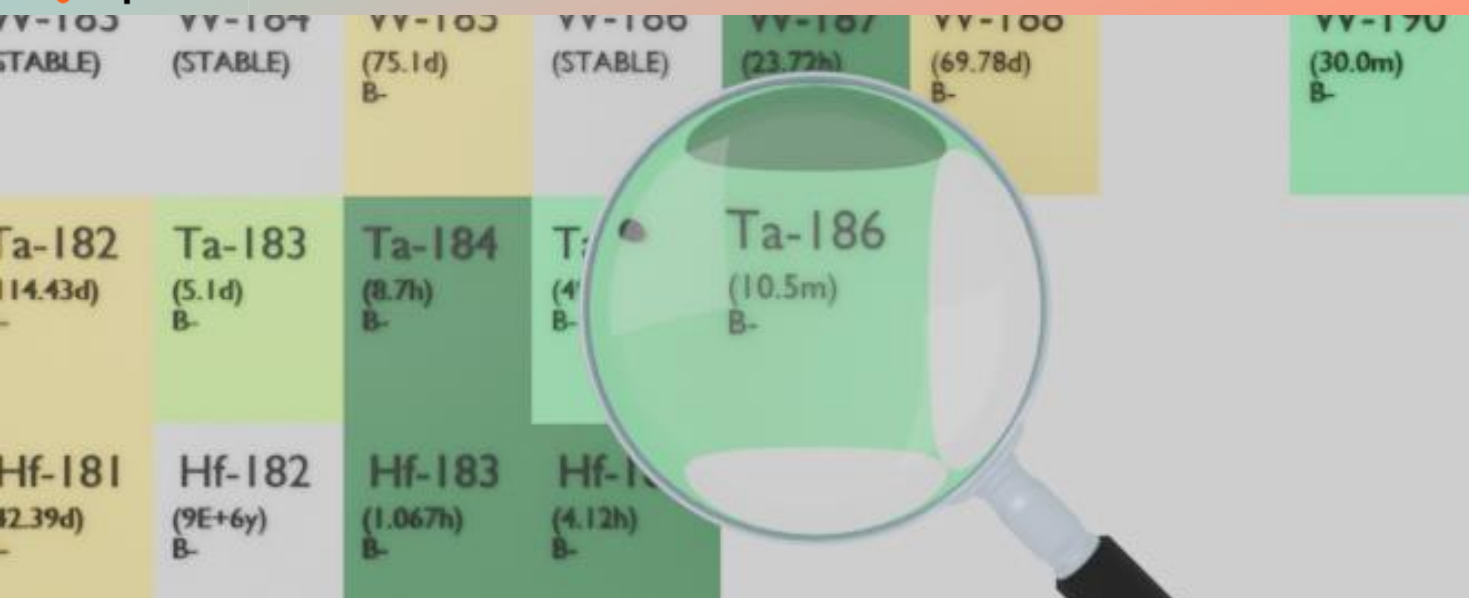




TANTALUM-186

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Ta-186
Atomic number (Z): 73
Mass number (A): 186
Neutron number (N): 113

RADIOACTIVE DECAY

Decay modes: β^-
Half-life: 10.5 [m]
Decay constant: 1.1002×10^{-3} [1/s]
Daughters: W-186 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 1.07104 [MeV]
Mean photon energy: 1.42016 [MeV]
Air kerma rate constant, Γ_{10} : 5.241×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 5.241×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 1.716×10^{-13} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000×10^0 [Gy $\cdot$ kg/Bq $\cdot$ s]

Equilibrium dose constant for betas/electrons, $\Delta_{\beta,\beta^+,e^-}$: 1.716×10^{-13} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 2.275×10^{-13} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

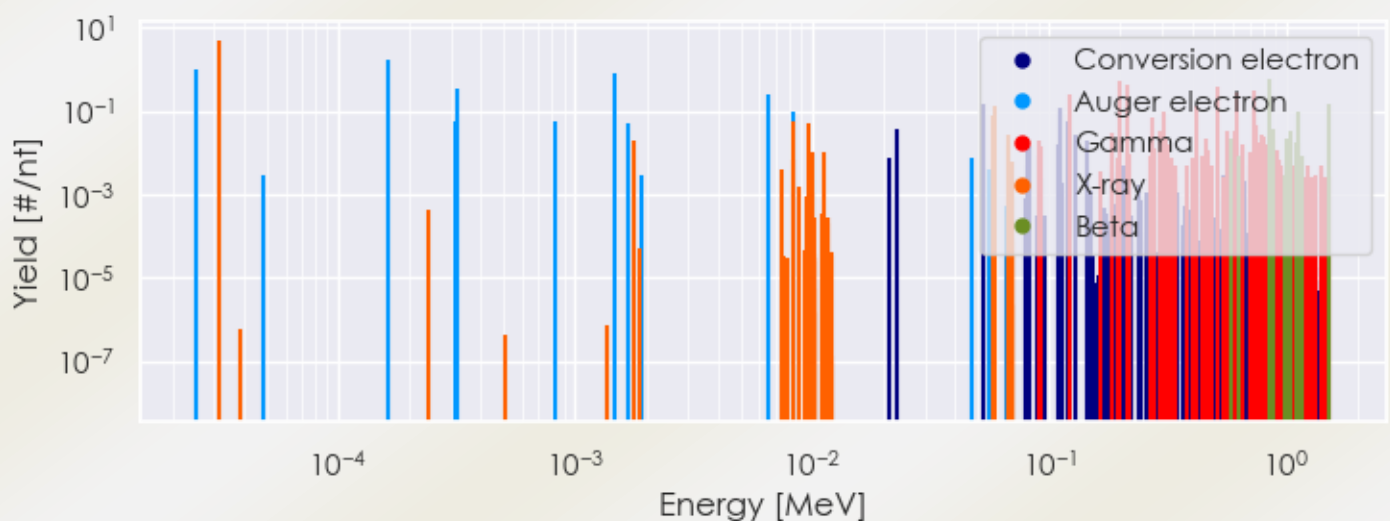
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Ta-186 DPK.csv

SUMMARY SPECTRA (PLOT)

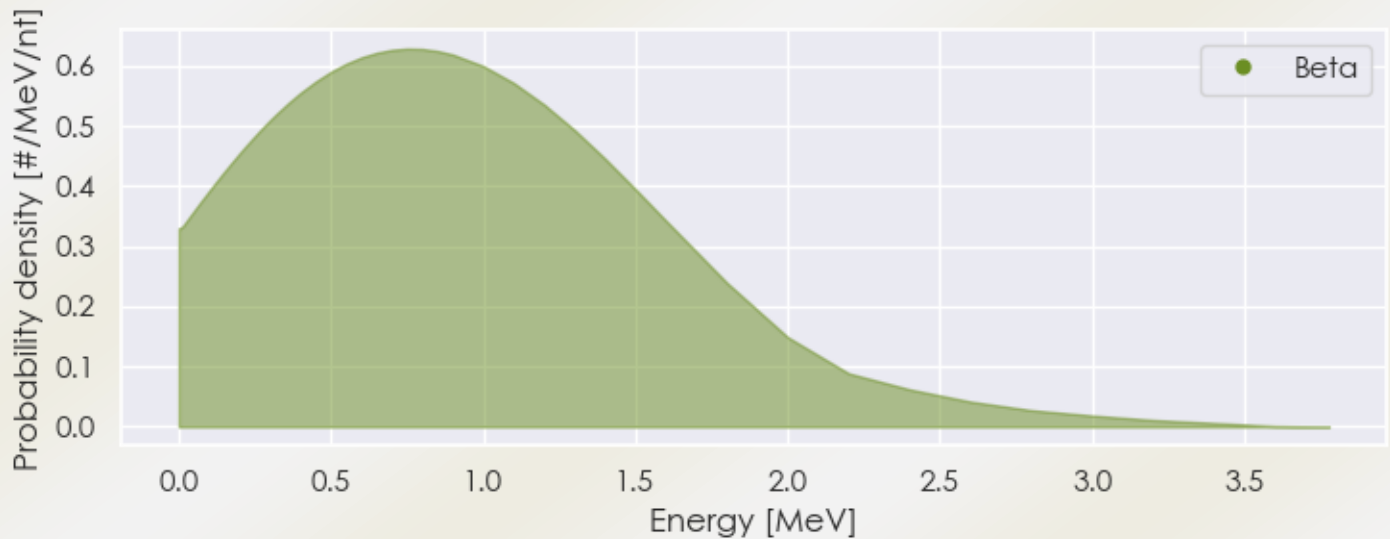
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Ta-186 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-186 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-186 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
3.13083e-05	4.968e+00	X-ray
1.77803e-03	1.837e-02	X-ray
8.38982e-03	5.735e-02	X-ray
9.69189e-03	5.235e-02	X-ray
9.95867e-03	1.017e-02	X-ray
5.81161e-02	7.356e-02	X-ray
5.94830e-02	1.277e-01	X-ray
6.71212e-02	1.373e-02	X-ray
6.74178e-02	2.654e-02	X-ray
9.10000e-02	1.850e-02	Gamma

9.27000e-02	1.400e-02	Gamma
1.22300e-01	2.500e-01	Gamma
1.83200e-01	3.000e-02	Gamma
1.97900e-01	5.000e-01	Gamma
2.14900e-01	4.250e-01	Gamma
2.74200e-01	6.750e-02	Gamma
2.77000e-01	1.250e-02	Gamma
2.92500e-01	3.350e-02	Gamma
3.07500e-01	9.650e-02	Gamma
3.09200e-01	2.250e-02	Gamma
3.15600e-01	1.500e-02	Gamma
4.17700e-01	1.250e-01	Gamma
4.57000e-01	2.150e-02	Gamma
4.65000e-01	1.100e-02	Gamma
5.10600e-01	3.750e-01	Gamma
5.67200e-01	3.350e-02	Gamma
5.83200e-01	1.100e-02	Gamma
6.10500e-01	3.400e-02	Gamma
6.15300e-01	2.800e-01	Gamma
6.54900e-01	1.500e-02	Gamma
6.58400e-01	1.250e-02	Gamma
7.07000e-01	1.000e-02	Gamma
7.09000e-01	1.000e-02	Gamma
7.26000e-01	1.000e-02	Gamma
7.37500e-01	2.900e-01	Gamma
7.39200e-01	1.000e-01	Gamma
7.40500e-01	4.500e-02	Gamma
7.59400e-01	1.750e-02	Gamma
7.83340e-01	2.800e-02	Gamma
7.99800e-01	2.400e-02	Gamma
8.30000e-01	1.500e-02	Gamma
8.84100e-01	1.950e-02	Gamma
9.23000e-01	1.150e-02	Gamma
5.89342e-01	2.174e-02	Beta
8.50485e-01	5.482e-01	Beta
8.64738e-01	1.087e-02	Beta
8.73938e-01	2.363e-02	Beta
8.90452e-01	3.686e-02	Beta

9.98772e-01	2.174e-02	Beta
1.04005e+00	3.308e-02	Beta
1.11127e+00	1.796e-02	Beta
1.12107e+00	9.451e-02	Beta
1.13455e+00	1.512e-02	Beta
1.53222e+00	1.512e-01	Beta
2.53385e-05	9.823e-01	Auger electron
1.61576e-04	1.692e+00	Auger electron
3.13689e-04	5.857e-02	Auger electron
3.19093e-04	3.304e-01	Auger electron
8.19314e-04	5.318e-02	Auger electron
1.47449e-03	7.829e-01	Auger electron
1.66141e-03	5.050e-02	Auger electron
6.56720e-03	2.500e-01	Auger electron
8.32445e-03	9.600e-02	Auger electron
2.30110e-02	3.523e-02	Conversion electron
5.26110e-02	1.462e-01	Conversion electron
8.11270e-02	1.509e-02	Conversion electron
8.24940e-02	1.361e-02	Conversion electron
1.10223e-01	1.563e-02	Conversion electron
1.10727e-01	1.173e-01	Conversion electron
1.12094e-01	9.826e-02	Conversion electron
1.20029e-01	5.861e-02	Conversion electron
1.22300e-01	1.634e-02	Conversion electron
1.28211e-01	2.676e-02	Conversion electron
1.45211e-01	1.852e-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