



TERBIUM-151M

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Tb-151m
Atomic number (Z): 65
Mass number (A): 151
Neutron number (N): 86

RADIOACTIVE DECAY

Decay modes: β^+ , Electron capture, Internal transition
Half-life: 25.0 [s]
Decay constant: 2.7726e-02 [1/s]
Daughters: Tb-151 (93.4%), Gd-151 (6.6%)
Radioactive daughters: Tb-151, Gd-151

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.07927 [MeV]
Mean photon energy: 0.08079 [MeV]
Air kerma rate constant, Γ_{10} : 3.390e-18 [Gy·m²/Bq·s]
Air kerma coefficient, K_{air} : 3.453e-18 [Gy·m²/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 1.270e-14 [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy·kg/Bq·s]

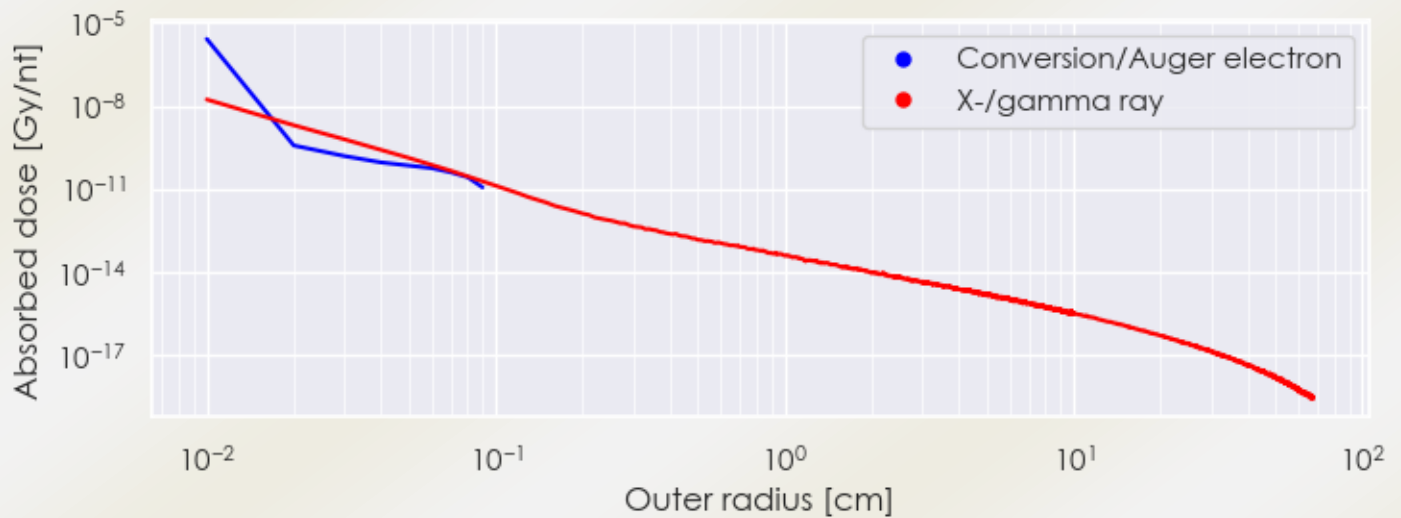
Equilibrium dose constant for betas/electrons, $\Delta_{\beta, \beta^+, e^-}$: 1.270×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 1.294×10^{-14} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

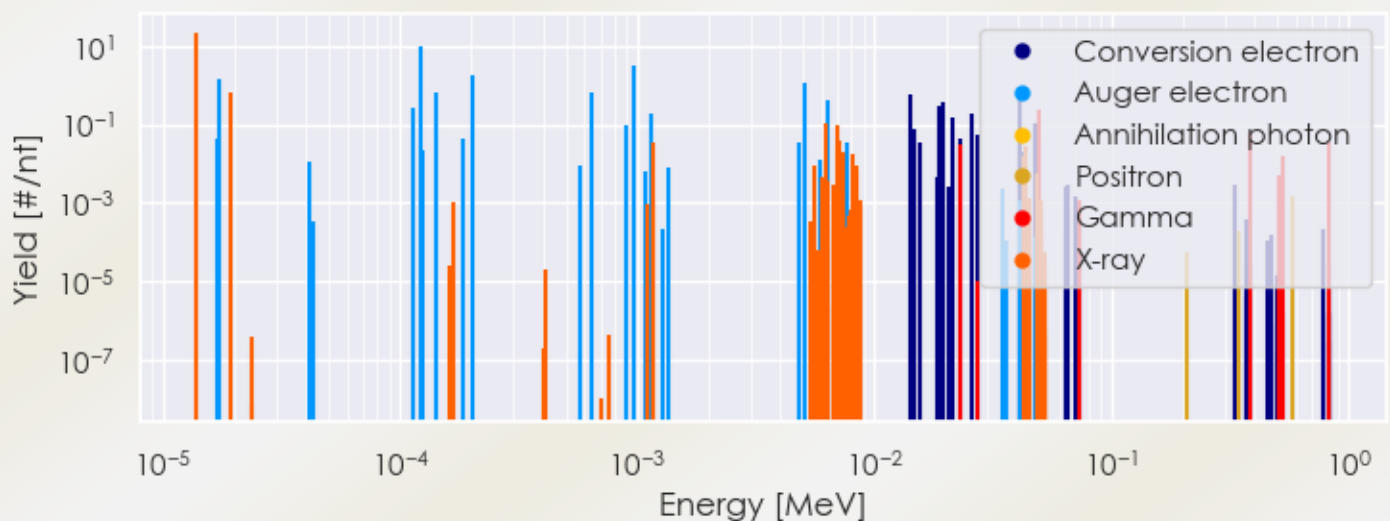
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Tb-151m DPK.csv

SUMMARY SPECTRA (PLOT)

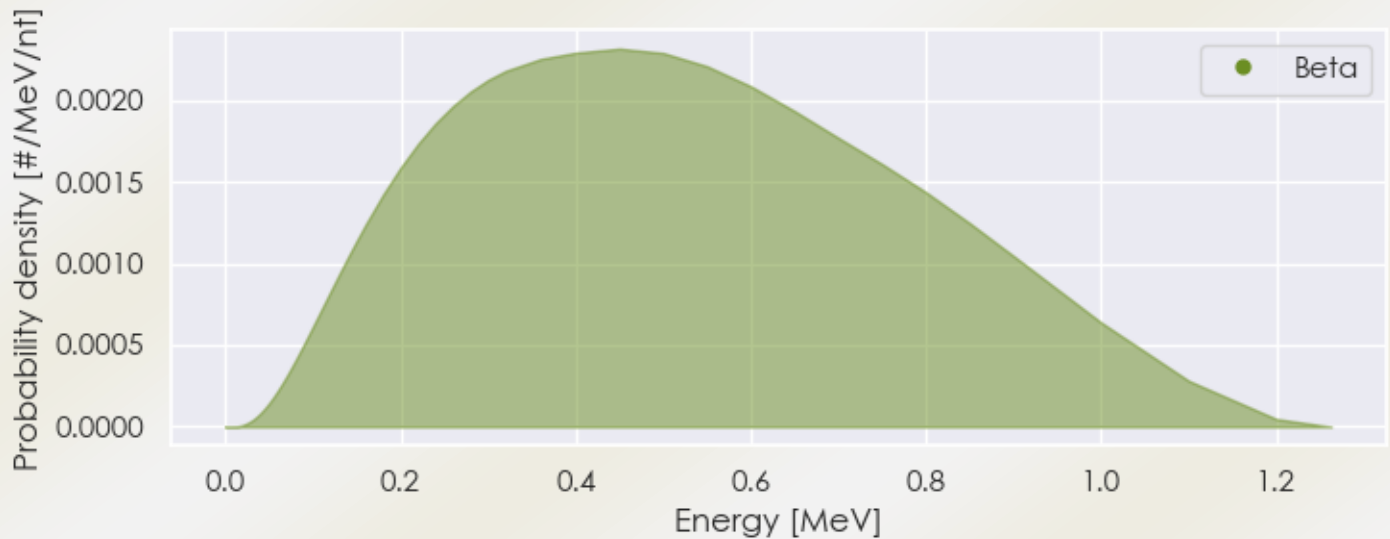
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Tb-151m 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-151m 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-151m Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.38853e-05	2.239e+01	X-ray
1.94298e-05	6.154e-01	X-ray
1.16644e-03	3.514e-02	X-ray
6.22629e-03	1.263e-02	X-ray
6.26070e-03	1.116e-01	X-ray
6.91969e-03	2.630e-02	X-ray
6.98190e-03	9.901e-02	X-ray
7.07629e-03	3.710e-02	X-ray
7.35101e-03	1.884e-02	X-ray

8.10032e-03	1.729e-02	X-ray
2.29200e-02	3.138e-02	Gamma
4.23559e-02	1.534e-02	X-ray
4.30603e-02	2.757e-02	X-ray
4.94600e-02	2.242e-01	Gamma
3.79700e-01	6.313e-02	Gamma
5.22400e-01	1.517e-02	Gamma
8.30500e-01	3.302e-02	Gamma
1.68638e-05	4.137e-02	Auger electron
1.73725e-05	1.381e+00	Auger electron
4.15900e-05	1.081e-02	Auger electron
1.13377e-04	2.769e-01	Auger electron
1.21593e-04	1.027e+01	Auger electron
1.23705e-04	2.277e-02	Auger electron
1.40996e-04	6.481e-01	Auger electron
1.82293e-04	4.329e-02	Auger electron
2.00632e-04	1.790e+00	Auger electron
6.46324e-04	6.846e-01	Auger electron
8.97990e-04	9.319e-02	Auger electron
9.66424e-04	3.182e+00	Auger electron
1.15021e-03	1.840e-01	Auger electron
4.77277e-03	3.426e-02	Auger electron
5.09802e-03	1.123e+00	Auger electron
5.92896e-03	1.201e-02	Auger electron
6.32117e-03	3.956e-01	Auger electron
7.58548e-03	3.509e-02	Auger electron
1.42469e-02	5.989e-01	Conversion electron
1.46591e-02	7.323e-02	Conversion electron
1.54147e-02	3.495e-02	Conversion electron
1.88391e-02	2.986e-01	Conversion electron
1.95947e-02	3.829e-01	Conversion electron
2.13232e-02	1.553e-01	Conversion electron
2.29200e-02	4.353e-02	Conversion electron
2.55032e-02	1.963e-01	Conversion electron
2.71000e-02	5.176e-02	Conversion electron
4.07869e-02	4.408e-01	Conversion electron
4.11991e-02	5.006e-02	Conversion electron
4.19547e-02	2.062e-02	Conversion electron

4.78632e-02	1.124e-01	Conversion electron
4.94600e-02	3.141e-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/SNMML-MAIN/iCore/Store/StoreLayouts/Item_Detail.aspx?iProductCode=0-932004-80-6