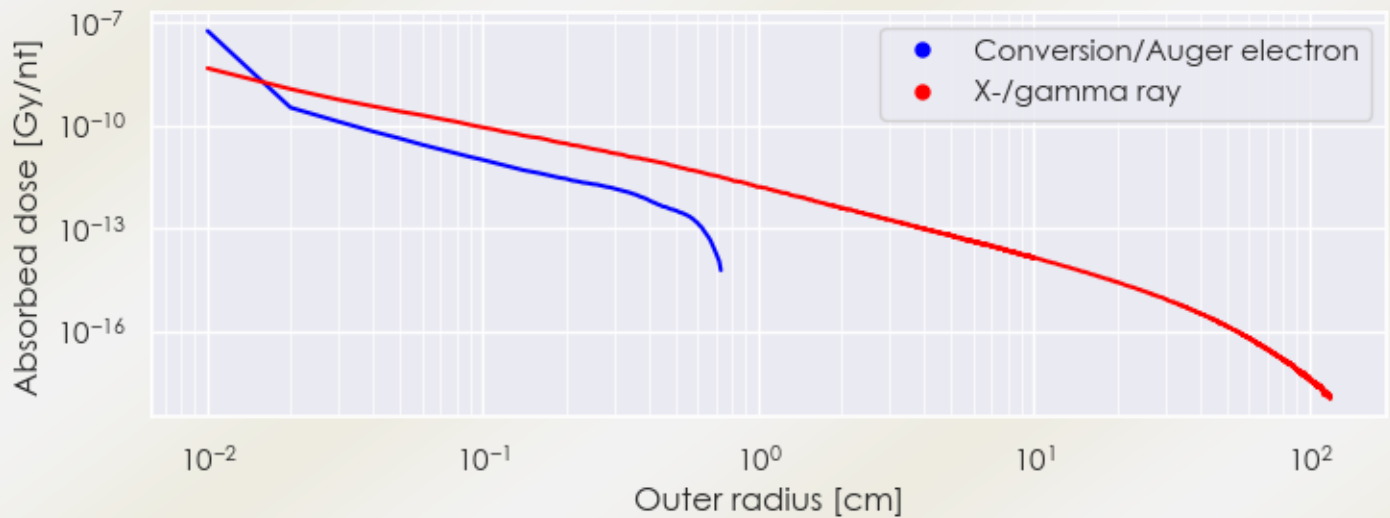
Equilibrium dose constant for betas/electrons, $\Delta_{\beta, \beta^+, e^-}$: 2.346×10^{-13} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 5.809×10^{-13} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

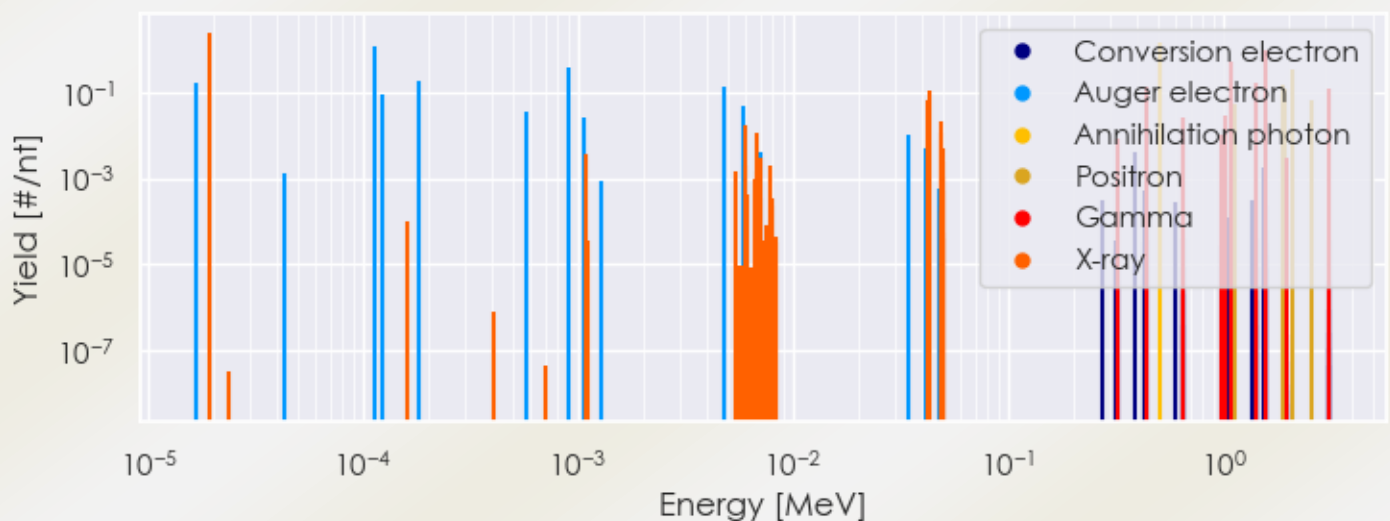
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Tb-146 DPK.csv

SUMMARY SPECTRA (PLOT)

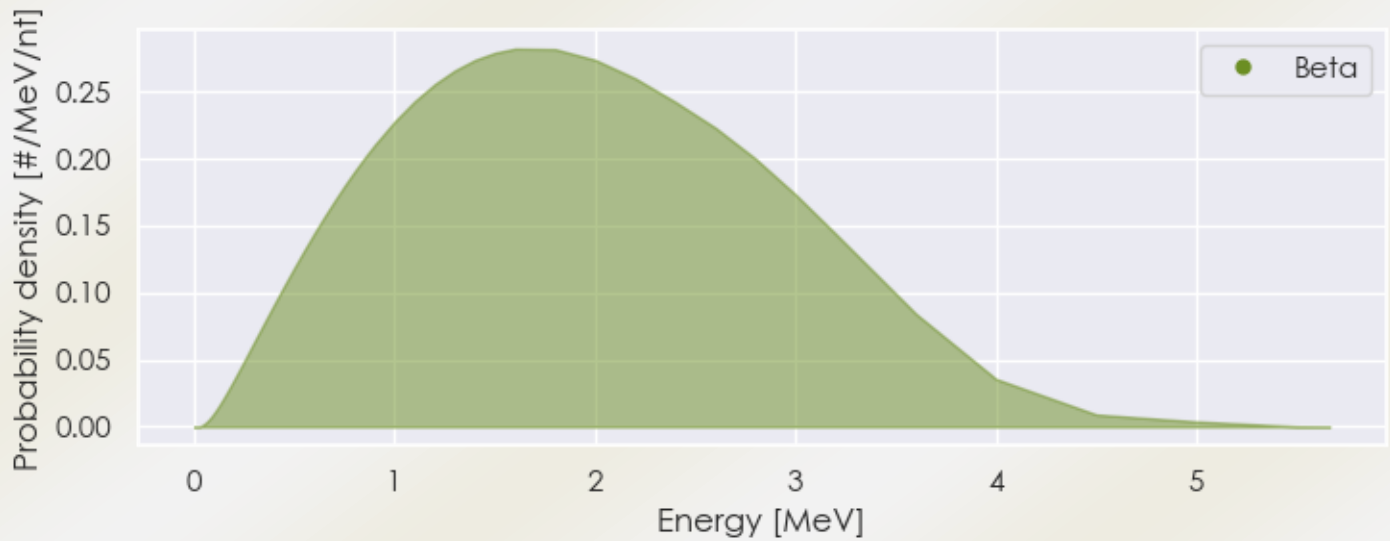
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Tb-146 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-146 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-146 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.94294e-05	2.521e+00	X-ray
6.04290e-03	1.770e-02	X-ray
6.71540e-03	1.141e-02	X-ray
4.23559e-02	6.317e-02	X-ray
4.30603e-02	1.136e-01	X-ray
4.86161e-02	1.154e-02	X-ray
4.87612e-02	2.232e-02	X-ray
4.41000e-01	1.310e-01	Gamma
5.11000e-01	1.459e+00	Annihilation photon
6.55000e-01	2.600e-02	Gamma

9.87600e-01	1.000e-02	Gamma
1.03190e+00	2.900e-02	Gamma
1.07890e+00	5.160e-01	Gamma
1.41710e+00	1.720e-01	Gamma
1.57950e+00	1.000e+00	Gamma
3.13960e+00	1.170e-01	Gamma
1.14105e+00	5.435e-02	Positron
1.89063e+00	1.467e-01	Positron
1.93882e+00	1.250e-01	Positron
2.09779e+00	3.315e-01	Positron
2.56492e+00	6.739e-02	Positron
1.68638e-05	1.694e-01	Auger electron
1.13380e-04	1.134e+00	Auger electron
1.23653e-04	9.325e-02	Auger electron
1.82280e-04	1.771e-01	Auger electron
5.72552e-04	3.571e-02	Auger electron
8.97941e-04	3.821e-01	Auger electron
1.07580e-03	2.594e-02	Auger electron
4.77165e-03	1.405e-01	Auger electron
5.92770e-03	4.927e-02	Auger 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