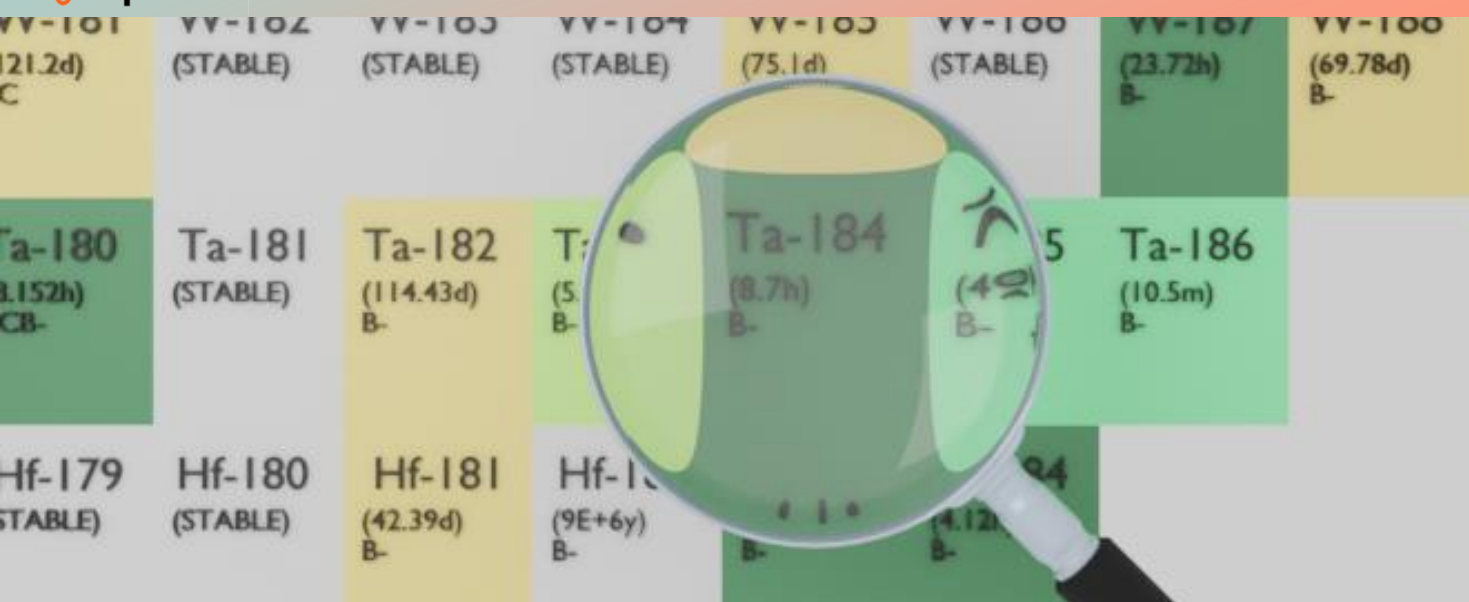




TANTALUM-184

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Ta-184
Atomic number (Z): 73
Mass number (A): 184
Neutron number (N): 111

RADIOACTIVE DECAY

Decay modes: β^-
Half-life: 8.7 [h]
Decay constant: 2.2131×10^{-5} [1/s]
Daughters: W-184 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.54255 [MeV]
Mean photon energy: 1.57267 [MeV]
Air kerma rate constant, Γ_{10} : 5.843×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 5.843×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 8.693×10^{-14} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy $\cdot$ kg/Bq $\cdot$ s]

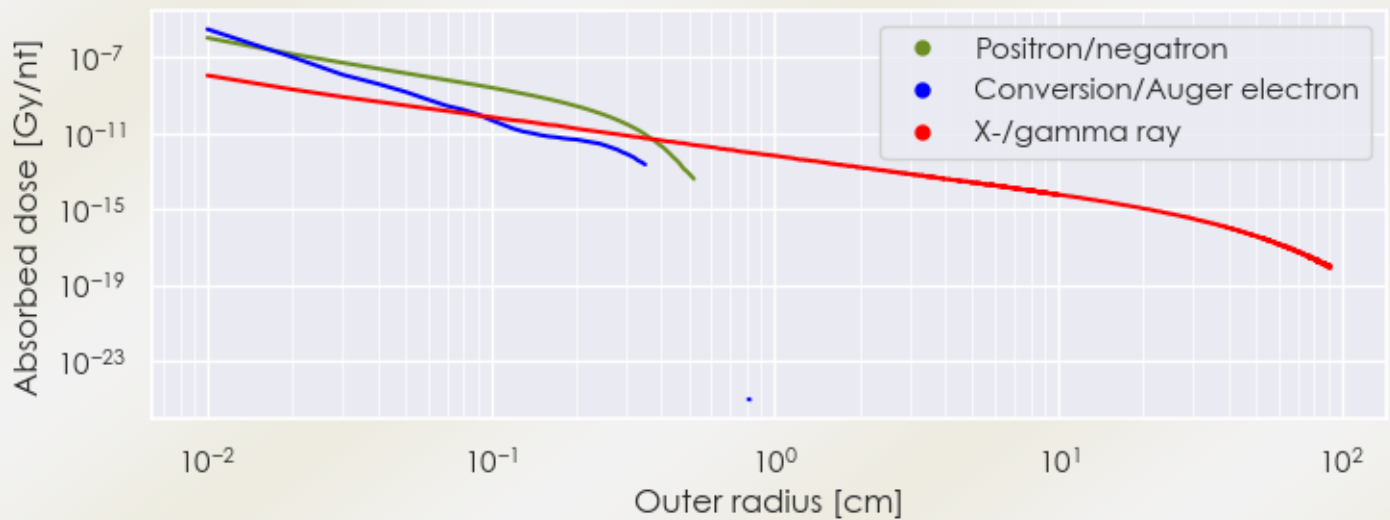
Equilibrium dose constant for betas/electrons, $\Delta_{\beta, \beta^+, e^-}$: 8.693×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 2.520×10^{-13} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

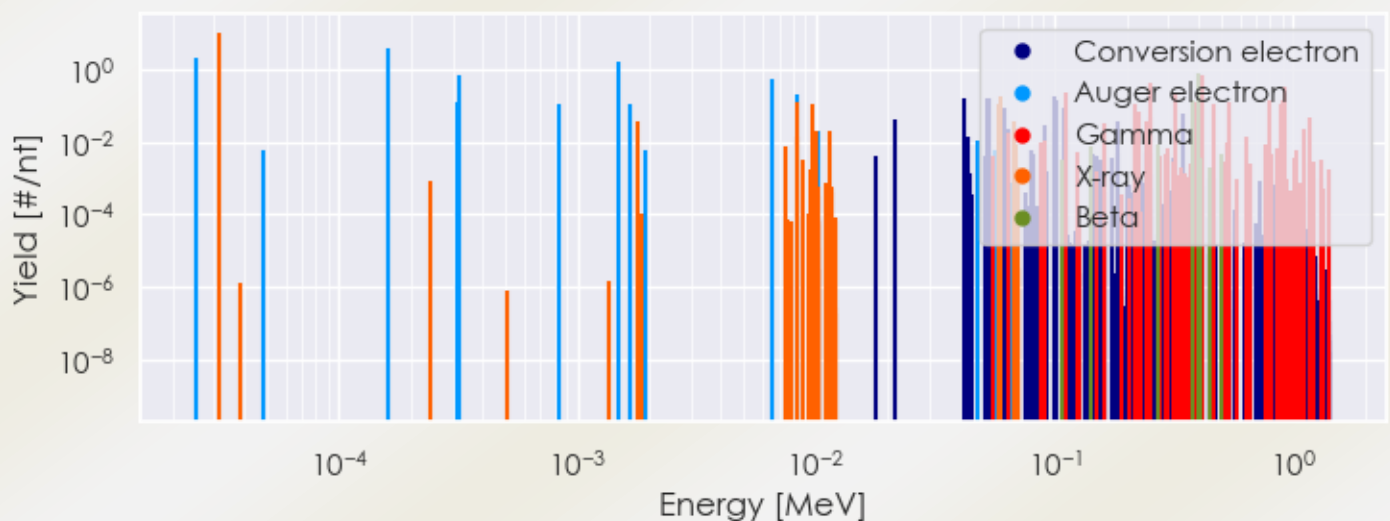
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Ta-184 DPK.csv

SUMMARY SPECTRA (PLOT)

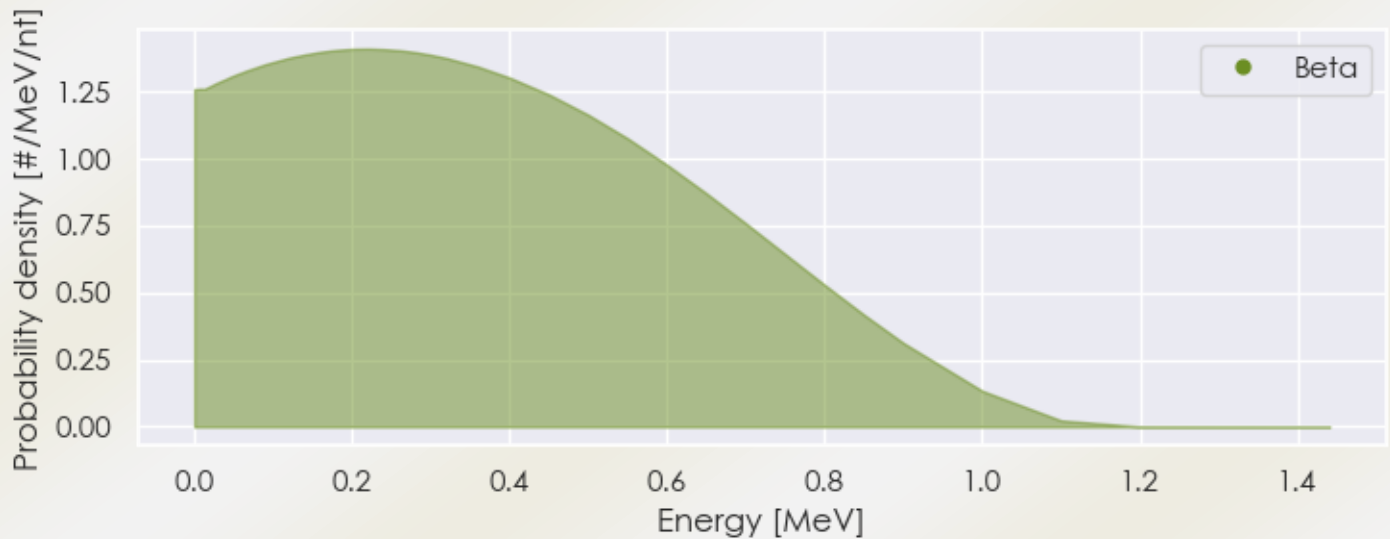
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Ta-184 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/Ta-184 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/Ta-184 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
3.13061e-05	1.067e+01	X-ray
1.77836e-03	3.939e-02	X-ray
8.32492e-03	1.371e-02	X-ray
8.38982e-03	1.210e-01	X-ray
9.69189e-03	1.150e-01	X-ray
9.95867e-03	2.146e-02	X-ray
1.13129e-02	2.140e-02	X-ray
5.81161e-02	1.063e-01	X-ray
5.94830e-02	1.845e-01	X-ray
6.37000e-02	1.710e-02	Gamma

6.71212e-02	1.984e-02	X-ray
6.74178e-02	3.835e-02	X-ray
9.12700e-02	1.033e-02	Gamma
1.11192e-01	2.369e-01	Gamma
1.61270e-01	3.168e-02	Gamma
1.62000e-01	1.656e-02	Gamma
2.15340e-01	1.138e-01	Gamma
2.16540e-01	1.728e-02	Gamma
2.26740e-01	6.624e-02	Gamma
2.44440e-01	3.528e-02	Gamma
2.52850e-01	4.320e-01	Gamma
2.53000e-01	4.896e-02	Gamma
3.18040e-01	2.282e-01	Gamma
3.84280e-01	1.246e-01	Gamma
4.14010e-01	7.200e-01	Gamma
4.61060e-01	1.066e-01	Gamma
5.36710e-01	1.274e-01	Gamma
6.41990e-01	1.404e-02	Gamma
7.92070e-01	1.454e-01	Gamma
8.94770e-01	1.066e-01	Gamma
9.03290e-01	1.498e-01	Gamma
9.20930e-01	3.197e-01	Gamma
1.11012e+00	2.232e-02	Gamma
1.17377e+00	4.752e-02	Gamma
3.80418e-01	1.473e-01	Beta
3.99165e-01	8.233e-01	Beta
2.53339e-05	2.111e+00	Auger electron
1.61609e-04	3.637e+00	Auger electron
3.13858e-04	1.261e-01	Auger electron
3.19661e-04	7.132e-01	Auger electron
8.31802e-04	1.120e-01	Auger electron
1.47503e-03	1.679e+00	Auger electron
1.66246e-03	1.084e-01	Auger electron
6.57648e-03	5.343e-01	Auger electron
8.33420e-03	2.053e-01	Auger electron
1.01209e-02	1.964e-02	Auger electron
2.15810e-02	4.248e-02	Conversion electron
4.15030e-02	1.697e-01	Conversion electron

4.32530e-02	1.339e-02	Conversion electron
4.71853e-02	1.115e-02	Auger electron
5.21270e-02	1.667e-01	Conversion electron
5.34940e-02	1.699e-01	Conversion electron
6.14288e-02	8.646e-02	Conversion electron
6.37000e-02	2.390e-02	Conversion electron
9.15810e-02	2.809e-02	Conversion electron
9.91150e-02	1.823e-02	Conversion electron
9.96190e-02	1.717e-01	Conversion electron
1.00986e-01	1.487e-01	Conversion electron
1.08921e-01	8.595e-02	Conversion electron
1.11192e-01	2.392e-02	Conversion electron
1.83161e-01	3.890e-02	Conversion electron
3.44321e-01	5.801e-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