



Ta-170 (6.76m) ECB+	Ta-171 (3.18h) EC	Ta-172 (1.1h) EC	Ta-173 (3.14h) ECB+	Ta-174 (1.1h) EC	Ta-175 (10.5h) ECB+	Ta-176 (8.09h) ECB+	Ta-177 (56.56h) EC
Hf-169 (3.24m) ECB+	Hf-170 (16.01h) EC	Hf-171 (23.6m) ECB+	Hf-172 (2.0E+15y) A	Hf-173 (2.0E+15y) A	Hf-174 (2.0E+15y) A	Hf-175 (70d) EC	Hf-176 (STABLE)

TANTALUM-173

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Ta-173
Atomic number (Z): 73
Mass number (A): 173
Neutron number (N): 100

RADIOACTIVE DECAY

Decay modes: β^+ , Electron capture
Half-life: 3.14 [h]
Decay constant: 6.1319e-05 [1/s]
Daughters: Hf-173 (100.0%)
Radioactive daughters: Hf-173

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.16864 [MeV]
Mean photon energy: 0.5824 [MeV]
Air kerma rate constant, Γ_{10} : 1.825e-17 [Gy·m²/Bq·s]
Air kerma coefficient, K_{air} : 2.231e-17 [Gy·m²/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 2.702e-14 [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy·kg/Bq·s]

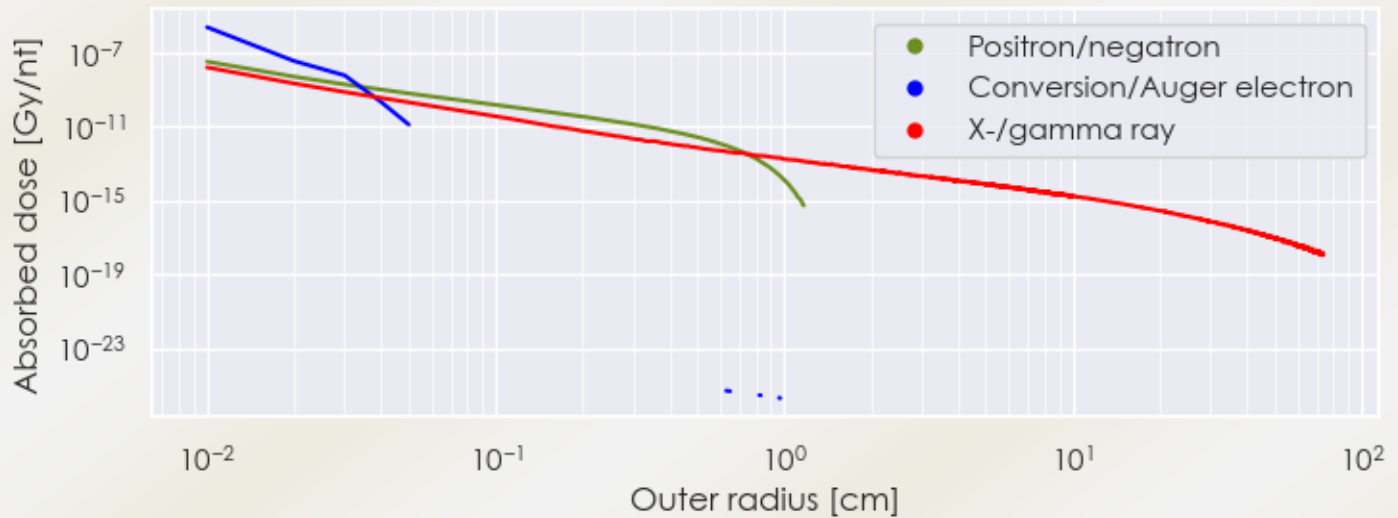
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-, \beta+, e-}$: 2.702×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 9.331×10^{-14} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

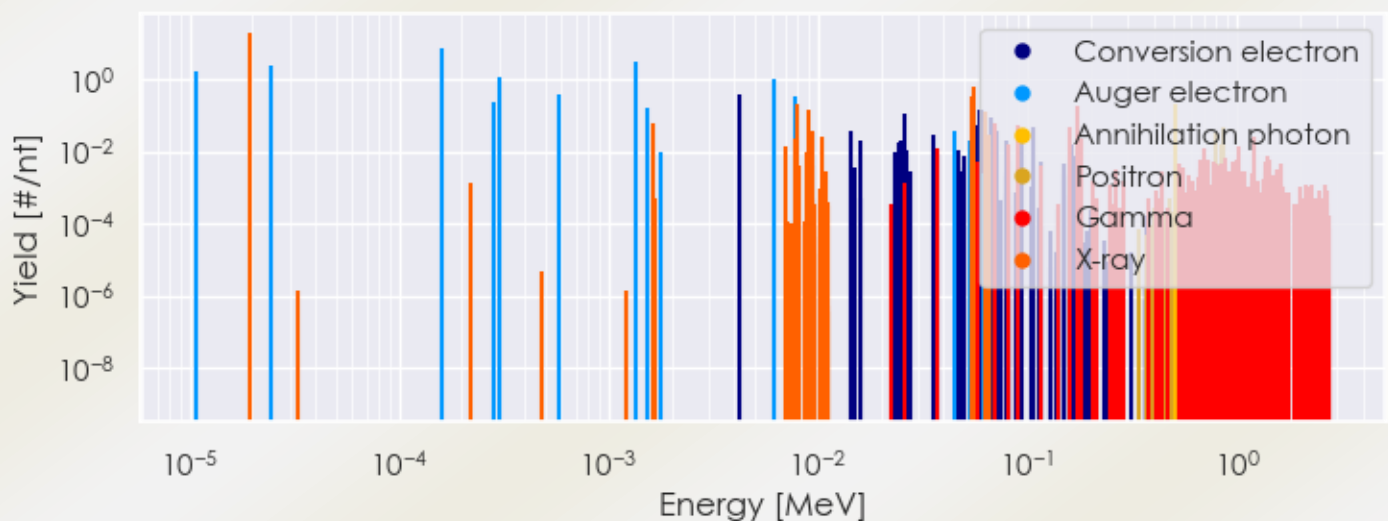
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Ta-173 DPK.csv

SUMMARY SPECTRA (PLOT)

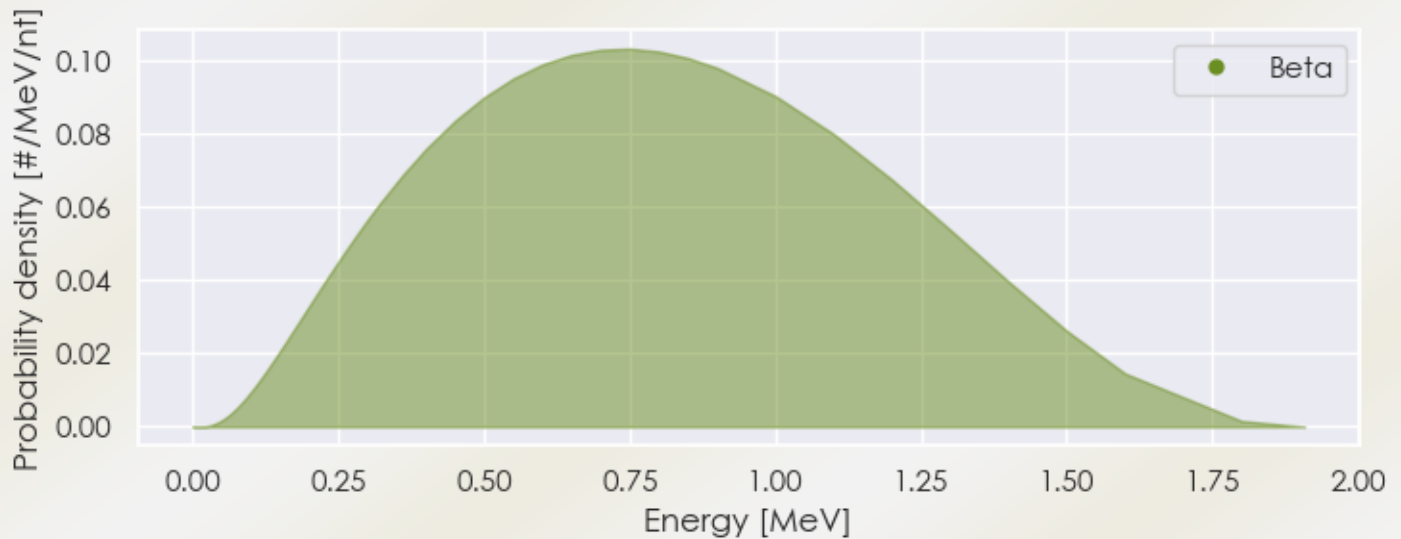
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Ta-173 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-173 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-173 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.93957e-05	1.966e+01	X-ray
1.63807e-03	5.923e-02	X-ray
6.98230e-03	1.375e-02	X-ray
7.83281e-03	2.276e-02	X-ray
7.88959e-03	2.008e-01	X-ray
9.03750e-03	1.401e-01	X-ray
9.14599e-03	1.161e-02	X-ray
9.34358e-03	3.490e-02	X-ray
1.05374e-02	2.549e-02	X-ray
3.74000e-02	1.243e-02	Gamma

5.47191e-02	3.441e-01	X-ray
5.59237e-02	6.020e-01	X-ray
6.31238e-02	6.408e-02	X-ray
6.33831e-02	1.239e-01	X-ray
6.50467e-02	1.441e-02	X-ray
6.51063e-02	2.790e-02	X-ray
6.97000e-02	5.950e-02	Gamma
8.15000e-02	1.470e-02	Gamma
9.03000e-02	5.040e-02	Gamma
1.60400e-01	4.900e-02	Gamma
1.72200e-01	1.750e-01	Gamma
1.80600e-01	2.223e-02	Gamma
5.11000e-01	2.099e-01	Annihilation photon
7.00600e-01	1.155e-02	Gamma
1.03000e+00	1.418e-02	Gamma
1.20820e+00	2.678e-02	Gamma
7.87332e-01	3.409e-02	Positron
8.47286e-01	1.542e-02	Positron
8.63966e-01	4.668e-02	Positron
1.08310e-05	1.717e+00	Auger electron
2.44615e-05	2.431e+00	Auger electron
1.59777e-04	6.843e+00	Auger electron
2.84000e-04	2.169e-01	Auger electron
3.03417e-04	1.163e+00	Auger electron
5.79373e-04	3.626e-01	Auger electron
1.36408e-03	2.971e+00	Auger electron
1.54262e-03	1.563e-01	Auger electron
4.21800e-03	3.635e-01	Conversion electron
6.17893e-03	9.467e-01	Auger electron
7.80075e-03	3.514e-01	Auger electron
9.45366e-03	3.290e-02	Auger electron
1.44550e-02	3.710e-02	Conversion electron
1.60180e-02	1.891e-02	Conversion electron
2.46180e-02	1.735e-02	Conversion electron
2.48180e-02	1.929e-02	Conversion electron
2.61550e-02	1.084e-01	Conversion electron
2.66370e-02	1.121e-02	Conversion electron
3.53010e-02	2.774e-02	Conversion electron

4.45281e-02	3.815e-02	Auger electron
4.68050e-02	1.129e-02	Conversion electron
5.31026e-02	1.975e-02	Auger electron
5.84550e-02	5.212e-02	Conversion electron
5.89370e-02	1.432e-01	Conversion electron
6.01417e-02	1.424e-01	Conversion electron
6.76010e-02	8.331e-02	Conversion electron
6.97000e-02	2.276e-02	Conversion electron
7.07370e-02	3.774e-02	Conversion electron
7.19417e-02	3.691e-02	Conversion electron
7.94010e-02	1.923e-02	Conversion electron
9.49180e-02	3.480e-02	Conversion electron
1.06718e-01	4.408e-02	Conversion electron
1.61437e-01	1.475e-02	Conversion electron
1.62642e-01	1.121e-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