



Dy-153 (5.4h) CB+A	Dy-154 (3.0E+6y) A	Dy-155 (9.9h) ECB+	Dy-156 (STABLE)	Dy-157 (8.14h)	Dy-158 (STABLE)	Dy-159 (144.4d) EC	Dy-160 (STABLE)	Dy-161 (STABLE)
Tb-152 (17.5h) CB+	Tb-153 (2.34d) ECB+	Tb-154 (21.5h) ECB+	Tb-155 (5.35d) EC	Tb-156 (5.35d) EC	Tb-157 (7.1h) EC	Tb-158 (180y) ECB-	Tb-159 (STABLE)	Tb-160 (72.3d) B-
Gd-151 (124d) CA	Gd-152 (1.08E+14y) A	Gd-153 (240.4d) EC	Gd-154 (STABLE)	Gd-155 (STABLE)	Gd-156 (STABLE)	Gd-157 (STABLE)	Gd-158 (STABLE)	Gd-159 (18.479h) B-

TERBIUM-156

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Tb-156
Atomic number (Z): 65
Mass number (A): 156
Neutron number (N): 91

RADIOACTIVE DECAY

Decay modes: Electron capture
Half-life: 5.35 [d]
Decay constant: 1.4995×10^{-6} [1/s]
Daughters: Gd-156 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.08351 [MeV]
Mean photon energy: 1.93705 [MeV]
Air kerma rate constant, Γ_{10} : 6.929×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 6.929×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 1.338×10^{-14} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy $\cdot$ kg/Bq $\cdot$ s]

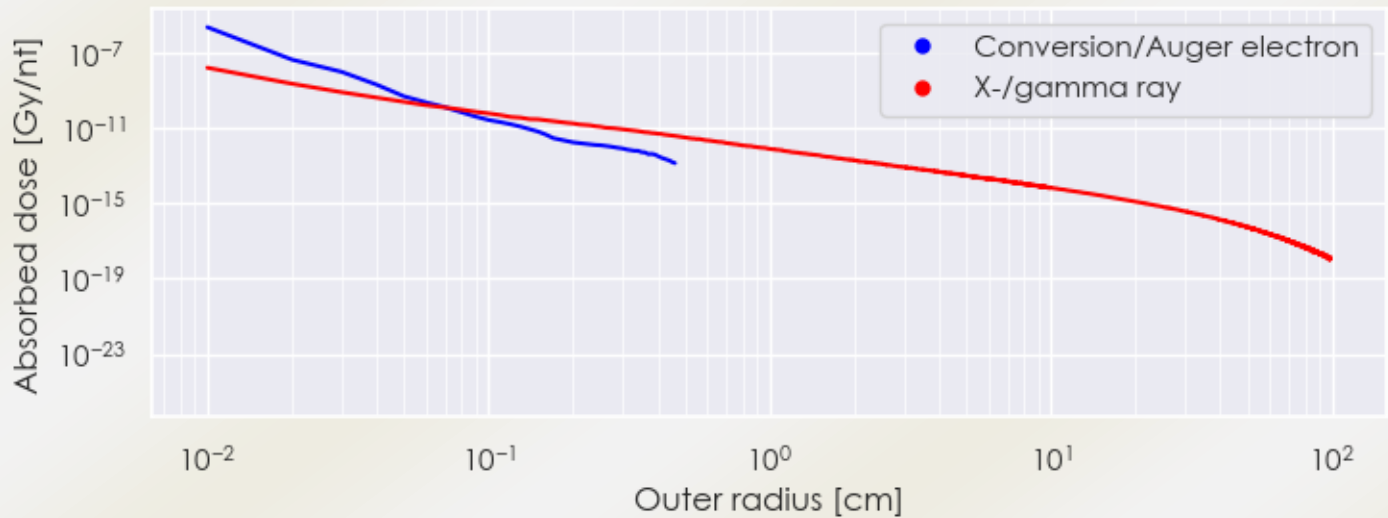
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-, \beta+, e-}$: 1.338×10^{-14} [Gy · kg/Bq · s]

Equilibrium dose constant for photons, Δ_p : 3.104×10^{-13} [Gy · kg/Bq · s]

DOSE POINT KERNELS (PLOT)

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

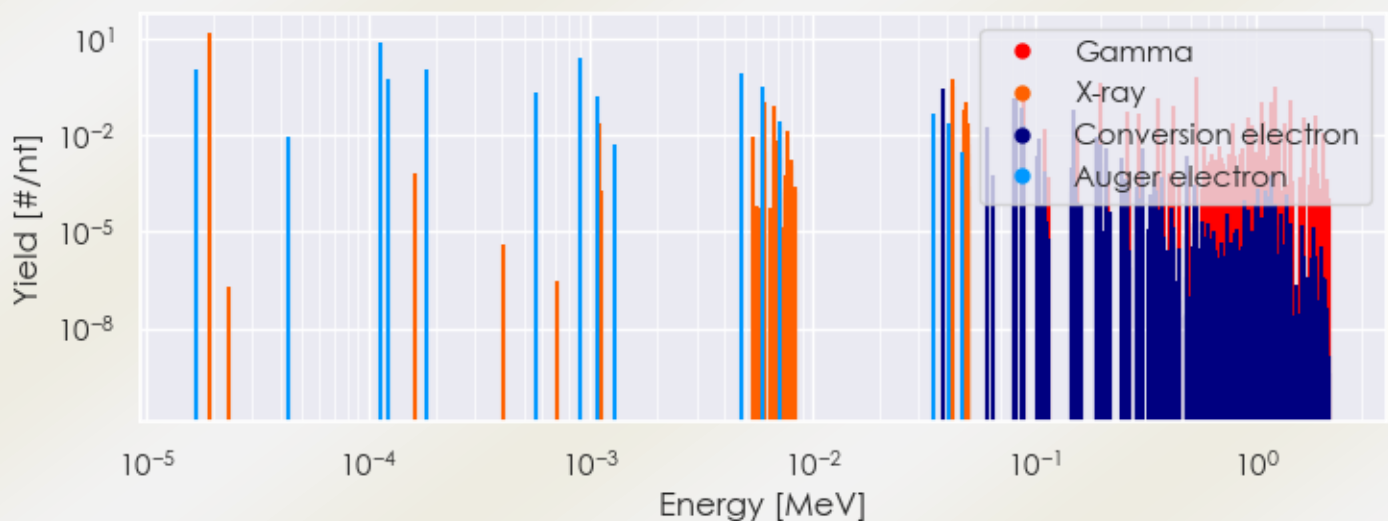
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Tb-156 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-156 Summary 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-156 Summary Spectrum.csv

Energy [MeV]	Yield [# /nt] if > 0.01	Radiation type
1.94289e-05	1.622e+01	X-ray
1.09465e-03	2.484e-02	X-ray
6.01111e-03	1.264e-02	X-ray
6.04290e-03	1.118e-01	X-ray
6.71540e-03	7.985e-02	X-ray
7.08639e-03	1.901e-02	X-ray
7.78484e-03	1.402e-02	X-ray
4.23559e-02	3.195e-01	X-ray
4.30603e-02	5.745e-01	X-ray
4.86161e-02	5.838e-02	X-ray
4.87612e-02	1.129e-01	X-ray
4.99916e-02	1.283e-02	X-ray
5.00239e-02	2.490e-02	X-ray
8.89700e-02	1.767e-01	Gamma
1.11930e-01	1.488e-02	Gamma
1.55150e-01	1.581e-02	Gamma
1.99190e-01	4.092e-01	Gamma
2.62540e-01	5.766e-02	Gamma
2.96490e-01	4.464e-02	Gamma
3.56380e-01	1.361e-01	Gamma
4.22340e-01	7.955e-02	Gamma
5.34290e-01	6.659e-01	Gamma
7.80080e-01	2.325e-02	Gamma
9.25680e-01	3.410e-02	Gamma
9.49080e-01	1.609e-02	Gamma
9.59660e-01	1.962e-02	Gamma
1.03776e+00	1.045e-02	Gamma

1.06511e+00	1.077e-01	Gamma
1.06715e+00	2.812e-02	Gamma
1.15407e+00	1.037e-01	Gamma
1.15903e+00	7.248e-02	Gamma
1.22244e+00	3.100e-01	Gamma
1.26660e+00	1.073e-02	Gamma
1.33446e+00	2.539e-02	Gamma
1.42167e+00	1.223e-01	Gamma
1.64624e+00	3.782e-02	Gamma
1.84545e+00	4.123e-02	Gamma
2.01445e+00	1.122e-02	Gamma
1.68638e-05	1.088e+00	Auger electron
1.13408e-04	7.295e+00	Auger electron
1.23241e-04	6.025e-01	Auger electron
1.83174e-04	1.138e+00	Auger electron
5.63340e-04	2.113e-01	Auger electron
8.98010e-04	2.468e+00	Auger electron
1.07565e-03	1.675e-01	Auger electron
4.77511e-03	9.023e-01	Auger electron
5.93064e-03	3.165e-01	Auger electron
7.12052e-03	2.749e-02	Auger electron
3.47386e-02	4.984e-02	Auger electron
3.86670e-02	2.743e-01	Conversion electron
4.11460e-02	2.468e-02	Auger electron
6.16270e-02	1.838e-02	Conversion electron
8.06202e-02	2.462e-02	Conversion electron
8.10230e-02	1.450e-01	Conversion electron
8.17273e-02	1.529e-01	Conversion electron
8.74282e-02	7.620e-02	Conversion electron
8.89700e-02	2.016e-02	Conversion electron
1.48887e-01	6.409e-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