

Dy-147 (4.20m) ECB+	Dy-150 (7.17m) ECB+A	Dy-151 (17.9m) ECB+A	Dy-152 (2.38h) ECA	Dy-153 (6.4h) A	Dy-154 (3.0E+6y) A	Dy-155 (9.9h) ECB+	Dy-156 (STABLE)	Dy-157 (8.14h) EC
Tb-148 (50m) CB+	Tb-149 (4.118h) ECB+A	Tb-150 (3.48h) ECB+A	Tb-151 (1.1h) EC	Tb-152m (4.2m) ITECB+	Tb-153 (2.32h) EC	Tb-154 (21.5h) ECB+	Tb-155 (5.32d) EC	Tb-156 (5.35d) EC
Gd-147 (18.1h) CB+	Gd-148 (74.6y) A	Gd-149 (9.28d) ECB+	Gd-150 (1.79E+6y) A	Gd-151 (1.1h) EC	Gd-152 (1.08E+6y) A	Gd-153 (240.4d) EC	Gd-154 (STABLE)	Gd-155 (STABLE)

TERBIUM-152M

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Tb-152m
Atomic number (Z): 65
Mass number (A): 152
Neutron number (N): 87

RADIOACTIVE DECAY

Decay modes: β^+ , Electron capture, Internal transition
Half-life: 4.2 [m]
Decay constant: 2.7506e-03 [1/s]
Daughters: Tb-152 (78.8%), Gd-152 (21.2%)
Radioactive daughters: Tb-152, Gd-152

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.15198 [MeV]
Mean photon energy: 0.76193 [MeV]
Air kerma rate constant, Γ_{10} : 2.868e-17 [Gy·m²/Bq·s]
Air kerma coefficient, K_{air} : 2.915e-17 [Gy·m²/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 2.435e-14 [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy·kg/Bq·s]

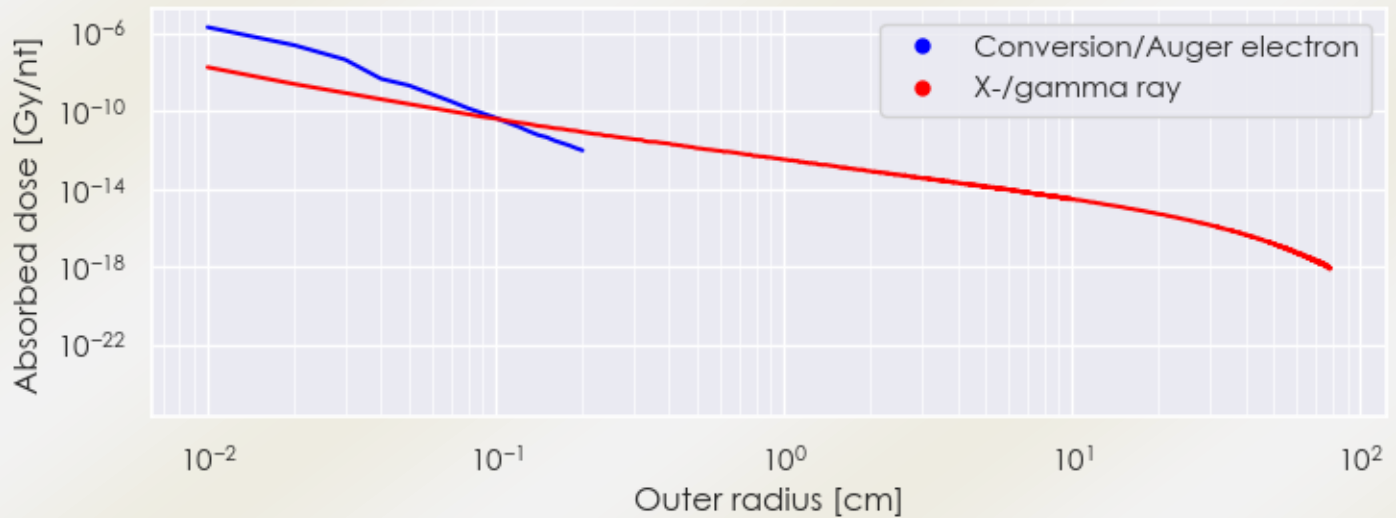
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-, \beta+, e-}$: 2.435×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 1.221×10^{-13} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

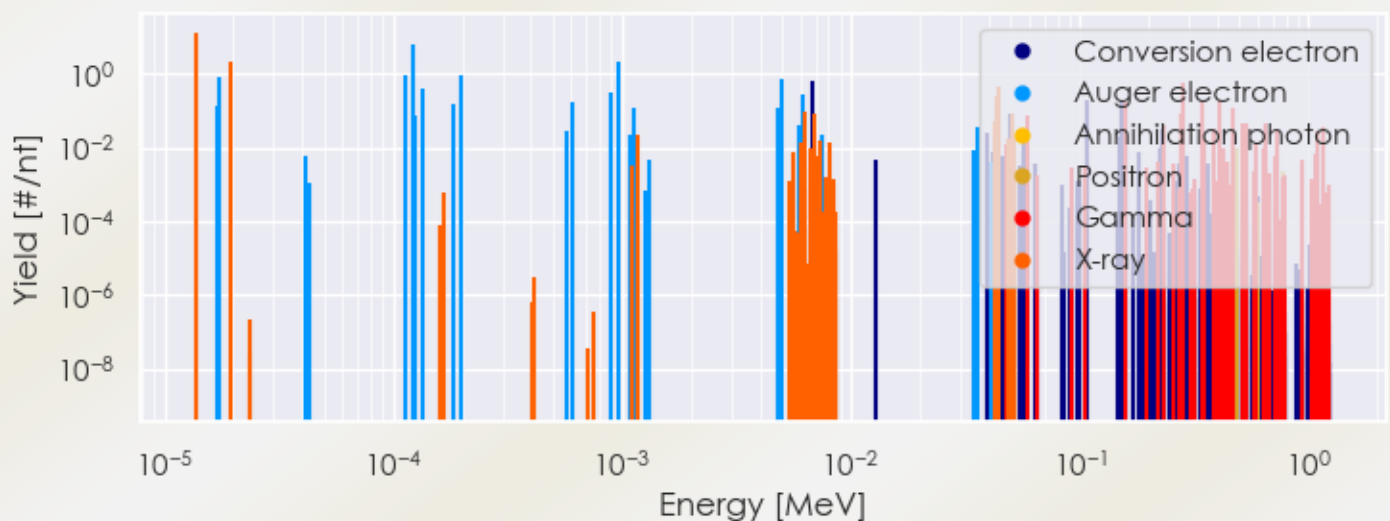
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Tb-152m DPK.csv

SUMMARY SPECTRA (PLOT)

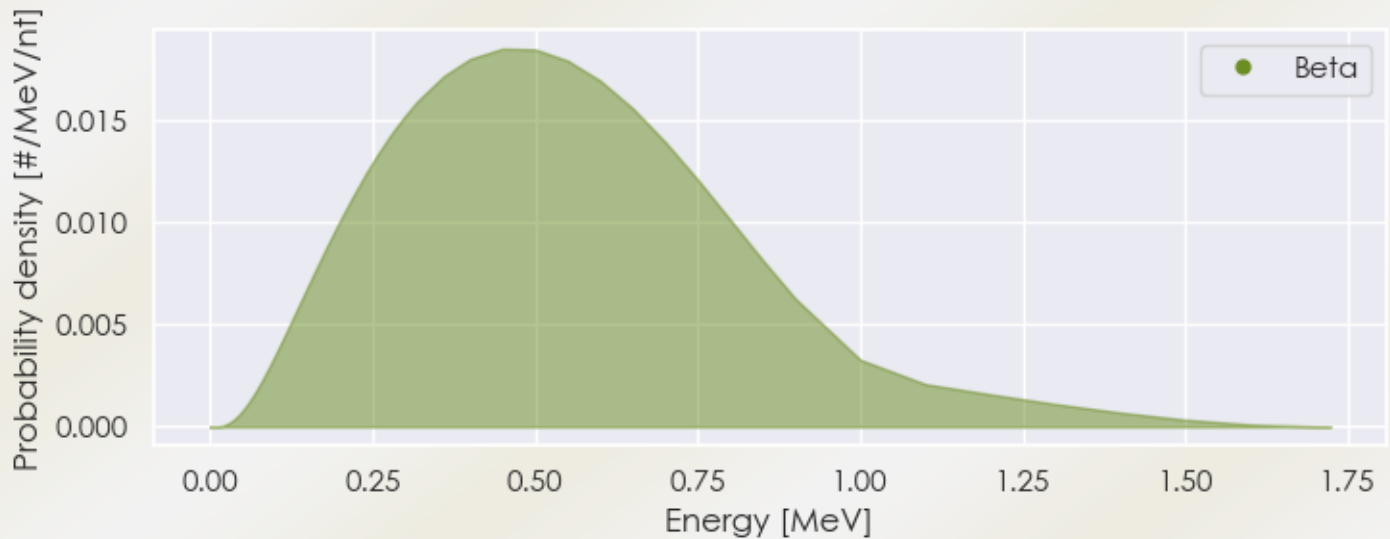
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Tb-152m 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-152m 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-152m Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.38215e-05	1.344e+01	X-ray
1.94295e-05	2.074e+00	X-ray
1.16030e-03	2.296e-02	X-ray
6.04290e-03	1.454e-02	X-ray
6.22630e-03	1.072e-02	X-ray
6.26069e-03	9.479e-02	X-ray
6.98190e-03	7.901e-02	X-ray
7.35101e-03	1.600e-02	X-ray
8.10032e-03	1.380e-02	X-ray

4.23559e-02	5.160e-02	X-ray
4.30603e-02	9.278e-02	X-ray
4.37992e-02	2.372e-01	X-ray
4.45546e-02	4.251e-01	X-ray
4.80000e-02	1.175e-02	Gamma
4.87612e-02	1.824e-02	X-ray
5.03066e-02	4.348e-02	X-ray
5.04632e-02	8.410e-02	X-ray
5.17791e-02	1.849e-02	X-ray
5.89000e-02	7.218e-02	Gamma
1.59590e-01	1.652e-01	Gamma
2.35400e-01	4.235e-02	Gamma
2.77200e-01	8.471e-02	Gamma
2.83290e-01	5.965e-01	Gamma
3.44260e-01	2.009e-01	Gamma
3.51700e-01	1.823e-02	Gamma
3.85900e-01	3.288e-02	Gamma
4.11100e-01	1.817e-01	Gamma
4.71900e-01	1.184e-01	Gamma
5.11000e-01	2.439e-02	Annihilation photon
5.19400e-01	4.723e-02	Gamma
5.26800e-01	1.644e-02	Gamma
5.32600e-01	4.304e-02	Gamma
5.86200e-01	1.375e-02	Gamma
6.47400e-01	4.304e-02	Gamma
7.26000e-01	3.169e-02	Gamma
1.10620e+00	2.810e-02	Gamma
1.16690e+00	3.707e-02	Gamma
1.68638e-05	1.394e-01	Auger electron
1.73725e-05	7.975e-01	Auger electron
1.13380e-04	9.331e-01	Auger electron
1.21985e-04	6.138e+00	Auger electron
1.23645e-04	7.674e-02	Auger electron
1.34554e-04	3.813e-01	Auger electron
1.82328e-04	1.458e-01	Auger electron
1.99132e-04	9.709e-01	Auger electron
5.72363e-04	2.939e-02	Auger electron
6.03927e-04	1.755e-01	Auger electron

8.97955e-04	3.143e-01	Auger electron
9.61284e-04	2.091e+00	Auger electron
1.07582e-03	2.134e-02	Auger electron
1.13645e-03	1.188e-01	Auger electron
4.77225e-03	1.156e-01	Auger electron
4.96923e-03	7.489e-01	Auger electron
5.92833e-03	4.053e-02	Auger electron
6.17680e-03	2.619e-01	Auger electron
6.84001e-03	6.377e-01	Conversion electron
7.41840e-03	2.302e-02	Auger electron
3.58945e-02	3.530e-02	Auger electron
3.93269e-02	2.530e-02	Conversion electron
4.25487e-02	1.756e-02	Auger electron
5.02269e-02	8.525e-02	Conversion electron
5.73032e-02	2.052e-02	Conversion electron
1.07530e-01	1.852e-01	Conversion electron
1.50917e-01	1.985e-02	Conversion electron
1.51329e-01	2.031e-01	Conversion electron
1.52085e-01	1.504e-01	Conversion electron
1.57993e-01	9.193e-02	Conversion electron
1.59590e-01	2.421e-02	Conversion electron
2.31230e-01	3.334e-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