



FD-197 (3m) CB+	FD-198 (2.4h) EC	FD-199 (90m) ECB+	FD-200 (21.5h) EC	FD-201 (9.33h) EC	FD-202 (5.25E+4y) ECA	FD-203 (51.873h) EC	FD-204 (STABLE)	FD-205 (1.53E+7y) EC
TI-196 (1.84h) CB+	TI-197 (2.84h) ECB+	TI-198 (5.3h) ECB+	TI-200 (26.1h) ECB+	TI-201 (7.2h) EC	TI-202 (12.23d) EC	TI-203 (STABLE)	TI-204 (3.78y) B-EC	TI-205 (3.78y) B-EC
Hg-195 (10.53h) CB+	Hg-196 (STABLE)	Hg-197 (64.94h) EC	Hg-198 (STABLE)	Hg-199 (STABLE)	Hg-200 (STABLE)	Hg-201 (STABLE)	Hg-202 (STABLE)	Hg-203 (46.612d) B-

THALLIUM-200

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: TI-200
Atomic number (Z): 81
Mass number (A): 200
Neutron number (N): 119

RADIOACTIVE DECAY

Decay modes: β^+ , Electron capture
Half-life: 26.1 [h]
Decay constant: 7.3770e-06 [1/s]
Daughters: Hg-200 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.04076 [MeV]
Mean photon energy: 1.31059 [MeV]
Air kerma rate constant, Γ_{10} : 5.226e-17 [Gy·m²/Bq·s]
Air kerma coefficient, K_{air} : 5.240e-17 [Gy·m²/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 6.530e-15 [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy·kg/Bq·s]

Equilibrium dose constant for betas/electrons, $\Delta_{\beta,\beta^+,e^-}$: 6.530×10^{-15} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 2.100×10^{-13} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

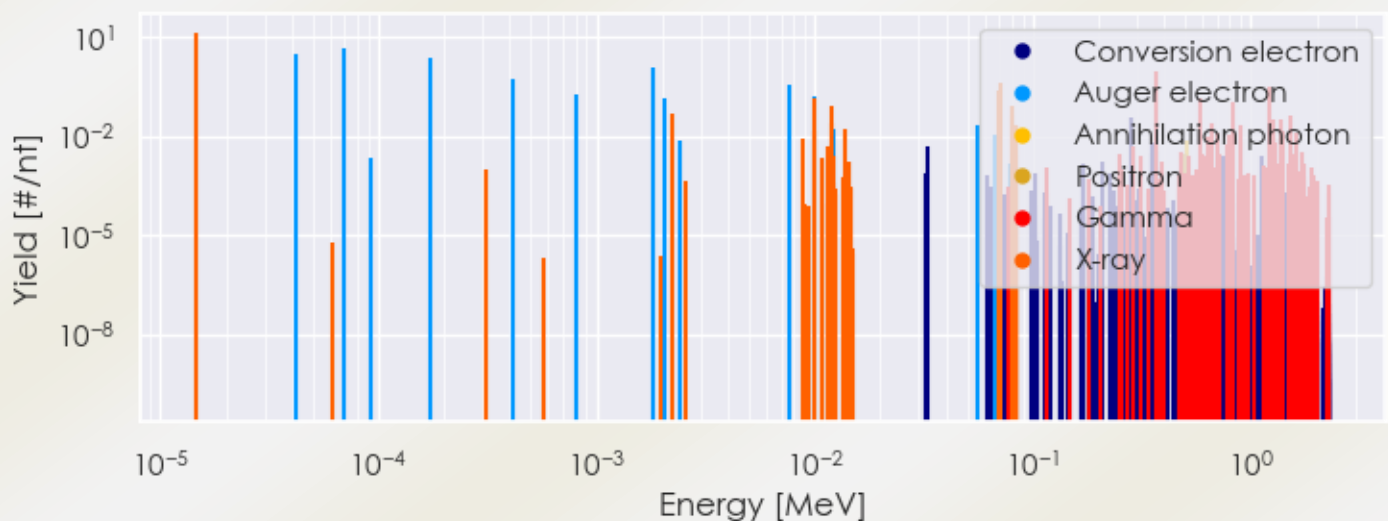
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/TI-200 DPK.csv

SUMMARY SPECTRA (PLOT)

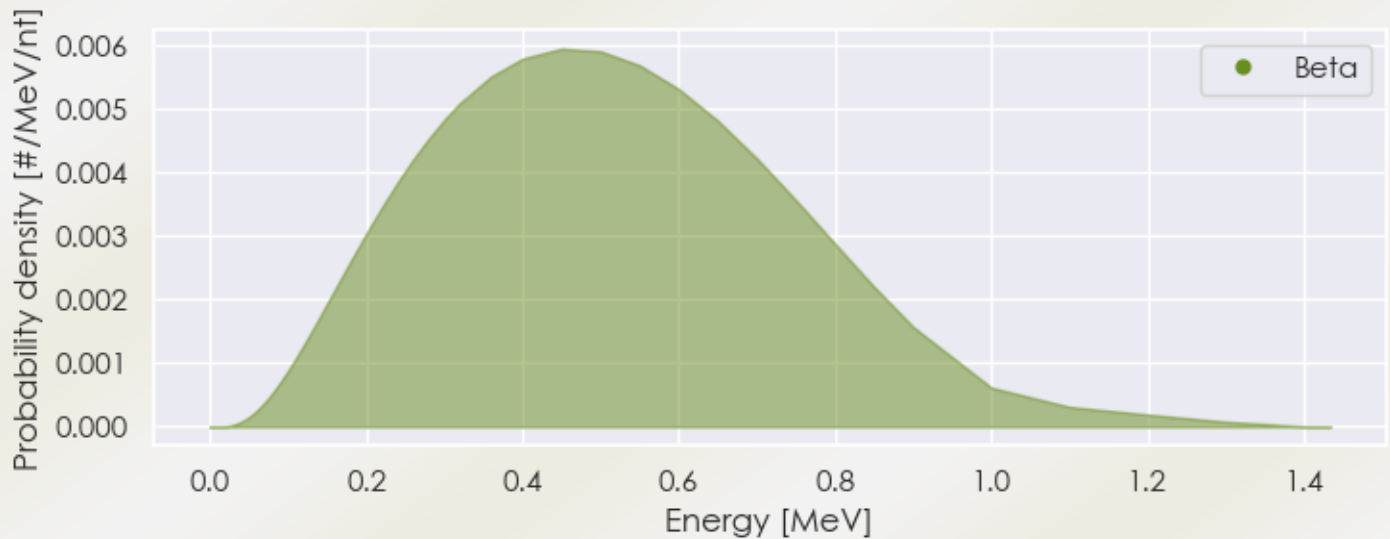
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/TI-200 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/TI-200 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/TI-200 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.47030e-05	1.404e+01	X-ray
2.22238e-03	4.593e-02	X-ray
9.89221e-03	1.520e-02	X-ray
9.98619e-03	1.339e-01	X-ray
1.18592e-02	8.409e-02	X-ray
1.19285e-02	2.527e-02	X-ray
1.38758e-02	1.680e-02	X-ray
6.90989e-02	2.359e-01	X-ray
7.10661e-02	3.998e-01	X-ray
8.00792e-02	4.417e-02	X-ray

8.05161e-02	8.548e-02	X-ray
8.26796e-02	1.041e-02	X-ray
8.27860e-02	2.039e-02	X-ray
3.67942e-01	8.720e-01	Gamma
5.79280e-01	1.378e-01	Gamma
6.28630e-01	1.003e-02	Gamma
6.61350e-01	2.276e-02	Gamma
7.01560e-01	1.291e-02	Gamma
7.87100e-01	1.029e-02	Gamma
8.28320e-01	1.081e-01	Gamma
8.86150e-01	2.023e-02	Gamma
1.20570e+00	2.991e-01	Gamma
1.22550e+00	3.357e-02	Gamma
1.27352e+00	3.314e-02	Gamma
1.36290e+00	3.401e-02	Gamma
1.40764e+00	1.448e-02	Gamma
1.51490e+00	4.011e-02	Gamma
1.60450e+00	1.168e-02	Gamma
4.20438e-05	3.179e+00	Auger electron
6.99139e-05	4.649e+00	Auger electron
1.74634e-04	2.444e+00	Auger electron
4.15540e-04	5.163e-01	Auger electron
8.14256e-04	1.717e-01	Auger electron
1.80740e-03	1.261e+00	Auger electron
2.03985e-03	1.394e-01	Auger electron
7.64815e-03	3.769e-01	Auger electron
9.85687e-03	1.611e-01	Auger electron
1.20935e-02	1.663e-02	Auger electron
5.57212e-02	2.095e-02	Auger electron
6.69357e-02	1.134e-02	Auger electron
2.84589e-01	3.409e-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